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The Language and Cross-Cultural Perceptions of Deception

Brent Logan Laing

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Arts

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ABSTRACT

The Language and Cross-Cultural Perceptions of Deception

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Master of Arts

While much research has shown that some linguistic features can indicate a person is lying, this line of research has led to conflicting results. Furthermore, very little research has been done to verify that these supposed linguistic features of deception are universal. In addition, few studies have researched the cross-cultural perceptions of deception, which knowledge could greatly improve the detection of deception across cultures. The current study addresses these gaps in the literature by analyzing and comparing truthful and deceptive discourse of eight native English-speaking Americans and eight non-native English-speaking Ghanaians. The discourse was elicited in one-on-one interviews where each interviewee spontaneously responded to questions about themselves. Later, interviewee responses were judged by 47 native English-speaking Americans and 35 non-native English-speaking Ghanaians. The results showed that Americans and Ghanaians lie differently—Americans' lies were more superfluous and redundant; had more pronoun inconsistencies, adjectives, adverbs, and modal verbs; and had fewer negative emotion words than their truths. Ghanaians' lies, on the other hand, also had more pronoun inconsistencies but had fewer negations than their truths. Furthermore, the groups' baseline speech differed in superfluousness, positive emotion words, word count, and response latency. Regarding detecting deception, Ghanaians were slightly more accurate and significantly more confident in detecting lies than Americans. Both groups were slightly more accurate and confident in judging the veracity of statements within their own cultures. Neither group, however, demonstrated truth- or lie-bias cross-culturally. These results have implications for law enforcement investigators and analysts who can learn the differences between Americans' and Ghanaians' truthful and deceptive speech so as to more accurately detect deception through language. In addition, cross-cultural deception perception research can improve cross-cultural communication and understanding.

Key words: deception, deception detection, linguistic features of deception, forensic linguistics, law enforcement, interrogation, cross-cultural perception, cross-cultural communication, Ghanaians

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Chapter 1

Introduction

Many have wondered whether there really is a way to detect deception. Over the past few decades, researchers have worked to answer this question. Ekman (2003) ascertains that lying can be detected by carefully paying attention to facial expressions and body language. Ekman (2003:15) coins the term MICRO EXPRESSION, which he explains are facial expressions that last shorter than a fifth of a second. These expressions are so brief because they are being suppressed. The micro expression thus reveals emotions that the individual is trying to conceal, (*see* Izard 1994; Ekman et al. 1987, 2009; ten Brinke et al. 2012). With this ability, Ekman (2003) explains that one can more accurately detect whether or not someone is lying based on the expressions or micro expressions on the speaker's face. Supporting this, ten Brinke et al. (2012:412) state that deception often consists of an utterance together with unfelt emotions or the masking of honest emotions. Therefore, if the sentiment of the language being used does not match the expression—or lack thereof—on the speaker's face, which expression indicates how the speaker truly feels, then he or she is most likely lying. Interestingly, Ekman et al. (1987) illustrates that micro expressions are made and interpreted the same way universally (*see also* Izard 1994; Ekman 1994, 2003, 2009).

If there are methods of detecting lies through reading nonverbal behavior, is there a way to detect lies through analyzing verbal behavior? Much research has attempted to answer this question, providing evidence of several linguistic features as characteristic of lying. However, several studies have provided conflicting results on the matter, presenting the first problem addressed in this study (*see* Knapp et al. 1974, Todd 1977, Ebesu & Miller 1994, Walczyk et al. 2003, Zhou et al. 2003, Zhou et al. 2004, Walczyk 2009, Duran et al. 2010, Hauch 2012). Also,

contrary to micro expressions being universally consistent, little has been done to discover whether supposed linguistic features of deception are also universal. Therefore, if these linguistic features are not the same cross-culturally, law enforcement personnel and analysts attempting to detect deception in non-native English speakers may be misidentifying liars and truth-tellers, which inaccuracies could have significant consequences, especially in the lives of suspected criminals. The question of the universality of linguistic features of deception comprises the second problem addressed in this thesis.

Concerning people's deception detection abilities, it has been found that people generally achieve accuracy at about the level of chance (*see* Kleinmuntz & Szucko 1982, Ekman & O'Sullivan 1991, Ekman 2003, Reinhard et al. 2013). Interestingly, Vrij et al. (2010) found that experts' abilities to detect deception were in reality no better than laypeople's. While Kassin and Fong (1999) asserted that deception detection training does not significantly improve one's accuracy, more recent research has reported that it indeed can (Vrij et al. 2015). While this has been researched within Western cultures, other research has found that deception detection is also possible across cultures, and that people actually achieve about the same level of accuracy whether they are detecting deception in their own culture or across cultures (Bond & Atoum 2000, Al-Simadi 2000). However, little has been done on this topic, covering only a few different nationalities. This is the third problem that is addressed in the current study.

Intriguing though tragic if true, Triandis (1994) insisted that the Persian Gulf War began as a result of an Iraqi official mistakenly believing that an American negotiator had lied to him. Thus, as people's perceptions govern their decision-making, it is important to understand the existing cross-cultural perceptions of deception. Several studies have shown that nervous behavior and diverted eye contact are mistakenly generally seen as deceptive cues (Bond et al.

1990, DePaulo et al. 2003, Brewer & Williams 2005). And some cultures have shown a tendency to believe those of other cultures more when judging through audio-visual means (Bond & Atoum 2000), while others have provided evidence of lie-bias across cultures (Da Silva & Leach 2013). Little research has been done, however, addressing cross-cultural perceptions of deceptive speech (audio only), and more work on cross-cultural bias in deception detection involving other cultures is needed. These issues comprise the fourth problem addressed in this thesis.

Because circumstances presented themselves for the primary researcher to travel to Ghana, this thesis considers native English-speaking Americans and non-native English speaking Ghanaians and therefore provides answers to the following research questions: (1) In the context of the present experiment, what linguistic features do Americans and Ghanaians use in deceptive speech?; (2) What linguistic differences are there, if any, between American and Ghanaian baseline speech in this context?; (3) How do the groups differ with regards to accuracy and confidence levels when detecting deception within their own culture versus across cultures?; and (4) Does either culture display cultural bias in identifying liars?

The next chapter provides a review of the literature on the topics of the linguistic features of deception and cross-cultural perceptions of deception. Following this is a detailed outline of the research design used to provide answers to the research questions. Next, the results of the experiment and data analyses are presented, followed by a discussion of the results and their implications. Finally, a conclusion of the study and its findings is given.

Chapter 2

Review of Literature

Introduction

The purpose of this thesis is to address the question of whether there is a way to detect lies in verbal behavior with a focus on the linguistic features (i.e. word choice, language structure, etc.) of deceitful communication generally and across cultures. It also sets out to provide better understanding of some cross-cultural perceptions of deception. To begin, I present two dominant theories regarding the language of deception, clarify how some of the most examined linguistic features of deception have been categorized in past studies, then explain how I will review the most examined linguistic features of deception, and finally, how these features have been examined cross-culturally.

Dominant Theories of Deception and Language

Interpersonal Deception Theory (IDT). This theory, proposed by Buller and Burgoon (1996), describes deception as a communicative activity between interlocutors in which both parties in essence collaborate in the conveyance and acceptance of deception. IDT also classifies NONIMMEDIACY—the deceiver’s psychological distancing manifest through lack of self-references, hedging, and vagueness in speech—as a phenomenon of deception.

Scientific Content Analysis (SCAN). Coined by Sapir (1987), SCAN theory states that people naturally want to tell the truth and find it extremely difficult to lie with full commitment, even though they can commit the most heinous of crimes. Therefore, deceptive language is different than truthful language, and any inconsistency or unnatural change in word choice or story sequence evidences a lie. One of Sapir’s (1987) examples of this is found in a man

describing a past car accident, deceptively referring to a non-existing car that he alleged was involved. Within the same statement, the man referred to the car as “that vehicle,” “the car,” “the vehicle,” and “the dark colored car.” SCAN suggests that this change in references for the same car is unusual, unnecessary, and therefore denotive of deceit. As this theory was for many years used for law enforcement training, it is largely the basis for deceptive language research conducted for the consultation of the Federal Bureau of Investigation (FBI) and other law enforcement agencies (Smith 2001; Adams & Jarvis 1996, 2004, 2006).

Categorizing Linguistic Features of Deception. It should also be noted that researchers take the liberty of categorizing linguistic features of deception in various ways. Advocates of IDT generally categorize the following linguistic features as all elements and manifestations of ‘nonimmediacy’: (1) a lack of or shift in self-referencing pronouns, (2) increased use of modal verbs, (3) more allness terms (‘all,’ ‘any,’ ‘always,’ ‘none,’ ‘nobody,’ etc.) and vagueness, (4) more passive verbs, and (5) more negative sentences (*see* Kuiken 1981, Buller & Burgoon 1996, Zhou 2005, Buller et al. 2006, Zhou and Zhang 2008). Furthermore, Knapp et al. (1974), discussed in this chapter, refers to modal verbs (could, should, may, might, etc.) as an element of “Certainty” and labels allness terms as “Leveling Terms,” i.e. words or phrases of over-generalization. This same study labels ‘self-references’ (‘I,’ ‘me,’ etc.) and ‘other-references’ (‘him,’ ‘her,’ ‘they,’ etc.) as linguistic elements of “dependence.” Lastly, several studies list adjectives and adverbs under the umbrella of ‘modifiers,’ (Ebesu & Miller 1994, Buller et al. 1996, Zhou et al. 2003, Ali and Levine 2008).

Linguistic Features of Deception

A great body of research examines what linguistic features are characteristic of deception, some of it founded upon the abovementioned theories. However, whether or not these features can predict deception is still open to debate, mainly because of conflicting findings. In the following sections, I present the literature from past research that both supports and refutes the claim that these features are indicative of deception. The features most discussed and those that I address here, in order from the most frequently addressed in the literature to the least, include: (1) pronouns and nouns, (2) emotion words, (3) word count, (4) vagueness and allness terms, (5) verb tense, (6) modal verbs, (7) adjectives and adverbs, (8) superfluousness and redundancy, and (9) response latency. I then also present a review for what research has been done involving the perception of detection generally and cross-culturally.

Pronouns and Nouns. One of the most talked-about linguistic features of deception in the literature involves the amount self-references in a speaker's or writer's statement (Knapp et al. 1974; Sapir 1987; Ebesu & Miller 1994; Buller et al. 1996; Adams & Jarvis 1996, 2004; Newman et al. 2003; Zhou et al. 2004; Bachenko et al. 2008; Toma & Hancock 2010; Hauch 2012). The general claim is that deceptive utterances and statements tend to exclude or limit the number of self-referencing pronouns such as 'I,' 'me,' 'my,' etc. (*see* Knapp et al. 1974, Ebesu & Miller 1994, Buller et al. 1996, Adams & Jarvis 1996, Newman et al. 2003, Zhou et al. 2004, Hancock et al. 2008, Toma & Hancock 2010, Hauch 2012). Additionally, several studies emphasize the unnatural shift in pronoun usage as a feature of deception (*see* Sapir 1987; Adams & Jarvis 1996, 2004; Bachenko et al. 2008). However, by contrast, various studies have not found the number of self-references or deviations in pronoun usage to be a significant linguistic

cue to deception (*see* Todd 1977, Porter & Yuille 1996, Ebesu & Miller 1994, Duran et al. 2010). These studies are further discussed and compared below.

Self-references. Several studies have found a reduced number of self-references as replaced by more general pronouns to be characteristic of lying in spoken language. Knapp et al. (1974) test this as a sub-feature under the umbrella of “dependence,” as mentioned above. Knapp et al. (1974) discovered this linguistic feature of deception when military veterans who were also university students were asked to argue against the notion of veterans receiving an increase in educational benefits. Knapp et al. (1974) give the following example of the “average” statement demonstrating this feature of lacking self-references:

"One (no Self Reference) cannot help but think that increased veterans' benefits should not be given to them (Other Reference) since it would not be for the good of the country (no Self-interest Statement)." (p. 19)

In this example, the pronoun ‘one’ is replacing a potential self-reference that Knapp et al. (1974) imply would seem natural. Furthermore, the researchers reason that such a lack of self-references and increase in other-references in deceptive speech evidences a deceiver’s “attempt to ‘disassociate’ themselves from their deceptive behaviors,” (Knapp et al. 1974, p.19). In light of Interpersonal Deception Theory (IDT), many researchers consider this psychological distancing as the basis of nonimmediacy (*see* Kuiken 1981, Buller & Burgoon 1996, Zhou et al. 2003, Buller et al. 2006, Zhou and Zhang 2008). Furthermore, Kuiken (1981), discussing a psychological experiment interested in people’s levels of self-regard, suggests that the participants who attempted to deceive generally seemed to have employed nonimmediacy in doing so. Kuiken (1981) mentioned the substitution of ‘you,’ referring to people in general, for the first-person singular pronoun ‘I.’ He uses the following to example to contrast:

(1) “*You usually feel shy when...*’

versus

(2) “*I usually feel shy when...*” (p. 184)

Therefore, (2) demonstrates a person’s willingness to be included in the statement rather than referring to the population at large. Substituting ‘you’ in this way is highly similar conceptually and semantically to the substituting of ‘one’ as illustrated by Knapp et al. (1974). Furthermore, Porter and Yuille (1996), citing SCAN theory, provide a similar example:

(3) “*You could see a bunch of books*”

versus

(4) “*I could see a bunch of books,*” (Porter and Yuille 1996:446)

Sapir (1987) suggests that, as this example illustrates, using other-references in the place of self-references is a deviation from what would be expected and is a common way one might remove oneself from an untruthful statement.

While the studies outlined above have researched elicited deceptive speech, other studies interestingly come to similar conclusions regarding self-referencing pronouns in deceptive speech as found in transcribed oral statements from past criminal cases (Adams & Jarvis 1996, 2004; Bachenko et al. 2008). In such texts, the speakers were speaking in real-life contexts and were obviously not participants in a laboratory setting. Adams and Jarvis’ (1996) research methodology was to analyze the discourse of texts that FBI investigators had separated into categories of true and false, and it is implied that the false statements have somehow been verified as deceptive. Adams and Jarvis (1996) highlight significant shifts in pronoun and noun usage as a linguistic feature of deception and illustrate that spoken statements that deviate from the normal use of such parts of speech should raise FBI investigators’ suspicions. The authors

explain that FBI investigators have noticed constancy in the use of the pronoun 'I' in truthful statements. On the other hand, deceivers tend to omit 'I,' showing a lack of commitment to the statement linguistically and psychologically removing themselves from it. To illustrate this point, the authors offer the following example:

"I got up at 7:00 when my alarm went off. I took a shower and got dressed. I decided to go out for breakfast. I went to the McDonald's on the corner. Met a man who lives nearby. Talked with him for a few minutes. I finished breakfast and drove to work."

(no page numbers provided)

In this example, Adams and Jarvis (1996) note the consistent use of 'I' until the fourth sentence. They suggest that the fourth and fifth sentences of this account show evidence that the speaker is lying about those respective details. The sentences containing 'I' are probably true, while the others which do not employ the pronoun are false. The authors suggest that because of the consistent use of 'I' in the first four sentences, as well as the use of it in the last sentence, it seems rather inappropriate, unexpected, and unnatural for the speaker to stop using 'I' and then start again, as there is no apparent reason for doing so. Thus, Adams and Jarvis' (1996) report informs us that FBI agents are or at least have been trained in detecting deception through searching for inconsistencies in suspects' use of the pronoun 'I.'

Bachenko et al. (2008) also contribute to the discussion using the terminology, "unnatural shifts in referential expression." They created a computational model for predicting deception by tagging linguistic features they believed were characteristic of lying. The model, also analyzing criminal statements, proved to be much more accurate than humans. One of the features included in the model is self-reference frequency. They provide an example from Scott Peterson, currently on death row for murdering his wife and unborn child:

“BROCCHINI: You drive straight home?”

“PETERSON: To the warehouse, dropped off the boat,” (p. 44)

Peterson’s no self-reference response here contrasts with the more natural, *I drove to the warehouse, and I dropped off the boat*. In harmony with Adams and Jarvis (1996), Bachenko et al. (2008) reinforce that such omissions of pronouns or first-person references should cause suspicion concerning the veracity of the statement.

While several studies have focused on deception in only spoken language, Newman et al. (2003) addressed both spoken and written language. They took this approach while also investigating a broader scope of lie type. The authors conducted five different experiments in order to acquire truthful and deceptive texts. These experiments consisted of (1) videotaped one-on-one interviews of 101 male and female undergraduate students telling their true views on abortion and then deceptively arguing for their opposing view on the same topic, (2) 44 male and female undergraduate students doing the same only via typing, (3) 55 participants of the same demographics giving hand-written arguments for both sides on the same topic, (4) 27 male and female participants speaking truthfully and lying about four people they truly like and truly dislike, and (5) a mock crime situation involving 60 participants of the same demographics who were instructed to deny stealing money when interrogated. Interestingly, Newman et al. (2003), employing the Linguistic Inquiry and Word Count (LIWC) natural language processing software, found that across all five experiments deceivers made fewer first-person singular references (‘I,’ ‘me,’ ‘my’). Here we find that the researchers acquired an exact baseline—a sample of truthful text to which the researchers can compare the same person’s deceptive text—for each response in four of the five experiments. This implies that as participants gave truthful responses first, they had time to contemplate their deceptive responses to the same items. In any case, Newman

et al. (2003) has shown that a lower count of self-references is indicative of lying within both spoken and written texts. Similarly, Zhou et al. (2004) found fewer self-references as a deceptive feature in asynchronous computer-mediated communication (CMC), Hancock et al. (2008) the same for synchronous CMC, and Toma and Hancock (2010) the same in online dating profiles.

Unlike studies mentioned thus far, Adams and Jarvis (1996) also demonstrate how the use of 'we' may reveal deception. They do this in context of 'we' being used instead of 'he...me' or another appropriate pronounal separation of the individuals involved in the context of alleged rape cases. Adams and Jarvis (1996) illustrate, for example, that if a woman is accusing a man of rape and refers to herself and him as 'we,' then further questions should be asked. The authors illustrate using the following example:

"He forced me into the woods,"

versus

"We went into the woods."

(no page numbers provided)

In the case of the latter, Adams and Jarvis (1996) explain that interrogators should ask the woman about the relationship between herself and the accused. If she claims that they were not previously involved in a relationship, then it is likely she is lying. The deviation is found in the norm that the accuser would not imply togetherness by using the self-referencing pronoun 'we' if she were telling the truth in this context. However, if the accuser was in a relationship with the alleged rapist, then such usage would be deemed as normal, at least to some degree, as the pronoun had been used frequently in the past. Furthermore, Adams and Jarvis (1996) refer to clues of deception that can be found in the inclination to use the first person plural 'we' instead of 'I.' They give the following hypothetical example of a teenager's response to a question about what he did Saturday evening:

“We all met at the movie theater, watched a movie, then stopped to get something to eat. We had a few drinks at the bar on the way home. We stayed until just after midnight. We each drove home....” (no page numbers provided)

The analysts explain that the use of ‘we’ here in a question about one individual is an indication that the responder is attempting to conceal or avoiding taking sole responsibility for the actions mentioned. Thus, Adams and Jarvis (1996) heavily illustrate instances where unnatural shifts in first-person singular and first-person plural pronouns can indicate deception.

Other-references. In addition to researching the inconsistent use and number of first-person pronouns, research has also marked inconsistency in pronouns that refer to other people or things as evidence of deception. For example, Adams and Jarvis (1996) expound for FBI investigators that if suspects replace a pronoun or possessive pronoun phrase (i.e. ‘my wife,’ ‘her cousin,’ ‘his car,’ etc.) that they have been consistently using with a different pronoun or noun, this should catch investigators’ attention. This indicates a change in the suspect’s life, and such changes are noted more frequently through nouns (*see also* Sapir 1987). As an example, the authors provide the following statement of a man who shot his wife, referring to his wife as ‘my wife’ seven times prior to changing the noun used for said referent:

“...I lost control of the gun. I sensed that the barrel was pointing in Louise's direction and I reacted by grabbing at the gun to get it back under control. When I did this the gun discharged. It went off once and I looked over and saw blood on Louise's face.”

(no page numbers provided)

Adams and Jarvis (1996) explain that lies as the one above contain a shift in possessive pronoun usage in order to remove the family relationship, as perpetrators typically find it almost impossible to confess to hurting a family member. The substitution in this case was even stronger

evidence of lying since the arraigned never introduced his wife as Louise but rather suddenly used ‘Louise’ after using ‘my wife’ several times, leaving the reader to only assume that Louise and ‘my wife’ are the same person. Furthermore, Bachenko et al. (2008) provide a similar example from the story of Captain Jeffrey MacDonald who was found guilty of murdering his wife and children. The authors explain that in his statement MacDonald said “my daughter” and “my wife” were sleeping. But when reporting to emergency personnel, he referred to his family as “some people”:

“So I told him that I needed a doctor and an ambulance and that some people had been stabbed.” (p. 44)

This is a demonstration of not only inconsistency in pronoun usage but also a substitution of a vaguer pronoun supposedly acting as psychological distancing through language. In other words, much like Adam and Jarvis’ (1996) example above, the speaker is creating a larger gap by removing the family relationship between him and the victim. Also regarding inconsistencies in the use of other-references, Adams and Jarvis (2004) provide insight on the use of pronouns as part of the lacking or substitution of sensory details. For example, ‘something,’ also a non-specific pronoun, might replace a more specific description like ‘a small white box.’ Adams and Jarvis’ (2004) analysis shows how the use of vague pronouns constituting a lack of specific sensory detail in the relaying of crime events, or events related to crimes, is evidence of deception. Consider Adams and Jarvis’s (2004) example of a man providing explicit details about setting fire to his car but then ended his account lacking sensory details:

“...I took a cigarette lighter and lit it (touch). I took off back up the steep hill (touch). I caught a ride with someone (vague and equivocal) on the hard-top road, but I’m not sure (negation, lack of knowledge) who it was...” (pp. 10-11)

Here we see that when retelling the event, he uses a vague and equivocal pronoun, ‘someone’, to replace what apparently would have been a more descriptive explanation of the person and situation had the story been true. Adams and Jarvis (2004) make reference to another example about a woman who used specific sensory details in describing what happened just before an alleged assault crime but used vagueness and no sensory detail when describing the actual event of the assault. In this account, she referred to the assailant as “‘someone’ instead of ‘a tall man wearing a black ski mask,’” (p. 7). The authors suggest that the inconsistency found in recounting sensory details in the most important part of the statement—the account of the crime itself—should inform officials that further questioning about the criminal account could likely reveal deceit. Thus, from the examples presented in this paragraph, we find that pronouns like ‘some,’ ‘someone,’ or ‘something’ act as distancing and vague language that remove relationship definitions and sensory details, giving evidence that one may be lying.

Conflicting Findings. While the abovementioned studies provided evidence for fewer self-references in deceptive speech, Ebesu and Miller (1994) and Buller et al. (1996) present support for such findings only in certain conditions. Concerned specifically about how various types of lies might affect deceptive language, Ebesu and Miller (1994) give 103 male and female undergraduate students directions on how to lie or tell the truth in four different scenarios that one may experience in interacting with an authority figure in the workplace or at school. The participants either (1) fabricated something completely false, (2) simply withheld truth, (3) implied the truth, or (4) told the truth. Responses like (1) and (4) constituted “direct” responses, while (2) and (3) were “indirect.” Ebesu and Miller’s (1994) results illustrated that only when being direct in some scenarios did deceivers use significantly fewer self-references than non-deceivers. However, the authors also show that the deceivers used more self-references than non-

deceivers when being indirect. Discussing these results, Ebesu and Miller (1994:436) suggest that truthful, baseline speech may contain “a mixture of vagueness and nonimmediate terms as well as precise and immediate words,” and that baseline language “may not be entirely different from all forms of deception.” Contributing similar findings, Buller et al. (1996), reported that deceptive participants in videotaped interviews who responded to a series of questions intended to elicit “factual, attitudinal, and emotional information” (p. 274) used fewer self-references, but deceptive participants in another experiment where interviewers conveyed varying levels of suspicion did not use fewer self-references. Buller et al. (1996:282) explain that these inconsistencies in linguistic cues suggests that “it is impossible to describe a deceptive linguistic pattern,” because deceivers strategically attempt to either disassociate themselves from the conversation or “maintain conversational normalcy.” Therefore, while Ebesu and Miller (1994) show that fewer self-references is a characteristic of only direct lies and not deceptive language that simply intends to withhold truth, Buller et al. (1996) suggest that the conflicting findings regarding self-references make it difficult to tell whether it is a deceptive feature or not, but that the self-referencing number may be affected by the suspicion levels of the receivers.

Other studies have simply not found the number of self-references to be a statistically significant indicator of lying in spoken texts. For example, Todd (1977), replicating Knapp et al.’s (1974) research but only using female participants, found no significant differences between deceptive speech and truthful speech with the exception of what Knapp et al. (1974) and subsequently Todd (1977) refer to as “disparaging remarks,” i.e. assertions that serve to lift the speaker up by putting others down (*see* Knapp et. al 1974:11). In more recent years, this is commonly included in and referred to as ‘negative affect’ or ‘negative emotion’ and is addressed later on in this literature review. Relevant to this section, however, is Todd’s (1977) lack of

support for fewer self-references as a linguistic feature of deception. Todd (1977) speculates that such results may be due to the exclusively female group of participants, thus suggesting that linguistic features of deception may vary depending on gender. Likewise, Porter and Yuille (1996), testing Sapir's (1987) SCAN theory found no difference between lies in truths with regard to self-referencing pronouns. Their two-part experiment instructed participants to covertly "steal" a \$100 bill or simply retrieve a folder from a university department's office and then lie or tell the truth about what they did to a trained interrogator. While some participants were to tell the truth, some to outright lie, and some to partially lie, the statistical results were virtually the same for all deception and truth, dissimilar to Ebesu and Miller's (1994) results reporting significantly fewer self-references in direct lies. Porter and Yuille (1996) therefore reported no significant differences in the number of self-references between truthful and deceptive speech.

In light of some of the conflicting findings with regards to the linguistic characteristics of lying, Hauch et al. (2012) performed a computational meta-analysis of thirteen studies, coding the studies' independent and dependent variables, as well as taking into account the effect sizes of each study. The results of this meta-analysis suggests harmony among the studies involved that lacking self-references is a statistically significant indication of deceptive language. Thus, as several sources, including Hauch et al.'s (2012) meta-analysis, provide support for fewer self-references as a feature of deception in spoken and written language, several others provide conflicting results for the same.

Summary. Interestingly, as these studies have all focused on the use of pronouns as a tool for identifying deception, there exists still a conflict in findings. It appears, however, that this conflict may be due to varying levels of suspicion involved. As mentioned above, Buller et al. (1996) found a positive correlation between levels of suspicion and the number of self-

references. In other words, those under low levels of suspicion used fewer self-references, while those under higher levels of used more. Furthermore, while Knapp et al. (1974) had their participants simply tell lies, Todd (1977), who seemingly rivaled Knapp et al.'s study, had his participants try to "persuade" the interviewer that they were indeed telling the truth, implying that the interviewer was likely portraying suspicion. This may have contributed or been the reason for Todd (1977) not finding that deceptive speech contained fewer self-references. Other studies that have reported their findings on self-referencing pronouns as a feature of deception have not detailed levels of suspicion as Buller et al. (1996) did. Thus, there may have been varying levels of suspicion on the part of the receivers of deception in these various studies, therefore leading to various linguistic behaviors and hence various findings.

Also potentially contributing to the conflicting findings regarding self-references, all of these studies' methodologies seem to have given their participants varying or undefined levels of time to prepare their answers. For example, Ebesu and Miller (1994) apparently made their participants aware of scenarios in which they would need to lie ahead of time, but no time period for premeditation is defined. While that is so, the situation may have also included unanticipated questions eliciting spontaneous lies, but, again, this is not clarified. Hancock et al. (2008), however, assigned some participants to a "liar role," but it is unclear whether or not the liars knew the topics on which they would be lying about ahead of time. Thus, their synchronous CMC interactions may have produced spontaneous lies or premeditated ones. In essence, none of these studies addresses whether there is a difference between spontaneous lies and prepared ones.

Finally, while there has been conflict regarding the number of self-references, there has been no conflict on the research and theory concerning pronoun inconsistencies as illustrated by Sapir (1987), Adams and Jarvis (1996, 2004), and Bachenko et al. (2008). Pronoun

inconsistencies as presented by these authors encompasses simply the unnatural use of pronouns in general (e.g. dropping them, replacing them inappropriately, using them to replace specific details, using the “wrong” pronouns, etc.) as has been illustrated in this section. Therefore, searching for pronoun inconsistencies as a whole may be a more reliable method of detecting deception through pronouns.

Emotion Words. This section will summarize the literature on emotion portrayed through language and how it relates to truth and deception. Like previous linguistic features, research makes varying claims with regard to this topic. Some studies report on emotion words generally (positive and negative), while others report on only negative emotion words, also known as ‘negative affect.’ Some of the literature includes the use of negations (‘not,’ ‘no,’ ‘never,’ etc.) as a part of negative affect, whereas others may not include it or may analyze negations separately from emotional language. In any case, there exists conflicting results regarding emotion word and negation frequencies in deceptive versus truthful language.

A number of studies have shown that deceptive language typically contains a higher number of negative emotion words or expressions. First, Knapp et al. (1974) reported that deceivers made more “disparaging remarks” than truth tellers. Knapp et al. (1974) explained disparaging remarks as expressions made to elevate oneself by putting others beneath oneself.

An example of this is given:

“Hell, we sweated it out in Vietnam while these other kids got to goof-off in school and have a good time.” (p. 11)

While this requires rather subjective interpreting, Knapp et al. (1974) confidently assert this version of negative affect to be characteristic of lying. Todd (1977) came upon similar results with his exclusively female group of participants. Interestingly, this was the only feature that

Todd (1977) and Knapp et al. (1974) agreed on despite the fact that Todd replicated Knapp et al.'s research. Furthermore, Newman et al. (2003) affirmed that, in both spoken and written texts, people use more negative emotion words when being deceptive versus genuine. The authors provided examples of such words: 'hate,' 'worthless,' and 'sad.' While Newman et al. (2003) analyzed negations and positive emotion words as separate features, these did not vary significantly between truth and lies. Further, Bachenko et al. (2008) mention their tagging of negative emotion words as a contribution to their successful model for predicting deceptive texts. Thus, the authors imply that deceptive language tends to employ more negative affect than truthful language. Expounding upon this, Vrij (2008) claimed that deceptive statements are believed to contain higher negative emotion words due to feelings of anxiety and/or guilt in connection with the act of deceiving. Moreover, Zhou et al. (2004) have also maintained the notion that increased negative emotion words are an indicator of lying in CMC between dyads. However, the same study reported that the between-group results (as opposed to the within-group or dyad results) showed deceivers to actually express more positive emotion, using positive, reinforcing adjectives like 'great.' Thus, to conclude, Zhou et al. (2004) tentatively report that deceivers may use more emotion words in general, providing a nice segue to our next set of research.

Just as Zhou et al. (2004) were compelled to conclude that deceivers apparently used more emotion words in general than truth tellers, Hauch et al. (2012) in their thirteen-study meta-analysis reported increased affective language, whether positive or negative, to be unique to lying as well. Zhou and Zhang (2008) reiterated this point despite Zhou's earlier findings that contradicted this, relating no significant difference on this issue (*see* Zhou 2005).

In stark contrast to most of the studies mentioned concerning affective language, Adams and Jarvis (2004) theorized and provided some evidence that the presence of emotions in written witness statements suggest truthfulness. They explained that witnesses who were truly somehow involved in a crime or traumatic experience will typically describe how that experience emotionally impacted them, usually in their concluding sentences. Thus, deceptive statements usually do not contain emotional details. However, Adams and Jarvis (2006) stated that emotion in written language could suggest veracity or deception but unfortunately explained only how it suggests veracity and provided no explanation as to how it might imply deception.

Turning specifically to negations ('no,' 'not,' 'never,' etc.) in deceptive language, several studies have reported this feature to indicate deceit (Hancock et al. 2008, Toma and Hancock 2010, Hauch et al. 2012). Hancock et al. (2008), however, clarified that this was so only for "unmotivated liars," (p. 14). Furthermore, Adams and Jarvis (2004) indicated that negations could infer deception and provided the following example similar to the one above about the man first including and then omitting sensory details:

"I caught a ride with someone (vague and equivocal) on the hard-top road, but I'm not sure (negation, lack of knowledge) who it was. I'm not sure (negation, lack of knowledge) where I went right after that, but I ended up at my house. I really don't remember (negation, lack of memory) much more than what I've told you." (p. 11)

Thus, negations can be strategically used by liars to be vague and disclose fewer details.

Moreover, Adams and Jarvis (2006) illustrate the same concept explaining that "The man didn't run" is non-specific in that it does not tell the listener what the man actually did. Thus, research has provided evidence that and examples of how an increased number of negations can be indicative of lying.

Diverting from this, however, at least two studies have found no support for negations as a feature of deception. Newman et al. (2003) reporting such results argued that deceptive speakers have the tendency to avoid “negation connectives” (i.e. ‘not,’ ‘but,’ ‘except,’ etc.) so as to not risk contradicting and incriminating themselves. Furthermore, Duran et al. (2010) reported the same according to the results of their Coh-Metrix and LIWC analyses. In summary, while several studies have discriminated the increased count of negations as a deceptive feature, others have provided contending results.

Word Count. Also heavily discussed, word count (also referred to as ‘statement length’) appears to contain a potential cue to deception. However, like other linguistic features discussed in the literature, there are differing outcomes presented in the research. Some studies reported that liars, relative to truth tellers, typically use more words. Other studies show that liars use fewer words. And yet others found no significant difference between the word counts of lies and truths.

Several articles claim that deceptive language tends to possess a higher word count than truthful language. Zhou et al. (2003) and Zhou et al. (2004) both reported that deceivers, whether interacting via synchronous or asynchronous CMC, used more words than truth tellers. While Zhou et al. (2003) acknowledged that deceivers’ lacking details should make their word counts lower, they hypothesized that, as participants needed to work together to tackle a hypothetical problem, the deceivers had to use more words to convince their partners that they (the deceivers) had experience on the topic at hand, therefore establishing credibility. Zhou et al. (2004) explained that the deceivers’ higher word count was likely due to liars’ attempts to build a relationship of trust with those to whom they were lying. Moreover, Hancock et al. (2008), also researching CMC, reported too that deceivers used more words. The researchers speculated that

this may have been due the fact that liars responded mostly to opinion questions, which were unverifiable. Thus, deceivers were less threatened and could include more details in their lies without raising suspicion. Furthermore, Duran et al. (2010) found supporting evidence in their deception in CMC research, showing that both LIWC and Coh-Metrix computations produced the same result. As this study's aim was primarily to compare the two NLP tools, the authors provided no elaboration as to why deceivers used more words than nondeceivers. Lastly, Ali and Levine (2008), researching deceptive conversation, reported that liars "talked longer," (p. 87). As the authors state that this finding agrees with Zhou et al. (2004), readers should assume that "talked longer" means 'used more words.'

Some research has opposingly reported a lower word count as a characteristic of deception. Knapp et al. (1974), though the results were not quite significant ($p=.079$), reported that deceptive participants used fewer words in speech. They categorized this as a facet of reticence and explain that liars use fewer words to disassociate themselves from the interaction. Ebesu and Miller (1994) came unexpectedly to the same conclusion, as they had hypothesized that deceivers would say more. Colwell et al. (2002) found that liars said significantly less in their study perhaps due to anxiety increasing their verbal performance. Burgoon et al. (2003) addresses detecting deception in both written and spoken language. Their results demonstrated that deceivers used fewer words in both mediums. Furthermore, Toma and Hancock (2010) showed that deceptive dating profiles used fewer words overall than truthful profiles perhaps in an effort to avoid incongruities with their earlier dating profiles. Such explanations, however, are largely speculative. Therefore, several studies providing evidence of spoken and written deceptive language being wordier than truthful texts competes with other findings.

The reason for these differences in findings may be that both large and small word counts may indicate deceptive language. One research article illustrates how both large and small word counts in written statements related to criminal accounts should raise suspicion. Adams and Jarvis (2006:15) explain that when witnesses or suspects write their accounts of what happened in the crime at hand, their account of the crime itself should be scrutinized if it is “unusually short.” Likewise, the authors state that investigators should be suspicious if the prologue to the statement is “unusually long,” (p. 15). Adams and Jarvis (2006) state that such written statements demonstrate a lack of focus on the incident in question and advise investigators that further interrogation may reveal missing details concerning the event of the crime.

Subsequently, additional research contradicts both sides to the word-count argument presented thus far by reporting no difference between the word counts of deceptive and truthful language. In this camp, Todd (1977) reports no significant difference in spoken deceptive and truthful messages, again, possibly due to gender differences, citing Wood (1966) who asserted that males use more words than females in conversation generally. In addition, Porter and Yuille (1996) also reported no significant difference on this issue despite the fact that participants gave significantly fewer details. Finally, Burgoon et al. (1996), in corroboration, argued that deceivers tend to not use fewer words but rather try to maintain similar word counts across truthful and deceptive interactions so as to avoid suspicion. Thus, while several studies have provided evidence for word count as a linguistic feature of deception, there remains a strong inconclusiveness because of widely varying and conflicting results across all linguistic mediums. Again, the conflict may be due to the varying methodologies and that lies are conveyed differently depending on the context. Specifically, as in Todd’s (1977) odd case, it may be due to gender differences, though such are not addressed in the current study. However, it also may be

due to periods of premeditation. The participants in Colwell et al. (2002) and Ebesu and Miller (1994), for example, having a lower word count, evidently had time to prepare their answers, while the CMC studies possibly did or perhaps did not. Furthermore, varying levels of suspicion may again also play a role. Both Todd (1977) and Porter and Yuille (1996) seemingly included interrogative features in their elicitations of deceptive speech, implying suspicion on the part of the receiver. Thus, clarification regarding preparation time may reveal it as a factor here, and varying suspicion levels may also have an effect.

Allness Terms and Vagueness. A number of research has investigated linguistic vagueness as a possible cue to deception. Often included in the category of vagueness are allness terms ('all,' 'every,' 'any,' etc.), i.e. terms of overgeneralization. In this chapter thus far, there has been a theme in the literature involving some linguistic features of deception that cross over into vagueness, e.g. Adams and Jarvis' (2004) discussion of negations and vague pronouns like 'someone' or 'something' replacing more specific sensory details. Thus, a sense of vagueness has to this point been demonstrated, but there are several studies that delve slightly deeper into vagueness as a distinct category and feature of deception.

Several studies have researched and evidenced the broad scope of linguistic vagueness as a feature of deception. Surprisingly, this feature is generally agreed upon. This paragraph presents the literature specifically on allness terms. As illustrated in the introduction of this chapter, Knapp et al. (1974:13) encompasses the use of allness or "Leveling" terms, "every, all, none, nobody, etc.," under the umbrella of linguistic vagueness. Their study reported that the deceivers tended to use more allness terms than nondeceivers. Furthermore, Buller et al. (1994), analyzing again the spoken language of participants from five separate experiments, reported that people's messages were "less clear" when lying compared to when telling the truth. Clarity was

measured by the number of allness terms. Additionally, Buller et al. (1996) demonstrated a positive correlation between levels of suspicion and allness terms used in lies. In other words, when people being lied to showed higher levels of suspicion, the liars would use more allness terms. Moreover, Zhou et al. (2004) implicitly reported allness terms as feature of deception in that such terms were grouped together with adjectives and adverbs, despite the fact that some allness terms carry no such part of speech (i.e. ‘everything,’ ‘everybody,’ etc.). It is assumed then that the researchers’ computations only calculated adjective and adverb allness terms. It also undoubtedly follows that the abovementioned studies looking at modifiers had the same perspective (*see* Ebesu & Miller 1994, Buller et al. 1996, Zhou et al. 2003, Ali and Levine 2008). Also supplementing discussion on the role of allness terms in deception, Zuckerman and Driver (1985) found a positive correlation between liar motivation and allness terms.

While the studies reviewed above looked at allness terms specifically, other studies report on vagueness through other means. For example, Porter and Yuille (1996) reported one of the few significances they found was that liars gave a smaller quantity of details, a finding that also relates to word count studies discussed above. Also, Duran et al. (2010), who conduct further analysis on Hancock et al.’s (2008) transcripts of deceptive and truthful CMC conversations, argued that liars’ subconscious tendency is to be vaguer in their responses, basing their argument on receivers’ frequent inquiries for clarification from the senders. This is in harmony with Hancock et al. (2008). To further illustrate how vagueness and allness terms can be used to deceive, Lakoff (1973) expounded indirectly upon this phenomenon of communication in terms of ‘hedging.’ Hedging terms are given including ‘kind of,’ ‘sort of,’ ‘basically,’ ‘pretty (much),’ ‘somewhat,’ ‘mostly,’ ‘almost,’ ‘especially,’ ‘often,’ ‘typically,’ and ‘more or less,’ (p. 472). Furthermore, Lakoff (1973) explains the semantic and pragmatic differences behind the

meanings of various utterances depending on the subject's relationship to its category. She provides the following examples:

“c. *A penguin is sort of a bird.* (True, or close to true)

“d. *A bat is sort of a bird.* (Still pretty close to false)” (p. 471)

Lakoff (1973) illustrates here the ability to make somewhat true statements using the vagueness of the hedge, ‘sort of.’ While *d.* is debatably true, Lakoff shows that it lacks in truthfulness and strongly contrasts with ‘A bat is a bird,’ employing no vague phrase. Thus, it follows that research vouching for vagueness as a feature of deception suggests deceptive interlocutors are inclined to use hedging terms to perhaps portray a degree of honesty while leading their partners to believe their statements simply as truth. Hence, several studies have, despite analyzing vagueness in various ways, come to the same conclusion that linguistic vagueness is characteristic of deception.

While this is so, one pioneer study provided counterevidence. Todd (1977), once again contesting Knapp et al. (1974), found no significance in the deceptive speech of women with regards to vagueness and/or allness terms.

Verb Tense. In his philosophical discussion on deceptive communication, Sapir (1987) asserts that it is typical and expected that the past tense is utilized when one is recounting past events. In this light, Adams and Jarvis (1996) discuss deviation in the usage of verbs and stress the importance for FBI investigators to pay close attention to the tense used (present, past, or future). They offer a guide being that the use of the past tense, naturally, is the norm for FBI investigators and interrogators because people are usually relaying to them accounts of past events. The following example of deviating from this norm is given:

“It happened Saturday night. I went out on my back deck to water the plants. It was almost dark. A man runs out of the bushes. He comes onto the deck, grabs me and knocks me down.” (no page numbers provided)

As noticeable, Adams and Jarvis (1996) point out the deviation as occurring from the fourth sentence on, the speaker switching from the past tense to the present while recounting a single event from the past. Adams and Jarvis (1996) propose that such deviation could indicate fabrication. Moreover, in the context of parents looking for a missing child, this example is given:

“I just pray that Jenny is all right.” (no page numbers provided)

The norm in this situation would be for parents to use the present tense, e.g. ‘pray’ and ‘is,’ as innocent parents still view their child as being alive. Also mentioned here was the Susan Smith case from the 1990s, where Smith killed her two small children and pretended they had gone missing. Adams and Jarvis (1996) noted her use of the past tense immediately after the alleged abduction of her two boys. The authors recount that Smith told reporters ““My children wanted me. They needed me. And now I can't help them.”” However, her husband David, who was unaware of his wife’s crime, offered words of comfort, stating ““They're okay. They're going to be home soon,”” (Adams & Jarvis 1996). Because Susan knew the children were gone, she employed the past tense, while David naturally possessed a hope and assurance that his children were still alive and used the present tense.

Bachenko et al. (2008) in their model for predicting deception also include deviations from normal verb tense usage. The authors explain here that choice of verb tense may be telling, but what is much more indicative of deception are changes in tense. This is somewhat in contrast to Adams and Jarvis (1996) who highlighted Susan Smith’s choice of the past tense over the

present. Interestingly, Bachenko et al. (2008) also use an example from Susan Smith to illustrate their point:

“I just feel hopeless...I can't do enough. My children wanted me. They needed me. And now I can't help them. I just feel like such a failure.” (p. 43)

Here, providing a little more context to the scene than Adams and Jarvis (1996), Bachenko et al. (2008) draw attention to Smith's unusual shift in verb tense. As the example demonstrates, she uses the present tense consistently when talking about herself but the past when talking about her deceased children. Hence we see the use of present tense and past tense back-to-back within a brief, cohesive monologue.

In short, the researchers mentioned in this section assert that both the choice of verb tense and the inconsistency of verb tense within a statement constitute evidence of lying. It is somewhat debated, however, whether the tense choice or the shift in verb tense within a statement is more indicative of deception. In any case, these assertions regarding abnormal verb tense, while intuitive, are not strongly founded upon empirical research.

Other studies that employ natural language processing (NLP) software (Newman et al. 2003, Zhou et al. 2004, Zhou 2005, Hancock et al. 2008, Duran et al. 2010, Toma & Hancock 2012) do not address the topic of shifts in verb tense, likely due to the tool's inability to detect such unnatural deviations. However, many of these studies contribute to the topic of verbs in deception with regards to the frequency of modal verbs (may, might, could, should, etc.) as expounded upon in the following subsection of this literature review.

Modal Verbs. As this section illustrates, it is generally believed that deceptive language contains a higher number of modal verbs than ingenuous language, though contradictory results

are also reported for this linguistic feature. As mentioned in the introduction, this feature is often also considered a facet of nonimmediacy and/or uncertainty.

Knapp et al. (1974), the first study to report on modal verb frequency as a potential sign of deception, report no statistical significance ($p = 0.17$) but nonetheless report a difference with “confidence.” Their method analyzed the use of modal verbs as a supplement to general “Qualifications,” which consisted of “tentative constructions as might, may, should, could, etc.,” (p. 13). Consequently, Knapp et al. (1974) believe there is some difference worth noting with regards to nonimmediacy as demonstrated through an increased number of modal verbs. Providing statistically significant support for this, Zhou et al. (2003), Zhou et al. (2004), and Zhou (2005) all validate the use of more modal verbs as indeed a feature of deceptive language in synchronous and asynchronous CMC.

In contrast, various studies offer opposing evidence with respect to modal verbs as potential indicators of deception. Newman et al. (2003), considering only modal verbs of future tense, i.e. ‘will,’ ‘might,’ and ‘shall,’ report no significant difference in the frequency of these modal verbs in untruthful versus truthful language both spoken and written. The research targeted only these modal verbs under the hypothesis that the present tense is used more often than the past or future when telling the truth. This, however, is not confirmed in their findings. Similarly, Duran et al. (2010) did not find the use of modal verbs in general (not just future tense modals) to be a factor in deceptive text-based CMC language. However, the researchers acknowledge the limitation of the NLP tool used, Coh-Metrix, in not being able to effectively identify “tentative construction phrases,” using terminology from Knapp et al. (1974). Duran et al. (2010) note that some modals, e.g. ‘must’ and ‘may,’ can be used both tentatively and nontentatively. They provide the following examples of nontentative uses of ‘must’ and ‘may’:

“*You must go now*” and “*You may not,*” (p. 448). Here, the use of modals demonstrates no uncertainty or reluctance such as would ‘I think you may be able to.’ The authors state thus that the Coh-Metrix index is likely “too general” to make the subtle distinctions between the tentative use and the nontentative use, and, consequently, all modal verbs were likely included in the computation. Contrary to this explanation, however, Ali and Levine (2008) reported surprising significance using the LIWC tool. Their results demonstrate that deceivers’ spoken language from recorded interviews contained significantly fewer modal verbs—completely opposite results from the studies in the paragraph above involving both spoken and written text. Thus, there exists an ongoing discussion concerning the role of modal verbs in deceptive and truthful language due to widely varying findings, but it appears that those who have reported results other than a significant increase in modals in deceptive language also faced issues with natural language processing tools.

Adjectives and Adverbs. Whereas a much smaller number of studies address the amount of descriptive language manifest through adjective and adverb frequency, there exists still a debate concerning it also. Once again, some posit that deceptive language contains a higher measure of descriptive words while others suggest that deceptive language in fact uses fewer descriptive words.

A few studies have concluded that deceptive language typically contains more adjectives and adverbs than truthful language. Zhou et al. (2003) reported that deceivers in staged online communications used significantly more modifiers, which are defined as the ratio of adjectives and adverbs to verbs and nouns. Thus, with this result, the researchers reported that deceivers’ language was more expressive than truth tellers. Furthermore, Zhou and Zhang’s (2008) summary of their research on simultaneous and non-simultaneous CMC include increased

“expressivity,” also marked by the use of more adjectives and adverbs, than truthful messages (*see also* Zhou et al. 2004). While this is so, they also give the disclaimer that interpretation of such deceptive behavior is bound somewhat by contextual factors and therefore may not always be extendable to other contexts, i.e. outside of CMC. Correspondingly, Ebesu & Miller (1994), Buller et al. (1996), and Ali & Levine (2008) all reported deceptive speech to contain significantly more modifiers than truthful speech, providing support that this linguistic feature is indeed extendable to other contexts. Parenthetically, Ali and Levine (2008) specifically define ‘modifiers’ as strictly adjectives and adverbs. None of these studies, however, ventures to explain why their findings might be so, except for Buller et al. (1996) who only mention an increase of modifiers as being a facet of nonimmediacy. Nevertheless, the research summarized in this paragraph illustrates that more adjectives and adverbs denotes deception.

On the contrary, there exists counterevidence to the abovementioned findings. Further, DePaulo et al. (2003) in their meta-analysis of 120 studies related to verbal and nonverbal deception concluded that liars generally are inclined to give fewer descriptions of people, places, and things. Moreover, Duran et al. (2010) targeted *wh*-adverbs using LIWC and Coh-Metrix in an effort mainly to identify questions. The study did not research adjectives or other types of adverbs. Nonetheless, their data show a difference in truthful and deceptive CMC with regards to adverbs, illustrating that deceivers used significantly fewer *wh*-adverbs than nondeceivers. In a drastically different context, Villar et al. (2013) reported in their study concerning the language of false confessions that those who lied about committing a social transgression they actually did not commit used fewer adjectives than those who truthfully maintained their innocence. It should be noted that the researchers created a situation where university students, mostly female, were accused of and interrogated concerning two social transgressions of their choice, one to falsely

confess to and one to truthfully confess to. In any event, as the studies mentioned here maintain that fewer adjectives and adverbs imply deceit.

While there are seemingly conflicting findings concerning the number of adjectives and adverbs also, a larger majority of research provides evidence for more adjectives and adverbs as a feature of deception. Furthermore, DePaul et al. (2003) while reporting deceivers gave fewer descriptions did not report specifically on the number of adjectives and adverbs. Duran et al. (2010), as well did not have the same focus as theirs was more concerned with *wh*-adverbs indicating questions. Moreover, Villar et al. (2013) addressed the language of false confessions, which is quite a new topic of discussion in law and forensic linguistics, and its language may have different characteristics than other forms of deception.¹ Finally, support for more adjectives and adverbs as a feature of deception comes from research concerning superfluosness, as more adjectives and adverbs implies a contribution to superfluosness.

Superfluosness and Redundancy. Perhaps because only minimal research has honed in on superfluosness (i.e. providing excessive and unnecessary detail) and redundancy (repetition of words) as exhibitiv of deceit, there is seemingly less debate concerning these linguistic features. Nevertheless, while some research has marked increased superfluosness and repetition of words, others who have analyzed the feature found no significant differences in truthful and untruthful language.

A few studies show that deceptive language tends to be more superfluous and repetitive by nature. Zhou et al. (2003) and Duran et al. (2010) illustrate this in the context of CMC. Zhou et al. (2003) explain that the significant difference found in the superfluosness and redundancy of deceptive text relative to truthful text maintains the notion that deceivers are inclined to

¹ False confessions are debatably not deceptive as they often consist of suspects psychologically surrendering to oppressive interrogators and thus do not produce language that truly intends to deceive, (*see* Villar et al. 2013).

include meaningless words or expressions in situations where they want their statements to appear complete though they in reality do not have much to say. Zhou et al. (2003) profess this explanation to be especially probable in asynchronous communication where deceivers have more time to plan their responses. Moreover, Duran et al. (2010) found deceivers to be more redundant linguistically than nondeceivers. Providing further support on the issue, DePaulo et al. (2003) evidence from their wide-ranging meta-analysis that people tend to repeat words more often when lying than when telling the truth. Finally, Davis et al. (2005), analyzing the discourse of 28 criminal suspects giving statements to assistant district attorneys, noted that their lies mitigating the extremity of their crimes contained a higher number of repeated words and phrases than truthful confessions. Thus, research demonstrates a propensity for people to repeat words or expressions and provide excessive or unnecessary details when telling a lie versus telling the truth.

Some research, however, found no significant difference between the superfluosity and redundancy of truthful and deceptive language. Knapp et al. (1974), seemingly the first to report on this and several other potential features of deception, provided no evidence that deceivers were more redundant than nondeceivers. Likewise, and yet fully contradictory to their 2003 findings, Zhou et al. (2004) could not designate redundancy as a linguistic feature of deception according to their statistically insignificant results concerning asynchronous CMC. Therefore, the literature once again illustrates inconsistency in the research, here specifically regarding superfluosity and redundancy in language. However, the conflict in findings is not quite as prevalent as with other features mentioned in this chapter.

Response Latency. Not as widely discussed as many other linguistic features of deception, response latency is also somewhat contested. Response latency refers to the time

between when a question or statement requiring a response is made and when the conversation partner responds or begins to respond. Presented first are studies that have shown that there are significant differences in the response latencies of truthful and deceptive conversation.

In a vast study testing 158 cues to deception using the speech of criminal suspects and news interviews, DePaulo et al. (2003) reported significance between the response latencies of liars and truth tellers in face-to-face conversation, especially when people were lying about transgressions. The difference was, as hypothesized, that response latencies were longer before lies than before truths. DePaulo et al. (2003) postulated that this was due to the cognitive load that spontaneous lying requires in that liars first recall the truth, remove it, and then replace it with a fabrication. Furthermore, Walczyk et al. (2003) considering the response times of lies versus truths in response to both yes/no and open-ended questions found that it took people, on average, 230 milliseconds longer to lie. As participants in this study, university psychology students were interviewed in a laboratory for the elicitation of various responses. All responses were unrehearsed. Later, Walczyk (2009), however, reported that response latencies only varied significantly in response to yes/no questions and for only two of the four topics discussed (“Academics” and “Current Residence”). In these cases, students’ response times were significantly longer. Considering that participants’ responses in this study were likewise unrehearsed, Walczyk (2009) provided the explanation that these results were due to students’ necessity to suppress often-talked-about and thus easily-recalled information in order to lie, therefore imposing upon them a heavier cognitive load. Hence, in this paragraph research is presented supporting a longer response time for deceivers.

In contrast, there are studies that cannot give support to these findings, reporting no significant differences. Zhou’s (2005) hypothesis stated that liars would respond more quickly in

attempts to “reinforce their ideas,” (p. 151). Yet she, in the context of instant messaging, found results that provided no support for DePaulo et al.’s (2003) findings. Moreover, also researching the issue in the context of face-to-face communication, Davis et al. (2005) reported no significance for long or short pauses in speech, whether before responding or in the middle of responses. Thus, these studies were unable to provide evidence for longer response times extended to another context (CMC) nor in the same context (face-to-face).

Summary. From this literature review, we can gain a sense that something is happening linguistically with regards to these features as potential features of deception. While the findings on the number of self-references are quite contradictory, it appears that the literature on pronoun inconsistencies is not. Regarding emotion words, the results varied but the majority showed evidence of more emotion in deceptive language except for in the context of recounting a traumatic event (*see Adams & Jarvis 2004, 2006*). With regards to word count, it appears that other undefined factors such as premeditation time, topics, and suspicion levels may generate conflicting results. Thus, defined contexts may paint a clearer picture. As for allness terms and vagueness we find little to no conflict, though a myriad of ways to measure it. Verb tense issues were illustrated to be rather intuitive though no empirical studies have confirmed this as a feature of deception. An increased number of modal verbs appears to be characteristic of deception as those who reported otherwise may have had issues regarding natural language processing tool tagging. Of the studies analyzing adjectives and adverbs, the majority have found a high number of adjectives and adverbs to indicate lying, also contributing to the large majority of studies that assert superfluousness and redundancy to be characteristic of lying. And finally regarding response latency, this is a more recent area of inquiry, and its significance seemingly depends on

yes/no or information questions (Walczyk 2009) and the topic of conversation (DePaulo et al. 2003).

While Ali and Levine (2008:87) submit that there are no linguistic features of deception that are consistent across all studies, and Buller et al. (1996) stated that there are no predictable linguistic features of deceptive speech, it appears that a majority of studies hold up some linguistic features as characteristic of deception, and others could be made clearer with more defined contexts and ramifications for response preparation times and levels of suspicion on the part of the receiver. The current study, therefore, takes the discussed linguistic features of deception under consideration in the context of spontaneous responses on the topic of self with no suspicion communicated by the receiver.

Cross-cultural Research on Linguistic Features of Deception

While the results presented in the vast amount of research on the linguistic features of deception are insightful and intriguing, very little research has been published on whether or not these features are universal. Given that few studies mentioned differences in the ethnicities, nationalities, and/or linguistic backgrounds of their participants, we are left only to assume that the text-providers and participants involved in research at U.S. universities are native-English speaking Americans. We are also left to assume that cultural differences were not taken into account nor analyzed.

Studies that have in fact provided more specific demographic information on participants gave no such information on linguistic backgrounds, with the exception of three studies explicitly stating that their participants were all native speakers of English, (Porter & Yuille

1996, Zhou et al. 2003,² Zhou 2005). For example, Ebesu and Miller's (1994) group of participants consisted of several ethnic groups: Caucasian, Chinese, Filipino, Hawaiian, mixed without Hawaiian, Korean, and "other" (p. 426). While this is so, there is no mention of English proficiency or mother tongues, and no data are given or conclusions drawn that demonstrate differences between ethnicities. In addition, Davis et al. (2005) provided that the study included African Americans, Caucasians, and Hispanics. Having analyzed the speech of criminal suspects, there must have inevitably been dialectal variation that may produce varying results or impact the data in some way. Davis et al. (2005), however, do not address this. Likewise, Colwell et al. (2002) reported their study including Asians, African Americans, Caucasians, and Hispanics but provided no information on linguistic backgrounds and made no mention of ethnicity as a variable.

Recognizing the need for research in the linguistic features of deception for non-native English speakers, Zhou and Sung (2008) conducted a study on the deceptive language of Chinese participants whose first language was not English. As usual, Zhou and Sung (2008) focused on computer-mediated communication, this time simultaneous CMC. The twenty English-speaking Chinese participants played "the Mafia game"³ via instant messaging. Interestingly, the authors reported findings not typical to native English speakers being that no evidence was reported concerning the typical linguistic features of deception discussed earlier in this chapter. On the contrary, the deceptive Chinese participants were found to communicate less over all, use lower linguistic complexity, and have a higher level of linguistic diversity when they communicated.

² This study stated that all participants were actually "predominantly" native speakers of English. Exactly how many native English speaking and non-native English speaking participants there were was not specified.

³ "The Mafia game" is a well-known role-playing game where players are secretly assigned to assume one of three roles: a mafia member (killer), a villager, or a policeman/detective. This game typically provides ample opportunity and motivation for one to lie about their assigned role in order to persuade others and convince them of one's innocence.

Thus, this study is somewhat groundbreaking because it illustrated that perhaps non-native English speakers do not lie the same way as native English-speaking Westerners. It is evident, therefore, that further research is needed in this area.

Perceptions of Deception

Whereas dozens of researchers have worked fervently to identify which linguistic features are likely cues to deception, others have researched people's perceptions of deception and discussed the societal implications of their results. This section addresses the literature on, first, the within-culture studies on the perceptions of deception and then the cross-cultural studies of deception.

Within-culture Studies. DePaulo et al. (1996) asserted that people lie twice a day, on average. But what does research have to say about people's beliefs about deception? How good are people at detecting it? And can training increase accuracy? This section presents literature to answer these questions in the order posed.

There are many common misconceptions about lying. Brewer and Williams (2005) cited survey results demonstrating that people often think that nervous behavior like diverting eye contact and increased body movements are indicators of lying. However, Brewer and Williams (2005) reported that research has debunked this (*see* DePaulo et al. 2003). Also, Bond et al. (1990), later discussed, found that participants who paused and avoided eye contact while speaking were judged to be deceptive despite whether or not the speaker was lying or telling the truth. Regarding verbal deception cues, the authors stated that people tend to believe that truthful accounts are more detailed than deceptive ones. Brewer and Williams (2005) posited that this has been confirmed by research to some extent. Furthermore, Brewer and Williams (2005) explained

that another misconception is that consecutive deceptive stories, over time, are more inconsistent than consecutive truthful ones. This belief, however, has also been challenged by research (*see* Granhag and Strömwall 1999). What is more, Brewer and Williams (2005) reported also that these beliefs about deception are generally the same for laypersons and experts (*see also* Vrij et al. 2010). Thus, laypersons and lie-catching experts hold several misconceptions about deception, which could lead to inaccurate accusations.

People's inaccurate beliefs about deception apparently make them poor deception detectors. In part two of their analysis, Newman et al. (2003) reported that their LIWC model of was over twice as accurate (68%) at detecting deceitful messages than human judges (30%). In contrast, researchers generally agree that humans typically do not perform quite that low when identifying liars, but rather perform at about the level chance (*see* Kleinmuntz & Szucko 1982, Ekman & O'Sullivan 1991, Ekman 2003, Reinhard et al. 2013). Furthermore, Bond and DePaulo (2008) in their meta-analysis concluded that differences between untrained individuals' abilities to detect deception are generally not significant, and whether or not a deceiver is believable depends more on their credibility than other factors.

Several studies have contributed to the discussion regarding training for and experience with deception detection. Reinhard et al. (2013), for example, researching experienced and non-experienced job interviewers found that those would had accurate beliefs about deceptive cues were indeed more accurate at detecting lies. However, the more experienced job interviewers did not hold accurate beliefs about cues to deception and did not detect deception better than laypersons or less experienced interviewers. Additionally, the more experienced interviewers showed a tendency to label statements as lies more than the other groups, regardless of the statements' actual veracity. Thus, Reinhard et al. (2013) conclude that it is not experience that

matters, but rather proper education in the indicators of deception. Furthermore, Kassin et al. (2005) wanted to know whether trained law enforcement individuals were better at detecting false confessions than untrained university students. Interestingly, the authors reported that the university students were surprisingly more accurate at identifying the false confessions than the policemen. Interestingly, the study also reported that participants were more accurate at identifying lies through auditory than visual means (*see also* Anderson et al. 1999, DePaulo et al. 1982, Bond & DePaulo 2006). Tying this back to Reinhard et al. (2013), it seems then that the policemen in this study lacked proper training, otherwise Kassin et al.'s (2005) findings contest Reinhard et al.'s (2013). In the latter vein, Kassin and Fong (1999) contend with Reinhard et al.'s (2013) call for training in that it, at least up to that point in time, was ineffective (*see also* DePaulo 1994, Zuckerman et al. 1984). In contrast, Vrij et al. (2015) reported that a recent deception detection training workshop for police detectives actually improved said detectives' performance in discerning lies and truths. Therefore, whether deception detection training improves accuracy is somewhat debated, but people generally perform at chance levels despite how much experience they might have in catching lies. Also noteworthy is the literature suggesting that detecting deception is generally easier through audio versus video.

Cross-cultural Studies. While much research has addressed the issue of perceptions of deception within the same culture, a few have focused their efforts on researching how people judge those of other cultures on the subject of statement veracity. Various findings on the topics of cross-cultural perceptions and cross-cultural detection of deception have been reported as a result. Because there are so few and there are because there are so many cultures to research, no studies appear to conflict on these matters. A summary of these findings is given below.

Some research has compared the cross-cultural perceptions of lying between groups who shared little to no common language backgrounds. Comparing cultures of both the East and the West, Bond and Atoum (2000) analyzed the veracity judgments of both Americans and Jordanians telling lies and truths. One set of participants including both Americans and Jordanians were videotaped telling some lies and some truths about people the participants liked and disliked (*as seen in* Bond et al. 1990). The Americans spoke in English, while the Jordanians spoke in Arabic. Further, none of the Americans reported to know Arabic, while 59 of the 60 Jordanians claimed they did know English. A separate group of participants consisting of both Americans and Jordanians then watched the video clips and made judgments as to whether they thought each speaker was telling the truth or lying. Bond and Atoum (2000) reported that both groups could to some extent detect deception cross-culturally. In addition, Americans judged Jordanians to be more truthful than fellow Americans, contrary to the authors' ethnocentrism hypothesis. Bond and Atoum (2000) suggested that this may have been because listening to an unfamiliar language might cause judges to recognize how ignorant they are toward the speaker's culture. Consequently, these judges then give the speaker the benefit of the doubt. In line with this logic, the Jordanians, having some degree of English proficiency, did not demonstrate the same inclination in judging Americans. Hence, detecting deception is possible between Americans and Jordanians, though not necessarily more or less accurate than within their cultures, and Americans displayed a truth-bias toward Jordanians.

Moreover, Bond and Atoum (2000) did another, similar experiment with participants from Maharashtra, a state in western India (60 graduate students and 60 questionably illiterate farmworkers). These participants watched and judged the same videos from the first experiment. While all of them natively spoke Marathi, half of them (the graduate students) spoke English as

an additional language, and none of them professed to know Arabic. The results showed that the Indians performed slightly better than 50% in detecting lies. In fact, the farmworkers performed as equally well as the graduate students. Similar to the first experiment, Indians tended to display truth-bias toward Americans and Jordanians to some extent, but the farmworkers demonstrated a stronger truth-bias than the students. It is also important to mention that the participants were reported to be unable to detect deception using only video or only audio. Again, Bond and Atoum (2000) showed that cross-cultural deception detection is possible and on par with same-culture lie detection. Additionally, evidence was given showing a truth-bias toward foreigners versus compatriots.

Al-Simadi (2000) conducted a similar study between Jordanians and Malaysians. The author also reported an audiovisual medium is required for cross-cultural deception. It was explained that such findings imply that there must be cross-cultural similarities in deceivers' behaviors. Furthermore, Al-Simadi (2000) reported, contrary to the hypothesis, that both Jordanians and Malaysians were more accurate in detecting lies across cultures than within cultures. This may presumably be why no truth-bias of any kind was reported. Therefore considering these studies (Bond et al. 1990, Bond & Atoum 2000, Al-Simadi 2000), the general consensus seems to be that people tend to believe those of other cultures more than their own when judging the veracity of statements through audiovisual means. Additionally, people are able to detect lies at about the same accuracy level cross-culturally as they do within their own culture, even when judges do not understand a speakers' language.

Other research has looked at native- versus non-native speakers of English. Da Silva and Leach (2013) also researched cross-cultural deception using a similar method. However, their study included a wide range of ethnicities. The group of judges consisted of African Americans,

Arab/West Asians, Caucasians, Hispanics, a Latin American, South Asians, South East Asians, and “other[s].” While the authors mentioned that these participants were psychology students at the Canadian university (implying they were proficient English speakers), they did not, however, specify whether the judges were native English speakers. The two groups of video-recorded participants, on the other hand, were only labeled as native English speakers and non-native English speakers. The non-native English speakers all had beginner proficiency in English. The authors found that the judges were more confident in their judgments of native English speakers than non-native English speakers when both groups were telling the truth. Also, having hypothesized that non-native English speakers’ lies would be more easily detected due to increased cognitive load when speaking a second language, Da Silva and Leach (2013) found that their hypothesis on cross-cultural deception detection accuracy was not supported. Somewhat contrary to results from Al-Simadi (2000) and Bond and Atoum (2000), Da Silva and Leach (2013) found that the multi-ethnic group of judges showed a truth-bias toward native English speakers and a lie-bias toward non-native English speakers. Thus, assuming that at least some of the judges were native English speakers, and while some of the judges were probably of the same ethnicity as the non-native English speakers being judged, this study evidently showed truth- and lie-bias across cultures as well as within cultures.

Summary

This literature review has presented the research concerning the most discussed linguistic features of deception and highlighted the harmony and conflict with their findings. It has explained that, as conflicting findings may be due to varying contexts, topics, and levels of suspicion, the current study analyzes these features as a means to contribute to the discussion

under the specific context of spontaneous lies on the topic of self, given under no suspicion. Furthermore, it has shown that only one study has researched the linguistic features of deception of non-native English speakers (Zhou and Sung 2008). More research, therefore, should be done in order to gain a sense of whether or not non-native speakers of English deceive the same way as native English speakers. Finally, it has summarized the key literature on cross-cultural perceptions of deception and shown that deception detection is possible, though not more or less accurate, across cultures. It was also illustrated that both lie-bias and truth-bias were held cross-culturally in different studies.

It is important to understand whether non-native English speakers use the same linguistic features when lying as do native English speakers, and it is important to better understand people's perceptions of deception cross-culturally. These are important due to the large number (millions) of non-native English speakers within the United States, some of them in trouble, duly and unduly, with the law. It is also important to understand the linguistic features and perceptions of deception cross-culturally because of the increasingly frequent contact we have with individuals from all over the globe. Yet society still lacks the knowledge of whether the same measures used to detect lies from native English speakers can be used to detect lies from non-native English speakers, and little to nothing is known about the perceptions of deception between Americans and West Africans.

The current study specifically compares native English speaking Americans' linguistic features with those of people from Ghana in West Africa. According to the U.S. Department of State, Ghana has one of the fastest growing economies in Africa, and there also exists a robust foreign exchange student program between the U.S. and Ghana. Moreover, Ghanaians acquire their respective tribal languages as their first language. However, because English is the official

national language of Ghana, Ghanaians generally learn to speak English at native-like fluency. Thus, any differences in the linguistic features of deception between Americans and Ghanaians cannot be attributed to Ghanaians' English proficiency level, making Ghanaians a prime population to work with for comparative, cross-cultural deception research.

The current study, therefore, intends to provide insight as to how native-English speaking Americans lie in the given context, how Ghanaians lie in the same context, how Americans' and Ghanaians' truthful speech differ linguistically, whether there are significant differences in how accurate the two groups are at identifying lies cross-culturally and within their own cultures, and whether or not any truth- or lie-bias is displayed either cross-culturally or within cultures. Thus, the research questions for this study are (1) In the given context, what linguistic features do Americans and Ghanaians use in deceptive speech?; (2) What linguistic differences are there, if any, between American and Ghanaian baseline speech in this context?; (3) How do the groups differ with regards to accuracy and confidence levels when detecting deception within their own culture versus across cultures?; and (4) Does either culture display cultural bias in identifying liars?

Chapter 3

Research Design

Introduction

This chapter provides a detailed overview of the research design for this thesis. The purpose of this thesis is to provide a better understanding of the linguistic features of deception for both Americans and Ghanaians in the context of spontaneous lies told on the topic of self and under no suspicion, as premeditation time, topic, and suspicion level could affect the linguistic output (*see* Ebesu & Miller 1994; Buller et al. 1996; DePaulo et al. 2003; Adams & Jarvis 2004, 2006; Walczyk 2009). Additionally, this thesis sheds light on the perceptions of deception across native English speaking Americans and non-native English speaking Ghanaians. The research done for this thesis consists of two parts: Part 1, one-on-one interviews where participants were asked to both lie and tell the truth, and Part 2, a Qualtrics survey where other participants determine whether the speakers in Part 1 were telling the truth or lying. The research design and methodologies of Parts 1 and 2 are described below in this order. For each part, details about and demographics of the participants involved are given, then the stimuli used in the experiment is presented. Next, the experiment's method is explained in detail, followed by an account of how the data from were analyzed.

Part 1: Interviews

The purpose of this part of the experiment was to address research questions (1), *In the given context, what linguistic features do Americans and Ghanaians use in deceptive speech?*; and (2), *What linguistic differences are there, if any, between American and Ghanaian baseline*

speech in this context? As explained above, the first part of the experiment entailed one-on-one interviews where both truthful and deceptive speech were elicited.

Participants. For Part 1, all participants (N=16, eight native-English speaking Americans and eight non-native English speaking Ghanaians) were university students. The American participants were current students at Brigham Young University in Provo, Utah, USA. Five of the Ghanaians interviewed were current students at the University of Ghana, and three were students of the Brigham Young University-Idaho online program. Table 3.1 below shows the demographics for both groups of interviewed participants.

Table 3.1. Demographics of interviewed participants

Nationality	Average Age	Gender	Locations of Origin
Americans	23.25	4 males, 4 females	Arizona, Idaho, Ohio, Minnesota, Utah, Oregon, Washington D.C.,
Ghanaians	23.13	6 males, 2 females	Accra, Adukrom, Dansoman, Cape Coast, Koforidua

Though initially a total of six Ghanaian females were interviewed for this experiment, four of the females' responses were not used for the following reasons: the interview for one of them was interrupted twice by passersby walking through the room, distracting the interviewee and seemingly altering her responses; one other female had in fact been present for another participant's interview; one had a difficult time refraining from laughing, inhibiting her ability to give cohesive responses; and one was excessively shy, hindering her ability to respond to the questions, and also spoke very quietly, making it difficult to obtain a quality audio recording.

Stimuli. Each participant was asked to produce both deceptive and truthful texts. In order to obtain both types of texts, the interviewees were asked a series of seven questions. All interviewees responded to the same questions (*see* Figure 3.1). These items, like Buller et al (1996), were used to elicit “factual, attitudinal, and emotional information” (p. 274) about the interviewees themselves. Specifically, items 2, 5, and 7 were borrowed from a similar experiment by Klein and Epley (2015). These questions were chosen because of their ability to elicit attitudinal and perhaps emotional information about oneself concerning commonplace topics of casual conversation. All of Klein and Epley’s (2015) questions were not used, as the

<p>Control:</p> <ol style="list-style-type: none">1. What’s your <i>least</i> favorite movie or book and why? T2. What celebrity would you most like to meet and what would you say to them? F <p>For survey:</p> <ol style="list-style-type: none">3. What did you do last night between the time you got home and went to bed?4. Tell about a teacher who has been particularly influential in your life. Briefly explain how this person influenced you.5. What is an interesting fact about you that would surprise other people?6. What was the last item you bought for yourself? Please describe it.7. What is your favorite hobby and what do you like most about it?
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Figure 3.1. Interview questions for experiment Part 1.

researcher developed other questions (items 1, 3, 4, and 6) that aimed to elicit factual information (3 and 6) in addition to attitudinal and emotional information, as well as eliciting responses to questions posed in the past tense (items 3,4, and 6) in addition to the present. Also, item 1 was posed with a negation, while item 6 asked for a description. Using questions with these varying features helped the researcher to see if the type of question affected the production of supposed linguistic features of deception such as negation, negative affect, abnormal verb tense, and increased descriptive language. Items (3 and 6), eliciting factual information, also reflect the nature of questions typically posed in legal situations (court, interrogation, etc.). Thus, the variety of questions provided insight as to whether linguistic features are consistent across various kinds of questions within the given context of this experiment (i.e. answering spontaneously questions about self under no apparent suspicion).

Continuing with the explanation of how truthful and deceptive texts were elicited, an iPad was set up on a table and facing the interviewee (and was completely visible to the interviewee) before the interview began. An iPhone was placed next to the interviewee, and the participant put an earbud with a microphone in their right ear to remain there throughout the duration of the interview for the purpose of obtaining clearer audio recordings of the interviewee's replies than what the iPad could pick up from a distance. For the elicitation of responses, the interviewer would raise one of two signs that stated "LIE" or "TRUTH" in bold all-caps as he began to pose a question from Figure 3.1. This asking and raising of the sign were done simultaneously so as to create a spontaneous-response situation. The signs were simply printed from a computer and were each the size of a half sheet of 8.5 x 11 in. paper. The sign would remain raised until the participant finished their response.

Method. During the interview, the participant sat in a chair across from the researcher. While in Ghana, two Ghanaian research assistants were present to aid me in recruiting and interacting with the Ghanaian people. The interviews took place in the participant's dorm room on the University of Ghana campus where roommates were sometimes in earshot though not present in the room where the interview was taking place. When roommates could overhear an interview, they were kindly refused to participate in the study, despite some asking to. This of course was to ensure that all elicited responses were spontaneous, the participants having not received the chance to premeditate their answers. The dorm-room setting was relatively quiet, though noise from roommates and students just outside was sometimes present. One interview was done in a large study room that echoed, as this was the place most conducive and convenient for the interviewee at the moment. The echoing, however, did not significantly affect the quality of the recording and did not inhibit the intelligibility of the speaker. As for the distance-learning students, those interviews took place in a church Sunday school room where traffic just outside was audible. For these interviews, only the interviewer and interviewee were present. The American interviews, on the other hand, were all done in a reserved study room at the BYU campus library. Only the interviewer and interviewee were present. The study rooms were quiet, though some talking from adjacent rooms was faintly audible at times. This, however, did not pose any problems for understanding the recordings. In all cases, the one interviewee was the only participant present and being interviewed. In no cases had any interviewees overheard or were exposed in any way to the interview questions nor the interview process beforehand. Also, the interview questions on the interviewer's paper were not made visible to the interviewee during the interview.

The interview questions were posed to each participant in a different order with the exception of items 1 and 2—all participants would tell the truth to 1, and all would tell a lie in response to 2. This was done for control per request of the Institutional Review Board (IRB), but these control questions were not analyzed. These items were used in the beginning of the interview as practice questions to ensure the interviewee understood the directions. Questions 3 through 7 were randomized in order that no participant within either group would respond to the questions in the same order. This randomization allowed for more accurate data collection, as the language and ideas expressed in the responses did not follow any certain pattern due to influence from the same set of previous questions. The random ordering of questions was done before meeting with any of the participants using the random number generator found at www.random.org. The random number generator was programmed to yield numbers 1 to 7 at random. Each time a 1 or a 2 was yielded, these were not recorded, as items 1 and 2 were always to be given first and second. When any number 3 through 7 was yielded by the generator, it was written down as the first item to be asked after questions 1 and 2. The next number between 3 and 7 yielded by the generator would be the second question posed for that set, and likewise for the subsequent items. If a number between 3 and 7 already in the set was yielded again by the generator, this turn was skipped, as none of the questions were to be asked more than once. This process continued until questions 3 through 7 were randomized. This same process was done to produce eight sets of randomized items. These eight were used for the group of Ghanaians, and the same eight were used with the Americans.

As for determining to which questions each participant would lie and to which they would tell the truth, a randomized order of “Lie” and “Truth” was assigned to each of the eight randomized question sets. This randomization was done by simply flipping a coin; heads was

‘truth,’ while tails indicated ‘lie.’ As the truth telling and lying was already set for numbers 1 and 2, the first coin flip indicated the elicitation of a lie or a truth to the first question to be asked after question 2. A coin flip indicated ‘lie’ or ‘truth’ for each question in a set. However, because there were five questions to receive a lie or truth assignment, and the researcher needed some lies and some truths from each participant, the randomizing stopped when three truths or three lies had been established by coin flipping. The subsequent items within the set were then assigned a deceitful elicitation if there were already three truths assigned in the set. Likewise, the subsequent items within the set were assigned a truthful elicitation if there were already three lies assigned within the set. Thus, each of the eight sets of randomized questions were assigned three lies and two truths or three truths and two lies for items 3 through 7. Therefore, after the control questions were answered, participants gave either two lies and three truths, or vice versa. In total, having answered all seven questions, participants yielded either three lies and four truths or vice versa. This produced a total of 112 responses to work with.

During the interview, each participant was audio recorded on the iPhone through the earbud microphone. As well, the Ghanaian participants were video recorded using the iPad, while the Americans were unknowingly only mock video recorded with the iPad. This was because of a decision change after obtaining the Ghanaians’ responses and after further consideration of the research design. At this point, it was decided that audio clips, rather than audiovisual clips, were most appropriate for the purposes of this study. Thus, in order to maintain consistency, having video recorded the Ghanaians, the Americans were asked to agree to being video recorded as well, and the researcher pretended to video record them with an iPad.

Concerning the process of the interview, each participant was greeted and asked to sit in a chair across from the interviewer. The interviewer would then give the participant the consent

form explaining the process of the interview and that some of their responses would be used on an online survey (*see* Appendix A). They were also informed of the potential to earn \$25 USD if they were among the top eight most believed liars according to the responses from the future survey takers. This incentive was given in order to raise the stakes of the situation and increase the cognitive load, (*see* Vrij et al. 2011). When the participant understood the process and the ramifications of participating and agreed to participate by signing the consent form, the interviewer would briefly review the process again before initiating recording on the audio and video devices. After all technology was set up and recording, the interviewer would raise the “TRUTH” sign while simultaneously asking question #1. When the participant was clearly finished with their response, the interviewer would raise the “LIE” sign while simultaneously posing question #2. Once this question was answered, the interviewer would clarify with the interviewee that their response to #1 was indeed the truth, and their response to #2 was a lie. This was done so as to confirm that the participant understood the directions as to when to lie and when to tell the truth. It should be noted that one Ghanaian participant erroneously responded truthfully to item 2 (*see* Appendix C). He was instructed again as to how he should respond, he confirmed that he then understood, and the interview continued. In all cases, once it was established that the interviewee was responding appropriately, the interview process would proceed, following the same pattern of the interviewer posing the questions in random order while simultaneously raising the sign indicating whether to lie or tell the truth to each.

When the interviews with the Americans concluded, it was revealed to them that video had in fact not been taken, and that only audio would be used for the online surveys (Part 2). They were each given the explanation that the mock video recording was a way to increase the anxiety of the situation as deceptive cues are more likely to leak out in tenses situations (*see* Vrij

et al. 2011). In all cases, the interviewee was thanked for their time and promised to be contacted concerning the results of the survey and informed whether they won the reward money.

Data Analysis. In order to answer research questions (1), *In the given context, what linguistic features do Americans and Ghanaians use in deceptive speech?*, and (2), *What linguistic differences are there, if any, between American and Ghanaian baseline speech in this context?*, the interviewer's questions and the interviewees' responses were carefully transcribed for discourse analysis (see Appendix C). They were also transcribed to be used as survey items for Part 2 discussed later. The transcription was done in a manner that no corrections of grammar were made to the speech. It represented all utterances as spoken, including interjections like 'um,' 'uh,' and 'hmm.' Even sighs and laughing were notated in parentheses, e.g. "(Sigh)" and "(laughing)." Furthermore, in the three cases where interviewees asked for clarification or repetition of any question, their inquiries as well as the responses from the interviewer were transcribed. For example, when a two-part question was given (e.g. items 1 and 7 in Figure 3.1), there were two cases where the interviewee answered the first part of the question and then needed to be reminded what the second part was. In another case, the interviewee, in response to item 1, asked if the celebrity needed to be a living one. In this case the interviewer responded "Um, not necessarily," and allowed the interviewee to answer as he wished.

Concerning the discourse analysis, a total of fifteen linguistic features were examined to determine whether or not they were characteristic of deception in the context of this experiment. These include (1) adjective and adverb frequency, (2) pronoun inconsistencies, (3) self-reference frequency, (4) abnormal verb tense, (5) modal verbs, (6) negative emotion words, (7) negations, (8) positive emotion words, (9) total emotion words, (10) response latency, (11) superfluousness, (12) "um"/"uh" frequency, (13) "you know" frequency, (14) vagueness and allness terms, and

(15) word count. The reason for taking the “um”/”uh” frequency into consideration stems from Arciuli (2010) who found that “um” was less frequent in a group of laboratory participants, and Villar et al. (2012) who found the same in the verified deceptive speech of a convicted killer. This was not addressed in the literature review as this feature is only examined by these two studies and is not one of the most discussed features of deception. The analysis of “you know” was a result of what appeared to the researcher during the discourse analysis process to be a possible trend of deceptive speech.

The above fifteen features were analyzed using the following methods. The Linguistic Inquiry and Word Count tool (LIWC) was used to gather data for the statements’ word counts, self-reference percentages, and positive and negative emotion percentages. Each response from the interviews was copied and pasted into the LIWC tool, which yielded the word counts and abovementioned percentages specific to each response. These numbers were recorded in an Excel spreadsheet that was set up to provide the raw data for each response of every interviewee. The analysis of adjective and adverbs, abnormal verb tense, modal verbs, negations, pronoun inconsistencies, superfluousness, and vagueness and allness terms was done via the researcher identifying, highlighting, and tallying the occurrence of these features in each response. This was done in a Microsoft Word document. Each feature was assigned a unique color, underlining, or bold-type feature. All the words or phrases that constituted a feature were highlighted or formatted according to their unique format for easy visibility and counting. The occurrences of these features were tallied for each response, and these tallies were entered into the Excel data sheet. As for response latency, this was measured by using the Audacity audio playing and recording software. The silent time between the end of the interviewer’s question and the beginning of the interviewee’s answer the question was highlighted, and Audacity gave the

measurement of this time in milliseconds. It is important to note, however, that the researcher measured the time it took for the interviewee to begin answering their response with content words, therefore sighs, lip smacking, “ums,” and “uhs” made or uttered before the interviewee began to respond to the question with content words were included in the response latency measurements. These measurements were entered into the data sheet.

More specific explanations about how the linguistic features were tallied are given here. It should be noted, however, that the discourse of each response was analyzed and the counts for each linguistic feature were tallied several times over a course of several months by the researcher. Adjustments were made in cases where words were overlooked, words were incorrectly counted, and/or tallies were incorrectly input into the data sheet. Such was done until the researcher could find no errors in the data. In cases of doubt concerning how to count certain linguistic features, standard American English dictionaries (Merriam-Webster and those found at Dictionary.com) as well as Davies’ (2008) Corpus of Contemporary American English (COCA) were thoroughly searched in order to determine parts of speech (most especially for adjective and adverb counts), the behavior of words grammatically, and how people typically use such words or expressions. For example, *wh*-words (‘why,’ ‘who,’ ‘where,’ etc.) are sometimes adverbs and sometimes not. Also, ‘a lot’ is technically an expression made up of a determiner and a noun, but standard dictionaries and COCA confirm its use as an adverbial expression meaning ‘much’ or ‘greatly.’

Concerning adjectives and adverb frequencies, all adjective and adverb parts of speech were counted in the adjective and adverb frequency count. Additionally, all words that grammatically acted like an adjective in the sentence were also counted in this category. An example of this is found in the phrase “math questions,” where ‘math,’ being a noun, is

modifying the noun, 'question,' and syntactically behaving like an adjective. Naturally, adverbial time expressions like 'last night' and 'yesterday' were also counted in this category. Each adjective, adverb, and adverbial expression was counted having a value of 1. Thus, adverbial expressions consisting of more than one word counted as 1. Furthermore, concerning verb tense, any instances where the speaker used an unnatural verb tense or demonstrated an inconsistency in verb tense usage were counted. Each abnormal verb tense word or expression counted as 1. Likewise, all modal verbs having each a value of 1 were counted in the interviewee responses. All negations in each response were also tallied. These consisted of the words 'no,' 'not,' 'never,' '-n't,' 'none,' 'except,' 'besides,' and 'without.' Regarding pronoun inconsistencies, the researcher identified all instances were counted with a value of 1 where a pronoun, whether first-, second-, or third-person, was omitted, e.g. "Love swimming" instead of 'I love swimming.' Also, all instances were counted as 1 where a speaker changed the referencing pronoun within a single response, e.g. "She" (high school English teacher) being used consistently but referred to moments later as "some teacher." Furthermore, each instance where an inappropriate pronoun was used, for example 'him' referring to a female and 'it' referring to a plural referent, counted as 1. With regard to superfluousness, each phrase and/or idea repeated was counted as 1. Thus, the first time the person said that phrase and/or idea was not counted but only the subsequent expressions of that same phrase or idea were counted. Words or phrases repeated due to stuttering were not counted as redundant or superfluous, as this does not reflect psycholinguistic repetitiveness. Regarding "you know" and "um/uh" values, the number of times a speaker said 'you know' (as an interjection), 'um,' and 'uh' were counted and tallied in their respective categories. Finally, each vagueness and allness term counted as 1. The vagueness terms tallied for this category, defined by Lakoff (1973) as "hedging" terms, included 'kind of,'

‘sort of,’ ‘basically,’ ‘pretty (much),’ ‘somewhat,’ ‘mostly,’ ‘almost,’ ‘for the most part,’ ‘especially,’ ‘often,’ ‘typically,’ and ‘more or less.’ The researcher also included the more nowadays terms, ‘and stuff’ and ‘whatever.’ Allness terms included in this category included ‘all,’ ‘every,’ ‘everything,’ ‘nothing,’ ‘never,’ ‘always,’ ‘any,’ ‘anything,’ ‘anyone,’ ‘anytime,’ and ‘all the time.’ These counts were all encompassed in one category of vagueness and allness terms. All of these tallies were entered into the data spreadsheet in their respective columns. In order to then obtain accurate numbers to work with that were relative to each response’s word count, the equation tool was used in Excel to divide the total for each of these features for each response by that response’s word count. The quotient was then multiplied by 100 to yield a percentage with six decimal places (no percentages were rounded off). Thus, the values run in the statistics were, for example, the percentage of adjectives and adverbs, and not simply the number of adjectives and adverbs in each response, as this would not provide an accurate measure of expressive language relative to how much language was used.

In order to determine which of these features were characteristic of deception (answering research question 1), two mixed-effects logistic regressions (one for the American data, and one for the Ghanaian data) were run using the statistical analysis software, SPSS. For both analyses, each of the percentages and values of the fifteen analyzed features were the fixed effects, and “Lie/Truth,” (whether the utterance was a lie or a truth) was set as the target. The reference category was set as “Truth,” and the interaction between the question number (*see* Figure 3.1) and the interviewee was the subject. As typical practice for running a mixed-effects logistic regression, the analyses began with all fifteen fixed effects, and the features demonstrating the least significance were weeded out, one-by-one, until only the features with significance were

left, revealing which features were significantly characteristic of either lying or telling the truth for both the American group and the Ghanaian group.

In order answer research question (2), *What linguistic differences are there, if any, between American and Ghanaian baseline speech in this context?*, a one-way ANOVA was run to find any potential linguistic differences between the truthful answers of the two groups. The ANOVA analyzed the effect of nationality on the fifteen linguistic features in the truths of both groups. Thus, “Nationality” was the independent variable, and each of the fifteen linguistic features were the dependent variables. This was to discover any differences between Americans’ and Ghanaians’ baseline speech.

Part 2: Online Survey

The purpose of Part 2 of the research is to answer the third and fourth research questions: (3) *How do the groups differ with regards to accuracy and confidence levels when detecting deception within their own culture versus across cultures?* and (4) *Does either culture display cultural bias in identifying liars?* In order to answer these questions, responses from the interviews in Part 1 were made items of three separate surveys which were taken by a new set of participants (survey takers). Each item on the survey contained an audio clip and transcribed text of the audio clip from an interviewee’s response from Part 1 of the research. These surveys obtained information from a group of American survey takers and a group of Ghanaian survey takers concerning their judgments as to whether the responses in the survey items were lies or truths. They also required the survey participants to rate their level of confidence in each of their judgments as well as a brief explanation as to why they think the speaker was lying or telling the truth. A more detailed description of the surveys and an explanation as to how the information

from it was used to answer research questions (3) and (4) are given in the Stimuli and Method section below. Following this is an outline of the statistical analyses performed to answer research questions (3) and (4).

Participants. The participants for the Qualtrics surveys were either native English-speaking Americans or they were Ghanaians whose mother tongues were that of a Ghanaian tribe (*see* Table 3.2 below). A total of 47 native English speaking Americans responded to and completed the surveys. Likely due to the length of each of the three surveys (approximately 15-20 minutes) and perhaps the attention and concentration each required, some survey takers started but did not complete a survey. Thus, a total of fourteen Ghanaians completed any of the three surveys, but the responses from Ghanaians who did not respond to every item on a survey

Table 3.2. Demographics of Survey Participants.

Nationality	Number of Participants	First Language (L1)
American	47	American English
Ghanaian	35	Ewe, Ga, Twi, or some other Ghanaian language

were also used in the data analysis. Thus, effectively 35 Ghanaians participated in the surveys. All of the survey participants were either native English-speaking Americans or native Ghanaian-language-speaking Ghanaians according to each participant’s self-report. No other demographic information for the survey participants was gathered, however, the surveys’ distribution targeted young adults.

Stimuli and Method. In this survey portion of the study, forty-two responses from the interviewees were chosen at random⁴ to be used as survey items in the form of audio and text. This number was chosen so that when divided into three separate surveys each survey contained a reasonable number of items or “blocks”⁵ (fourteen) for survey takers to respond to within approximately fifteen minutes. Each of the three surveys were identical in format. The first page of the survey contained the consent form for being a survey participant (*see* Appendix B). The participants were informed at the bottom of the page that they agreed to the terms of the form by clicking “OK.” The survey then asked for the participant’s nationality, with “American,” “Ghanaian,” and other options given in a multiple choice format. The other options acted as a distractor so that it was not made obvious to the survey takers that only Americans and Ghanaians were included in the study. This was done so as to help facilitate an environment where the participants judged only based on the voice, accent, and language of the speakers rather than on any preconceived beliefs or stereotypes about each nationality. It was most likely, however, that the Ghanaians quickly recognized Americans as Americans from their speech, and Americans likely recognized the Ghanaians as African from their speech. In any case, the survey setup may have helped facilitate a judgment on language more so than not, but that is difficult to determine and its analysis is beyond the scope of this study. After the survey participants indicated their nationality, they then indicated their first language in a similar multiple choice format with languages other than American English and Ghanaian languages as distractors. The survey then advised the participants to use headphones to better hear the audio recordings. As for the subsequent items to be judged, audio recordings were cropped to each contain only a

⁴ This and all other random selection for this research was done through utilizing the random number generator found at www.random.org

⁵ Terminology used in Qualtrics survey software. A block may contain multiple elements which remain intact and together, behaving as one item.

question posed by the interviewer and the interviewee's response to that question. For each item on the surveys, the transcription of the speech in the audio clip was pasted directly below the audio player (see Figure 3.2 below). The transcription was there to aid survey takers it was difficult for Americans to understand the Ghanaian English and vice versa. Thus, survey participants made judgments of the speakers through audio with the assistance of the transcription if needed.

To further explain the organization of the survey items to be judged, I will go in order from the top of a survey block to the bottom of it. See Figure 3.2 below for an illustration of a survey block. First, in order to give survey takers at least somewhat of a baseline for each interviewed participant, one truthful response of the speaker was provided preceding each item to be judged. This was done because several studies show that having a baseline for any speaker is essential to detecting deception, as the deviations from one's baseline are what reveal deception (see Sapir 1987; Adams & Jarvis 1996, 2004; Ekman 2003; Ali & Levine 2008). Thus, the baseline for a speaker used on the surveys was either the truthful control item (question 1 in Figure 3.1, *What is your least favorite movie or book, and why?*) or another truthful response from the interview that was not used as an item to be judged on any of the three surveys. This was carefully done so any survey participants taking more than one of the surveys would not encounter an item to be judged as the baseline from a different survey and therefore know it to be a truth. In any event, after listening to the speaker's given baseline response, the survey participants were to then listen to and make a judgment of an audio clip where the speaker was lying or being truthful. The survey subjects then indicated their guess as to the veracity of the statement, marking "Lying" or "Telling the Truth." They were then to indicate their level of confidence in their judgment on a scale from one to five and, finally, provide some kind of

This is an **example** of the speaker telling the **truth** (transcription provided below):



Q: What is your favorite hobby, and what do you like most about it?

A: Um, my favorite hobby is playing football, watching football. It's my favorite. And the reason is that I have passion for it. When you have passion for something it, it's, it's, you, you just draw, it just draws you closer. Anytime something is going on about it, you, you, you're just drawn by it because of its passion. Yeah.

Please listen to the audio clip below and **indicate whether you think the person in question is lying or telling the truth**. A transcription is provided below.



Q: What is the last item you bought for yourself? Please describe it.

A: The last item I bought for myself? Ok, it's, it's a deodorant spray, a Sure. Adidas, Adidas Sure I bought for myself. Yeah.

Lying



Telling the Truth



How confident do you feel in your prediction?

Not at all confident/Purely guessing



Somewhat confident



Confident



Very confident



I'm absolutely certain



Briefly explain why you think this person is lying or why you think this person is telling the truth.

>>

Survey Completion
0% 100%

Figure 3.2. Example of Qualtrics Survey Block.

response in a text field explaining briefly why they thought the response was truthful or deceptive.

At end of the survey, the participants were given an attention-check item asking them to type a phrase in quotes (e.g. “red chair”) in a text field. This of course was to flag any survey takers that were simply rushing through the survey and not taking it seriously enough for the needed analysis. Survey takers who did not respond to this question or who were observably rushing through the survey were not included in the analysis (the number of these is undetermined as they were deleted periodically throughout months of data collection), with the exception of Ghanaians who only responded to a few blocks in a survey. Some Americans also only responded to a few blocks of a survey, but their responses were not used, as there were a sufficient number of completed American surveys to work with. In the case of the incomplete Ghanaian surveys, the text they gave in response to the items asking for their explanation as to why they think the speaker is lying or not helped to determine their validity. Also, if the Qualtrics data showed that the participant spent ample time on the survey, this also helped validate the participant’s responses. After the attention-checking item, the participants received their scores revealing how many items they judged correctly.

Data Analysis. Several analyses of the survey data were carried out in search of answers to research questions (3), *How do the groups differ with regards to accuracy and confidence levels when detecting deception within their own culture versus across cultures?*, and (4), *Does either culture display cultural bias in identifying liars?*. The data from each of the surveys were downloaded from Qualtrics and entered into an Excel spreadsheet in a format that lined up each of the participants’ responses to each survey item. Thus, the nationality of the speaker, the nationality of the listener, the judgment of lie or truth made by the listener, and the listener’s

indicated confidence level were entered for every survey response. This format provided 930 survey responses to work with—672 American responses and 258 Ghanaian responses.

Moreover, another spreadsheet was created to show the percentage of Americans and Ghanaians respectively who said that that item on the survey was a lie. This yielded of course 42 points of data to work with as there were a total of 42 items to be judged. These percentages were provided for each survey item by the Qualtrics results report.

To answer research question (3), accuracy percentages were calculated, and three one-way ANOVAs were run. The accuracy percentages were calculated for both Americans and Ghanaians in order to see how accurate each group was at detecting lies within their own culture, cross-culturally, and overall. These were calculated for each respective group by adding the number of accurate judgments made by the group and dividing that total by the total number of responses from that group. As for the statistical analyses, the first one-way ANOVA was run to compare how accurate and confident the Americans were when judging Americans versus when judging Ghanaians. This ANOVA (using only the data for American listeners) tested the effect of speaker nationality (independent variable) on American listeners' accuracy and confidence levels (dependent variables). The second ANOVA tested the same for Ghanaian listeners. The third ANOVA was run to find potential differences between Americans' and Ghanaians' accuracy and confidence levels overall. Thus, this tested the effect of listener nationality (independent variable) on listener accuracy and listener confidence level (dependent variables). Therefore, the results of these analyses would provide insight into differences in accuracy and confidence levels between Americans and Ghanaians when attempting to detect deception generally and when attempting to detect deception in those of their own culture and those of a different culture.

In order to answer research question (4), four one-way ANOVAs were run in order to discover evidence of potential culture bias between the groups. Specifically, to answer the question as to whether Americans believed one group more than the other, a one-way ANOVA was run to determine the effect of speaker nationality on the Americans' tendency to indicate "Lying" (using the percentages of how many Americans viewed responses as lies) when the speakers were telling the truth or lying. Thus, the dependent variable was the percentage of Americans who indicated "Lying," while the independent variable was speaker nationality. This same type of analysis was done on only the truthful responses from interviewees in order to determine Americans' tendency to accuse Ghanaians of lying versus their tendency to accuse other Americans of lying when both groups were telling the truth. Likewise, these same two analyses were repeated using the Ghanaian listeners' data in order to determine whether Ghanaian listeners believed one group more than the other. Therefore, it was hoped that these analyses would provide the researchers with a sense of culture bias.

Chapter 4

Results

This chapter presents the results of the statistical analyses and findings of both parts of the research experiment outlined in Chapter 3. Part 1 of the research experiment included the analysis of linguistic features of deception for Americans and Ghanaians respectively. Part 2 of the research experiment included the analysis of the survey data, which concerns the cross-cultural perceptions of deception.

Results for Research Question 1: Linguistic Features of Deception

Presented here are the results pertaining to the first research question, *In the given context, what linguistic features do Americans and Ghanaians use in deceptive speech?* In order to answer this question, the linguistic features in the lies and truths of each of the participants were recorded and the average number of each of the linguistic features was determined for the Americans and Ghanaians.

Americans' Linguistic Features of Deception. The calculated averages for each linguistic feature in the American participants' truths and lies are presented in Table 4.1 below. Higher averages for lies were found for self-references, pronoun inconsistencies, positive emotion words, total emotion words, vagueness and allness terms, abnormal verb tense, modal verbs, adjectives and adverbs, superfluousness and redundancy, and "you know." Lower averages for lies were found in negative emotion words, negations, word count, and response latency times. All of these averages turned out to be more or less as expected barring those for self-references, negative emotion words, negations, and word count. The features contributing to "nonimmediacy" (vagueness terms, abnormal verb tense, modal verbs, and self-references) all

were higher in lies than in truths, though being nonimmediate suggests a lower count for self-referencing pronouns in lies than in truths. Pronoun inconsistencies, on the other hand, were higher for lies than truths as expected. For negative emotion words, most studies have found that lies contain more negative emotion words, though the current study shows fewer negative emotion words for lies. Considering total emotion words, this result was as expected as several studies have shown deceptive language to contain more emotion words in general. Negations were also expected to be higher for lies than truths, opposite to what the data show. Concerning word count, it was expected that the results would demonstrate a difference as they have, however, I was unsure whether the word counts for lies would be higher or lower for lies than

Table 4.1. Americans’ averages per lie or truth for individual linguistic features examined.

Linguistic Feature Examined	Lie Average	Truth Average
Self-references (LIWC)	9.169	8.598
Pronoun Inconsistencies %	0.296	0.071
Negative Emotion Words (LIWC)	0.073	0.949
Positive Emotion Words (LIWC)	4.010	2.847
Total Emotion Words (LIWC)	4.083	3.800
Negations	1.429	1.739
Word Count	50.444	62.714
Vagueness and Allness Terms %	2.542	2.066
Abnormal Verb Tense %	0.248	0.000
Modal Verbs %	2.867	1.316
Adjectives and Adverbs %	20.356	18.877
Superfluousness and Redundancy %	2.023	0.814
Response Latency Times (ms)	155.000	216.214
“Um”/“Uh” %	2.882	3.658
“You know” %	0.705	0.181

truths as past research has provided evidence for both as possibilities. Aside from these four features, the averages illustrate trends consistent with much past research.

To determine which of the linguistic features examined are characteristic of deception for Americans, a mixed-effects logistic regression was run. This statistical analysis provided insight as to what linguistic features are unique to Americans’ deceptive speech in the given context, to which the Ghanaians’ results could be compared. The results of this analysis are found in Table 4.2. Because the reference category for the mixed-effects logistic regression was set as “Truth,”

Table 4.2. Statistical results of the Mixed-effects Logistic Regression for the examined linguistic features of Americans.

Fixed Coefficients
Target: Lie/Truth
Reference Category: Truth

Variable	Coef. (SE)	Sig.	95% CI	
			Lower	Upper
Intercept	-3.397 (1.228)	.007	-5.864	-0.931
Adjectives & Adverbs	0.102 (0.052)	.055	-0.002	0.206
Superfluosness	0.530 (0.236)	.029*	0.056	1.005
Negative Emotion	-1.712 (0.802)	.038*	-3.323	-0.100
Pronoun Inconsistencies	0.938 (0.496)	.065	-0.059	1.935
Modal Verbs	0.425 (0.165)	.013*	0.094	0.757

SE = Standard Error

CI = Confidence Interval

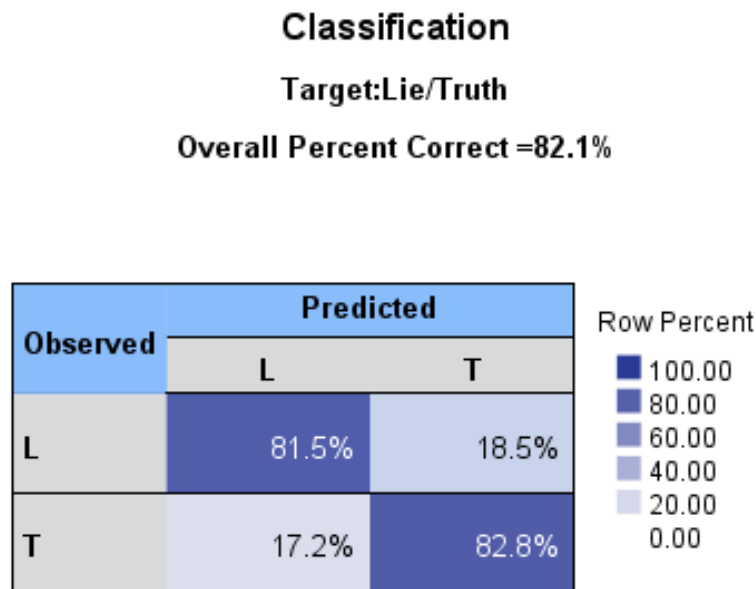
the coefficient values represent how lies contrast with truths. Thus, positive coefficients (such as 0.096) indicate that, in comparison to truths, lies are more likely to contain more adjectives and adverbs, for example. Therefore a negative coefficient value indicates that in comparison to truths, lies are less likely to contain, for example, more negative emotion words.

As typical of mixed-effect logistic regression statistical analyses, the variables demonstrating no significance (or significance values far from less than .05) were weeded out until only the features demonstrating significance and/or features close to significance remained. Thus, the features which were included but did not reach or come close to significance at the $p < .05$ level included abnormal verb tense, negations, number self-references, positive emotion words, total emotion words, response latency, vagueness and allness terms, “um”/”uh” frequency, word count, and “you know” frequency. The results, therefore, revealed that out of the fifteen linguistic features considered, three were statistically significant and two were almost significant and thus worth mentioning: adjectives and adverbs, $p = .055$; superfluousness, $p = .029$; negative emotion words, $p = .038$; pronoun inconsistencies, $p = .065$; and modal verbs, $p = .013$.

A higher number of negative emotion words, interestingly, proved to be characteristic of truth telling rather than lying, unlike superfluousness and modal verbs. Furthermore, two of the fifteen linguistic features were nearly statistically significant: adjectives & adverbs, $p = .055$; and pronoun inconsistencies, $p = .065$. The positive coefficient values also illustrate these features as characteristic of lying.

This model for predicting lies and truths using the linguistic features in Table 4.2 above proved to be better than chance, yielding 82% overall accuracy (*see* Table 4.3 below). The results of this model are better than the results that humans are typically capable of achieving

Table 4.3. The model’s accuracy percentages in predicting Americans’ lies and truths.



(see Kleinmuntz & Szucko 1982, Ekman & O’Sullivan 1991, Ekman 2003, Reinhard et al. 2013). The linguistic features in Table 4.2 correctly predicted 82% of lies and 83% of truths.

Ghanaians’ Linguistic Features of Deception. The results of the analysis of the Ghanaian participants’ truths and lies are given in Table 4.4. While the averages between lies and truths for self-references and “um”/“uh” were virtually equal, lies possessed higher averages for pronoun inconsistencies, negative emotion words, positive emotion words, total emotion words, word count, modal verbs, superfluousness and redundancy, and “you know.” In contrast, lies had lower averages for negations, vagueness and allness terms, abnormal verb tense, adjectives and adverbs, and response latency. Most of these figures are evidently consistent with much past research and thus match what was expected with the exception of negations, vagueness and allness terms, abnormal verb tense, and self-references. Interestingly, there were fewer negations as well as vagueness and allness terms in lies than in truths, opposite to what

Table 4.4. Ghanaians’ averages per lie or truth for individual linguistic features examined.

Linguistic Feature Examined	Lie Average	Truth Average
Self-references (LIWC)	10.923	10.917
Pronoun Inconsistencies %	0.462	0.161
Negative Emotion Words (LIWC)	0.692	0.467
Positive Emotion Words (LIWC)	5.783	5.411
Total Emotion Words (LIWC)	6.475	5.394
Negations	0.469	2.173
Word Count	44.538	42.097
Vagueness and Allness Terms %	1.647	3.923
Abnormal Verb Tense %	0.071	0.234
Modal Verbs %	4.385	2.379
Adjectives and Adverbs %	17.407	18.927
Superfluosness and Redundancy %	3.558	2.729
Response Latency Times (ms)	297.846	309.581
“Um”/“Uh”	3.059	3.079
“You know”	0.279	0.000

most past Western-society research has found. Abnormal verb tense averages also turned out to be opposite of much past research, while self-reference averages were quite even for lies and truths, consistent with some research and inconsistent with other research and popular theories regarding self-references in deceit.

A mixed-effects logistic regression was run also for the Ghanaian data in order to determine which of the linguistic features examined are characteristic of deception for Ghanaians

in the given context (i.e. spontaneous response to questions about self and under no suspicion). Like the Americans' mixed-effects logistic regression, because the reference category was set as "Truth," the coefficient values represent how lies contrast with truths. Table 4.5 below illustrates the result of this test, revealing that only one linguistic feature differed significantly between Ghanaian lies and truths: negations, $p=.022$. The negative coefficient for this feature (-0.430) demonstrates that it is not characteristic of lying but of truth telling. On the other hand, the results show that there was almost a significant difference between lies and truths with regards to pronoun inconsistencies, $p=.079$. The positive coefficient for this feature (0.573) marks it as indicative of deception for Ghanaians, much like for Americans (*see* Table 4.2).

Table 4.5. Statistical results of the mixed-effects logistic regression for the examined linguistic features of Ghanaians.

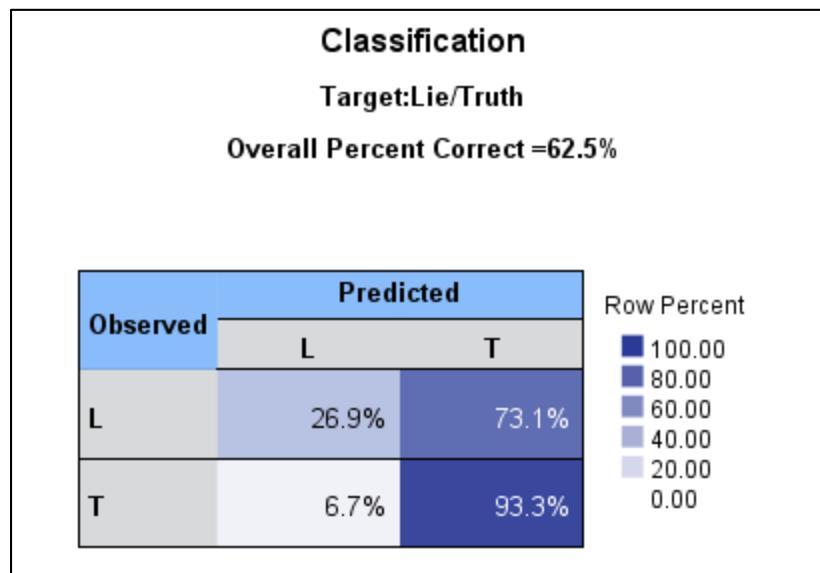
Fixed Coefficients				
Target: Lie/Truth				
Reference Category: Truth				
Variable	Coef. (SE)	Sig.	95% CI	
			Lower	Upper
Intercept	-0.025 (0.309)	.937	-0.663	0.613
Negations	-0.430 (0.176)	.022*	-0.793	-0.067
Pronoun Inconsistencies	0.573 (0.312)	.079	-0.072	1.217

SE = Standard Error

CI = Confidence Interval

The model these features create, however, predict lies surprisingly poorly, as illustrated in Table 4.6 below. It predicted lies correctly only 27% of the time, while it was highly accurate in predicting truths (93%). Overall, the model predicted lies and truths correctly 62.5% of the time. This demonstrates accuracy that is not much better than chance, and therefore not much better than humans at differentiating between deceit and veracity (see Kleinmuntz & Szucko 1982, Ekman & O’Sullivan 1991, Ekman 2003, Reinhard et al. 2013). The model’s 27% accuracy in predicting lies demonstrates its inefficiency despite the significance found in negations and near significance found in pronoun inconsistencies. In other words, there were no statistical differences in the number of these linguistic features in lies and truths for the Ghanaians.

Table 4.6. The model’s accuracy percentages in predicting Ghanaians’ lies and truths.



Results for Research Question 2: American and Ghanaian Baselines

In order to answer research question (2), *What linguistic differences are there, if any, between American and Ghanaian baseline speech?*, the truthful discourse of both Americans and

Ghanaians elicited from the interviews was analyzed. The fifteen linguistic features to be examined were tallied and recorded as outlined in Chapter 3. The average figures and frequencies for these linguistic features as they appear in each group’s baseline speech are given in Table 4.7. These figures illustrate that the Americans’ baseline speech, compared to Ghanaians’, was higher only in negative emotion words, word count, “um”/“uh,” and “you know.” Thus, when telling the truth, Ghanaians were apparently more superfluous, had longer response latency times, and used more self-references, positive and total emotion words, negations, vagueness and allness terms, abnormal verb tense, and modal verbs. The averages for adjective and adverb frequency were virtually the same.

Table 4.7. Americans’ and Ghanaians’ baseline averages for linguistic features examined.

Linguistic Feature Examined	American Baseline Average	Ghanaian Baseline Average
Self-references (LIWC)	8.598	10.917
Pronoun Inconsistencies %	0.071	0.161
Negative Emotion Words (LIWC)	0.949	0.467
Positive Emotion Words (LIWC)	2.847	5.411
Total Emotion Words (LIWC)	3.800	5.394
Negations	1.739	2.173
Word Count	62.714	42.097
Vagueness and Allness Terms %	2.066	3.923
Abnormal Verb Tense %	0.000	0.234
Modal Verbs %	1.316	2.379
Adjectives and Adverbs %	18.877	18.927
Superfluosness and Redundancy %	0.814	2.729
Response Latency Times (ms)	216.214	309.581
“Um”/“Uh”	3.658	3.079
“You know”	0.181	0.000

A one-way ANOVA was run analyzing the effect of nationality on the fifteen linguistic features in the truths told by both groups. Thus, “Nationality” was the independent variable, and each of the fifteen linguistic features were the dependent variables. For truths, the results demonstrated no significant effect of speaker nationality on pronoun inconsistencies [$F(1, 57)=.491, p=.486$], negations, [$F(1, 57)=.525, p=.472$], negative emotion words [$F(1, 57)=1.115, p=.295$], modal verbs [$F(1, 57)=1.147, p=.289$], abnormal verb tense [$F(1, 57)=1.592, p=.212$], vagueness and allness terms [$F(1, 57)=1.282, p=.262$], “um”/”uh” [$F(1, 57)=.870, p=.355$], and number of adjectives and adverbs [$F(1, 57)=.040, p=.842$], though speaker nationality had an almost significant effect on number self-references [$F(1, 57)=2.771, p=.101$], total emotion words [$F(1, 57)=3.002, p=.089$], “you know” [$F(1, 57)=3.398, p=.070$], response latency [$F(1, 57)=3.067, p=.085$], and word count [$F(1, 57)=4.961, p=.057$], tentatively demonstrating that Ghanaians used more self-references and emotion words than Americans, while Americans said “you know” more, generally responded to questions more quickly, and had higher word counts than Ghanaians. On the other hand, speaker nationality significantly affected superfluousness and redundancy [$F(1, 57)=9.253, p=.004$] and positive emotion words [$F(1, 57)=7.103, p=.010$]. Thus, Ghanaians were more superfluous and used more positive emotion words than Americans.

Results for Research Question 3: Accuracy and Confidence Levels

Presented in this section are the outcomes of the statistical analyses helping to answer research question (3), *How do the groups differ with regards to accuracy and confidence levels when detecting deception within their own culture versus across cultures?* To address research question (3), the accuracy percentages representing both Americans’ and Ghanaians’ abilities to detect lies overall, within cultures, and across cultures were calculated (*see* Table 4.8 below).

Table 4.8. Deception detection accuracy percentages of Americans and Ghanaians.

		Speaker		Overall
		Americans	Ghanaians	
Listener	Americans	52%	51%	51%
	Ghanaians	53%	60%	56%

Also, the average confidence levels for both listener groups overall, when judging American speakers, and when judging Ghanaian speakers were calculated (*see* Table 4.9 below). Regarding accuracy levels, Americans demonstrated an overall accuracy level of 51% in detecting lies, while Ghanaians were 56% accurate overall. When American listeners judged American speakers, the listeners were accurate 52% of the time, while American listeners were 51% accurate in detecting Ghanaian speakers' lies. With regards to Ghanaians' accuracy levels within and across cultures, they demonstrated 60% accuracy when attempting to detect the lies of other Ghanaians, while demonstrating 53% accuracy when judging American speakers. Considering these percentages, it appears that Ghanaians detect deception slightly better within their own culture than in Americans, whereas Americans showed little to no difference in their accuracy of detecting deception within-culturally (in Americans) and cross-culturally (in Ghanaians). Furthermore, while Ghanaians appear to be somewhat more accurate in detecting lies generally, both groups demonstrated roughly the same level of accuracy in detecting deception, being at about the level of chance.

Regarding both groups' confidence levels, survey participants judged their level of confidence in each of their answers on a scale from 1 to 5, 5 being the most confident. Table 4.9 illustrates that both Americans and Ghanaians were apparently slightly more confident when

Table 4.9. Listener confidence level averages.

		Speaker		Overall
		Americans	Ghanaians	
Listener	Americans	2.68	2.61	2.65
	Ghanaians	3.15	3.29	3.22

judging speakers within their own culture. Furthermore, the overall averages show that Ghanaians were more confident in their judgments than Americans.

To find potentially significant differences between groups with regards to accuracy and confidence levels, three one-way ANOVAs were run. The first tested the effect of speaker nationality on American listeners' accuracy and confidence levels. The outcome demonstrated that speaker nationality did not have a significant effect on American listeners' accuracy, [$F(1, 670)=.095, p=.758$], nor confidence levels, [$F(1, 670)=.638, p=.425$]. The second ANOVA tested the same for Ghanaians listeners. This test showed that speaker nationality also did not significantly affect Ghanaian listeners' accuracy [$F(1, 256)=.882, p=.349$], nor confidence levels, [$F(1, 256)=1.379, p=.241$]. The third ANOVA was run to find potential differences between Americans' and Ghanaians' accuracy and confidence levels overall. Thus, this tested the effect of listener nationality on the listener's accuracy and confidence levels. The results demonstrated that listener nationality had a significant effect on listener confidence levels, $F(1, 928)=53.215, p<.001$, showing that Ghanaians were significantly more confident in their judgments than Americans overall. While this is so, listener nationality had no significant effect on deception detection accuracy, $F(1, 928)=1.661, p=.198$, illustrating that neither nationality was better at detecting lies than the other.

Results for Research Question 4: Cultural Bias

With the purpose of answering research question (4), *Does either culture display cultural bias in identifying liars?*, the averages for what percentage of each group indicated “Lying” for an American speaker and for a Ghanaian speaker were calculated (see Table 4.10). Thus, cultural bias in this study is defined by either group’s tendency to indicate “Lying” for speakers of their own culture versus those of the other culture. The averages showed that fewer participants of each culture indicated “Lying” when judging those of their own culture than when judging those

Table 4.10. Cross-cultural and within-culture averages for listeners believing that the speaker was lying both when telling the truth and overall.

		Speaker			
		Americans		Ghanaians	
		<i>When telling the truth</i>	<i>Overall</i>	<i>When telling the truth</i>	<i>Overall</i>
Listener	Americans	37.25%	39.3%	42.67%	45.18%
	Ghanaians	32.63%	37.75%	26.92%	31.32%

of the other culture. In other words, it appears that both Americans and Ghanaians tended to accuse speakers of the opposite culture of lying more often than those within their own culture. This suggests that both cultures demonstrated a truth-bias toward their own culture. Such was found in analyzing only the judgments of truths (“*When telling the truth*”) and also in analyzing all the judgments, i.e. of both truths and lies (“*Overall*”).

For statistical analysis, four one-way ANOVAs were run. The first tested the effect of speaker nationality on the American listeners’ tendency to indicate “Lying,” using the percentages of how many Americans judged each response to be a lie. There was no significant

effect of speaker nationality on the American listeners' tendency to indicate that the speaker was lying when the speaker was telling the truth or lying, $F(1, 41)=.925, p=.342$. This same analysis was done using only the truthful responses from interviewees in order to see Americans' tendency to accuse Ghanaians of lying versus their tendency to accuse other Americans of lying when both groups were telling the truth. There again was not a significant effect of speaker nationality on the American listeners' tendency to indicate "Lying" when the speakers were telling the truth, $F(1, 18)=.555, p=.466$. This illustrates that Americans showed no significant truth-bias toward their own culture and no lie-bias toward Ghanaians. The same analyses were performed with the Ghanaians' judgments. Speaker nationality also had no significant effect on the Ghanaians listeners' tendency to indicate that the speaker was lying generally, $F(1, 40)=.621, p=.435$. Likewise, Ghanaian listeners' tendency to indicate "Lying" was not significantly affected by speaker nationality when the speaker was telling the truth, $F(1, 18)=.266, p=.612$. Thus, the Ghanaian survey participants, like the American survey participants, demonstrated no statistically significant truth- or lie-bias within their own culture or cross-culturally.

Summary

Considering the results reported above, there appears to be evidence of differences between Americans' and Ghanaians' deceptive as well as baseline speech in the context of the experiment carried out for this thesis. When being deceptive, the Americans were significantly more superfluous and redundant in speech and also used more modal verbs. Contrary to past research, Americans also used significantly fewer negative emotion words in deceptive speech. Furthermore, they also demonstrated a higher number of pronoun inconsistencies as well as a higher number of adjectives and adverbs. Ghanaians on the other hand demonstrated a

significantly lower number of negations when lying. However, like the Americans, their deceptive speech possessed more pronoun inconsistencies than their truths. While this is so, the model for predicting deception in Ghanaians' speech based on these linguistic features was largely inefficient, suggesting that there were in fact there were no statistical differences in the frequency of these linguistic features in lies and truths for Ghanaians. As for baseline speech the groups differed in that Americans had significantly higher word counts while Ghanaians were significantly more superfluous and used more positive emotion words. Americans also appeared to say "you know" more and had shorter response latency times.

Regarding the survey results, there was evidence that deception detection is not only possible cross-culturally but that there is little to no difference between the cross-cultural deception detection accuracy levels between Americans and Ghanaians despite the fact that Ghanaians were significantly more confident in their veracity judgments of the interviewees' statements. Though the averages showed that each group was more accurate and confident when judging those of their own culture, these differences were not statistically significant. Furthermore, the results provided no evidence of cultural bias in the task of identifying liars. In other words, Americans did not accuse Ghanaians of lying more than other Americans, and Ghanaians did not accuse Americans of lying more than other Ghanaians contrary to what some research has suggested would occur cross-culturally (*see* Da Silva & Leach 2013). Moreover, neither culture displayed a truth-bias toward the opposite culture, contrasting Bond and Atoum (2000) and Al-Simadi (2000).

Chapter 5

Discussion

Introduction

This chapter provides a discussion of the results presented in Chapter 4 and how they can be related to and reconciled with past research on the language and perceptions of deception. The various implications of such findings are also discussed. After discussing the results answering the research questions, limitations of the research for this thesis are outlined, and suggestions for further research are given.

Discussion of Research Question 1 Results

This section discusses the results answering research question (1), *In the given context, what linguistic features do Americans and Ghanaians use in deceptive speech?* The results of this study showed that the linguistic features of deception for Americans are generally not the same as those for Ghanaians (*see* Table 5.1). The Americans used fewer negative emotion words, more modal verbs, more adjectives and adverbs, and were more superfluous and redundant in deceptive than in truthful speech. Conversely, Ghanaians used fewer negations in deceptive responses than in truthful ones, while Americans did not. Both groups, however, had more pronoun inconsistencies in lies than truths. How these results relate to past research is discussed here below.

Because no previous study has analyzed the linguistic features of deception for English-speaking Ghanaians, I relate mostly the findings concerning the Americans' linguistic features of deception to previous research. However, the Ghanaian features of deceptive speech as presented

Table 5.1. Linguistic features of deception for Americans and Ghanaians compared.

Linguistic Features of Deception	Americans	Ghanaians
<i>More Pronoun Inconsistencies</i>	Y	Y
<i>Fewer Negative Emotion Words</i>	Y	N
<i>Fewer Negations</i>	N	Y
<i>More Modal Verbs</i>	Y	N
<i>Increased Superfluosity</i>	Y	N
<i>More Adjectives and Adverbs</i>	Y	N

Y = Yes, N = No

in the results are also discussed. This is presented one feature at a time in the order given in Table 5.1 above.

Pronouns. As illustrated in Chapter 2, past research has reported varying results concerning the use of pronouns in deceptive language. More specifically, previous research has provided conflicting results concerning the number of self-referencing pronouns. However, I mentioned near the end of Chapter 2 that the literature provides no apparent conflict concerning pronoun inconsistencies in general, i.e. dropping pronouns, replacing them inappropriately, using them to replace specific details, using the wrong pronouns, etc. Thus, while the data demonstrated no significant differences in the number of self-referencing pronouns in the deceptive and truthful responses of the American interviewees, similar to Todd (1977) and Porter & Yuille (1996), there was a difference in pronoun inconsistencies as a whole, supporting the findings of Sapir (1987), Adams & Jarvis (1996, 2004), and Bachenko et al. (2008).

The results are interesting because all of the studies supporting the current study's findings were composed of texts that were likely produced under some level of suspicion (though we do not know for sure). However, the interviewer in the current study showed no suspicion when interviewing the participants. It is possible then that either (1) the level of suspicion conveyed from the interviewer or listener may not have a significant impact on this specific linguistic feature, or (2) the induction of anxiety (video-recording) and raised stakes (reward money based on performance) may have created a stressful enough situation so as to be similar to a situation where suspicion is present. The former I suggest tentatively, however, because the abovementioned studies do not define the levels of suspicion that were used in elicitation. Thus, we can only assume that suspicion was present to some degree because of the interrogative nature of elicitation as implied in the studies' descriptions of their methodologies. The latter, on the other hand, is supported and the former weakened by Buller et al. (1996) who asserted that increased suspicion elicited more self-references. Their experiment, however, provided no baselines for participants' lies to be compared with, and their assertion regarding suspicion and self-references was not founded upon statistical analysis. Furthermore, all of the participants (whether laboratory or not) of the studies mentioned above, including the current study, seem to have had varying periods of time to prepare their answers. Except for the current study, these premeditation times were not reported and apparently not taken into account. Again, only assumptions can be made from the studies' research design descriptions. Thus, I only tentatively suggest that issues regarding pronouns in deceptive speech are perhaps not affected by levels of suspicion and lengths of premeditation time.

With regards to the Ghanaians' tendency to produce more pronoun inconsistencies, it can only be said that such occurs perhaps solely in the context of spontaneous lies told under no

apparent suspicion because there is no past research done using other contexts which to compare these findings.

Why pronoun inconsistencies happen in deception can be partially explained by psychological distancing as presented in SCAN theory and supported by several studies mentioned in the literature review. However, it is obvious that such theories cannot account for all pronoun inconsistencies, as they account only for self-referencing pronouns. I suggest, therefore that deceptive speech is characterized by inconsistencies in the use of first-, second-, and third-person pronouns, and not solely the number of self-references or inconsistencies involving first-person pronouns. Overall pronoun inconsistencies may occur in deceptive speech because the cognitive pressure that lying imposes causes one to (1) remove themselves and others from the deceptive accounts, (2) forget or lose track of their fabrication of the players involved, (3) find it difficult to consistently reference a person or item that does not truly exist (e.g. talking about a new watch they never saw or bought), and/or (4) mix the genders of the real person and the fabricated figure being referenced (e.g. saying “him” when deceitfully describing a female). Therefore, searching for pronoun inconsistencies as a whole may be a more reliable method of detecting deception through pronouns.

Negative Emotion Words. As for the Americans’ use of fewer negative emotion words when lying, this result is contradictory to some past research (Knapp et al. 1974, Todd 1977, Newman et al. 2003, Zhou et al. 2004, Bachenko et al. 2008, Vrij 2008). It is not, however, necessarily contradictory to Adams and Jarvis (2004, 2006) who illustrated that truths tend to include emotion words in general while liars tend to omit them because no real emotional connection exists. Thus, the Americans used more negative emotion words in truths than in lies because the speakers possessed a real emotional connection to the topic being discussed.

However, because there were no significances found concerning positive emotion words and total emotion words, and because the present study has analyzed the deceptive language in a fairly different context than that of Adams and Jarvis (2004, 2006), the results of the present study only somewhat corroborate Adams and Jarvis' (2004, 2006) assertion regarding affective language. It should also be mentioned, however, that the result of fewer negative emotion words in lies may be explained by the types of questions interviewees answered in the experiment. The control question to always elicit a truthful answer, as mandated by the IRB (item 1 in Figure 3.1, *What is your least favorite movie or book, and why?*), asked the interviewee to talk about their least favorite movie or book. All other questions asked in the interview were more positive in that they did not require the interviewee to talk about an inherently negative topic or something they disliked. Therefore, much of the negative emotion words were attributed to interview question 1, and this may have caused the results to show the truthful speech to contain a significantly higher number of negative motion words than the deceptive speech. If this is truly the reason behind this result, however, this also illustrates that the measure of affective language is dependent upon the topic being discussed. Thus, the frequency of emotion words, whether positive or negative, may vary depending on the level of negativity or positivity of the topic being discussed or the question being answered. This, therefore, may explain the conflicting results in the literature concerning emotion words in deceptive language.

Considering the explanation for Americans' displayed tendency to use fewer negative emotion words in the given context, it would seem that Ghanaians should follow suit. But while the data show that they in fact did not use fewer negative emotion words in deceptive speech, they did use significantly fewer negations, which feature is directly related to negative affect according to some studies, and is sometimes categorized together with negative emotion. As

mentioned in Chapter 3, item 1 in Figure 3.1, *What is your least favorite movie or book, and why?*, elicited higher negation percentages than any other interview question. Thus, the results show that Ghanaians used significantly fewer negations in deceptive speech also possibly due to the control item. However, it may also be due to a deviation from the baseline as related to Adams and Jarvis (2004, 2006). While this is so, there is still a difference between Americans and Ghanaians with regards to negative affect and negations in speech. Therefore, the data suggest that perhaps Americans and Ghanaians differ in how they linguistically manifest their negative emotion in deception.

Modal Verbs. Moving on to the topic of modal verbs, the results support past research that reported deceptive language has an increased number of modal verbs. I echo past studies' assertions stating that the higher number of modal verbs within deceptive speech is due to the speaker's tendency to be more nonimmediate when lying. It may be argued that the increase in modals is due to the control item 2 in Figure 3.1, *What celebrity would you most like to meet, and what would you say to them?*, which is posed using the conditional, "would," and to which all participants lied. While this argument may have credence, it is weakened by the fact that interview question #5, eliciting both lies and truths, also contained the conditional "would." Thus, it appears that deceptive speech in the context of spontaneous response on the topic of self under no suspicion tends to contain a higher number of modal verbs. The statistical results demonstrated, however, that this was not characteristic of lying for Ghanaians in the given context, suggesting another way that Americans and Ghanaians lie differently.

Superfluousness and Redundancy. Concerning the feature of increased superfluousness and redundancy, the results demonstrated findings consistent with the majority of past research. Thus, this would mean that deceivers typically display increased linguistic superfluousness in

various contexts, i.e. those of presumably various topics, premeditation periods, and, evidently, varying levels of suspicion as Davis et al. (2005) analyzed criminal suspects giving statements to district attorneys.

Adjectives and Adverbs. Finally, the results demonstrating an increased use of adjectives and adverbs as unique to lying for native English-speaking Americans appear to parallel the majority of past studies addressing the feature of linguistic expressivity as characterized by adjective and adverb counts (*see* Ebesu & Miller 1994; Buller et al. 1996; Zhou et al. 2003, 2004; Ali & Levine 2008) Interestingly, whereas Ebesu and Miller's (1994) research design facilitated no suspicion on the part of the receiver (*see* "Scenario 3"), Buller et al.'s (1996) and Ali and Levine's (2008) methods did facilitate suspicion. In fact, Buller et al. (1996) reported that deceivers used more "modifiers" when facing higher levels of suspicion. With regards to the topic, it is evident that all of the studies had participants talk about themselves. However, not all the studies elicited spontaneous-response lies. Thus, it could be that a higher number of adjectives and adverbs is characteristic of lies told on the topic of self and is not dependent upon levels of suspicion or premeditation opportunities. While the studies do not clearly define their contexts in these ways, however, this is only a tentative suggestion. Furthermore, what also may have affected the present study's outcome on this matter is the way adjectives and adverbs were coded and tallied. Much of the research on adjectives and adverbs in deception have used natural language processing tools that tag parts of speech. However, I counted not only adjectives and adverbs according to parts of speech but also words that behaved syntactically like adjectives and adverbs. I suggest that this is a more accurate approach to measuring expressivity in language, especially since young people are constantly changing the language through word formations that alter or expand existing words' parts of speech. In any

case, what can be said without reservation is that native English-speaking Americans in the context of the current study tend to use a higher number of adjectives and adverbs when deceiving whereas Ghanaians do not. An explanation for this could be that people have more details to draw from about themselves and their lives than can be more easily manipulated than when talking about a something or someone other than themselves. Furthermore, the lack of suspicion may dissuade the tendency to be briefer, thus making the speaker feel less inhibited to provide more detailed descriptions.

Other Linguistic Features. As for the other supposed linguistic features of deception (vagueness and allness terms, abnormal verb tense, word count, and response latency), they apparently are not characteristic of deceptive speech within the context of spontaneous-response lies about self under no suspicion. Concerning vagueness and allness terms, each study measured this feature in various different ways, which were not clearly defined and potentially subjective. As this study focused on tallying specific allness and vagueness words and phrases, it may not have reached significance due to its unique and more objective approach toward obtaining numerical values representative of vagueness in speech.

Regarding abnormal verb tense, while this was found in the deceptive discourse, it obviously did not reach significance. It appears that this may be due to the low number of values representing verb tense irregularities that the discourse provided. As well, this feature is presented in the literature in the context of seemingly high stakes lies from individuals involved with the law, e.g. crime suspects and witness accounts. Hence this feature may be more prevalent in higher stakes deception.

On the topic of word count, the results demonstrated that there were no significant differences between lies and truths for either nationality. While past research has provided

evidence for both longer and shorter statement lengths as a feature of deception, I turn to Adams and Jarvis (2006) to help explain the current study's findings. As mentioned in Chapter 2, Adams and Jarvis (2006) showed that a deviation from what would be normal for the individual in the given situation could indicate deception, whether this deviation is in providing an unusually long or unusually short statement. Thus, analysts may be able to use word counts as evidence of deception when scrutinizing the baselines and potential lies of a certain individual. However, the current study has analyzed a large quantity of statements from sixteen individuals with widely ranging statement lengths whether telling the truth or lying. Therefore, the statistics likely did not show significance because of these widely varying statement-length tendencies. Also, each camp of findings—that of more words as a feature of deception, that of fewer, and that providing no difference—each contained methodologies using seemingly various levels of suspicion, eliciting discourse on various topics, and perhaps also giving participants varying lengths of response-premeditation time. Therefore, it appears that neither topic, nor suspicion level, nor preparation time alone can account for the conflicting results. Perhaps the combination of these three contextual features might account for word counts as an indicator of deception, but that is difficult to determine as such specifics are not explicitly defined in the methodologies of past research. Thus, until research can discover that context and these elicitation specifics affect how lies are told, at least with regards to word counts, it seems most logical to rely on the assumption that the differences lie in the varying personalities and statement-length tendencies of individuals.

Finally, regarding the lacking statistical significance for response latency times, the results of the current study match those of Zhou (2005) and Davis et al. (2005) who also likely analyzed spontaneous-response answers. Additionally, Davis et al.'s (2005) context of criminal

suspects giving their statements to assistant district attorneys dealt with responses about self. As these real-life situations certainly raised the stakes and cognitive load involved, it is interesting that the results of the current study followed suit. Of course, the present study's use of the reward money and video-recording device increased the stakes and anxiety of the situation, though very likely not as much as that of the criminal suspects. Also interesting, however, is Zhou's (2005) context of a problem-solving situation involving participants instant messaging each other from separate rooms. With regards to response latency, it may have varied due to participants not being monitored by anyone physically present and becoming distracted with their phones or other things on the computer screen. Such matters could have also lead to inconsistent response times for lies and truths and hence insignificant results. On the other hand, as noted in Chapter 2, Walczyk et al. (2003) and Walczyk (2009) provided conflicting results on this matter despite similar contexts of questions about everyday topics and unrehearsed responses to them. This somewhat supports the lacking significance in the current study employing a similar context. Though it is difficult to speculate why there are conflicting results, what can be said about the present study is that in the context of spontaneous responses to questions about self under no suspicion (though some anxiety induced and stakes somewhat raised) there are no response latency differences between lies and truths for both Americans and Ghanaians.

Discussion of Research Question 2 Results

In this section are discussed the results outlined in Chapter 4 addressing the second research question, *What linguistic differences are there, if any, between American and Ghanaian baseline speech in the given context?* As no past research has examined this topic, the discussion is centered on interpreting the results and discussing how the results were achieved.

Interestingly, the outcome of the statistical analysis showed that the Americans and Ghanaians differ with regards to their baselines, i.e. truthful speech. While Ghanaians were more superfluous and used more positive emotion words, Americans generally had higher word counts ($p=.057$). Moreover, there were nearly significant results showing that Americans responded to questions more quickly and said “you know” as an interjection more often than Ghanaians, whereas Ghanaians used more self-referencing pronouns.

While it is difficult to say why such differences exist, one possible explanation as to why the Ghanaians’ speech was more superfluous could be that the Ghanaians felt the need to make themselves clear to the foreign interviewer (a Caucasian native English-speaking American), and this was manifest through repeating words, phrases, and ideas. However, it could also very well be that superfluosity and redundancy are simply the norm in Ghanaian culture, at least within contexts similar to the context of this study’s experiment.

The near significant difference between the number of self-references may also have something to do with the Ghanaians being influenced by the foreign interviewer. The higher number of self-referencing pronouns may have occurred to accommodate the foreigner in speaking more grammatically and less casually. Again, however, this may possibly be a linguistic norm for English-speaking Ghanaians.

Considering the difference in positive and total emotions words in baselines, it is also difficult to speculate as to why this is so. The positive emotion words may have something to do with the high level of religiosity within Ghanaian culture. While this argument is weakened by the fact that the American interviewees were students of a religious institution and thus likely all religious themselves, there still evidently exists a difference between the groups in thinking and speaking with optimism as well as speaking with emotion in general.

As for the differences in word count, one could argue that the Ghanaians' lacking word counts could have been due to English being a second language for them. This suggests that Ghanaians have somewhat of a limited vocabulary and limited proficiency hindering their ability to produce more words. This could very well be, though, because English is Ghana's national language, this argument lacks some support, at least against the age group involved in this study. It was never apparent to the researcher that there was any lacking English proficiency or searching for English words when interviewing Ghanaians and interacting with young adults while in Ghana. The differences in word counts may be due to differences in cultural norms, i.e. perhaps it is not as culturally acceptable or normal for Ghanaians to give verbose (though ironically redundant) answers in response to questions in interview settings. I speculate here, however, and do not profess to know of any such cultural stereotype, though research regarding the high power distance in Ghanaian culture may support this (*see* Hofstede 2001, Bjørge 2007). On the other hand, this outcome may simply be attributed to the personalities of each group's interviewees.

The difference regarding response latency may debatably have been due again to English being Ghanaians' second language, hence increasing the cognitive activity of the Ghanaian working to produce a response in English. Further research on the response latency of Ghanaians when speaking their mother tongue versus when speaking English may support this notion. On the other hand, there may be numerous explanations for this difference as there are a myriad of factors at play.

Finally, as for "you know" frequency, the data showing no uses of this expression in Ghanaians' truthful speech (and minimal use of it in deceptive speech) seems to imply that this

expression is simply not a prevalent conversational interjection in Ghanaian English as it is in American English.

Discussion of Research Question 3 Results

The results pertaining to research question (3), *How do the groups differ with regards to accuracy and confidence levels when detecting deception within their own culture versus across cultures?*, are discussed here. None of the differences displayed in the averages and percentages were statistically significant except for the difference between overall American and Ghanaian confidence levels. Therefore, while both Americans and Ghanaians were slightly more accurate and confident when detecting lies within their own culture, as opposed to across cultures, these results were not statistically significant.

With regards to accuracy, the lacking significant effect of listener nationality on listener accuracy answers the research question, asserting that the groups do not differ significantly in their abilities to detect deception within-culturally, cross-culturally, and overall. Due to the lacking significance, the accuracy percentage results only somewhat support Bond and Atoum (2000) who found that judges (who did not understand the language of the speakers) were more accurate in detecting lies within cultures than across cultures. It also somewhat supports Da Silva and Leach (2013) who did not find non-native English speakers' lies to be more easily detected despite increased cognitive load when speaking a different language. The current study's results, however, were contradictory to Al-Simadi (2000) who reported percentages showing that accuracy was higher in cross-cultural judgments than within-culture ones for Malaysians and Jordanians who shared common languages (Arabic and English). In all cases, however, as every accuracy percentage in the current study was above the level of chance (50%), this study's

accuracy results are consistent with past research stating that cross-cultural deception detection is possible.

Considering the congruencies and conflicts of the current study's findings on accuracy with past research, it appears that speaking a common language does not affect listener accuracy and when judging deception, at least through audio means. Thus, the cognitive load imposed by speaking a second language does not make deception easier to detect. Furthermore, because the present study and Bond and Atoum (2000) reported higher accuracy percentages for within-culture deception detection, whereas Al-Simadi (2000) reported higher accuracy cross-culturally, it appears that the differences lie in the cultures being compared and perhaps the level of cross-cultural familiarity between them. The current study and Bond and Atoum's (2000) both involved two cultures that are seemingly quite foreign to each other (American vs. Ghanaian and American vs. Jordanian). Perhaps the contrastive results reported by Al-Simadi (2000) were because of more cross-cultural familiarity and similarity, as the dominant religion in both Jordan and Malaysia is Islam, and both participant groups spoke Arabic. This would suggest then a positive correlation between cross-cultural familiarity and ability to more accurately detect deception.

Regarding confidence levels, it appears that, with the present study, each group's tendency to be slightly more confident when judging within-culture speakers is consistent with Da Silva and Leach (2013) who provided evidence that native English-speaking judges were more confident when judging native English speakers. However, as the group of judges in Da Silva and Leach (2013) was multi-ethnic, it could also support increased confidence levels in cross-cultural judgments. Because of the current study's confidence outcome, however, the trend

evidently seems to be that confidence in one's judgments is higher when attempting to detect deception in others within one's same culture.

In addition to these trends in confidence levels, it is interesting that in the current study Ghanaians were significantly more confident than Americans in detecting deception overall. This could be because Ghanaians are generally more familiar with American culture than Americans are with Ghanaian culture, and hence were more confident in judging Americans than Americans were at judging Ghanaians, increasing the Ghanaians' overall confidence level. This would be congruent with the proposed correlation between accuracy level and cultural familiarity.

Discussion of Research Question 4 Results

A discussion of the research question (4), *Does either culture display cultural bias in identifying liars?*, is given here addressing how the results relate to past research and why such results were obtained. It also answers the research question with a no, despite differing findings in past research.

The results for cultural bias showed that both Americans and Ghanaians accused those of their own cultures of lying less than those of the opposite culture, though these differences were not statistically significant. Thus, this suggests that there was really no cultural bias held when judging the veracity of the interviewees' statements. This is seemingly contrary to Bond and Atoum (2000) who found that Americans (judging via audiovisual means) displayed a truth-bias toward Jordanians whose speech the judges could not understand. Bond and Atoum (2000) speculated that this may have been because the Americans, listening to an unfamiliar language, might have recognized how ignorant they are toward the speaker's culture and then gave the speaker the benefit of the doubt. In line with this logic, the Jordanians, having some degree of

English proficiency, did not demonstrate the same inclination in judging Americans. I suggest, however, that the current study's findings on this matter are in fact not contrary to those of Bond and Atoum (2000), but rather are consistent with their speculations because the Americans understood the Ghanaians' speech. Thus, the Americans did not display a truth-bias toward Ghanaians because the Ghanaians fluently spoke English. The present research also seems to agree with Da Silva and Leach (2013) in that Americans displayed no truth-bias toward non-native English speakers. Contrary to Da Silva and Leach (2013), however, the Americans in the current study also did not hold a lie-bias toward the non-native English speakers (Ghanaians). I suggest that this could be due to a lack of cultural stigma and/or developed stereotypes between Americans and Ghanaians. Americans and Ghanaians on a large scale likely do not have enough interaction to have already developed significant cultural biases toward each other like native English-speaking Americans and non-native English-speaking Americans, for example.

Implications

Research Question 1. The implications of the findings related to research question 1 are discussed here in the order of each significant linguistic feature listed in Table 5.1 above. These implications are mostly relatable to law enforcement officers and analysts who attempt to detect deception and should impact the way they search for deception in native English-speaking Americans and non-native English speaking Ghanaians.

Pronoun Inconsistencies. Because the number of self-references were not a significant indication of lying for either culture, but pronoun inconsistencies were indicative of lying, the suggestion has been made that pronoun inconsistencies as a whole (i.e. first-, second-, and third-person) be used for detecting deception. If this indeed is a more accurate method toward detecting deception through pronoun usage, then law enforcement and deception detectors

should consider using this method and avoid considering only the number of self-references in a given discourse. Though this is used today as a deception detection technique, past research has demonstrated conflicting results on this matter. However, the focus on pronoun inconsistencies overall has received no opposition from deception research and is supported by this study's results. Additionally, the results of this study have shown that this linguistic feature can also be used in detecting deception in Ghanaians. Such, however, is not the case for other linguistic features.

Negative Emotion Words and Negations. One example of how Americans' and Ghanaians' deceptive speech differ is found in negative emotion words. As Americans were found to use fewer in lies, it was suggested that analysis of emotion words should be based on the topic at hand. Deception analysts should consider the topic at hand and gauge whether it is naturally positive, negative, or emotionally neutral, and then base their judgments and analyses on deviations from what would likely be an unnatural linguistic expression of emotion in that specific context rather than basing judgments on a blanket generalization stating that deceptive language contains more negative emotion words or whatever the generalization may assert. For example, if a witness is being questioned about hating someone or something and is claiming to be averse to that person or thing then the witness's baseline number of negative emotion words would be higher than when explaining their loyalty toward a person or thing. I suggest that the same goes for the linguistic expression of emotion, both positive and negative. Thus, while deceivers whether consciously or unconsciously seem to take different approaches to lying (either using too many emotion words in an attempt to convince or use too few because they simply struggle to come up with a lie), interrogators and analysts should look for an excessive number positive or negative emotion words (above that which would be expected in the

situation) or a lack of emotion words (fewer than would be expected) in order to identify deceit. While this is so for native English-speaking Americans, the results have shown that this is not the case for Ghanaians. Thus, if these findings concerning emotion words are accurate, analysts should not assume they can use the findings supporting emotion words as somehow characteristic of deception when attempting to detect deception in non-native English-speaking Ghanaians.

The results have shown, however, that Ghanaians used fewer negations in their deceptive answers. As deception analysts typically look for more negations in deceptive speech, using such a guide would cause them to potentially overlook deception in a Ghanaian's statement if these findings are accurate. As suggested earlier, increased negations in deceptive speech may simply be a way Ghanaians manifest negativity. Thus, law enforcement should consider the individual's baseline for negations and perhaps the negative emotion appropriate for the topic and base their judgments of negations relative to this.

Modal Verbs. Considering Americans' use of modal verbs, past research was supported that deceptive language typically includes a higher number of modal verbs. Therefore, analysts judging the veracity of statements should want to consider the number of modal verbs in a potentially deceptive statement compared to that speaker's truthful speech. Once again, while this is true for native English-speaking Americans, the same is not true for Ghanaians, and analysts should therefore not attribute a high number of modal verbs in a Ghanaians' speech to deception.

Superfluosity and Redundancy. On the topic of superfluosity and redundancy, Americans seem to give excessive details and repeat ideas when being deceptive. This is consistent with much past research, and analysts should continue to look for levels of

superfluosness when judging the truthfulness of statements. As further discussed in the next section, the topic of superfluosness is particularly important as it is actually typical of Ghanaians' truthful speech. Because this is not a feature of deception for Ghanaians, misinformed analysts may wrongfully accuse a Ghanaian of lying when they in fact are not, which could lead to wasted time and resources interrogating innocent suspects, unnecessary emotional and psychological distress for the Ghanaian, and/or perhaps even wrongful incarceration.

Adjectives and Adverbs. Finally, the data demonstrating that Americans used more adjectives and adverbs in deception responses is consistent with a majority of research on deception, though it has been tentatively suggested that this seems to fluctuate depending on whether or not the speech is centered on self. Other factors concerning personality, anxiety level, and premeditation time may also affect the outcome. Another factor that may have contributed to conflicting findings in the past is the potentially different ways adjectives and adverbs have been tallied by researchers (or NLP tools). While increased adjective and adverb use is characteristic of lying for native English-speaking Americans, deception detectors and analysts should not assume this to be true cross-culturally, at least for Ghanaians.

Conclusion. To conclude the discussion concerning research question 1, this study has shown that Americans and Ghanaians do not tell lies in the same way. The linguistic features of deception for native English-speaking Americans are not the same for non-native English speaking Ghanaians. Therefore, American law enforcement officers and analysts cannot use the same deception detection training used to judge the veracity of Americans' speech to judge the veracity of Ghanaians' speech. Doing so may lead to falsely accusing a Ghanaian of lying or overlooking a Ghanaian's deceit. This discussion also suggested that certain linguistic features of

deception may vary depending on the contexts in which the lies are told. Furthermore, it appears that personality may also be a factor at least for features like word count and expressivity. In all cases, it is important for deception detection analysts to base their judgments upon baseline samples of an individual's speech and search for deviations from their norm and what might be normal in the given situation with regards to the linguistic features discussed in this section.

Research Question 2. The implications of the results answering research question 2 are also related to law enforcement and deception detection analysts. The discussion of these implications is given below.

The most important linguistic difference between Americans and Ghanaians is that of superfluosity and redundancy. It is the most important because superfluosity is characteristic of, though not unique to, truthful speech for Ghanaians. The facts that Ghanaians are more superfluous in speech than Americans generally, and superfluosity is a significant indicator of deception for Americans, creates the biggest pitfall for potential problems. It seems that repetitiveness is a particularly easy feature for listeners to notice. Thus, the discrepancy would make it easy for an interrogator or linguistic analyst judging by the American norm to deem a Ghanaian's statement to be unusually redundant and thus accuse the Ghanaian of lying when they are actually not.

Considering the difference between the groups' number of self-references, this could also be a hindrance to analysts trying to detect deception. As there is much research and training suggesting that a lower number of self-references can indicate deception, trained law enforcement are likely looking for this trend. However, if Ghanaians tend to use more self-references than Americans, then deception detectors may fail to spot a Ghanaian deceiver.

Regarding emotion words, Ghanaians used significantly more positive emotion words than Americans. Thus, if law enforcement are looking for deceit in a lack of emotion words, they should be aware that Ghanaians' baselines have a higher level of positive emotion, so they can look for a deviation from that rather than from an American level of positive emotion in language. Otherwise, a Ghanaian's lie may be mistaken for a truth.

Because Americans had generally higher word counts than Ghanaians, analysts should be wary of judging the veracity of a Ghanaian's statement based upon a normal American word count. Doing so may make the Ghanaian's word count seem like a deviation from what is normal (shorter than normal) and thus also lead to undue suspicion of an innocent person.

While the data also showed that Americans responded to questions more quickly than Ghanaians, analysts should be aware of the tendency for Ghanaians to take slightly more time before responding, whether it be due to cultural differences in pragmatics or the cognitive load of speaking a second language. As the general stereotype is (as supported by the response latency averages in Table 4.1) that people respond more quickly when they are lying in attempts to appear knowledgeable, delayed response times may also be seen by interrogators as a deviation from normal behavior, leading to undue suspicion. On the other hand, they may assume that the Ghanaian's response times, not being unusually short, are normal, possibly causing overlooked deception. But if interrogators are informed of potential differences in response latency in other cultures, they would be able to more accurately identify lies and truths using that culture's baseline rather than a native English-speaking American's.

Finally, analyzing the frequency of the interjection, "you know," is unique to this study. Though not a statistically significant indicator of deception, I suggest that this feature be researched further, as it appears that it could possibly be a trend within deceptive speech perhaps

in other contexts. The averages in Table 4.1 reveal quite a large gap between lies and truths for this feature. If significance were found in future research, this may become a new feature of deception for law enforcement and deception detection enthusiasts to look for. While this could then be used in detecting deception in native English-speaking Americans, it may not be applicable for detecting the same in Ghanaians since they appear to use it infrequently.

Research Question 3. Because the accuracy percentages for each group showed each group to be slightly more accurate when attempting to detect deception within their own culture versus in the opposite culture, and because of Al-Simadi's (2000) contrastive findings between two similar cultures, it is possible there is a positive correlation between cultural familiarity and deception detection accuracy. Thus, it seems that as different cultures become more similar to or familiar with each other, they also become better at cross-cultural lie detection. The same correlation may also exist regarding people's confidence levels in detecting deception, i.e. the more familiar people are with a culture, the more confident they are in their abilities to detect lies within that culture.

Considering further the data on confidence levels, it also appears there may be positive correlation between confidence level and accuracy. The Ghanaians, being significantly more confident in their answers than Americans, appeared also to be more accurate in detecting lies within people of their own culture, in Americans, and overall. This could mean that those who are confident in their abilities to detect deception are generally more accurate in their guesses, and vice versa, though it should not be assumed that one of these factors causes an increase in the other.

Research Question 4. Considering the findings pertaining to cultural bias, it is interesting to see that there were no significant truth- or lie-biases displayed. Even though

nationality seemed to have affected accuracy levels, any lacking accuracy was evidently not attributed to holding a cross-cultural truth- or lie-bias. As suggested above, the lack of bias may be due to a lack of cultural stigma between Americans and Ghanaians. It might also suggest that the survey participants of both nationalities were not ethnocentric enough for bias to reach statistical significance. If both of these are true, this is a positive thing for the global society, and it would be hoped that, as these cultures increasingly interact, the lack of cultural stigma and ethnocentric bias would persist. On the other hand, these results also imply that either culture does not tend to believe those of the other culture more than those within their own culture. If this is correct, it, in a sense, is also beneficial in that people of both cultures are not more easily deceived by someone of the opposite culture simply on account of their “accent.”

Limitations

There are several limitations to the current study that should be considered. As for the research design, this study is limited to the context of spontaneous-response lies about self, which were told under no suspicion though with induced anxiety (video recording) and slightly raised stakes (potential reward money). Whether or not this study’s findings concerning both Americans’ and Ghanaians’ linguistic features of deception can be extended to other contexts is for further research to discover. Furthermore, though the researcher had a large amount of discourse to analyze, the study is limited by the number of interviewed participants. An analysis of discourse gathered from a larger number of interviewees could potentially yield somewhat different results. However, the limited number of interviewed participants facilitated a more accurate within-subjects analysis, which is important in deception detection research. Additionally, because many of the interviewees’ responses reflected their opinions, the veracity

of these statements were largely unverifiable. Moreover, regarding the survey responses, the research could have benefited by a higher number of Ghanaians who completed the surveys instead of having to work with several Ghanaian responses from incomplete surveys. In any case, it would have been beneficial to have more Ghanaian survey takers in general. Another limitation to the design was the required implementation of truth and lie control questions. These, as control questions, were irrelevant to the discourse analysis and may have negatively influenced the results concerning emotion words. Finally, the analysis of the discourse was done only by the primary researcher and, though reviewed several times, may have benefited from being reviewed by more than one linguist.

Suggestions for Future Research

Linguistic Features of Deception and Baselines. Further research regarding the linguistic features of deception for native English-speaking Americans should be done within clearly defined contexts in order to discover whether or not any or all linguistic features of deception indeed vary across different contexts. I suggest that these contexts be defined in terms of the time one has to respond to questions, the topic being discussed, the level of suspicion portrayed on the part of the listener, and the degree of anxiety induced, if any. Additionally, more research should be done in order to identify the linguistic features of both truth and deception typical of other cultures. Linguistic features of truth and deception may differ between a whole host of cultures, including, perhaps, native English-speaking Americans and non-native English-speaking Americans, or even native English-speaking Caucasians and African American English (AAE) speakers. When researching the linguistic features of deception for non-native English speakers, researchers should also take proficiency levels into account.

Concerning, more specifically, the research of certain linguistic features for native English-speaking Americans, more should be done to answer certain questions regarding pronouns, emotion words, adjectives and adverbs, word counts, and “you know” interjections. Regarding pronouns, more research should be done to support the suggestion that analyzing the number of pronoun inconsistencies is a more accurate approach to deception detection than analyzing the number of self-referencing pronouns. Additionally, emotion words, whether positive or negative, should be more carefully researched taking into account the level of negativity or positivity inherent in the topic being discussed. Future research could observe their frequencies in varying emotional dynamics. Concerning adjectives and adverbs, future research may want to test the suggestion that analyzing expressivity in language ought to include words and adverbial expressions of other parts of speech (possibly overlooked by natural language processing tools) that are behaving like adjectives and adverbs syntactically. For word count, future work should analyze statement lengths (word counts) on an individual basis rather than seeking to generalize a deceptive word-count tendency for all people or even groups of people. Finally, I suggest that the interjection “you know” be researched further, as it appears that it may possibly be a trend within deceptive speech, perhaps in other contexts.

In any case, cross-cultural deception research is important as it would inform law enforcement officers and analysts regarding cross-cultural differences in deceptive behaviors. Such informed training would lead them to become more accurate in detecting deception and avoid undue suspicion and incrimination of the innocent. Likewise, it would also assist in investigations and lead to the rightful incrimination of the guilty.

Cross-cultural Perceptions of Deception. In order to better understand the general perceptions of lying cross-culturally, more research should be done addressing the following

matters. Further work should be done to confirm or discredit the notion that there is a positive correlation between cross-cultural familiarity and ability to more accurately detect deception. In addition, further research ought to be done to see whether a similar correlation exists between lie detection confidence levels and cultural familiarity. Moreover, it is important that research also seek to discover whether cultural bias exists through analyzing people's judgments of the veracity of statements. Such research ought to find answer to whether there is a positive correlation between cultural familiarity and truth- or lie-bias.

Further research in the cross-cultural perceptions of deception, as suggested here, would help society better understand the perceptions of deception both within cultures and cross-culturally, and could potentially improve cross-cultural communication and international relations.

Conclusion

This thesis has presented the literature on the linguistic features of deception as well as the Western culture and cross-cultural perceptions of deception. The results of the analysis demonstrated that Americans and Ghanaians lie differently. Americans' lies were more superfluous and redundant; had more pronoun inconsistencies, adjectives and adverbs, and modal verbs; and had fewer negative emotion words than their truths. Ghanaians' lies, on the other hand, also had more pronoun inconsistencies but had fewer negations than their truths, though this model poorly predicted Ghanaians' lies. Also, Americans' and Ghanaians' baseline speech differ in superfluosity, positive emotion words, total emotion words, number of self-references, word count, response latency, and "you know" interjection frequency. Regarding perception, the outcome demonstrated that Ghanaians were slightly more accurate and

significantly more confident in detecting lies than Americans. Both groups were slightly more accurate and confident in detecting lies within their own cultures. Neither group, however, demonstrated truth- or lie-bias cross-culturally. A discussion of the results suggested that law enforcement and analysts learn of these linguistic differences so as to more accurately detect deception cross-culturally. It was also suggested that Americans and Ghanaians possess no cultural bias due to a lack of cultural stigma, and that cross-cultural perception research can improve cross-cultural communication and international relations.

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Appendices

Appendix A – Interviewee Consent Form

Consent to Be a Video-recorded Research Subject

Introduction

This research study is being conducted by Brent Laing at Brigham Young University to inform the field of lie detection. My faculty mentor, Wendy Baker-Smemoe, PhD, is an associate professor of Linguistics and English Language at Brigham Young University and has published several articles on sociolinguistics. You were invited to participate because of your nationality, age, and willingness to participate.

Procedures

If you agree to participate in this research study, the following will occur:

- you will be interviewed for approximately ten (10) minutes, responding to a total of seven (7) questions
- before answering, you will be asked to either lie or tell the truth in your response
- if you do not want to answer a question, you are free to skip it by saying 'pass.'
- you will be video recorded answering each question
- during all recordings, you should not reveal whether you are lying or telling the truth
- one or more of these recordings will be selected to be used in a survey which will be distributed to approximately 200 people
- only survey takers and researchers will be allowed to view the videos
- the interview will take place at a time and location convenient for you

Risks/Discomforts

There may be some risk of discomfort or fatigue from being part of a research study. Therefore, you are allowed to take a break at any time and you can quit this experiment at any time if you feel uncomfortable or fatigued.

Benefits

There will be no direct benefits to you. It is hoped, however, that through your participation researchers may learn more about lie detection and cross-cultural understanding. Such research may assist law enforcement agencies as well as the general public, especially Ghanaians and Americans who communicate regularly with each other.

Confidentiality

The research data will be kept in a secure location on password protected computer and only the researcher will have access to the data. At the conclusion of the study, all identifying information will be removed and the data will be kept in the researcher's locked office.

Compensation

In total, there will be sixteen (16) participants following the same procedure you will be. After all videos have been obtained, survey-takers will judge some of them, indicating whether they think the people in the videos are lying or not. If you are one of the top eight (8) most convincing liars, you will receive \$25 USD. This compensation will not be prorated.

Participation

Participation in this research study is voluntary. You have the right to withdraw at any time or refuse to participate entirely without jeopardy to your class status, grade, or standing with the university. The total time commitment is approximately ten (10) minutes.

Questions about the Research

If you have questions regarding this study, you may contact Brent Laing at laing86@gmail.com or +1 (801) 227-9220 for further information.

Questions about Your Rights as Research Participants

For U.S. citizens: If you have questions regarding your rights as a research participant, contact IRB Administrator at +1 (801) 422-1461; A-285 A5B, Brigham Young University, Provo, UT 84602; irb@byu.edu.

For Ghanaian citizens: If you have questions regarding your rights as a research participant, contact Monique Mullenau at +233-302-650-000; 57 Independence Avenue, North Ridge, Accra, Ghana.

The faculty mentor, Wendy Baker-Smemoe, PhD, can be reached at +1 (801) 422-4714; 4057 JF5B, Brigham Young University, Provo, UT 84602; wendy_baker@byu.edu.

Statement of Consent

I have read, understood, and received a copy of the above consent and desire of my own free will to participate in this study.

Name (Printed): _____ Signature: _____ Date: _____

Appendix B – Survey Consent Page

Consent to Be a Research Subject

Introduction

This research study is being conducted by Brent Laing at Brigham Young University to inform the field of lie detection. My faculty mentor, Wendy Baker-Smemoe, PhD, is an associate professor of Linguistics and English Language at Brigham Young University and has published several articles on sociolinguistics. You were invited to participate because of your nationality, age, and willingness to participate.

Procedures

If you agree to participate in this research study, the following will occur:

- you will be asked to indicate your nationality
- you will listen to 14 audio clips, each containing a person either telling the truth or lying in response to a question (a "baseline" audio clip of each the speaker telling the truth is provided before each audio clip to be judged)
- you will then indicate whether you think the person in each video is lying or telling the truth
- you will then indicate your level of confidence in your answer on a scale of one (1) to five (5)
- then you will be asked to explain in a text field why you think the person is being truthful or deceiving
- this survey should take you approximately 8-10 minutes to complete
- at the end of the survey, you will be notified of your score and the opportunity to take another survey following the exact same format if you so desire.

Risks/Discomforts

There may be some risk of discomfort or fatigue from being part of a research study. Therefore, you are allowed to take a break at any time and you can quit this experiment at any time if you feel uncomfortable or fatigued.

Benefits

There will be no direct benefits to you. It is hoped, however, that through your participation researchers may learn more about lie detection and cross-cultural understanding. Such research may assist law enforcement agencies as well as the general public, especially Ghanaians and Americans who communicate regularly with each other.

Confidentiality

The research data will be kept in a secure location on password protected computer and only the researcher will have access to the data. At the conclusion of the study, all identifying information will be removed and the data will be kept in the researcher's locked office.

Compensation

There is not compensation for participating in this study as a survey taker.

Participation

Participation in this research study is voluntary. You have the right to withdraw at any time or refuse to participate entirely. The total time commitment is approximately 8-10 minutes.

Questions about the Research

If you have questions regarding this study, you may contact Brent Laing at laing86@gmail.com or +1 (801) 227-9220 for further information.

Questions about Your Rights as Research Participants

For U.S. citizens: If you have questions regarding your rights as a research participant, contact IRB Administrator at +1 (801) 422-1461; A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu.

For Ghanaian citizens: If you have questions regarding your rights as a research participant, contact Esther at +233-302-650-000; 57 Independence Avenue, North Ridge, Accra, Ghana.

The faculty mentor, Wendy Baker-Smemoe, PhD, can be reached at +1 (801) 422-4714; 4057 JFSB, Brigham Young University, Provo, UT 84602; wendy_baker@byu.edu.

Statement of Consent

***By clicking "OK" below, you indicate that you have read, understood, and received a copy of the above consent form and desire of your own free will to participate in this study.

OK

Appendix C – Interviewee Responses (Responses in italics were used as survey items)

Americans' Lies

Question 2. *What celebrity would you most like to meet, and what would you say to them?*

Um, who would I love to meet? I would love to meet Will Ferrell. I would tell him that he's my favorite actor (laughing)!

Oh, let's see. Oh, what was her name? Um, the girl on the Hunger Games. Uh, Jennifer Lawrence! Um, just 'cause I really, really like her acting style, and, um, I don't know. She just seems, like, really hilarious.

I would really like to meet...uh, I don't know celebrities that well. I would Miley Cyrus because she's really cool.

(Sigh) I would love to meet Charlize Theron. And I would, was it what we were going to ask them or say to them?

Interviewer: Uh, what would, um, what would you say to them?

Interviewee: I would say that her driving in *Italian Job* was awesome!

Probably Johnny Depp, and I would say to him, that's always been a tough question for me; I'd probably just say, you know, oh I love you so much! Can I get your autograph?

I would love to meet Britney Spears and ask her about, like, what kind of upbringing she had, her childhood.

Um, I've, I'd love to meet Natalie Portman, you know, she's well-educated, and I'd probably just ask her about her childhood, being raised. It's like, you know, with a diverse background, but also get, finishing school while being a famous actress, and stuff like that. Fun to find out.

A living celebrity?

Interviewer: Um, doesn't have to be living.

Interviewee: I think, um, one of the people I'd most like to meet just to kind of see what, um, their responses are to kind of current world events, um, would probably be, um, Kamu. Um, he's a (sic) interesting guy that I think would have a lot to say about, um, current problems with ecology and economy and things like that. Um, yeah, yeah, I'd probably ask, you know, um, you know, you're kind of this existentialist philosopher, talk about having to make your own way in the world, how would you make your way in the world we have today about 100 years, no, less than 100 years, 67 years after you wrote your stuff?

Question 3. *What did you do last night between the time you got home and went to bed?*

I went to a party with my friends; they live at King Henry. And they had this big, like, welcome-back-to-school party. Um, they were, there was like lots of pizza, and just a band came. It was just a lot of fun.

Um, my husband and I sat and watched some Netflix. We love the show *White Collar*. And so we watched that; um, we watched a couple episodes of that. And then we had some dinner; we had lasagna. And then we brushed our teeth, then went to bed.

I did some reading in one of the books that I have right now, and I ate a bowl of cereal 'cause I was starving.

Last night, I had a lot of homework, and I was very diligent. I am usually not very diligent, but I sat down, and my wife did dishes, and I did homework, and I got it all done. It was great.

Question 4. *Tell about a teacher who has been particularly influential in your life. Briefly explain how this person influenced you.*

I had an economics teacher, and he was just really knowledgeable about his subject—this was in high school—and he just, I don't know, he kind of inspired me to do my work properly and put in some effort, so probably have to say him.

Ok, that's fair. I had a high school English teacher. She was exceptional. And, um, I, I really appreciated all she did. You know, when you're kind of struggling in school a little bit and then some teacher takes extra time to especially help you, it, it means the world. And I think her influence helped me eventually want to pursue a degree in college and everything else.

Question 5. *What is an interesting fact about you that would surprise other people?*

Um, I took martial arts for a long time, so I might not look very big, but I'm a good little scrapper. And I can defend myself (laughing).

Let's see, an interesting fact about me. Um, probably that I'm left handed. Um, it's not super unique, but most people are right handed, so it's somethin'.

An interesting fact about me is that I have never traveled outside the country.

I'm a dancer. I have been practicing ballet for the past five years. But, so, you know, not very good 'cause I started later, but that's OK; it's fun.

I was actually very overweight when I was younger in elementary and middle school. And, um, this, I, I was really insecure about it at the time, but people see me now, and I'm, I'm quite under-, almost underweight (laughing), average, if you will. But, um, they don't know that, that in my younger years, I was, I was a quite a big, chubby boy.

Um, man it's just sometimes hard to think of things on the spot. I, I, well, my mom's from Norway and my dad's American. Lots of people don't know that, but they know I have blonde hair, so sometimes they suspose (sic), like, Scandinavian or something. But, you know, I, I usually don't just tell people right off the bat, "Hey, I'm Joe; I'm half Norwegian, half American," like.

Question 6. *What was the last item you bought for yourself? Please describe it.*

Um, the last thing I bought for myself was my iPhone 5. Um, it's the white and gold one. And it's super cute. I'm really glad to have updated from a 4.

I bought a large bag of M&Ms. And I forgot; it's just one of the giant ones. Um, and I was really hungry one day on campus, so I just ran and grabbed it. And now it's gone (laughing)!

Question 7. *What is your favorite hobby and what do you like most about it?*

My favorite hobby is probably mountain biking. Um. It's kind of hard to explain, really. It's more like just a feeling, like, the rush that you get when you're just, like, biking really, really fast and just through the wilderness.

I love swimming a lot. Um, I was on swim team in high school, and I just liked it because I get to be in the water, and it's a lot better than running.

You know, I've, growing up, I love playing basketball. It's probably one of my favorite sports. I, what I like most about it? You know, it's a hustle game, back and forth all the time. It's fast-paced, and it has just excitement. Someone knocks down a three-pointer or a dunk; you never know what's going to happen next.

Ok, um, recently, um, so I had a mission companion who was really into knitting. And, uh, it sounds weird, but he was a big dude like me, you know, and kind of tough and macho and stuff, but he liked to do things that would just help him calm his mind. Um, because I want to go into medicine, I thought about picking up something that's really, like, tactile that you can do with your hands, so lately, uh, when I get home and after the homework's done and stuff, and I sit down and maybe we watch a TV show or something, I've been trying my hand at knitting. I'm absolutely horrendous at it. Um, but it's going ok (laughing). It's fun. Like, I, what I love a lot are, uh, you can go to Jo-Ann's and get these, um, skeins of wool that are, like, from different countries, and you can get, like, Scottish and Icelandic, um, skeins, and so you can try out, like, the different kinds of sheep with the different amounts of la-, lanolin and stuff in it. Anyways, yeah, that's, that's been a lot of fun lately.

Americans' Truths

Question 1. *What is your least favorite movie or book, and why?*

Oh goodness. Um, movie and book. Probably my least favorite movie would be anything with Will Ferrell in it. I just, I just think he lacks acting skills, and my least favorite book, um, probably any science-related text book. I just, I can't handle it (laughing).

Oh, least favorite movie or book. Twilight. It's going to definitely be twilight. Um, I just can't get past, like, the writing style is really, really bad. And then, like, just the message I find, like, repulsive and negative.

I really dislike all of the Twilight movies and books because they're really shallow, and I hate that they make so much money because of it.

My least favorite movie is probably *National Lampoon's Vacation*, or whatever the official title is, the Christmas one or whatever. Um, it's just a terrible and really annoying movie. And I hate that everybody thinks it's hilarious and they always quote it because it's not funny.

Oh, that's tough. (Sigh) I think I'm going to go with *The Maze Runner* because it is completely insubstantial. And it just goes for shock value.

I really don't like *Twilight* because it is targeted for teenage girls, and I'm definitely not one of those. It does not fit me at all.

Um, I really don't like the book, *The Giver*. (I've) never been a fan of either of the book or the movie. And the main reason is 'cause I think it's kind of overly complex and overly analyzed, silly situation.

Least favorite movie or book. I have a really hard time with favorites, um, in general. Um, when I look at things like we were talking about movies the other day, um, I just, I'm pretty good at suspending my disbelief (laughing), so I don't usually get into too many problems with "oh the logic didn't follow", or, uh, "that person did something that was bad" or whatever. Um, but, (iPad falling) whoop!

Interviewer: Sorry.

Interviewee: Hey, no worries! Um, gosh if I have to pick one, um, let's see. No, I really can't think of one. I really can't think of a f-, uh, uh, I couldn't probably pick out a favorite, I could probably throw out a few that I would just, you know, be near the top of the list, but, uh, picking a least favorite would be tough.

Question 3. *What did you do last night between the time you got home and went to bed?*

Um, between the time I got home and I went to bed, I brushed my teeth, and I washed my face, did a little scripture study, and that's pretty much it. I talked to my RA (laughing).

What did I do last night after the time I got home? This is a really bad test of my memory. Oh! Now I remember. Um, I had to clean out my fridge 'cause something had spilled in it.

Uh, last night I finished up, uh, I'd just returned from the library, and I was with my roommates, and we were all together, and we ate a little ice cream, uh, talking about our day. One of my roommates is really into a girl, so we were talking about how he could ask her out for a while. Uh, and just brushed my teeth and got in bed. So.

Oh man, um, so I got home for, like, a very short period, um, and ate dinner with, uh, my wife and child. Um, we had, uh, what did we have? Oh yeah, we had mash potatoes and, uh, sausage and some other stuff. And then I went to an elders quorum game night. Um, I'm in the elders quorum presidency, and I'm over, like, activities committee, um, and so we had our first game night last night, and that was a blast. And so then I went home and immediately put the baby to bed and hit the sack 'cause I had to get up early this morning.

Question 4. *Tell about a teacher who has been particularly influential in your life. Briefly explain how this person influenced you.*

Um, there's a, uh, Professor Hallen here at BYU; I've taken several classes from her. Um, she's just great. I've learned a lot from her; she's very personable. And I can tell that she really cares about, you know, what her students think and what they want to learn and what she's teaching them, and, um, she's, she's been really influential in that aspect.

That would probably be one of my sociology professors, Dr. Phillips. Um, I took her freshman-level, um, sociology course, and just kind of fell in love with the subject matter. Um, and I actually added it as a minor. Um, and it's, like, just her teaching and her personality has had, like, very positive effects on me.

Um, so I've had a few professors like that, but one is Brother Gardner here at BYU. He was my editing teacher for a few of my classes. And he used to work for the Church, which is really inspiring to me because I want to work for the Church magazines one day. And he just had a lot of experience to tell, a lot of cool stories.

Um, so my high school chemistry teacher, um, his name was Mr. Knoll. He was very influential because, um, mainly because he just was the first high school teacher that I had that treated us like we weren't idiots, and, um, he wouldn't, he wouldn't take any crap from us. Like we, you know, if we didn't do our homework, or if we showed up late to class, or if we were disruptive or anything, he would call us out on it. And, um, so he really kind of pushed me

to take my education into my own hands rather than just be passive about, and just kind of do it, you know, the way that everybody else does it because it, you know, seems to be easy or whatever.

Well, in 4th grade, I had a Mr. McMillan. And he really took interest in me and helped me, um, as a math teacher he gave me some extra assignments and showed me some extra things. And, um, he was just a wonderful person and helped me to really see that, outside of the normal coursework, there's a lot to be learned. And just exploring that helped me be a better person.

Ok, um, when I was in high school, um, my first semester I got into the photography class, which was kind of amazing. Uh, I found out later that it's almost impossible to get in as a freshman, but I got lucky; I got a good place in the draw or whatever. Um, and I spent the next four years with this professor, and I ended up going through, I was secretary for a year and president for a year of the photo club. Um, but I've never had anybody, um, encourage me in quite the same way to be creative, um, truly creative as he did. You know, a lot of teachers encourage you to be creative within the idioms they understand, but he was really into letting us experiment and letting us basically do whatever we want, especially when we got up into the higher levels of photography, and when you'd be in the dark room, you'd be basically the only person in there. Um, so yeah, I just, I really enjoyed, uh, how he encouraged me to think, like, philosophically and creatively and even to use my religious background, uh, to create works that were meaningful to me, um, and perhaps meaningful to others.

Question 5. *What is an interesting fact about you that would surprise other people?*

Um, I'm a twin. So it would surprise most people because they don't know there's two of us. We'll be walking around on campus, and they'll see one of us one day and another, the other one the other day, and they won't know that there's two of us. They think there's just one. So, yeah.

Oh, ok. Um, something, I'm a pretty big dude, um, but I was born on the early end of premature. Um, I spent, uh, the first, like, month or so of my life in the hospital, um, under bright lights trying to, uh, get everything working again. Um, then my body started growing very quickly, and my lungs were underdeveloped, and I have asthma as a result, actually. Um, but yeah, I'm, like, 6'4", 250 right? Like, I'm a big dude, and I was born a very small dude.

Question 6. *What was the last item you bought for yourself? Please describe it.*

I'm assuming textbooks for school don't count. So that would probably be this one really nice calendar I got. Um, it's one of the ones that, like, you lay on a desk, and it's, like, pretty big so you can, like, actually write in it. Not like a picture one that you hang on a wall.

The last item I bought for myself was, um, up in Oregon, I bought myself a fleece, and it was, um, it was a black North Face one, and it had like the patches on the shoulder, kind of like North Face do. Um, but yeah, just a regular old North Face.

(Sigh) I have to remember. I think the last thing I got for myself was actually chocolate (laughing). Um, and it was milk chocolate with hazel nuts. Lindt was the brand.

Oh, well, I don't buy a lot of things. Uh, the last thing, if you can call it for myself, was a tank of gasoline. And I filled that tank up all the way.

Um, man, I'm trying to remember. I, last item I bought for myself. Um, well, if, if you count yesterday, uh, night, I purchased ice cream mutually with my roommate, and I did partake of the ice cream. So, I guess that'd be for myself. Yesterday, I bought some ice cream.

Question 7. *What is your favorite hobby and what do you like most about it?*

Um, my favorite hobby, I don't know if this quite counts, but I consider it a hobby. It's editing or doing anything related to words. I'm an editing minor. And, um, I love looking up words (laughing), like, it's just anytime I come across anything that I don't know or I'm not familiar with or someone has a question about I, I love to look it up. That's why I'm in the major and minor that I'm in.

My favorite hobby is probably swimming. Um, I did it all through high school, and, um, it's the only kind of exercise where I feel like I am actually good at it. So I like feeling like I'm good at something, and, um, it's just really relaxing for me. A lot of people say it's stressful, but I think it's really relaxing.

I really like to play soccer. It's just a fun way to get myself moving without actually having to be too structured about it. Yeah.

I love music and playing the piano, especially accompanying other people. You have a group setting where you communicate, um, on an individual level. It's, it's a heart to heart. It's a very pure language music can be. And when you're just interacting and, and creating that synergy there, it's, it's an experience you can't duplicate anywhere else.

Ghanaians' Lies

Question 2. *What celebrity would you most like to meet, and what would you say to them?*

Wow, let's say I would like to meet Jackie Appiah. And then what I would tell her that you are really a very beautiful girl, and I love your acting, like, it is so natural. So, so natural. Very natural when you act, oh man, I really feel like being in your place, you know. I'm really jealous of you. Yeah.

Oh, Jackie Appiah. She's, she's someone I really like, you know? I really like her so much. Hm, maybe I want a pen or something from her. Yeah.

Denzel Washington. Um, I'd just tell him I love him. That's all. Yeah.

I would like to, (laughing) well I would like to meet John Dumelo, and I would really want to tell him how great I like his movies. Yeah.

Uh, ok. (Sigh) Um, let me say Mr. Bean. Tell him that he's very funny.

Beyoncé. And if I meet him, I'll, I'll tell her she looks so gorgeous the way she, she dresses.

Mariah Carey. That I love her so much.

Question 3. *What did you do last night between the time you got home and went to bed?*

Last night when I got home (laughing), it was really hilarious you know, I had the very, the nicest of all the chats I've had in this world with a very fine brother. A very fine, pink lipped. Oh, man he gave me a hug and it was like, I was in heaven. I spent the whole time with him (interruption) talking, having fun, and I really enjoyed myself last night. I really did. I really did. Yeah, I was happy.

Oh, I was listening to music and stuff. Yeah. It was, it was, was not bad. Because Ghana lost against U.S. I, I, didn't really have anything to do so I just had to listen to music and just fall asleep by force. Ok.

Last night, um, when I got home, I got home around 8 o'clock, and my sister happened to be preparing dinner so I had to help. And around 9 o'clock there was a football match, which I was really in support with the African side. So I had to watch. So I watched and laid down and fell asleep.

Last night? I read my scriptures. I pondered over them. Over it. Yes.

Question 4. *Tell about a teacher who has been particularly influential in your life. Briefly explain how this person influenced you.*

Yeah, ok. When I was in secondary school, there was (name). It's his, he, he taught me how to like math and stuff. Normally he came to me to ask me how my math grades were. And sometimes I would tell him that it wasn't good. He was telling me it was a nice subject, so he normally came to me, taught me how to, you know, um go on with these math questions and stuff. And it helped. He influenced me by making me like math. Now math is my favorite subject. He, he normally used to beat me when I don't really do well in examination questions and stuff. And he really influenced my life. Right now math is my favorite course I really like to do.

Um, I'd say my JSS teacher, Mr. Samoraji. I think, um, right now he's working at the parliament house. And when we're in school, he was a very disciplinarian. He really used to talk to us about, um being the person you really are, not faking someone and trying to achieve what you really want to achieve. And, um, he spoke a lot but I've forgotten what's his name but I think (unintelligible) like that. Now, I yeah, can't. Yeah, he seems to be a very simple man. Yeah, that's what I like about him.

Um one teacher who has really influenced my life is, by name, Mister (name). And he has really helped me because, and has influenced my life because he always beats me in class and for that (unintelligible) I, he encourages me to learn. And that has really helped me in my life to be more determined and focused when, when I'm studying. So I really like Mr. (name) because of that.

Question 5. *What is an interesting fact about you that would surprise other people?*

Hm, ok. I would say I wouldn't care about, if I'm watching football, as I said it's my passion, if something really serious is happening, I wouldn't care; I wouldn't care about anything. Come and tell me something that's really serious that's going on, because football is my passion, come on. When I'm sitting behind the football match and I'm really interested in it and you come and tell me that something very important is going on, I'll tell you to wait. When the football match ends then, you, I, I can solve that issue.

Hm. Um. The fact that I could just go crazy or mad at someone over something little or meager. Yeah.

Oh, the interesting part about me is that, uh, love to crack jokes, and then um, I, I laugh a lot. I eat a lot. And then, um, yeah, I eat a lot. And when people see me I'm, also can be very scary at times. Yeah.

Hm, I am, I have a good sense of humor, and for that matter, I know people who comes in contact with me will really enjoy it. Because I have a good sense of humor.

Question 6. *What was the last item you bought for yourself? Please describe it.*

Hm! Well, I think it was, um, yes, that was very, la-, I think last week. I bought, I went to the mall, and I bought this watch. A very nice, beautiful watch. Oh, I wish I was wearing it. Um, cost \$250 GHC. Even though I didn't have

money when I saw it, I was like, this is mine, and I have to go home with it. I bought it. Very nice, good watch. Uh, let's say it looks very classy. Very classy. Um, it's gold and then just a little bit of silver around it. A lot of decorations. It's very beautiful for a lady's watch. It's very beautiful. For \$250 GHC when I'm broke. Ah, I think I did well. I did.

Um, that's Bordman. It's a type of body splash. Should I say, like, uh pentagon in shape. That's the item I bought, my last item was that. Yeah.

Uh, I bought a, um, drink from the supermarket. Parmalat. It's a custard drink, actually.

Hm, I bought myself a shoe, a shoe. Yeah.

Interviewer: Please describe it.

Interviewee: The shoe?

Interviewer: Describe it.

Interviewee: It's a nice cute shoe with lace on the top, pink lace. Yes.

Question 7. What is your favorite hobby and what do you like most about it?

Um, Ludu. I like Ludu. The fact that just you have to throw the die and then you have to (inaudible). So that's why I like, yeah.

My favorite hobby. Uh, I'll going for, should I say hockey. It makes you go up and down so I think I like it.

Uh, I like research. It helps, uh, gives me exposure, travelling.

Um, swimming. Um, swimming because I enjoy being in the water, especially when the water is warm. Kind of swimming in the water is very enjoyable to me. So, love being in water. I wish I could even sleep all night in the water.

Ghanaians' Truths

Question 1. What's your least favorite movie or book, and why?

Um, least favorite. Least favorite. Let's say *Chewa*. That's, it's a Ghanaian movie. And I really didn't like it because it was so demonic, like so demonic. And it bores me, like, it makes me think there are lots of demons around me, which there are not. So, yeah, I think I hate it.

Hmm, book, Goosebumps. It's, it's totally about fiction. It's not real, so I don't really like it.

My least favorite book or movie. Um, can't remember the least favorite book or movie. Right now, I can't think of one, can't think of one. I'm trying to remember which one. Um, *300* the, the part two, I think it didn't really end well. I didn't like the ending. Yeah. And the book, book. I don't really read books so, (laughing). But I'd say, I'd say *Straw of Sacrifice*. The guy who was made to die didn't really deserve to die. I hated it, the fact that he died. So.

My least? Uh, Do I even have one? I don't think so.

My least favorite? Hm. Haven't had to think about one (unintelligible) mentioned--I can't think of any now.

Um, least favorite movie and book, Um. Ok, this African book. *The Gods Are Not to Blame, The Gods Are Not to Blame*. Um, it's my least because, it's kind of, it's full of, um, warnings and wars and proverbs which are not kind of (laughing) interesting to me.

My least favorite movie is (name). And I don't like it because of the sex, uh, the way it was being done. The production is very poor. And then the characters they use weren't using the language well.

Ok. Favorite movie. (laughing) Can, can it be cartoons or this or?

Interviewer: Yes.

Interviewee: Ok. Avatar. Avatar. Because it's adventurous. You learn a lot from it. Yes.

***Question 2.** *What celebrity would you most like to meet, and what would you say to them?*

Carmen Diaz. Yeah. Yeah. And the reason why I want to meet her is, uh, should I say, she's courageous, she's strong. I like her movies so I think I want to meet her.

Question 3. *What did you do last night between the time you got home and went to bed?*

Um, last night, I actually wat-, I watched the Ghana's match. And after that I came to, I went on Facebook, yeah, and I chatted with my friends about the disappointment. So I was really sad, and I went to bed. I didn't really do much last night, just went to bed. Yeah.

Uh, I read I think some few books, then took my shower and just went to bed.

Um, I worked on my computer.

Um, I just watched some, a program, my favorite program, a soap opera. And then, um, did my assignments and then slept off. So the soap opera started from 8 pm to 9, and then from 10, from 9 to 9:30 I just did assignments and then slept off.

Question 4. *Tell about a teacher who has been particularly influential in your life. Briefly explain how this person influenced you.*

Hm. This teacher was actually, um, my technical teacher, like pre-tech. That's what we used to call it in, I think, GHS, yeah. And I really hated that course, like, I, I really didn't like it, but he had a way, he had a way of making me love it. Like, anytime he comes to the class he will make sure you are involved, like, What is this? What is that? And he will get you involved like even when you are wrong like, he w-, he wouldn't make you feel that bad, and I really like that. It, it, it made me passing that course. And I really loved the way he made me love the course. So I think he was very influential. Very very, eh, good influential I mean.

Uh, ok, that's a nice question. Uh, my teachers, there are so many but I think I have one in particular. She's called Ms. Frances. She wouldn't see you misbehave. She always train you, make sure you do the right thing. And I think I've grown to like her so much because I think I'm really disciplined. So I'm grateful to her.

Lord Mensah. Hi-, his name is Dr. Lord Mensah, and I like his passion when it comes to his work and how he goes about it. I really love it.

Um a teacher, can it be seminary or institute?

Interviewer: Yes.

Interviewee: Um a teacher, wow. That is great. It has been my institute teacher, um, who was also my stake president. He was very honest, direct, and kind of disciplined. So kind of, love his way of life. He does things at the right time. Kind of, I love this way, but kind of, it's hard for me to, um, emulate that, but as I keep doing it I see myself very happy because I've set him as my role model. Yeah.

Ok. Um. His name? He's called Mr. Samson. Mr. Samson, in high school. He helped me a lot in my studies. We had, um, classes, one-on-one classes. He taught me things he didn't teach others. He helped me a lot. Yes.

Question 5. *What is an interesting fact about you that would surprise other people?*

Hm, I think it will be when my friends, especially my old friends, find out that I'm a pastor. Like they'll be so surprised, like, really? This girl? I don't believe it. They'll really be surprised. But it's the truth. I am.

I'm multitalented. I do deco, I sing, I play the piano. So I think, that's what all, most of factors that will like let people like me or something like that.

That, the, the fact that people e-, underestimate me. That sometimes I can do more than what they actually think I can.

Interesting fact about me. Wow. I don't have any interesting facts that would surprise anyone. I'm just normal.

Question 6. *What was the last item you bought for yourself? Please describe it.*

The last item I bought for myself? Ok, it's, it's a deodorant spray, a Sure. Adidas, Adidas Sure I bought for myself. Yeah.

I bought kenke. Last night, I bought kenke, two balls of kenke, and then three fishes. Yeah, that's what I bought.

Well, I bought a shoe. Yes, a shoe, a black shoe that's, um, black shoe, which is called moccasin. It's, it's, it's kind of very durable and it lasts longer. It's very comfortable when you put it on, and you can use it for any occasion.

Ok. The last item I bought was a shoe. And it's black and has an 'H' design on it. And it's an easy wear.

Question 7. *What is your favorite hobby and what do you like most about it?*

Hm. My favorite is um, uh, playing Ludu. Because it's, it's actually, I, and I love it most when I play with my sister because I always win. And then, like, it makes me have, be very relaxed, like, you don't have to think about a lot of things because there are lots of dos and don'ts. And it's relaxing, especially when somebody's going home and bring it back, the person back, it's really hilarious, and I love it. I really love that whole, be like, I love to play it all the time so that I can just relax, laugh, laugh my head out. I really love it. Yeah. Really do.

Um, my favorite hobby is playing football, watching football. It's my favorite. And the reason is that I have passion for it. When you have passion for something it, it's, it's, you, you just draw, it just draws you closer. Anytime something is going on about it, you, you, you're just drawn by it because of its passion. Yeah.

My favorite hobby, um, I like playing football during my hobby, my, uh, free time and because it's a form of exercise, so I really like it.

My hobby? I like watching movies a lot. What was the next question?

Interviewer: What do you like most about it?

Interviewee: Movies? It's fun (laughing).