

**SECOND LANGUAGE BIAS AND ACCURACY OF DECEPTION JUDGMENTS**

by

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### **Declaration**

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I declare that **Second language bias and accuracy of deception judgments** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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**SIGNATURE**

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## **Abstract**

This study examined the ability of students to correctly discern between truthful and deceptive messages from a group of second language English speakers. Recent studies have found a ‘lie bias’ when making veracity judgments towards second language speakers. This lie bias may be problematic in a country such as South Africa where the majority of the population communicate, to a greater or lesser extent, in their second language. In this study participants (n=64) made classifications of 24 messages as either truthful or deceptive. The messages were created by second language English speakers who were asked to describe a truthful or deceptive event. The results revealed that there was a significant difference between the way that first and second language participants made their judgments. It is argued that this difference can be attributed to the notion that second language participants require more cognitive effort, than their first language counterparts, to understand and classify messages.

## **Key terms**

Cognitive Load, Deception Detection, Interpersonal Deception Theory (IDT), Lie Bias, Lie Detection, Online Survey, Second Language, South African, Truth Bias, Veracity Judgments

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## Definitions

Accuracy	Refers to the correct classification of truthful messages as ‘Truth’, and deceptive messages as ‘Deceptive’ (Burgoon, 2015).
Bias	An inclination towards selecting one specific choice instead of another (Reber, 1985).
Cognitive Load	The amount of mental effort, attention, and working memory required to accomplish a specific task (Greene, O’Hair, Cody, & Yen, 1985; Vrij, Granhag, & Porter, 2010).
Constructs	“The attributes of people societies, and organisations that social scientists wish to measure.” (Terre Blanche, Durrheim, & Painter, 2006, p. 142)
Constructs within this study	<p>The constructs in this study include various combinations of the judgments from all the receivers, combined according to the desired attributes and message veracity of the senders. The list of terms below is used to define the constructs that were compared in this study.</p> <p>Total – All the messages</p> <p>Truth – All the truthful messages</p> <p>Lie – All the deceptive messages</p> <p>Confidence Total – Confidence in judgments on all the messages</p> <p>Confidence Truth – Confidence in judgments on the truthful messages</p> <p>Confidence Lie – Confidence in judgments on the deceptive messages</p> <p>Female Total – All the messages by female senders</p> <p>Female Truth – All the truthful messages by female senders</p> <p>Female Lie – All the deceptive messages by female senders</p> <p>Male Total – All the messages by male senders</p> <p>Male Truth – All the truthful messages by male senders</p> <p>Male Lie – All the deceptive messages by male senders</p> <p>Black Total – All the messages by black senders</p> <p>Black Truth – All the truthful messages by black senders</p> <p>Black Lie – All the deceptive messages by black senders</p> <p>White Total – All the messages by white senders</p> <p>White Truth – All the truthful messages by white senders</p> <p>White Lie – All the deceptive messages by white senders</p> <p>Confidence Female Total – Confidence scores of all the messages made by female senders</p>

	<p>Confidence Male Total – Confidence scores of all the messages made by male senders</p> <p>Confidence Black Total – Confidence scores of all the messages made by black senders</p> <p>Confidence White Total – Confidence scores of all the messages made by white senders</p>
Deception	<p>A message that was created with the intention to convince someone of a notion that is known to be false by the messenger, without the intended person’s knowledge, consent, or forewarning (Vrij et al., 2010). Levine (2014b) views deception as an umbrella term that includes lies; “Other forms of deception include omission, evasion, equivocation, and generating false conclusions with objectively truth information” (Levine, 2014b, p. 380). For the purpose of this study the terms ‘deception’ and ‘lying’ are used interchangeably (Levine, 2014b). This is because this study deals exclusively with lying as a form of deception.</p>
Deception Detection	<p>The correct classification of truthful and deceptive messages (Burgoon, 2015).</p>
Decode	<p>The ability of receivers to interpret the messages created by senders, and assign meaning to them. This may be in the form of truthful or deceptive judgments (Buller &amp; Burgoon, 1996; Reber, 1985).</p>
Emotional Leakage	<p>The theory that emotional expression is not completely under conscious control. This purports that emotional expressions can ‘leak’ out when the emotions are felt strongly (Porter, ten Brinke, &amp; Wallace, 2012).</p>
Encode	<p>The process where senders attempt to form a credible message. This is done by attempting to create a message, as well as managing their nonverbal behaviour, to seem more believable (Buller &amp; Burgoon, 1996; Reber, 1985).</p>
Heuristic	<p>“Simple rules for making complex decisions or drawing inferences in a rapid manner” (Baron, Branscombe, &amp; Byrne, 2009, p. 39)</p>
Lingua Franca	<p>“the ‘contact’ language between two mutually incomprehensible languages.” (Firth, 1990, p. 270)</p>
Micro-expressions	<p>A brief and uncontrollable emotional facial expression that lasts 1/25 to 1/5 of a second. Micro-expressions occur when someone feels an emotion strongly, and attempts to conceal or mask the emotional expression (Porter et al., 2012).</p>
Nonstrategic Behaviour	<p>An unintended and commonly unconscious processes where emotions or cognitive processes are observable through unintended behaviours during communication. This is sometimes referred to as ‘leakage’ and be associated with revealing the</p>

	complexity of a message, or the sender's 'true' feelings (Buller & Burgoon, 1996).
Receiver	Refers to the participants (including discussions of various deception detection studies) who are asked to observe, and interpret, the behaviour (or aspect of the behaviours), of senders in order to judge the truthfulness of their message (Buller & Burgoon, 1996; Reber, 1985).
Second Language	Refers to the language that a person learned after their first or home language (Crowther, 1998). This study considers all participants whose first language is not English, as second language English speakers, and thus does not consider if English was indicated as a third or even fourth language.
Sender	Refers to the participants (including discussions of various other studies) who creates and delivers truthful or deceptive messages. This may be accomplished through video recorded messages, face to face interaction, or written accounts (Buller & Burgoon, 1996).
Strategic Behaviour	Deliberate actions that are taken in order to accomplish a specific goal. This could be to get a specific messages across, be more convincing, or seem more credible (Buller & Burgoon, 1996).
Veracity	'Truthfulness', 'a Truth' (Crowther, 1998).

## **Chapter 1 – Introduction and Background**

### **1.1. Introduction**

Recent studies have shown that speaking in a second language can have an adverse effect on one's credibility (Lev-Ari & Keysar, 2010). Informed by the Interpersonal Deception Theory (IDT) the current study was undertaken to discover if there is indeed a bias towards believing that second language speakers are deceptive more often than chance, within the South African context. In order to accomplish this, this study investigated how accurately a sample of first and second language English speaking South African participants could correctly classify truthful and deceptive messages delivered by second language speakers.

This type of research is especially pertinent in interactions when listeners (receivers) do not have access to sufficient contextual information to indicate if the message is truthful or deceptive. Within these interactions the receivers may only have access to what the person (sender) says, and possibly their nonverbal behaviour. Previous studies indicated that the nonverbal behaviour of second language speakers may be associated with deception, which increases the likelihood for second language speakers to be disbelieved (Evans & Michael, 2014).

The first chapter introduces the purpose of this study, as mentioned above, as well as provides an overview of this dissertation. This overview provides a discussion of the problem statement, as well as the research questions that were derived from previous studies within this field. The significance of the study is briefly introduced. This is followed by, a description of the research design. The chapter concludes with an overview of the chapters to follow

### **1.2. Problem Statement**

Previous studies have shown that people are usually not accurate in making judgments on the truthfulness of others' statements. These studies have indicated that our 'normal' ability to judge the veracity of others is much closer to chance, and that we could be just as accurate if we flipped a coin. Though receivers interpretations are not accurate, they are likely to believe that a message is truthful more often than deceptive, resulting in a 'truth bias' (Bond & DePaulo, 2006). Some studies have attempted to find behavioural cues that are indicative of deception, based on the additional cognitive load and emotional leakage associated with lying. Although there is evidence

that shows that there is an observable difference between being deceptive and being truthful, there are no behavioural cues that are reliably diagnostic of deception (DePaulo et al., 2003).

More recently some studies have found that there appears to be a 'lie bias' against senders speaking in their second language, regardless of deception detection ability of the receivers who make the judgments. Whilst the findings suggest that the judgments are persistently not accurate, it did show that the receivers were more likely to make deceptive judgments, than truth judgments, towards second language speakers (Da Silva & Leach, 2013; Evans & Michael, 2014). This could naturally pose a problem for senders who have no choice but to speak their second language in order to be understood. The most obvious examples of this will be at an airport terminal or under police interrogation, where a person is forced to speak in their second language because a translator is not available.

In a country such as South Africa, with 11 official languages (Statistics South Africa, 2012), this may be a daily experience for many people. In South Africa, where English is used daily as the lingua franca (Khokhlova, 2015), only 9.6% of the population reported English as their first language (Statistics South Africa, 2012). Furthermore, the researcher was not able to find any deception detection research conducted in South Africa, thus making it difficult to generalise the results from international studies into this particular context. Therefore, the potential for a lie bias towards second language speakers is currently unknown within South Africa.

This study therefore aimed to support previous international works by gaining a better understanding of deception judgments within the South African context. By building on previous work this study contributes to the literature through addressing some of the gaps left from international studies. This study intends to build on previous work by looking at a different population as considered by previous research, thus diversifying the literature (Evans & Michael, 2014) and by considering a sample of receivers who were more accustomed to listen to second language speech (Da Silva & Leach, 2013).

The purpose of the present study was to investigate the possibility of a second language lie bias in veracity judgments. This could help to increase the literature on deception detection with second language speakers within the South African context. Language is closely tied with race and culture within South Africa (Khokhlova, 2015). Therefore, this study also attempted to account for potential racial differences in both the senders and receivers as possible mediating factors in

deception judgments. In addition, differences in veracity judgments as a result of gender and the first or second language status of receivers were assessed.

### **1.3. Research Questions**

Based on the previous discussion, the formalised research questions for this study include the following:

1. Are second language speakers more likely than chance to be judged as deceptive?

The question above addresses the main purpose of this study. However, recognising that making veracity judgments may be influenced by various perceptual and social factors; three additional research questions were asked to ascertain whether the first question involves a general bias against second language speakers or if there are other influences not yet accounted for within this context.

Because of differences in gender socialisation, as well as popular perceptions about gendered social perception (Hodges, Laurent, & Lewis, 2011), this question is aimed at discovering if there could have been an effect on the participant's performance or judgments because of gender.

2. Is there a difference in judgments or confidence when the gender of the receiver / sender is taken into account?

Within the South African context language and race are intimately linked, and difficult to separate (Khokhlova, 2015). In order to look at the accuracy or bias of second language speakers in this context, the influence of race cannot be ignored. For this reason, race was accounted for in the measuring of deception detection, and this question is aimed at gaining a wider perspective of this field.

3. Is there a difference in judgments or confidence when the race of the receiver / sender is taken into account?

Because the South African context has such a rich multi-cultural climate, it is also necessary to take into account the receiver's linguistic ability. As previously stated, language and race are intimately linked within the South African context, in which English is treated as the lingua franca. It should be noted that first language English speakers come from a variety of backgrounds. Therefore, language status becomes a separate category for investigation, but remains to be tested. By taking into account the first, or second, language status of the receiver it becomes possible to justify or disregard this as a factor that may influence deception detection (Snelling, 2013).

4. Is there a difference in judgments or confidence when the first- / second language status of the receiver is taken into account?

The purpose of the following question was to discover if participants in this study held similar beliefs about deception cues as were identified in previous studies (e.g. Castillo, 2011; Global Deception Research Team, 2006). This may have implications in the perception around the suitability of attempting cross-cultural, as well as cross-linguistic, deception detection.

5. What are the perceived deceptive cues that receivers looked for to base their veracity judgments?

#### **1.4. Significance of the Study**

The results of this study can have a wide impact on multiple fields because the research implicates communicative contexts in which the trustworthiness of a message comes into question. These include, but are not limited to, a police interrogation, relationships, business negotiations, therapeutic contexts, and day to day communication where honesty may be vital. Cognisance of the various types of biases that people potentially face, as well as the factors that influence these biases can assist to improve communication and interactions. It may also improve the judgment results within the above listed situations.

#### **1.5. Research Design**

To investigate the possibility of a lie bias towards second language speakers, this study was conducted in two phases. The first phase entailed creating a research instrument. This consisted of a collection of video recordings that contained statements of second language (English) students purposively telling a lie or a truth. These second language students from the University of South Africa (Unisa) were asked to volunteer to be recorded while they narrated a truthful or deceptive message about a video they watched on a monitor. The recordings made from the second language speakers were collated to form the research instrument that was used during this study.

The second phase consisted of creating an online version of the research instrument and a second sample of voluntary Unisa students viewed the research instrument via an online survey tool (Surveygizmo), and made veracity judgments on the recordings. The responses were analysed to see if they showed any bias towards the recorded volunteers. Descriptive and inferential statistics were used in order to compare the data, to see if any significant differences or correlation were found.

Content analysis was used to identify the characteristics that receivers took into consideration when making veracity judgments.

By using an online survey method, this study attempted to gain access from a wider spread sample than could have been accessed by face to face sessions. Using students to participate in the online survey was considered logical as it was assumed that they had access to technology and the relevant knowledge to participate in an online study.

## **1.6. Chapter Overview**

### **1.6.1. Chapter 2 Theoretical Framework.**

Chapter two provides the theoretical framework for the study. This study was viewed through the theoretical lens of Interpersonal Deception Theory (IDT). IDT is supported by certain assumptions made about communication and deception that form its foundation. The predictions, which emanate from this foundation, consist of 17 propositions. Although this study did not make explicit use of all 17 propositions, the theory is discussed in terms of the underlining constructs within the propositions.

Chapter two begins by explaining the assumptions made by IDT. This is followed by a review on constructs derived from IDT, which are addressed in this dissertation. Thereafter, constructs which were not used in this study, but are inherent part of IDT, are briefly elaborated on. The chapter concludes with a critique of the theory as discussed by other authors, which was not mentioned within each construct. The constructs discussed within this chapter informed the writing of the literature review from which the variables, which are of interest in the current study, were derived.

### **1.6.2. Chapter 3 Literature Review.**

Chapter three provides the literature review that is based upon some of the constructs introduced within the theoretical chapter. This chapter draws on multiple studies that investigated deception detection in a broad as well as focused sense. This assisted the writing of the literature review, in that the general findings on deception detection studies are discussed first. These include the investigations that have been conducted to discover possible deception cues as well as studies that examined the effects of emotional leakage and cognitive load on deception (introduced within the theoretical chapter). The discussion proceeds to include various factors that can affect deception,

including gender and race, which are later introduced as variables considered in the current study. The chapter further discusses the possible effects that speaking a second language can have on deception. This chapter concludes by presenting previous studies that have included second language speech within their work, as well as a description of the context in which the current study was conducted.

### **1.6.3. Chapter 4 Research Method.**

Chapter four discusses the research design and method used in this study. As mentioned earlier, this study was conducted in two phases. The first phase describes how the research instrument was created. This includes the sampling method that was used, the pilot interviews, and the interviews that were conducted for the recordings that were used within the second phase. The second phase describes how the research instrument was assembled into an online survey by using the survey platform 'Surveygizmo'. The sampling procedure and processes of the second phase are then described. Ethical considerations for this study are discussed in the description of each of the two phases. The final section of the method chapter describes the data analysis techniques that were used to analyse the data.

### **1.6.4. Chapter 5 Results.**

Chapter five provides the results and the relevant tables and figures to summarise them. This chapter is organised according to the research questions and analytical techniques as introduced in chapter four. The chapter begins by describing the biographical information of the receivers who participated in this study. This includes various descriptive statistics of the participants as well as the research instrument, after which the answers to questions 1 to 4 are indicated according to the research questions and analytical approach. The chapter concludes with the Content Analysis that addresses the final research question.

### **1.6.5. Chapter 6 Discussion.**

Chapter six discusses the results that are presented in chapter five. The research questions and their findings are presented in the order in which they appear in the results chapter. This chapter represents a synthesis of the preceding chapters in order to provide a coherent and meaningful answer to the research questions. These are explained in terms of the theoretical framework, as well as compared to previous research findings and literature. In conclusion, the limitations and recommendations of the study are discussed.

## **Chapter 2 – Theoretical Framework**

### **2.1. Introduction and Theory Background**

The purpose of the current chapter is to introduce the Interpersonal Deception Theory (IDT) that served as the theoretical framework for this dissertation. This study was viewed through the theoretical lens of Interpersonal Deception Theory in order to answer the five research questions highlighted in the previous chapter. According to Creswell (2009), a theory is a set of variables that are related to each other that consists of certain propositions. It is meant to explain observations about particular occurrences in a logical way (Babbie, 2008), with the dual purpose of organising the knowledge that exists, as well as predict future processes or events. The hypotheses of a study, which are derived from the theoretical view, are tested systematically (Baron et al., 2009). Within any study a theory is used because it specifies a relationship between variables, and it helps to predict or explain possible findings.

Interpersonal Deception Theory is a post-positivistic theory (Burgoon & Buller, 2014). Proponents of the theory claim that there is a reality independent of us. We are able to make certain statements and predictions about this reality, because it is considered independent of us. However, researchers have their own subjective limitations in accessing the subject of their study, thus they do not have complete access to objective knowledge. This implies that research should be guided by the best available evidence (Robson, 2011).

Interpersonal Deception Theory was developed by Buller and Burgoon (1996) in order to predict deception, as well as explain it, within interpersonal communication (Burgoon, 2015). To account for both credible and non-credible communication within interpersonal contexts, the notions within the theory consider deception as a communicative process that develops throughout an interaction between two or more persons (Buller & Burgoon, 1996). IDT is structured according to 17 propositions that make certain claims and predictions that relate to deception within the context of communication. It is based on various assumptions that inform the propositions, and provides a basis for the theory (Buller & Burgoon, 1996; Burgoon & Buller, 2014).

The current study does however not make use of all the propositions. Rather it is based on a portion of the IDT propositions. For this reason, this chapter discusses IDT in terms of the relevant constructs upon which this study draws, instead of an over-complicated, exhaustive (and

unnecessary), discussion according to the propositions of the theory, as seen in other studies (Kirk, 2015; Wagner, 2011).

In order to provide such a relevant discussion of how IDT formed the theoretical framework of this study, this chapter is divided into several subsections. The first part of this chapter deals with the explicit assumptions made by IDT. This discussion begins with the assumptions regarding communication, cognitive load and interaction, norms and expectations, and finally the assumptions about deception. Thereafter, a discussion follows of several constructs that were adopted from IDT, which form the basis of the argument for this study. These constructs refer to interactivity, task demands, expectations of normality and bias. This chapter provides a short description of constructs not considered in this discussion, and concludes with previous critique on the theory and a summary of the chapter.

## **2.2. Assumptions**

The assumptions considered in this theory form the foundation of the propositions of IDT. In order to accept the framework of this theory, it is necessary to accept the base assumptions (Buller & Burgoon, 1996). For this reason, this discussion begins with the theoretical assumptions. That is followed by an examination of the relevant constructs upon which this study draws. The assumptions that are discussed in this section are those related to communication, cognitive load and interaction, norms and expectations, and finally deception.

### **2.2.1. Communication.**

The IDT assumptions regarding communication are used as a starting point for this discussion since IDT views deception as situated within the communication context. These assumptions, which underpin the entire theory, provide some explanation for the constructs that are explained later within this chapter (Burgoon & Buller, 2014).

According to Interpersonal Deception Theory, communication is a complicated process that includes different participants, each with their own motivations and aims. The process can occur within various contexts and through different mediums, as well as involve a number of contextual or personal factors. This may include, but is not limited to: If the participants know one another, what their expectations are, as well as their level of social skills (Buller & Burgoon, 1996; Burgoon & Buller, 2014).

One of the fundamental assumptions made by IDT is that deception is a form of communication (Patnaik et al., 2016), in that it is an active, dynamic and purpose driven process (Burgoon & Buller, 2014). This dynamic process means that senders and receivers need to be actively involved, and therefore both have to encode and decode messages at the same time (Buller & Burgoon, 1996). The encoding and decoding processes happen simultaneously, thus it is not possible according to IDT, to divide communicators into receivers and senders during an interaction. This type of divide can only be made at an abstract level, as done in this study, because normally communicators simultaneously fill both those roles (Buller & Burgoon, 2008).

Proponents of the Interpersonal Deception Theory argue that both these processes (encoding and decoding) increase a person's cognitive load (e.g. the amount of mental effort needed to process information), which can distract them from interpreting, or projecting a credible message correctly (Buller & Burgoon, 1996). From the onset, it is assumed that there are no cues that are universally diagnostic of deception. This assumption is made because of the dynamic nature of communication and that interactions change and develop as both parties receive conversational feedback. With this developing and dynamic interaction the cues that could indicate that someone is telling the truth or lying would also change. Although there may not be universally diagnostic cues, the theory does hold the assumption that there is an observable behavioural difference between honest and deceptive speakers. This is because the behaviour of the speakers change observably when they are honest, compared to when they are deceptive (Buller & Burgoon, 1996; Burgoon & Buller, 2014).

This observable difference occurs through the participant's strategic behaviours (e.g. intended behaviours), as well as their nonstrategic behaviours (e.g. unintended behaviours) that result from the interaction. IDT assumes that people use both strategic and nonstrategic behaviours during the encoding and decoding process (Bond, Levine, & Hartwig, 2014; Buller & Burgoon, 2008). Strategic behaviours increase the credibility of the message, and are not necessarily a predominantly conscious act. This is because from an early age many communicative acts become habitual as a result of practice. But they are nonetheless sometimes intentionally performed to accomplish a specific goal (Buller & Burgoon, 2008). For example, gesturing during a conversation to show how big something was. In contrast nonstrategic behaviours are unintentional, and commonly entail an unconscious process that could make the emotional or cognitive process observable through behavioural leakage, for example, not being able to hide a smile after hearing a funny story. Nonstrategic behaviours are unintentional and result from the additional control required in order to engage in strategic behaviours (Buller & Burgoon, 1996).

Finally, advocates of the IDT assume that judgments are made on the basis of how credible the person appears. How the receiver perceives the sender's character (i.e. if they seem honest or trustworthy), or competency (e.g. experience, intelligence, and knowledge) could affect receiver's veracity judgments. The sender's ability to hold her/his composure (e.g. appear to be calm and relaxed), seem sociable (e.g. warm, cheerful, and friendly), or dynamic (e.g. are talkative, energetic, assertive) could also affect the way in which they are perceived (Buller & Burgoon, 1996; Burgoon & Buller, 2014). This would naturally include their physical appearance and other observable characteristics (e.g. gender and race), which may influence others' perceptions due to stereotypical beliefs or social norms (Baron et al., 2009). The concept of social norms is discussed later in this chapter.

### **2.2.2. Cognitive Load and Interaction.**

“Information management is fundamental to communication” (Burgoon & Buller, 2014, p. 350). The management of information refers to the strategic behaviours that actively change the meaning of the central message in order to increase the credibility and trustworthiness. This places emotional and cognitive strain on both the sender and receiver (Buller & Burgoon, 1996).

When senders lie they have to control various aspects (e.g. the tone of their voice) of their message in order to make it convincing. They have to create the message, attempt to keep a credible identity, regulate their behaviour while sending the message, consider the feedback, and manage their perception of themselves based on their interpretation of the feedback. In addition observable manifestations of these behaviours should be hidden from the receiver in order for the message to be successful (Buller & Burgoon, 1996; Vrij, Leal, Mann, & Fisher, 2012).

Receivers, on the other hand, need to hear the message, interpret what is said, judge if it fits with their knowledge of the topic, observe the senders behaviours and suspected deception cues, and manage their behaviour to not signal their possible suspicion to the sender (Buller & Burgoon, 1996).

The effort to accomplish this can differ because of the complexity of the context of the conversation, the persons involved, and types of messages, etcetera. IDT assumes that people with better social skills are more successful in handling the additional demands (Buller & Burgoon, 1996). However, evidence from Bond and DePaulo (2008) suggested that receivers' abilities to detect deception were similar, regardless of their communicative skills. This contradicts the

assumption that detecting deception is a communication skill. This implies that detection ability should differ significantly between receivers. This notion led the authors to revise their assumption and to consider that it is only the sender's communication ability that determines whether the deception was successfully concealed. Therefore, according to the revised version of IDT, the receiver's communicative skills do not play a role in deception detection (Burgoon & Buller, 2014). This is not to say, however, that the emotional or cognitive strain on receivers does not influence their judgments.

Interpersonal Deception Theory theorists, as a result, assume that receivers and senders are both influenced by cognitive and behavioural limitations. Because of these limitations both senders and receivers need to choose where to focus their attention (Buller & Burgoon, 1996). This could imply, as mentioned above, that the receiver's own cognitive load influences their veracity judgments.

### **2.2.3. Norms and Expectations.**

IDT theorists propose that people have expectations about the way in which others will behave. These expectations help to organise interpersonal communication as they provide a quick and efficient schema (a cognitive framework that helps classify and interpret information) (Buller & Burgoon, 1996). Two notable expectations that people bring into communication are honesty and reciprocity. People assume that others will be honest in their interactions, be friendly, positive, and worthy of trust. People also assume that others will not lie to them if they are being honest (Buller & Burgoon, 1996, 2008). The latter refers to the presumption that people are truthful rather than deceptive.

If there is a violation of these expectations, proponents of IDT assume that it would be noticed. Violations cause the receiver's attention to shift to the sender, as well as to the violation itself. In turn it leads the receiver to start evaluating the credibility of the message. Violations of expectations can occur irrespective of the actual truth of the message, however these violations do increase the receivers' attention towards the message in question (Buller & Burgoon, 1996; Burgoon & Buller, 2014).

### **2.2.4. Deception.**

IDT supporters assume that deception usually consists of three components (Buller & Burgoon, 1996):

- The deceptive message, that is usually verbal (Buller & Burgoon, 1996; Burgoon & Buller, 2014).
- Secondary behaviour, that is intended to increase the credibility of the message or the source. This may be verbal or nonverbal in nature (Buller & Burgoon, 1996; Burgoon & Buller, 2014).
- Unintended behaviours, that give some indication that the person is lying. This is usually nonverbal and is sometimes referred to as 'leakage' (Buller & Burgoon, 1996; Burgoon & Buller, 2014).

The deceptive message and secondary behaviour, which are known as strategic behaviours, are used to increase the credibility of the intended deception (Buller & Burgoon, 1996; Burgoon & Buller, 2014), or protect the person who delivers the message (Wagner, 2011). In turn the unintended behaviour, known as nonstrategic behaviours, can reduce the credibility, and provide an indication that the person may be lying. When people are deceptive, or suspect that someone is being deceptive, it increases their attention to the message and behaviour associated with the message. The senders may monitor the behaviour of the receivers in order to determine if their lie was successful. Receivers might, in turn, attempt to confirm or deny their suspicions about the sender. These additional actions would place more emotional and cognitive strain on both during this interaction (Buller & Burgoon, 1996; Burgoon & Buller, 2014).

#### ***2.2.4.1. Cognitive and emotional responses.***

It is assumed that behaviour associated with deception and suspicion, are displayed because of the participant's (receiver or sender) attempts to manage information that they present to others. The behavioural display could arise from the participant's attempt to control her/his behaviour, or from the cognitive effort that is required to deceive or detect deception. The behaviour can also be displayed as a result from emotional or unconscious arousal, or from expectations being violated. This can include varying degrees of guilt feelings from disregarding social rules or fear of getting caught when deceiving. The subsequent behaviours that result from displaying cognitive and emotional reactions could be caused by either strategic or nonstrategic behaviours (Buller & Burgoon, 1996; Burgoon & Buller, 2014).

The theorists make the assumption that deceptions as well as deception detection are complicated processes that increases the demand of attention required by the participants within the interaction. Thus, a deceptive interaction is more demanding than interactions based on honesty,

because of this added complication of managing fabricated responses, either by being deceptive or by trying to hide suspicion (Buller & Burgoon, 1996; Burgoon & Buller, 2014). This is because those who create deceptive messages have to create a plausible deceptive message, as well as monitor the receiver's feedback to make judgments on their success. Those who detect deception have to monitor their displays of suspicion while they search for potential cues that may indicate deception. In addition participants also have to manage the complexity of normal communication events elaborated on earlier (Buller & Burgoon, 1996; Burgoon & Buller, 2014).

### **2.3. Relevant Constructs**

As discussed above IDT was intended to explain deceptive interactions as well as their resulting judgments over the course of interactions. The theory, which is based on the assumptions elaborated on above, makes specific predictable claims about deceptive interactions. IDT consists of 17 propositions each of which addresses a particular aspect of interactions. The theorists claim that many of the propositions are not necessarily unique to the theory, although they do place emphasis on the role of the propositions in deception within communication (Buller & Burgoon, 1996).

This study does not use of all the propositions made by IDT. For this reason, several constructs were adapted from the propositions. To simplify the discussion, this chapter presents the constructs relevant to this research. The full adapted version of the theory can be read in *Engaging Theories in Interpersonal Communication: Multiple Perspectives* (Burgoon & Buller, 2014). And a list of the 17 propositions made by IDT is attached as Appendix A in this document.

The following section includes a discussion of the constructs applicable to the current study. These include the role that 'interactivity' plays within IDT as well as within this study. A description of what the theory refers to as 'task demands', which include the perspective that is taken by IDT in terms of emotional leakage, and cognitive load are reviewed. The discussion also aims to indicate the influence that these two concepts have on detecting deception. After this an argument regarding participants' communication expectations is presented, with specific reference to expectations of normal behaviour. This leads to a discussion on biases and expectations of truthfulness (truth bias). The chapter concludes with, an exposition of some concepts that are not addressed in this study, as well as a brief discussion on previous critiques on IDT.

### **2.3.1. Interactivity.**

IDT was originally developed from the belief that there is a difference between interactive and non-interactive deception. This construct, which influence the way in which messages are formed and judged, is central to the theory (Burgoon, 2015). According to the theory, both interactive and non-interactive contexts involve participants using strategic and nonstrategic behaviours in order to convey their messages. However, proponents of IDT argue that deception within interactive and non-interactive context present differently (Buller & Burgoon, 1996), as suggested by the findings of Dunbar et al. (2013). They further suggest that there is evidence to indicate that both emotional leakage and indications of cognitive load are present in non-interactive deception (Buller & Burgoon, 1996).

According to IDT interactivity can be placed on a continuum, with relation to social cues, immediacy, relational engagement, finally spontaneity and adaptability (elaborated on below). These concepts are present to different degrees depending on the participants' communication medium (e.g. if they are communicating via email, video recorded message or face to face). These concepts within interactivity also considers how the communication context can affect veracity displays (from senders) and judgments (from receivers) (Buller & Burgoon, 1996; Burgoon & Buller, 2014; Dunbar et al., 2013).

Social cues refer to the visual, verbal, auditory, and environmental cues that are available during interpersonal communication. According to IDT there are a number of social cues that influence the behaviour and perceptions of participants in terms of attention or self-absorption. This influence depends on the amount of information that is available to the participants (Buller & Burgoon, 1996; Dunbar et al., 2013). The quantity of information possibly influences potential biases in terms of the visual or demeanour bias (e.g. what senders look like). However, there seems to be evidence to indicate that verbal and auditory information (e.g. how senders sound) are more influential in terms of the receiver's judgment than visual information about a sender (Bond et al., 2014). This could in turn influence the participant's truth bias, which is elaborated on later in this chapter.

Immediacy, which has to do with both time and distance, refers to the present: 'The here and now'. Interactions can have high temporal immediacy, which means that they are occurring in 'real-time'. Temporal immediacy is concerned with how the interaction is harmonised, or if the participants emphasise the present through linguistic features. Interactions can also have high spatial immediacy which means that the participants can interact socially as well as physically. Spatial immediacy is concerned with physical proximity (physical distance), nonverbal behaviours

(i.e. gazing, touching, gestures etc.), or linguistic constructions (i.e. speaking in the active voice, or by saying 'we' instead of 'I'). Interactions that are highly immediate may foster closeness as well as personalisation. In contrast to non-immediacy that creates a sense of disassociation and distance (Buller & Burgoon, 1996).

Relational engagement refers to an implied relationship that is established when participants interact. This is assumed to originate from engaging with someone in a highly temporal and spatial immediate context. Within this type of context participants are oriented towards each other as individuals. According to IDT theorists this relational interaction influences participant's expectations, specifically their expectations for honesty and reciprocity. These expectations can increase participants' truth bias, which has been found to be higher in face to face communication as compared to less interactive contexts (Buller & Burgoon, 1996).

Spontaneity and adaptability are required during highly interactive communication as it is not possible to fully anticipate conversations. Participants in the interaction provide feedback to each other in the way that they communicate, as well as by what they say. Thus, as the conversation progresses it naturally changes and is accompanied by changes in behaviour. In contrast a situation that is non-interactive can provide participants with time to respond and construct their answers, although with the limitation of not having access to feedback on their communicated messages (Buller & Burgoon, 1996).

This study draws on the construct of interactivity in terms of propositions 1, 8 and 9 of the IDT (Appendix A). Proposition 1 suggests that the level of interactivity systematically affects the participants' behaviour as well as cognition. This is because participants are required to attend to both encoding and decoding tasks in a highly interactive context. These include intercepting, and interpreting, social cues, as well as constructing and conveying a relevant response within an appropriate time frame (Buller & Burgoon, 1996; Burgoon & Buller, 2014). In accordance with both proposition 8 and 9 respectively, higher interactivity can result in more truth judgments when considering proposition 8, whereas proposition 9 predicts that it would then lead to lower deception detection accuracy. This is because increased truth judgments increase the amount of deception messages that are mistakenly classified as the truth (Burgoon & Buller, 2014).

The method chosen for this study to investigate a possible lie bias towards second language speakers entailed the use of isolated video recorded messages. Showing receivers only one recorded message meant that there would not have been a highly interactive and dynamic relationship

between the senders and receivers within this study. Although the senders and receivers were not in conversation, they were however required to attend to various aspects present in interpersonal communication. “IDT posits that deception performances, in both interpersonal and non-interpersonal contexts, include strategic and non-strategic behaviour” (Buller & Burgoon, 1996, p. 216). The senders within this study formed a message that was either truthful or deceptive. They were required to attend to various aspects of their message and performance by making use of strategic behaviours in order to seem credible. According to IDT this additional attention on creating a credible message results in the potential display of nonstrategic behaviours, which presents differently depending on the veracity of the message (Buller & Burgoon, 1996; Burgoon & Buller, 2014). The receivers were able to see the senders and hear the messages and were given the opportunity to state if they believed the messages or not. This required them to actively attend to various social cues (filtering by what they believed was relevant), and attend to the message. They then needed to compare the message to what they already knew (or suspected), in order to provide a veracity judgment.

The communication demands to accomplish either of these tasks are assumed to increase during deceptive, as compared with honest, interactions. In addition, it is argued to involve behavioural leakage as well as increased cognitive load. This is assumed to occur because of a greater use of strategic behaviour, resulting in a higher occurrence of nonstrategic behaviours. In continuation of this discussion the construct that is presented next is concerned with the task demands associated with honesty and deception.

### **2.3.2. Task Demands.**

“Task demands concern whether or not participants are engaged in a conversation that is mentally or emotionally difficult to conduct” (Burgoon & Buller, 2014, p. 352). In referring to the task demands of a conversation IDT draws on two concepts, namely emotional leakage and cognitive load. Both of these concepts have been considered in previous studies as separate theoretical frameworks, and therefore are discussed at length in this dissertation.

The concept ‘emotional leakage’ has gained considerable attention within the last couple of decades in its own right (Darwin, 1873; Ekman & Friesen, 1971; Sauter, Eisner, Ekman, & Scott, 2010; Yan, Wu, Liang, Chen, & Fu, 2013). It focusses on the way that emotions and emotional expressions are controlled by senders during deception. It also argues that these expressions are at times unconscious, and that they are observable to others. The concept ‘cognitive load’ has been

gaining increased attention recently (Patterson, 2009; Vrij et al., 2008; Vrij, Fisher, & Blank, 2015; Vrij, Granhag, Mann, & Leal, 2011). Cognitive load refers to the idea that delivering a deceptive message uses more mental resources than an honest one. Furthermore, increased cognitive load results in certain behaviours that can be indicative of deception.

“These inadvertent behaviours, which we are calling nonstrategic, usually reflect perceptual, cognitive, and emotional processes accompanying message encoding and decoding or the communicative situation” (Buller & Burgoon, 1996, p. 207). Within IDT both approaches are considered to have influence on behaviours that could be considered as nonstrategic. Proponents of IDT make the assumption that senders with competent conversational skills are better equipped to manage their emotional behaviours and the additional cognitive load required during deception, than senders ill equipped with such skills (Buller & Burgoon, 1996; Burgoon & Buller, 2014).

Therefore, if senders are skilled communicators it increases their ability to project a credible image. Being a skilled communicator assists the senders to cope with the demands of communication, and thus also be able to handle the additional demands of deception more effectively. This ability aids senders to encode their messages to seem more credible, and possibly give them increased control of unintentional behaviours (Buller & Burgoon, 1996; Burgoon & Buller, 2014).

In considering the foundations of these two concepts (emotional leakage and cognitive load), the discussion begins with the underlying assumptions made by each. Followed by a comprehensive discussion of each view, from which IDT draws certain conclusions.

#### **2.3.2.1. Emotional leakage.**

Emotional leakage finds basis in an argument made by Darwin (1873) in his book; *The Expression of Emotions in Man and Animals*. He stated that people are not completely in control of their behaviours, with specific reference to their facial expressions. It therefore follows that there are certain emotional expressions that cannot be made unless the emotions are actually felt. In addition, when those emotions are felt, the emotional expressions cannot be completely concealed.

In the past couple of decades’ research has found considerable evidence to suggest that there are several observable facial expressions of ‘basic emotions’ (e.g. happiness is symbolised by a smile and tightening of the eyelids) that are universally recognisable and displayed across cultures

(Ekman, 1992; Ekman & Friesen, 1971). Here the term ‘basic emotions’ is used to refer to emotions that are considered to be unique and distinctive, which also include distinctive recognisable expressions<sup>1</sup> (Ekman, 1994; Tracy & Randles, 2011). The idea of universal facial expressions of emotions was proposed by Darwin (1873) but was largely rejected, in favour of theories that suggest that emotional expressions result from social learning. However, more recent studies found evidence that supports Darwin’s theory (Ekman & Friesen, 1971).

These emotional facial expressions are considered to be involuntarily to a degree, and can occur at any point in response to stimuli that elicit the emotion (Darwin, 1873; Ekman, 1994, 2004). There are specific facial movements (e.g. tightening of the eyelids) that are not under conscious control, and cannot be expressed voluntarily (by most people), but which are however expressed when the emotion is actually felt (Porter & ten Brinke, 2008).

Emotions in the context of deception can be manipulated in several ways in order to influence the credibility of the message. These manipulations include neutralising that refers to an attempt to conceal an emotion (e.g. keeping a ‘poker face’). Masking an emotion is an attempt to show one emotion (that is not felt), in order to hide a different emotion (that is felt), thus intentionally falsifying an emotional display. Finally, simulating an emotion refers to showing an emotional expression that one is not feeling (Porter & ten Brinke, 2008).

A significant limitation of this approach is that emotional displays are not only part of deceptive encounters, but form part of normal communication in everyday life. There are no emotional indicators unique to deception, and thus it may be possible to correctly judge a sender as anxious, afraid, angry, or happy. However, these emotions can be present in someone who is truthful as well as lying. An honest person may feel as afraid as a guilty one, because there is a chance that she/he may not be believed, and wrongfully punished (Vrij et al., 2010). In order not to commit this error there must be enough information to judge if the emotion is reasonable within the sender’s position. Although this approach can still be prone to some error (Ekman, 2009).

### **2.3.2.2. Cognitive load.**

More recent studies have looked at the possible effects that deception has on cognitive load. Cognitive load stems from the need to negotiate and focus limited cognitive resources in order to efficiently complete various tasks. If there are further tasks that require attention they will increase

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<sup>1</sup> note: a distinctive expression is not a characteristic of what constitutes as an emotion (Ekman, 1994; Tracy & Randles, 2011).

the cognitive load, and it will be more difficult to negotiate the required cognitive resources. Deception is considered as an additional task that is placed on a person, along with the tasks normally associated with communication, and thus increases cognitive load. It has also been argued that an exception to this rule exists. This is most notable at times when it is easier to tell a short simple lie than telling a long complicated truthful story (Buller & Burgoon, 1996; Burgoon & Buller, 2014; Greene et al., 1985; Vrij et al., 2010).

The assumption is thus that the additional mental effort increases behaviours that are indicative, or associated with, a high cognitive load. Implications of cognitive load include that the performance on another tasks can suffer, in that it could be susceptible to more errors or slower processing. Some of the behaviours normally associated with complex task processing include: Longer pauses, dilating pupils, as well as shorter messages and less eye contact (Greene et al., 1985).

It is believed that, in general, deception significantly increases cognitive load during conversations as it is more cognitively demanding than telling the truth (Vrij et al., 2008). This is because during deception senders have to control several verbal and nonverbal channels in order to seem convincing. This requires them to fabricate a plausible story that is believed by others. In doing so they need to remember what they told to whom, as well as the critical details of the story to maintain the ruse. In addition they must avoid losing track of what they have already said, as well as anticipating and steering clear of contradictory information (Greene et al., 1985; Porter et al., 2012; Remland, 2009; Vrij et al., 2012; Warren, Schertler, & Bull, 2009). This process adds to the already complicated task of normal communication. These additional tasks thus increase the likelihood of mistakes, or behavioural indicators of cognitive load (e.g. logical errors in the story or blink-rate) (Greene et al., 1985; Vrij et al., 2012; Warren et al., 2009).

As with emotional leakage some of the behaviours that are indications of cognitive load are also not completely under conscious control. Examples such as vocal cues, pupil dilation, vocal pitch or blink-rate can occur without conscious knowledge of the action, and with very limited control. Other behaviours related to cognitive load (e.g. errors in memory, lengthy pauses, or speech errors) can in addition potentially be reliable indicators of deception (Evans & Michael, 2014; Porter et al., 2012; Remland, 2009; Vrij et al., 2008, 2012).

A limitation of the cognitive load approach is similar to the limitation discussed above concerning emotional leakage. Specifically, that the presence of behaviour associated with

cognitive load in isolation cannot be used as an indication of deception. This is because senders, who can be seen as potential suspects, may attempt to remember what really happened at a specific time or place. Trying to recall events correctly and providing an accurate and honest description can place the sender under severe cognitive strain. However, to overcome this limitation, there are interview schedules that can be used to distinguish between guilty and innocent subjects, which are designed to increase the cognitive load significantly for deceptive speakers (Vrij et al., 2010). This is discussed in more detail in the following chapter.

Furthermore, it is possible for the receiver to be influenced by their own cognitive load, which could lead to inaccurate or biased judgments. Burgoon, Blair, and Strom (2008) argue that cognitive load could also have an adverse effect on the judgments of the receivers. According to the authors; “The sheer amount of social information to be processed also can result in erroneous judgments” (p. 593). This also makes it possible for increasingly biased or inaccurate responses if the receiver’s cognitive load is high.

Results from a study by Biernat, Kobryniewicz, and Weber (2003) suggest that a high cognitive load can increase stereotypical beliefs. This may result in believing that someone is lying based on possible stereotyped beliefs, which can include: Certain behavioural cues, age, gender, culture or race. However, the authors do explicitly state that this may not be the result in every case. Instead the stereotype must be relevant in the context. For example, the belief that deceivers do not look you in the eyes, which has been found to be a popular, although inaccurate, view about deception, and is not a sure indication that someone is lying (Hurley, Griffin, & Stefanone, 2014). Stereotypes are cognitive structures that influence the way in which we perceive our social world. Some of these perceptions could be about characteristics or traits that are believed to be shared by a social group. Describing stereotypes as cognitive structures also assists in explaining why they are increased when cognitive load is higher (Baron et al., 2009). That is, when receivers have a great deal of information to process they tend to use heuristics to simplify the processing of the information. Heuristics, of which stereotypes are one, assist receivers to make judgments quickly and efficiently. However, they are prone to errors. They could also be explained as an extended form of the fundamental attribution error (Gilbert, 1989). The fundamental attribution error refers to the tendency of receivers to believe that the behaviour of a sender is due to their internal states (who they are as people) rather than possible external influences. For example, if a person looks nervous, it could be attributed to the belief that the person is afraid of being caught, and thus lying, rather than the context in which they are (i.e. accused of a crime they did not commit). It can also increase other stereotypical beliefs about visible characteristics of the sender (e.g. their gender or race), in

order to make veracity judgments (Baron et al., 2009). Gilbert (1989) further suggested that the fundamental attribution error is prone to increase under conditions of high cognitive load.

The fundamental attribution error incurred by cognitive load, may lead receivers to judge senders as more honest or deceptive as a result of an increase in the receivers' own cognitive load. If receivers are under higher cognitive load, they may be prone to stereotypical beliefs about deception cues (e.g. beliefs about eye contact or nervous behaviour), auditory indicators (e.g. accented or second language speech), or other visible characteristic of the sender (e.g. age or gender). This leads to making biased judgments and lowering deception detection accuracy. O'Sullivan (2003) found evidence for this argument in that receivers who attributed more positive qualities to a sender tended to be truth biased, and when they attributed negative qualities to a sender they tended to be lie biased.

#### **2.3.2.3. Propositions concerning task demands.**

The current study drew on the construct of 'communication demands' according to the Interpersonal Deception Theory's propositions 1, 8, 9, and 16 (Appendix A). Proposition 1 explicitly considers that the behaviours and cognitions of both senders and receivers are influenced by the conversational demands. These demands as discussed above include emotional leakage and cognitive load. According to the assumptions made by IDT the ability to manage one's behavioural display of emotions as well as the cognitive load required by deception entails a certain amount of communication skill. Propositions 8 and 9 consider that the conversational skill of the senders (discussed above) could increase the receiver's credibility judgments (proposition 8), and decrease the receiver's detection accuracy (proposition 9). Finally, proposition 16 makes the prediction that the receivers' judgments are influenced by what happens at the end of the interaction, specifically the last behavioural display of the sender. This could indicate that although receivers might be rightly suspicious of a sender at the beginning of an interaction, they could still judge senders as truthful based on their performance at the end of the interaction. Again, this refers to the communication skill of the sender to appear credible. Also considered are the effects that the cognitive load of the receivers could have on their deception detection ability, and the possible influence of the fundamental attribution error on accuracy (Burgoon & Buller, 2014).

Results that support the arguments for the effects of emotional leakage and cognitive load on deceptive displays are considered in the next chapter. Although consistent with the assumptions of IDT it seems as if there is not a uniform display of deception. This could result in senders

attempting to control the behaviours that they associate with stereotypical displays of deception. This could in turn also influence receivers to look for these stereotypical behavioural displays, in order to base their judgments.

Stereotypical beliefs are influenced by socialisation, and thus by proxy influenced by social and cultural norms. Thus, what senders and receivers believe to be normal behaviours, influence their performance in creating, or judging a credible message. The following construct deals with perceptions of normality, and its influence on the current study.

### **2.3.3. 'Expectation of Normality'.**

As discussed in the first part of this chapter, Interpersonal Deception Theory assumes that receivers have expectations about the way that senders will behave. These expectations find their bases in social norms, which claim that receivers expect senders to use 'normal' social behaviours (e.g. looking someone in the eye) during conversations. If senders do not use the social pattern that the receiver deems 'normal', the receiver could become suspicious or judge senders as deceptive. During the interaction it is not necessarily important for the senders to show a specific behaviour, but rather that their overall behaviour conforms to the receivers expectation of social norms (Buller & Burgoon, 1996; Burgoon & Buller, 2014).

One of the factors that affect what senders and receivers deem as 'normal' social behaviour is their own cultural background. This is specifically relevant in cross-cultural interactions, where specific behaviour might influence the participant's expectations or perceptions of normality. Within this type of interaction gender norms and other stereotypes could also influence behaviours and judgments. Cultural norms are discussed more explicitly within this section because of the large influence that they have on this study. This is also because in previous deception detection studies, gender has not been consistently found to be an influential factor (Aamodt & Custer, 2006). In order to continue this discussion in terms of cultural norms, a description of norms is presented first, followed by a discussion on how cultural norms influence behavioural expectations.

Norms can be viewed as social rules that dictate what is expected of someone in a specific situation. For example, to be polite to strangers. A group expects that members will behave, think or feel a specific way in different situations. This serves several functions in that it makes situations less ambiguous, and thus easier to preserve the expected conduct. It also increases the effectiveness of the group, making it more likely that the groups would continue to function well (Baron et al.,

2009; Matsumoto, Seung Hee Yoo, & Fontaine, 2008). Norms are created in order to govern various social groups, and can include gender or cultural norms, each with a set of specific 'rules'. This study discusses these norms within the topic of culture, because of the assumption of the penetrating influence that culture has on norms, and their creation (Baron et al., 2009).

Culture is believed to influence people's behaviours, as well as how they perceive the behaviours of others (Baron et al., 2009). This influence naturally translates into the context of deception and veracity judgments. In turn, this is responsible, to some extent, for potential biased judgments in a cross-cultural setting. Culture can be defined as a shared system of information and meaning, as well as the beliefs and perceptions of a specific group of people. This system is conveyed from one generation to another, and thus works to preserve order, and avoid social disorder. To accomplish this function, norms are created that help to direct the behaviour of group members (i.e. gender norms) (Baron et al., 2009; Matsumoto et al., 2008).

Because of the way in which norms function, they also require behaviours to change. Emotions can be a source for behavioural change, thus norms could be associated with regulating emotions. The norms for emotions, as well as the expression of emotions, become one of the core objectives of a cultural system. The norms that centre around emotional expressions or behavioural displays are referred to as 'display rules' (Matsumoto et al., 2008).

Display rules are culture specific norms that function to manage as well as change expression of emotions in different situations. As discussed earlier, certain facial movements are universally recognised, and not completely under conscious control, but rather become active when an emotion is felt. Participants with a certain culture would therefore need to simulate an unfeared emotion, or alternatively neutralise, or mask some of their felt emotions in order to conform to the display rules of their culture (Ekman, 2004; Hurley & Frank, 2011; Matsumoto et al., 2008). These rules have been investigated in Ekman's (1972) study (as cited in Matsumoto et al., 2008), where Japanese and Americans were shown a stressful stimuli alone, or with an experimenter who had a higher social status. The findings of this study indicated no difference in emotional expression as a result of culture when participants were alone. Rather when participants viewed the stimuli with the experimenter, the Japanese participants were more likely to mask negative emotions with a smile, which was interpreted as evidence of display rules (Matsumoto et al., 2008).

This indicates that culture can have a significant impact on deception as well as the recognition of deception. If one culture sanctions certain emotional or behavioural expressions, which are not

sanctioned by another, the discrepancy could create a misunderstanding of the reactions of participants. For example, certain groups stand closer in conversation, whereas others view this as an invasion of privacy. In addition, differences on what behaviours are perceived as indicative of deception can create similar misunderstandings. This could in turn significantly lower accuracy, as well as increase the bias of receivers (Al-Simadi, 2000; Ekman, 2004).

Although it should also be noted that one of the, potentially, major cultural difference in deception detection studies could also be in the way that participants in different cultures define 'truth'. Results from previous studies suggest that there is a cultural difference in what is defined as the truth. Thus the actions or intentions of senders might be correctly classified, but interpreted differently within a cross-cultural sample (Fu, Lee, Cameron, & Xu, 2001; Park & Ahn, 2007). This distinction falls outside the scope of this study, but would make an interesting contribution within the South African context.

This study looks at the construct of normality in terms of propositions 8, 9, and 16 of Interpersonal Deception Theory (Appendix A). As discussed during the previous two constructs propositions 8 and 9 are concerned with the likelihood that receivers make truthful, possibly biased judgments (proposition 8), as well as accurate deception detection judgments (proposition 9). According to these two propositions the receivers are more likely to be truth biased, as well as less likely to detect deception, if the sender's behaviour adheres to their expectations of normal conduct. In accordance with proposition 16 these judgments are based on the last behavioural display of the sender. This creates the possibility that if senders deviate from the norm during the beginning of the message, they could be believed if their more recent displays adhere to the relevant norms (Burgoon & Buller, 2014).

Proposition 9 further predicts that receivers who have background information about the senders, could be more accurate in their judgments than those without such knowledge (Burgoon & Buller, 2014). This information could include previous encounters or relationships, where the receivers are familiar with the sender's normal behaviour. Access to truthful baseline behaviour may also assist receivers to make more relevant observations to base their judgments, than those not privy to such behaviour. If the receiver has knowledge about the conversation topic, they may be able to compare the message with their previous knowledge. Finally, if receivers have general knowledge about deception detection, it can provide them with an indication as to which of their observations are relevant within the context (Buller & Burgoon, 1996). The principles of proposition 9 can thus inform and influence what receivers perceive as 'normal' behaviour. For this

reason, the current study included a 20 second sample of baseline behaviour before every message. This is elaborated on within the method chapter of this dissertation.

As discussed before, receivers enter into a conversation with additional expectations. One such expectation is that senders would be truthful. This expectation of truthfulness could bias receivers' judgments towards senders, and make them less accurate in detecting deception. As previously discussed, several of the constructs look at the way that their respective topics influence judgment bias, this is discussed in the following section.

#### **2.3.4. Bias.**

This study views 'judgment bias' specifically from the perspective of IDT that is elaborated on within this section. The focus in this discussion is on the truth bias, which as discussed throughout this chapter, is influenced by various constructs. It also plays a distinct role within the propositions of IDT that are discussed at the end of this section.

The term bias is used within this study to refer to errors in thinking that create a systematic tendency to make judgments in a specific way (Baron et al., 2009; Burgoon, 2015). According to Burgoon et al. (2008), there are four types of cognitive biases that are mostly responsible for errors in veracity judgments. These biases are: The 'visual bias', 'demeanour bias', 'expectancy violation bias', and the 'truth bias'. The focus of this discussion is on the truth bias, although preceding this is a brief description of the remaining three biases.

- The visual bias refers to the predisposition of people to rely more on the nonverbal behaviour of others than on other forms of information (e.g. the words they use) (Burgoon et al., 2008).
- The demeanour bias stems from the inclination of receivers to emphasise the communication style used by the senders in order to base their credibility judgments (Burgoon et al., 2008). That is, they base their judgments on their perception of the senders' character, competency or sociability, to name a few. (Buller & Burgoon, 1996; Burgoon & Buller, 2014).
- The expectancy violation bias refers to the tendency of receivers to judge senders as deceptive if they do not display 'normal' behaviour (Burgoon et al., 2008). This bias, which was partly discussed above under normative expectations, has a strong connection with cultural (or social) normative behaviours (Buller & Burgoon, 1996, 2008).
- The truth bias refers to the predisposition that people have to assume that others are mostly honest, which leads to an overestimation of truthful messages (Burgoon, 2015; Burgoon et

al., 2008). This means that receivers are more likely to judge senders as truthful (Levine, Park, & McCornack, 1999).

The truth bias has found a strong basis in previous deception detection research. As will be discussed in more detail in the next chapter, it is a common finding that receivers are truth biased when making veracity judgments. This corresponds with the assumption made by IDT that receivers expect others to be truthful. Although accuracy levels are commonly found to be close to chance; the correct judgments on honest messages have been found to be significantly above chance, and correct judgments on deceptive messages have been found to be significantly below chance. This suggest that receivers tend to systematically prefer to make truthful judgments above deceptive judgments (Bond & DePaulo, 2006).

This tendency towards making truthful judgments may result from several mechanisms. One such mechanism could be the fundamental attribution error described above. Another could involve people's tendencies to use heuristic processing, which may result in biased judgments, when making various decisions (Baron et al., 2009). These biases naturally influence the accuracy levels attained by receivers.

In contrast to biased judgments, accuracy, in this context, refers to the correct classification of both honest and deceptive messages. Bias differs from accuracy because it is a tendency to make judgments in a particular way, regardless of what the correct classification is. In this study, in order for receivers not to be biased, both their truthful and deceptive judgments needed to be correct the same amount of time. If receivers do tend to be truth biased, their classification of truthful messages would be correct more often, than their classification of deceptive messages. This means that they would be more likely to judge others as truthful, than judge others as deceptive, regardless of the actual veracity of the messages (Levine et al., 1999).

IDT assumes that receivers are truth biased when they enter a conversation. The reason as to why senders are successful in creating deceptive messages is because receivers do not recognise leakage and deceptive cues when they are available (Burgoon & Buller, 2014). The complexity of communication requires senders and receivers to make use of heuristics, and are only able to concentrate on information selectively, as well as in such a way that it confirms their assumptions or first impression, and possibly their stereotypical beliefs as well (Buller & Burgoon, 1996). Therefore, when people assume that others are honest, they judge a conversation according to this

presumption. This may cause them to miss, or incorrectly judge, cues that are indicative of deception (Burgoon & Buller, 2014).

According to the theoretical perspective of this study, there are multiple propositions that are concerned with the truth bias. This study is specifically concerned with the predictions made by propositions 1, 8, 9, and 16. With regards to proposition 1, it was argued that both the context interactivity, as well as the conversational demands may influence the amount of truthful judgments made. Propositions 8 and 9 predict that if the receivers are truth biased, then they tend to make more truth judgments (proposition 8), as well as that they would be less accurate (proposition 9). According to IDT propositions 8 and 9 are concerned with veracity judgments during conversation, where proposition 16 is concerned with the judgments after the interaction. Proposition 16 is thus concerned with similar factors to propositions 8 and 9, but is specifically concerned with the last behaviour of senders, as well as if the receivers are truth biased at the end of the interaction (Burgoon & Buller, 2014).

There have been some recent discussions on the view that IDT takes with regards to the truth bias. In the section that follows the critique of this view is discussed in terms of the veracity effect (discussed directly below), and the truth / lie base rate (discussed later).

#### ***2.3.4.1. Veracity effect.***

Stemming from the truth bias, Levine et al. (1999) identified that the veracity of the message is a crucial factor of how accurately veracity judgments are made. Their argument follows that because receivers tend to make more truthful judgments; judgment accuracy could be increased if receivers were shown more truthful messages. This was named the ‘veracity effect’, and it claims that the receivers’ accuracy would differ depending on the veracity of the sender’s message (Levine et al., 1999; Park & Levine, 2015). The Park-Levine model is based on this veracity effect, and makes the prediction that the accuracy in deception judgments “is a positive linear function of truth-lie base-rates” (Park & Levine, 2015, p. 350). Therefore, if people are shown more truthful messages they will be more accurate in their judgments than if they are shown more deceptive messages (Park & Levine, 2015).

The Park-Levine model is aimed critically at IDT and previous studies that made use of 50/50% base-rates (discussed below) as part of their research design. Claiming that IDT is too complex, Levine, Clare, Green, Serota and Park (2014) maintains that the Park-Levine model is a more

accurate representation of detection accuracy. In terms of the truth-lie base-rate, Levine (2014b) is highly critical of previous deception research that used a 50/50% truth-lie base-rate. Levine (2014b) argued that deceptive messages are uncommon in naturally occurring communication. This means that the truth bias found in previous studies is an adaptive form of effective communication that resembles the way that judgments are usually made. The argument continues that truth accuracy is increased significantly if there are more truthful messages than deceptive messages. Thus, according to this approach previous studies that used a 50/50% base-rate were based on a biased methodological approach.

Burgoon (2015) disagreed with the idea that there would be greater truth accuracy in conditions where there is a higher truthful base-rate. Stating that the truth bias does not reflect accuracy levels at all, but rather that it is an overestimation of the truthfulness of messages. The reasoning follows that higher levels of bias means that accuracy is lower, and that the 'correct truth judgments' are not because of correct classification, but rather because of a set tendency to make judgments in a certain way (Burgoon, 2015). This does however not mean that the truth bias does not allow for the increase of effective communication as Levine (2014b) suggested. But rather that this bias should not be mistakenly redefined as 'accuracy' (Burgoon, 2015), which would be like moving the goal post in order for the score to look better.

Adaptive Lie Detection (ALIED) provides a different theoretical perspective on the truth bias. According to this account the truth bias is seen as a functional, adaptive and flexible process that increases the likelihood of making 'correct guesses'. It proposes that when people make veracity judgments they use either individual cues (about the message itself or knowledge of that specific situation), or more general information about the context (what other say about the person, or similar situations). Neither of these necessarily make detection more accurate, but they do influence the bias itself (Street, 2015).

The ALIED approach views both truth and lie biases as resulting from the same process that increases as the person uses more general information. When there is less diagnostic information (individual cues), then receivers need to base their judgments on more general information about the context. Previous research found that this usually resulted in an overestimation of honest judgments (Street, 2016). It is argued that this could make judgments relatively more accurate, but that it is a 'best guess' of what the context might look like. It could just as easily lead to inaccurate veracity judgments, where in reality more people might be truthful or deceptive, and the receivers

believe the opposite, their biased answering might lead to a very poor accuracy score and possibly detrimental decisions (Street, 2015).

Therefore, ALIED argues that bias occurs when people are required to make a veracity decision when they have to rely on more general information. Bias thus decrease when more diagnostic information is accessible, and that more general information both increases the bias, as well as determines the valence (truth- or lie) of the bias (Street, 2015, 2016). This has already been shown to lead to inaccurate judgments within an experimental setting, but could possibly lead to more effective communication within everyday life (Street, 2015).

The current study follows the definition of accuracy, and bias as put forth by Burgoon (2015) in that it needs to involve the correct classification of both honest and deceptive messages. One cannot say that classifying more truthful messages as the truth, at the expense of correct deception judgments is because of a type of ‘truth accuracy’. Detection ability will not be apparent from only correct truthful judgments or only correct deception judgments, because the resulting scores would be a product of biased judgments. IDT does not share ALIED’s more flexible view of judgment bias, but is not completely opposed to it. IDT does not give an explanation of the truth bias, beyond that certain factors influence the presentation of a truth bias, but rather includes it as something that has an effect on the receivers’ judgments. In looking at the way that receivers make their judgments this study uses the IDT approach to view the concept of bias (Burgoon, 2015).

#### **2.3.4.2. *Truth and lie base-rate.***

To test for accuracy and bias, studies need to account for the total classification of both truthful and deceptive messages, as well as the classification honest and deceptive messages separately. To accomplish this, studies use a 50/50% base-rate. This base-rate refers to the number of truthful and deceptive messages that are used in the study (Burgoon, 2016). For example, the base-rate used in the current study (50/50%) ensures that half of the total messages are honest (50%), and the other half are deceptive (50%).

This 50/50% base-rate is specifically useful for the purpose of looking at detection accuracy or bias, because it gives an equal chance for both classifications, and thus avoids an inherent truth or lie bias within the study’s method. This measurement works by comparing the likelihood of correct classification against chance. Given that only two choices are present within this study, the probable score that can be attained on average just by randomly guessing is around 50%. Therefore,

judgments need to significantly exceed 50% in order to make any claim to accuracy. This also allows researchers to look at veracity judgments made on honest and deceptive stimulus separately, which could give an indication if either was over- or underestimated by receivers (Burgoon, 2015).

Therefore, if the total score is measured at 50%, it would mean that receivers are probably guessing. This total score is compiled by different scores on truthful and deceptive messages. If the score is made up of 60% correct honest judgments and 40% correct deception judgments, as typically found in deception research (Bond & DePaulo, 2006), it would indicate a truth bias in how the judgments are made (Burgoon, 2015). The total score could thus be said to give an indication of classification accuracy, in comparison to random (or focused) guesses, where scores on the truth and deception messages would give an indication of potential bias in veracity judgments. Thus by using a 50/50% base-rate a study could have a clearer distinction between accurate and biased judgments (Burgoon, 2015).

Coupled with the methodological influence that a 50/50% base-rate would have on deception classification, is the amount of truthful and deceptive messages that the receivers believe form part of the study. Therefore, if the receivers are not told that some messages might be deceptive they could tend to rate every message as truthful. If, however receivers are told that half the messages are deceptive, they could attempt to engineer their answers based on the amount of previous judgments they have made. This could effectively distract the receivers from the research task.

Results from a study by Street and Richardson (2015) indicated that the receivers' expectation of how many honest and deceptive messages they were going to judge, made a difference in how they initially made judgments. The researchers designed a study to include 50% truthful and 50% deceptive videos. The receivers were able to make veracity judgments throughout the viewing of each video (time-series answers), and at the end of each were asked to make a final truth / lie judgment (final judgments). Included in the study were three receiver conditions based on the receiver's base-rate expectations. The conditions consisted of high lie expectation, equal truth / lie expectation, and high truth expectation. Although in reality the true base-rates were kept constant across the conditions (i.e. 50/50%). The findings of the time-series answers suggested that the expectations of the truth and lie base-rates did have an initial effect on the direction of the receiver's bias. Receivers who expected more lies had a lie bias towards the senders, and receivers who expected more truths, were truth biased. In addition, the receivers who were in the equal, and truth biased, conditions indicated that they were more confident when making truthful judgments. Another interesting finding was that it seemed as if receivers became more truth biased over time.

This was evident in the data where only the final judgments were considered. Therefore, if just the final judgments are considered it could reflect that base-rate expectations did not affect veracity judgments. But the analysis of the time-series decisions indicated that the expectations of receivers did have an initial effect on receiver bias (Street & Richardson, 2015). The results provided some evidence to the claim made by IDT that the receivers' judgments were influenced more by what happened at the end of an interaction (Burgoon & Buller, 2014).

### **2.3.5. Constructs Not Included.**

The purpose of this study was to determine if there is a lie bias against second language speakers. Video recordings of second language speakers were shown to a sample of receivers. Showing receivers only one recorded message means that there would not have been an interactive and dynamic relationship between the senders and receivers within this study (as discussed above). This lack in interactive relationship caused many of the propositions made by IDT to fall outside of the scope of this study, and therefore are not considered here.

The most relevant constructs that were subsequently omitted from this discussion were the following: Concepts concerning the relationship between the senders and receivers, reciprocity within the interaction, receiver's suspicions, as well as the behavioural displays of receivers. The main reasons for excluding these concepts from the discussion was because would have increased the complexity of the discussion, as well as distracted from the argument put forth throughout this dissertation, with minimal gain for the present argument. In this study the senders did not interact with the receivers, thus their relationship would not have directly affected their behaviour. Receivers would not have been able to expect senders to reciprocate their intentions as they viewed the veracity message well after the fact. Finally, receiver's suspicion and behaviours would also not have affected the veracity messages within this study for the reason just stated. For a more comprehensive view of Interpersonal Deception Theory this study refers to Buller and Burgoon (1996, 2008), and Burgoon and Buller (2014) for the latest updated version of theory, as used within the current study.

### **2.3.6. Critique.**

As indicated in the construct dealing with bias, IDT is not without criticism. Park and Levine (2015) were openly critical of IDT in the way that it views bias, and that the theory suggests a 50/50% base-rate (discussed above). This is because the authors assume that deception is uncommon in the

'real world', and therefore they argue that the base-rate within research should include more honest messages in order to reflect this.

IDT was additionally faulted for being too complex in comparison to the less complicated predictive theory of the Park-Levine Model (discussed earlier). The Park-Levine Model claims to better account for accuracy in deception detection studies than IDT because it is only concerned with two variables (base-rates and the truth bias) (Levine, Clare, Green, et al., 2014). The position of the current study is that deception in cross-cultural, as well as in second language studies is influenced by emotional and cognitive factors (in addition to various other influences). Both are accounted for within the discussion of IDT, as well as further predictions that have specific relevance within this dissertation (discussed throughout this chapter). As the current study assumes that deception is a complex event that is influenced by multiple factors, it was deemed more appropriate to adopt the perspective of IDT during the course of this discussion.

DePaulo, Ansfield, and Bell (1996) also questioned IDT for having too many interconnected processes, and that it does not seem to have a self-contained mechanism to manage the complexity. Burgoon and Buller (2014) replied to this critique by highlighting that IDT is meant to promote understanding at a macro-level. It thus incorporates multiple falsifiable propositions to assist in an overall understanding of deceptive interactions. The current study attempted to manage this complexity by discussing IDT according to the construct that was drawn on within the propositions. Although this attempt did not ease the complexity of the theory as mentioned above, it did provide a useful way of navigating the complexities to form a basis for interpretation within this study.

According to their own account Burgoon and Buller (2014) discussed some propositions that were included in the original theory (Buller & Burgoon, 2008) that were too abstract, and not falsifiable. These positions were therefore reworded and updated in the more current document to reflect more falsifiable positions that could be tested (Burgoon & Buller, 2014). Through developing the theory Burgoon and Buller (2014) also considered evidence from previous research that suggested that the communication skill of receivers to decode messages did not increase their deception detection accuracy. In a meta-analysis conducted by Bond and DePaulo (2008) results indicated that receivers did not significantly vary in their ability to make accurate veracity judgments. This suggests that it is possible that only producing a deceptive message is a skilled activity, and not its detection. This led Burgoon and Buller (2014) to remove receiver skill from the assumptions and propositions of IDT as discussed earlier in this chapter.

Recently Bond et al. (2014) claimed that there is a lack of convincing support for IDT. Their results on deception cues, derived from the data used by DePaulo et al. (2003), indicated a weak relationship between behavioural displays and deception. Bond et al. (2014) Therefore argued that these findings indicated that deception is not linked to behavioural displays, which in their interpretation results in a lack of evidence for IDT. In the way that Bond et al. (2014) interpreted the assumptions of IDT, is however incongruent with their findings. This is because IDT makes the assumption that behavioural displays will differ between honest and deceptive performances, as well as that deception is not linked to any specific behaviour because there are no universal deceptive profiles, an aspect not covered by Bond et al. (2014). This was substantiated by the results of Burgoon et al. (2016), who found that there was a nonverbal behavioural difference between truthful and deceptive statements.

#### **2.4. Conclusion**

This study assumes that the propositions made by Interpersonal Deception Theory are true in order to test the effects that gender, race, and language status could have on veracity judgments. It is believed, in this study, that gender, race and language status are influenced in some way by the conversational tasks (emotional leakage, and cognitive load), expectations of normal behaviour, biases discussed throughout this chapter. The purpose of this study was to discern if there was a significant difference because of these factors when veracity judgments are made about second language speakers.

IDT was used to inform the study's design, and in order to look at deception detection performance when making judgments on second language speakers. Although this theory does not address second language speakers directly; it is argued that it does address certain aspects of behaviour that are more pronounced when speaking in a second language (elaborated on in the following chapter). This study therefore considered the characteristics of deception in communication that deals with truth bias, cognitive load, emotional leakage, expectations of normalcy as well as other differences between honest and deceptive interactions to discuss and explain findings within the context of South Africa.

Chapter three discusses the findings from previous studies on deception detection that had a relevant impact on the current work. The chapter follows a specific pattern, in that the overall general findings of deception studies are presented first. This is followed by a discussion of some of the possible variables mentioned in this conclusion (e.g. gender and race). After which a more

comprehensive discussion follows in terms of second language speech, and its influence on deception studies. The chapter concludes with an overview of the context of the current study, this also functions as an introduction to the method chapter.

## Chapter 3 – Literature Review

### 3.1. Introduction

The main purpose of the current chapter is to provide an overview of relevant literature and previous research findings concerning deception detection in general, and specifically in regards to second language speakers. The chapter begins with an overview of deception detection in terms of previous findings on accuracy and bias of deception judgments. The possible effects that emotional leakage and cognitive load have on deception detection are examined. This is followed by a discussion on the possible effects of age, gender, race, and culture. The influence of speaking a second language on cognitive load and emotional leakage are then addressed. The chapter concludes with a comprehensive discussion on deception detection studies that included second language speakers in their samples. Finally, a brief introduction to the context of the current study is provided.

### 3.2. Deception

Over the last four decades, a plethora of studies have examined a wide range of factors that influence deception as well as its detection. The focus of some studies was to discern the extent to which lay people as well as professionals were able to detecting deception. Other studies investigated the effects of biographical variables such as age and gender that may influence deception detection (discussed later in this chapter). Researchers have also attempted to increase the accuracy of detection through training, and interviewing styles (Aamodt & Custer, 2006; Bond & DePaulo, 2006; Burgoon & Buller, 2014; Vrij et al., 2010).

In order to provide an overview of the literature on deception studies, the findings concerning observable behaviours that are indicative of deception are discussed first. The discussion intends to show that it is possible, although difficult, to detect deception from observable behaviours. In order to facilitate this discussion, these deceptive cues are mostly concerned with emotional leakage and cognitive load that were introduced in the previous chapter. An overview, which discusses previous findings relating to deception detection accuracies and bias, follows.

#### 3.2.1. Deception Cues.

As introduced in the theoretical chapter, the current study accepted the assumption that communication is fluid and dynamic. Interactions change overtime (Dunbar et al., 2014), and

therefore behaviours that are indicative of honesty and deception also change constantly. It is thus assumed, as previous studies suggest, that there are no behaviours that are universally diagnostic of deception (Burgoon & Buller, 2014).

Corroborating this assumption, previous research on deception cues has not found any reliable cues that are consistently diagnostic of deception. Although there is an indication that an observable difference between honest and deceptive behaviour does exist, it cannot be attributed to any specific behaviours (Castillo, 2011; DePaulo et al., 2003; ten Brinke, MacDonald, Porter, & O'Connor, 2012). This may be because the act of lying can be a very stressful event for most people as it can be either emotionally or cognitively challenging. The stress of lying may produce various physiological and psychological reactions that imply that the person is not being honest (Burgoon & Buller, 2014; Ekman, 2003b; Matsumoto, Hwang, Skinner, & Frank, 2011; Remland, 2009; Vrij et al., 2010).

Another area of deception research has focussed on attempting to increase the observable difference in behaviour between delivering honest and deceptive messages. Previous research provides some support for this approach in that asking participants to recall events in reverse order, which increases their cognitive load, has shown some improvement on deception detection (Vrij et al., 2012). It has also been suggested that requesting senders to constantly maintain eye contact will also result in an increase in cognitive load. This makes the act of deceiving more difficult and thus possibly easier to identify (Vrij et al., 2010).

In terms of emotional leakage, a concept that has gained considerable attention is that of micro-expressions. Micro-expressions are viewed, by some, to be reliable indicators of emotion, and thus could be reliable indicators of deception (Yan et al., 2013). Nonetheless, these expressions are easily missed as they are very brief (under 1/5 of a second) (Porter et al., 2012).

However, the view that there are 'any' observable behavioural differences between deception and telling the truth is not uncontested. Masip and Herrero (2015a) stated that it is not surprising that people only judge deception at chance level, because they believe that there are no observable behaviours that are distinctive indicators of deception. The view of this paper, and theoretical assumption, is that although there may not be unique behaviours indicative of deception, behaviours are nonetheless influenced by the emotional tension and cognitive load of lying (Burgoon & Buller, 2014). This is also the underlying assumption of more recent studies that investigated overall

behavioural patterns as potential indications of deception, instead of focussing on single or small clusters of behavioural cues (Diana et al., 2015).

This behavioural change may originate from emotional or cognitive efforts that are assumed to be required in order to lie. This could be an indication of emotional leakage, or evidence of cognitive load. As mentioned in the previous chapter, both these concepts have been considered as the underpinned theoretical frameworks in previous studies, and are therefore elaborated on separately below.

### ***3.2.1.1. Emotional leakage.***

Emotional leakage stems from the idea that emotional expressions are not completely under conscious control. What follows is a short description of the results from studies that examined emotional leakage as a theory, or as a factor that influences detecting deception. This construct was explained more thoroughly in the previous chapter.

Porter and ten Brinke (2008) conducted a study in which participants (senders) were asked to view various images intended to elicit different emotional responses (happiness, disgust, fear, and sadness). The senders were instructed to respond to images with a deceptive emotional expression (an emotion that they were not feeling at that moment), or an honest emotional expression (an emotion that they were feeling at that moment). The deceptive condition of the study included three types of responses. First, the participants were asked to fake an emotional expression, when they did not feel an emotion (simulating). The second asked them to display a neutral face, when they did feel an emotion (neutralising). The final condition asked the participants to show a fake emotion, when they were actually feeling a different emotion (masking). Results from the study indicated that emotional leakage occurred at least once in the deceptive condition of every participant. These inconsistencies occurred more when participants masked emotions with an unfeared emotional expression. Participants were more successful in keeping a neutral expression in order to hide their feelings. The findings were attributed to the possible complexity in creating a false (not felt) emotion (Porter & ten Brinke, 2008).

Studies conducted on micro-expressions served to continue this stream of debate. It is assumed that micro-expressions, which are brief ‘snapshots’ of a person’s felt emotions, cannot be falsified. This makes it a useful channel for deception detection, in that it would reliably indicate the person’s true feelings. However, micro-expressions are believed to be difficult to observe without specialist

equipment, or training, because of the recorded speed with which the expression passes (1/25 to 1/5 of a second) (Porter et al., 2012). In addition to the difficulty in observing these types of expressions, another problem in relying solely on micro-expressions is that they are rare. Ekman (2003a) discusses that, within a previous study, micro-expressions were only found in about ¼ participants who lied. Yan et al. (2013) found that from more than 1,000 recorded facial expressions, 245 facial expressions, which lasted less than 1 second, were leaked. From these expressions 109 were shorter than 500 milliseconds. In addition, Porter et al. (2012) only found partial facial expressions (in the upper or lower part of participants faces) that could be defined as micro-expressions within their database of 1711 analysed expressions.

However, the findings around micro-expressions could also suggest that, emotions are not under complete conscious control, because the stronger they are felt, the more likely it is that the person will not be able to hide their emotional expression. In addition, people will not be able to completely fabricate an emotional expression (Porter et al., 2012). Support for this argument comes from other studies that have found that the more intense the participants (senders) experienced the emotions, the more instances of emotional leakage were found (Hurley & Frank, 2011; Porter, ten Brinke, Baker, & Wallace, 2011; Porter et al., 2012). To illustrate an example of this is referred to as ‘duping delight’ that suggests that the person telling the lie may be feeling happy or exited when they believe that they are getting away with a lie (Ekman, 2009).

Warren et al. (2009) conducted a study that measured receivers’ accuracy in classifying truthful and deceptive messages when the messages that the senders constructed were either emotional or unemotional. This manipulation was achieved by asking senders to either describe a mildly pleasant promotional landscape video (unemotional condition), or a video depicting a surgical operation (emotional condition). The overall level of accuracy (both emotional and unemotional messages) attained by the receivers, was measured at close to chance (50%). When looking at only the judgments made on the truth or deceptive messages, with regards to the unemotional condition, the receivers’ accuracies were on average significantly below chance (36%). Meanwhile considering the accuracy attained in the emotional condition, receivers were able to accurately classify truthful and deceptive messages, on average, significantly above chance (64%). This provides some indication that emotional leakage could result because of higher emotional strain, as well as that these expressions could not completely be suppressed. This is consistent with the theoretic assumptions made in this study: That the demands of the conversational task influence the ability to create a deceptive message. In turn this could also possibly be influenced by cognitive load, which is elaborated on below.

### 3.2.1.2. *Cognitive load.*

As discussed in the previous chapter, this study set out from the assumption that creating deceptive messages increases the sender's cognitive load. This assumption is based on the idea that creating deceptive messages is an additional task that needs to be managed by the sender. This may not be the case with every deceptive message, it is however assumed to be the norm. In addition, this increase in cognitive load may in turn either increase behaviours associated with the need for more cognitive resources (blinking, etc.), or 'weaken' the sender's performance on other tasks (e.g. remembering a false story, alternatively inhibiting, or fabricating emotional displays). This increase in cognitive load is thus assumed to manifest in observable behaviours, and could make behavioural displays of truthful or deceptive messages distinguishable.

Research conducted on the effects of cognitive load in deception has found some evidence to indicate that deception does increase the display of behaviours that are indicative of cognitive load. Previous studies have shown that lies told under higher cognitive demand are detected more often than lies with lower cognitive demands (van't Veer, Stel, & van Beest, 2013; Vrij et al., 2015). Several studies have investigated different ways of increasing the observable differences between honest and deceptive behaviours. These studies attempted to make deceptive tasks even more difficult for deceivers, because it is assumed that deception increases cognitive load. This includes methods, such as asking unexpected questions that would be answerable by honest interviewees, but that deceivers would struggle to think of a plausible answer (Vrij et al., 2015; Warmelink, Vrij, Mann, Leal, & Poletiek, 2013). Studies have considered when and how to use evidence, in an investigative interview. Findings suggested that revealing evidence, gradually improves the detectability of senders, because they constantly need to revise their story (Dando, Bull, Ormerod, & Sandham, 2013). Another method is that the sender could be requested to repeat their story in reverse order, starting from the last event and explain towards the beginning. In order for an honest sender to tell this type of story they only need to remember what happened, and should be able to tell the story with relatively few errors. However, it is assumed that deceivers would not think to practice a lie backwards, and therefore their stories should contain more errors than their first descriptions. This could also include a number of behavioural indications of cognitive load (Vrij et al., 2012). Requesting senders to constantly keep eye contact seems to increase the cognitive load of deceivers as compared to honest senders. In needing to keep eye contact, and not have the freedom to look around, senders need to use more cognitive resources, which impairs their ability to focus on other tasks. This should, as with the previous method, increase the cognitive load of honest senders, but it would significantly impair the ability of deceivers to construct a credible lie while controlling their own behaviours. This may again result in deceivers displaying excessive behavioural

indicators of cognitive load, as well as increase the possibility of significant inconsistencies in the messages (Vrij et al., 2010).

From the evidence above it could be argued that if cognitive load influences the performance on certain tasks, it could, in turn, also influence the performance of receivers. This may also influence their potential for making biased judgments. This view is consistent with IDT in that both senders and receivers can be influenced by their own cognitive load (Buller & Burgoon, 1996). An argument made by Lev-Ari and Keysar (2010) gave an indication of this effect, where results revealed that senders were perceived as less credible when they spoke with a heavy accent compared to when they spoke with a mild accent. This was attributed to the increase in cognitive load experienced by the receivers. This interpretation was made because when receivers knew about the experimental conditions (measures of the credibility of accented speech) receivers ‘corrected’ their judgments for low and mildly accented speech. But they were unable to do the same in instances where speakers spoke in heavy accents. In an article by Vrij and Winkel (1994) results also indicated that speech fluency and style affected veracity judgments in cross-cultural interrogations. However, the authors focused their discussion on other aspects relevant to their study, which are discussed thoroughly under the heading of ‘race’ (see page 44).

### **3.2.2. Deception Detection.**

Research that focused on the accuracy of deception detection ability found that most people were not able to classify honesty and deception with more accuracy than a random guess (Bond & DePaulo, 2006; Porter et al., 2012; Vrij & Mann, 2001). These studies suggest that people are not able to accurately detect deception from the nonverbal behaviour of others. This was found despite the fact that the participants overestimated their ability to detect deception (Ekman, 1996, 2003b, 2009; Remland, 2009; Vrij & Mann, 2001).

Within previous studies receivers’ performance in distinguishing between honesty and deception were measured at slightly above chance level (50%), between 51%-54.1% (Bond & DePaulo, 2006; Morgan, Rabinowitz, Hilts, Weller, & Coric, 2013; O’Sullivan, 2003; Wright, Berry, & Bird, 2012). Receivers made correct judgments about honest messages significantly above chance level, between 60%-75%. But they made correct judgments about deceptive messages significantly below chance level, between 33%-47% (Bond & DePaulo, 2006; Morgan et al., 2013; O’Sullivan, 2003). These scores suggest that the participants were truth biased, in that they tended to make truth judgments more often than deception judgments.

According to a meta-study conducted by Bond and DePaulo (2006), there are some research methods that affect accuracy scores to some degree. Their analysis indicated that receivers made more correct judgments from audio or audio-visual material compared to video only (Bond & DePaulo, 2006). This was also found in previous research where both audio or audio-visual stimuli significantly increased correct judgments compared to only visual stimuli (Sweeney & Ceci, 2014). Receivers, in addition, made more correct judgments when they were motivated, if the sender's lies were unprepared, or if the receivers were shown a sample of baseline behaviours before making their judgments (Bond & DePaulo, 2006).

Consistent with these findings Bond et al. (2014) found that hearing veracity messages (audio stimuli) influenced the judgments made by receivers more than seeing the senders' behaviour (video stimuli). The authors interpreted this as evidence that receivers rely more heavily on the words and the vocal features of a message rather than the behavioural aspects.

The findings described above influenced the current study in several ways. This study opted to show receivers' audio-video recorded messages, specifically because it was concerned with investigating second language speech. This assisted the researcher to potentially reach a wider pool of potential participants, through online surveys. As well as that this provided receivers with more social information. For this reason, receivers were also shown a sample of baseline behaviour of the senders. This is discussed more thoroughly in the following chapter. Baseline recordings provided more information for receivers on which to base their judgments, as required by both IDT (Burgoon & Buller, 2014) as well as ALIED (Street, 2016).

In contrast to the above results Whelan, Wagstaff, and Wheatcroft (2015) found that when senders were under significant stress the accuracy of receivers was much higher. The stimulus within this context were truthful or deceptive videos of people who made public appeals for assistance in cases that involved relatives who were missing or murdered. These videos are considered ecologically valid, as they were true accounts of public appeals. In addition, they found that there was a relationship between the confidence ratings that receivers provided to their judgments and their judgment accuracy. The argument followed that previous inaccurate findings could possibly have been a methodological artefact from less ecologically valid samples. These findings provide possible evidence to support the emotional leakage approach to deception detection as described above. As such, it can be seen as a possible methodological critique against

the current study. As Hartwig and Bond (2014) did not find evidence to support this argument within their meta-analysis, it remains a limitation of the current study.

### **3.3. Possible Variables**

In addition to measuring the ability of receivers to detect deception from second language speakers, this study aimed to investigate the influence that several other biographical factors could have on deception detection. These included the gender and race of both senders and receivers (described below), as well as the linguistic status of the receivers (if they were first or second language speakers). This is discussed in greater depth later in this chapter. In order for the current study to discuss these measures in context, appropriate previous research findings were examined. The following discussion introduces the results that were found on the influence of specific biographical information of senders and receivers in deception detection research. The factors that are discussed include age, gender, race, and culture, as the language status of receivers is discussed later. The main reason for discussing age in this section is to provide an argument as to why it was excluded as a variable within the analysis of the current study. In turn gender socialisation could affect participant's performances, and was included to show what previous studies found. Racial stereotypes and explicit biases could have resulted in biased findings in other studies. And because race cannot universally be considered in cross-cultural interactions, this was separated into another category for discussion. Following this discussion is an overview of the effect that second language speech may have on general behaviour and conversational tasks. After this second language speech in deception studies are discussed.

#### **3.3.1. Age.**

It is arguable that older participants could be more accurate in reading nonverbal behaviour because of the experience that comes with age. However, age related differences have received mixed findings from previous research. A meta-study by Aamondt and Custer (2006) did not find any significant correlation between age and deception detection accuracy. In contrast Sweeney and Ceci (2014) found that there was a difference in performance from older receivers (aged 60-93) compared with college students (aged 18-23). The performance of older receivers was poorer than that of college students when making judgments from audio or audio-visual recordings, but both performed at chance level with only video recordings. The students (receivers) performed the best overall, and specifically made more correct judgments about other students (senders). This could indicate that a large difference in age might have an effect on deception detection. However, the difference may be due to other factors that are involved with aging, for example, facial appearance,

cognitive ability, working memory and concentration (Louw & Louw, 2009). For this reason, age differences were accounted for in the current study for documentation, but did not form part of the analysis. Instead the focus of the study remained on second language speakers, as well as the factors discussed below.

### **3.3.2. Gender.**

With regards to the gender of participants there could be several interrelated influences on the creation as well as detection of deception. These influences could originate with the conceptualisation of gender roles, and the normative behaviour discussed in the previous chapter. From an early age people are socialised into certain gender roles, and taught how to behave and conduct themselves. Gender normative behaviours could differ depending on the age, race as well as cultural backgrounds of the participants (Baron et al., 2009). Although these are not the focus of the current study, it is necessary to be aware of the broader influence of certain combinations of factors.

When considering the effects of the receiver's gender, there is some evidence that women make slightly more accurate interpretations of nonverbal behaviour, than men, when they are motivated to do so. This motivation refers to the desire to excel at a certain task, such as being able to read nonverbal behaviour (Hodges et al., 2011). However, this only seems to occur when the emotions are displayed intentionally by others. This implies, as other research suggests, that women are no better than men in reading deception (Hall, 2011; Remland, 2009).

As with age differences, previous findings regarding the effect that gender has on deception judgments also seem to be mixed. The meta-study by Aamondt and Custer (2006) showed that women and men performed similarly on deception detection tasks. This was also found in a study conducted by Solodukhin (2015), who's results indicated that the receiver's gender was not significantly related to their ability to detect deception. Similar results were found by Levitan, An, et al. (2015) and Levitan, Levine, et al. (2015). In these studies, receivers made veracity judgments without being able to see their conversational partner. The results indicated that the gender of the receiver did not have a significant impact on their detection accuracy. Furthermore, Heijboer (n.d.) found that the gender of the receivers did not test as significant when making veracity judgments on recordings (video only) of the senders. In contrast Tilley, George, and Marett (2005) found that women were more accurate than men when detecting deception across various electronic media

platforms. This suggests that interacting across electronic media could give different indications of deception to which women are more attuned.

When considering the effects of the sender's gender in deception success, the findings also seem to be mixed. In the same study by Tilley et al. (2005) the authors did not find a significant effect for gender (of senders) in deception success. This indicates that senders were not more transparent because of their gender. Levitan, An, et al. (2015) and Levitan, Levine, et al. (2015) also found that there was no difference because of the senders' gender when considering their deception success. In contrast the study conducted by Heijboer (n.d.) indicated that receivers tended to judge men as lying more often than women (lie bias towards men), as well as that women were judged as honest more often than men (truth bias towards women).

The above findings suggest a strong tendency to not find a gender difference in deception detection studies. This provided the rationale for the current research to investigate the effects of gender with a South African sample. This could provide relevant findings to this context which would elaborate on the literature within this subject, as well as the South African context.

### **3.3.3. Race.**

Because this study was conducted within the South African context, it was deemed necessary to examine the influence of race on deception detection. This is because of the possible influence that racial stereotypes may have on deception judgments. In terms of the role that race plays within deception detection studies, findings likewise seem to be mixed. When considering racial background, there is some evidence that showed a distinct racial difference in nonverbal behaviour. In their study, conducted in Amsterdam, Vrij and Winkel (1991) found that black participants' behaviours resembled cues that were popularly believed to be associated with deception. According to the authors, this could lead to inaccurate veracity judgments.

In a later study by Vrij and Winkel (1994), the researchers found evidence that suggested that the nonverbal behaviour commonly associated with black participants (discussed above) was judged as more deceptive than the nonverbal behaviour commonly associated with white participants (regardless of skin colour or accent). The study involved 173 patrol officers who watched a series of slides that showed a citizen whose race could be identified as either black or white. Along with the slides, the receivers listened to parts of the conducted interviews. The authors manipulated the skin colour of the participant (sender) in the slide series, as well as the accents within the spoken

interviews. The senders were instructed to make a certain amount of speech errors in order to simulate the spoken fluency, and speech style that is 'normally' displayed by each race (either black or white) in that country. The results from this study did not find that race or racial accent had an effect on judgment bias. Although the results did find evidence that suggested that the nonverbal behaviour of black participants (more speech disturbances, and answering indirectly) were judged as more negative than nonverbal behaviour of white participants (less speech disturbances, and more direct answers). In contrast the authors found that the accent and skin colour of black senders were judged more positively by receivers. The authors did concede that in a country with clearer racial prejudice, the results could be different.

Solodukhin (2015) studied the effects that speaking a second language had on deception detection (discussed below). In part of the study, the author needed to test for potential racial bias within the data. The author found that race of the receivers did not have a significant effect on their veracity judgments. The findings on the effects of second language speech are discussed later in this chapter.

In contrast however, Lloyd (2015) found a racial-based bias in relation to deception detection. The study looked at the ability, and possible bias, that black and white receivers had when considering the veracity of black and white senders. The findings indicated that the receivers (black and white) were more accurate when making judgments on white senders, as compared with judgments on black senders. The results indicated that although receivers were more accurate towards white senders, they had a bias towards making more truth judgments towards black senders. This seemed to be true for both black and white receivers. The author attributed these findings to a racial advantage in making more accurate judgments towards white senders, because they are the majority racial group in North America, as compared with the black senders. This advantage was argued to be because receivers were better able to discriminate between truths and lies. The author concluded that because of these findings, it is possible that interrogations involving a minority (racial) group could be compromised. These findings may be specifically interesting in the current study, because within the South African context the group sizes of these specific racial groups (black and white) are reversed. That is, the population that identified itself as black is by far the majority group, whereas the population that identified itself as white is in the minority (Statistics South Africa, 2012).

With the mixed findings above, the question of a racial difference seems to be mediated by other factors such as speech patterns and habitual behaviours, and suggest an ambiguous view of

bias in deception detection studies as a result of race. Racial differences within the South African context may also lead to a potential investigation of cultural differences. This is because differences in culture do not exclusively cross perceived racial lines within South Africa, but rather there are many distinctive cultural differences between people who identify themselves within the same racial categories.

#### **3.3.4. Culture.**

Culture is believed to influence people's behaviours, as well as how they perceive the behaviours of others (Baron et al., 2009). This influence could naturally translate into the context of deception and veracity judgments. And in turn could, to some extent, be responsible for potential biased judgments in a cross-cultural setting. Culture can be defined as a shared system of information and meaning, as well as the beliefs and perceptions of a specific group of people. This system is conveyed from one generation to another, and thus works to preserve order, and avoid social disorder. To accomplish this function, norms are created to guide the behaviour of group members, as discussed in the previous chapter (Baron et al., 2009; Matsumoto et al., 2008).

When considering previous cross-cultural studies on nonverbal behaviour it has been found that different cultures are able to recognise emotional displays of other cultures (Ekman & Friesen, 1971). In one such study conducted by Sauter et al. (2010), the authors investigated the ability of participants, from two distinctly different cultures, to recognise the emotional vocalisations (emotionally distinctive sounds) from their own and others' culture. The vocalisations included laughing and screaming, as well as pleasure, relief, etcetera. The first group was native English speaking European participants, and the second group was from a cultural group called Himba, that originate from northern Namibia. The Himba group was culturally isolated, living with no running water, electricity, or formal education, with little or no contact with other cultures. Overall the participants were more accurate concerning their own culture's expressions, but their judgments were significantly above chance for both. The European participants were more accurate in total, and it can be argued that this is because of their experience, knowledge about various groups of people, as well as cross-cultural contact (Sauter et al., 2010). The results from this study give an indication that recognising the nonverbal behaviours of others is possible in cross-cultural communication. It also suggests that there could be slight culture specific biases due to different cultural normative behaviours.

In cross-cultural deception studies, findings were similar, in that cross-cultural deception detection was possible but with some cultural influence. A study by Lewis (2009) investigated the ability of American and Spanish receivers to detect deception across culture as well as within their own. The findings indicated that the overall ability of receivers was in line with previous studies suggesting that judgments were made slightly higher than chance (54%). The ability of the American receivers to detect deception was higher across the two cultures, whereas the Spanish receivers were more accurate in detecting deception from Spanish senders. These findings thus show that culture seems to influence deception detection to some extent, as well as some evidence that suggests the possibility of detecting deception across cultures that do not share the same language (Lewis, 2009). These findings are complemented by an earlier study conducted by Bond and Atoum (2000). The participants' ability to correctly classify between truth and lies was found to be significantly, although barely, above chance (51.66%). The results from their study also indicated that it was possible to detect deception across different cultures that share a language, as well as those that do not. In addition, the participant's level of education did not seem to be an influencing factor in their results. The authors concluded that the preliminary findings suggested the possibility of cross-cultural deception detection, but that culture, as well as language, could introduce bias in veracity judgments (Bond & Atoum, 2000).

Within a recent study, Castillo (2011) also found a cultural bias between Columbian and Australian students. Her analysis indicated that there was a difference in the way that students from different cultures were judged, as well as that this effect was mediated by a language bias, discussed later in this chapter.

The influence that culture has on deception studies is assumed to be part the norms that are developed by certain groups of people. This includes the display rules that are developed in order for the norms to function (elaborated on in the previous chapter) (Matsumoto et al., 2008). Another influence that develops, from what was mentioned, are the beliefs that people have about deception and how to detect it.

#### **3.3.4.1. *Beliefs about deception.***

As previously discussed, there seems to be both universal and cultural indicators of behaviour and their interpretations. A part of this aspect of deception detection would be the different beliefs held by participants about deceptive cues, and their relevance to deception detection. One study, which attempted to determine people's beliefs about deceptive cues, was conducted by the Global

Deception Research Team (2006). The authors conducted two studies, which spanned across 75 countries and 43 different languages, probed participant's beliefs of how liars behave.

Within their first study they asked the open ended question: "How can you tell when people are lying?" (Global Deception Research Team, 2006, p. 62). Across 58 countries 2320 participants (20 women and 20 men from each country) answered with 11,157 responses that were coded into 103 beliefs. The most dominant belief was that liars avert their gaze, with 63.66% of the participants mentioning this as characteristic of liars. Nervousness was agreed upon by 28.15%, and incoherent stories were stated by 25.3% of the sample. Of the characteristics mentioned the most were verbal inconsistencies, speech fillers (e.g. uhms) and pauses, which were all mentioned by more than 15% of participants (Global Deception Research Team, 2006).

The second study consisted of asking 40 participants, 20 women and 20 men, in 63 countries (46 of the countries that were included in the first study) to complete a questionnaire that contained 10 items. The questionnaire was based on the most prevalent responses of the first study. From their answers 71.5% believed that avoiding eye contact was indicative of liars. Beliefs that liars shift their posture more often, use more self-touching behaviour and tell longer stories each made up 60% of the total answers. Also included were that liars stutter more, use longer pauses, as well as seem more nervous (Global Deception Research Team, 2006).

The belief that had the highest prevalence across both studies was that liars avoid looking one in the eye (Global Deception Research Team, 2006). This finding was consistent with Hurley et al. (2014) who found that 72% of receivers believed that deceptive senders avoid eye contact. These results show that various countries share similar beliefs on how to detect deception. However, the mentioned behaviours do not seem to be related to actual deception, and using these indications would make one less accurate in detecting deception (Bond & DePaulo, 2006). This could suggest that there are some 'universal norms' to which people need to 'conform' in addition to cultural norms that are followed. Or, as likely, that people's beliefs about deception could be strongly influenced by the media, as most of these participants were university students (Global Deception Research Team, 2006), and could thus have had access to similar media material (movies, books etc.).

Castillo (2011) also examined the beliefs people have about deception cues, in order to determine if there were cultural differences about these beliefs. The author asked 234 Australian and Colombian students to indicate which of the 17 listed behaviours would occur more, less, or the

same amount of time when someone, from the own culture and the other culture, was lying or being honest, in addition to their stereotypical beliefs about deception. This method shared some similarities to the study by the Global Deception Research Team (2006). Castillo's (2011) results indicated that there were some shared beliefs about deceptive cues between the two cultures. Both Colombians and Australians believed that liars' blinking, smiling, and scratching would increase, that they would have more errors in speech and more hesitations, as well as that they would take longer to respond with more pauses compared to truth tellers. The two cultures additionally held similar beliefs about eye contact.

Results from Al-Simandi (2000) indicated that there were similarities and differences in cultural beliefs about deception. Behavioural beliefs that were similar referred to postural shift, hesitations, and speech rates. Beliefs that differed between cultures referred to subject change in conversations, stuttering, making use of negative statements, blinking, and hand postures. Castillo (2011) also found some culture-specific cues, which was according to the author, provided evidence contrary to the findings of the Global Deception Research Team (2006). The two cultures (Columbian and Australian) differed in their beliefs of upper-body movements, vocal pitch, and gestures (Castillo, 2011). It should be noted that the study by the Global Deception Research Team (2006) aimed to explore the pan-cultural beliefs that were held across the world about lying. As well as that they did concede that some behaviours (specifically discussed: gaze direction) would be "subject to a variety of culture-specific interpretations" (Global Deception Research Team, 2006, p. 70). As literature suggests, in addition to the findings from Castillo (2011), these cues are not reliably diagnostic of deception, and might not be practically useful in deception detection (DePaulo et al., 2003).

The studies conducted by Castillo (2011), the Global Deception Research Team (2006), and Al-Simandi (2000), thus indicate that there seem to be beliefs about deception that stretch across cultures and countries, most notably about eye contact. As well as that some behaviours seem to be interpreted in a culturally specific way that indicates a possible confirmation about the interpretation of results in cross-cultural deception detection as discussed above.

### **3.4. Second Language**

When considering the effect that speaking in a second language could have on perceptions of nonverbal behaviour, the beliefs discussed by the Global Deception Research Team (2006) could indicate why there might be a lie bias. This could be because of the additional cognitive load, or emotional strain, which is related to speaking in a second language. Each could in turn result in

behavioural displays commonly associated with deception (Fehringer & Fry, 2007; Gregersen, 2005; Perani & Abutalebi, 2005).

Liu, Hu, Guo, and Peng (2010) found that a similar mental process was used when participants were asked to name pictures in their first and second languages. Brain activity, which was monitored via a Functional Magnetic Resonance Imaging (fMRI) scanner, determined that when the speaker spoke in their first language the process was more automatic, but that the process was similar to the one used for second language speech. This finding supports the idea that speaking in a second language is more cognitively demanding, than when speaking in one's mother tongue. This was also found in the work of Perani and Abutalebi (2005). Their results furthermore suggested that speakers with lower second language proficiency would require more cognitive resources than those with higher second language proficiency. This could influence their behaviour and the way in which they are perceived by others.

Gregersen (2005) found that the nonverbal behaviour of second language senders, which involved an anxiety provoking situation, differed depending on their anxiety level. Within this study the senders were students involved in a foreign language oral examination, where the behaviour of anxious or non-anxious senders was compared. The study reported that senders who described higher anxiety levels showed markedly different behaviour compared to senders who described lower levels of anxiety. Although they did not measure the senders' behaviour during deceptive situations, they found that behaviour during second language communication was affected by anxiety.

Both the cognitive load and emotional leakage processes described previously could result in various behaviours that are associated with nervousness, or cognitive load, as well as deception, at times. This is evident in that second language speakers used more speech fillers (e.g. uhms), pauses and made more speech mistakes (verbal inconsistencies), possibly because of their level of proficiency. They may also have seemed more nervous because they were self-conscious, or looked away often because of the cognitive effort of thinking about what to say next (Fehringer & Fry, 2007; Gregersen, 2005; Perani & Abutalebi, 2005).

According to Fehringer and Fry (2007) pausing tactics were more pronounced in participant's second languages compared to their first. Their findings suggest that speaking in second language requires more working memory, supporting the findings that speaking in a second language is less automatic (Liu et al., 2010). It also implies that speech fluency in a second language may not be a

function of proficiency. This could be inferred as the authors tested highly proficient bilingual speakers. One additional point of interest is that the authors mentioned that stressful or complex situations could increase these 'hesitant' behaviours. This means that the speaker's context could be another mediating variable when making inferences about behaviour (Fehringer & Fry, 2007). Consistent with these findings, Castillo (2011) found that the baseline nonverbal behaviour of Columbian participants changed depending on whether they were speaking in their first or second language.

Lev-Ari and Keysar (2010) found some evidence for the notion that speaking in a second language also affects the speaker's credibility. This was suggested from the results of two experiments (mentioned earlier). That is accented speech may be deemed as less credible because it is more difficult to understand than non-accented speech. In order to test this, the authors asked first language and second language speakers (with mild and heavy accents) to recite trivial information while being recorded. Receivers were asked to make veracity judgments, and the answers of first and second language speakers were compared. The results indicated that accented speech was considered to be less credible than native speech. In the second experiment the receivers were made aware of the intention to measure judgments based on the speakers' accents. In this experiment the results indicated that there was no difference between judgments made on messages by first language speakers and second language speakers with mild accents. Receivers were able to correct their judgment bias between these two groups, but were unable to do the same when considering heavy accented speech. The researchers attributed this tendency to the idea that accented / second language speech is believed to be less credible because it is more difficult to understand. This is apparent as the receivers were able to correct their biases for the mildly accented speakers, but not when considering the veracity of heavy accented messages (Lev-Ari & Keysar, 2010). As discussed previously, findings from Bond et al. (2014) indicated that hearing messages has a stronger influence on the judgments of receivers than seeing the sender. This suggests that the findings from Lev-Ari and Keysar (2010), would persist despite differences in nonverbal behaviour.

This could translate to studies that consider receiver's judgments on truthful and deceptive messages. As this study assumes that deception increases conversational demands, speaking in a second language could potentially assist detectors in correctly classifying truthful and deceptive speech. Although from the findings discussed above, the biographical information, or the baseline effort required to speak in a second language could still result in senders being judged as deceptive more often than not.

### **3.5. Second Language Deception**

The studies discussed below, which included second language speakers, examined a unique aspect of deception detection. These are discussed individually in order to provide a cleared picture of what has been achieved in this field, what the possible limitations were, as well as the possible findings that the current study attempted to view within the South African context.

In a pilot study conducted by Caldwell-Harris and Ayçiçeği-Dinn (2009), students were asked if they would prefer to lie in their first or second language and why. Some students stated that they would prefer to lie in their first language (Turkish) because they would be more fluent. Others stated that they would prefer lying in their second language (English) because of a numbing effect and distancing themselves from their lies. Data from the study suggests that Turkish students do have different reactions when lying in their first and second languages. When they lied in their first language they reported that they experienced strong emotions, whereas students who lied in their second language experienced a numbing effect on their emotions. Oddly, an additional finding indicated that the students who lied in their second language experienced higher physiological or psychological arousal. This was evident in that the participants showed a higher Skin Conductance Response (SCR), taken at the same time, when they lied in their second, compared to their first language. A higher SRC suggests that the person is experiencing higher physiological or psychological arousal as measured by the moisture content on their skin.

One of the earlier studies that assessed the effects of second language speech in deception detection was conducted by Cheng and Broadhurst (2005). The authors of this study tested the ability of students (receivers) to detect deception in first language (Cantonese) and second language (English) speakers (senders). Within this study the findings suggested that second language speakers were more likely to display behaviours that were attributed to lying. The findings also suggested that second language speakers were more likely to be judged as deceptive in comparison to first language speakers. The overall judgments were found to be correct above chance level. Judgments on truthful statements were measured at a mean correct score of 63.84% (second language), and 70.78% (first language) respectively. Correct scores on deceptive messages were 73.08% (second language) and 66.94% (first language) (Cheng & Broadhurst, 2005). Two limitations of this study were that some senders were allowed to alternate between their first and second languages, as well as that this study asked the senders to lie about their opinions on a social issue, making it difficult to measure how strongly they actually believed in the issue (Da Silva & Leach, 2013). An additional aspect of the study by Cheng and Broadhurst (2005) that has not yet received attention is that all the receivers in this study were second language English speakers (R.

Broadhurst, personal communication, April 21, 2016). That is, the senders were speaking in their second language (English) and the receivers were listening in their second language (English). This denotes that this study was potentially comparable with the current study, and is further drawn on within the discussion chapter.

Castillo (2011) who, as described earlier, found a culture bias between Australian and Columbian students, also found a lie bias directed to the Columbian students speaking in their second language (English). Columbians who spoke in their second language were more likely to be judged as deceptive compared to Columbians who spoke in their first language (Spanish). The author also found that there was a tendency to judge the first language Columbian speakers as more honest. A finding that was particularly interesting in this study was that the author did not find a difference in the behaviour of participants when they lied in their first or second language. That is, there did not seem to be a significant behavioural change of participants when lying in their first or second language (Castillo, 2011). This suggests, as argued earlier, that the difference in the receiver's judgments could have occurred because of the increased cognitive load associated with listening to accented speech (Lev-Ari & Keysar, 2010), instead of behavioural differences associated with the higher cognitive load of the senders.

In a study by Da Silva and Leach (2013), the authors tested Canadian students' accuracy in making deception judgments. The students' performances were consistent with previous research when making judgments on first language senders. The researchers found that the Canadian students did have a lie bias towards senders who spoke in their second language, and a truth bias towards senders who spoke in their first language. They were in addition not able to discriminate between truthful or deceptive messages from second language senders. The confidence levels of the students were higher when making judgments on first language senders, compared to second language senders. The authors theorised that one limitation of their study was that the students were not necessarily familiar with listening to second language speakers, and that this may have influenced their perception of deceptive behaviours (Da Silva & Leach, 2013). Another limitation was that the receivers viewed the video content of first and second language senders in the same session where, according to the authors, the receivers may have been able to distinguish that the study was about language proficiency (Da Silva & Leach, 2013; Leach & Da Silva, 2013). An alternative explanation could be that the judges were affected by the Halo Effect, and attributed more positive qualities to more fluent speakers when they were able to compare the performance of both first and second language speakers (Nisbett & Wilson, 1977). Or, that the receiver's cognitive

load was less while listening to the first language speakers compared to the second language speakers.

The latter limitation was accounted for by a follow up study conducted with Canadian students and Canadian police officers (Leach & Da Silva, 2013). The deception detection ability of both police officers and students were tested. The study made use of four research groups [student / officer (receiver) \* first / second language (sender)]. Within each group the receivers either saw the second language senders, or the first language senders. Both the officers' and students' performance were equally accurate in making judgments on the first language senders, as well as that both groups were truth biased. They performed at chance level when judging second language senders. Although this study failed to find a lie bias towards second language senders, there was an inability to distinguish between second language honesty and lies. The authors theorised that it is possible that people who interact with second language speakers for longer on a daily basis might show different results (Leach & Da Silva, 2013).

Solodukhin (2015) considered the language proficiency of the senders as a factor that could influence receiver judgment bias. The author tested the ability of receivers to make correct veracity judgments on senders classified as 'native' (first language speakers), 'advanced', 'intermediate', and 'basic' second language speakers. The findings were consistent with previous research, in that receivers were found, overall, to be truth biased, as well as accurate only slightly above chance. The results also suggest that the proficiency of the senders may have an effect on receiver's judgment bias as the receivers were the least accurate when making judgments on 'basic' second language English speakers. Furthermore, the receivers' ability to distinguish between truthful and deceptive messages was lower when considering the veracity of 'basic' English speakers.

Snelling's (2013) findings supported these results, in that receivers showed higher levels of correct judgments regarding first language speakers compared with second language speakers. Although the study found a truth bias towards both first and second language speakers, the results showed that the receiver's own language proficiency did not influence their judgment significantly. Overall receivers who were less proficient showed a truth bias towards everyone. According to the researcher this could be an indication that familiarity with second language speakers' nonverbal behaviours was not advantageous. Or, because of their familiarity they relied more on insufficient verbal content, instead of nonverbal cues. The researcher considered a second explanation that suggested that speaking a second language might not make one aware of the behaviours of second language speakers, because they would not be aware of their own nonverbal conduct. This could

indicate that interacting with others regularly may affect detection results. The researcher indicated that it might be valuable to look at the receivers' experience in listening to certain accents or speech patterns, and to examine the interaction between language proficiency, race and specific accents with regards to deception detection (Snelling, 2013).

A more recent article by Evans and Michael (2014) addressed some of these issues. The authors used a sample of first and second language Hispanic participants (senders) in North America. They conducted two studies. The first study was with a student population in an area with very few Hispanic residences. The second was conducted in an area that was familiar with the population. The results from the two studies were largely similar. They found that there was a lie bias towards second language senders, regardless of familiarity. This again provides an indication that the receiver bias might not completely occur because of sender behaviour, but could also be influenced by the cognitive load experienced by the receivers (Lev-Ari & Keysar, 2010). One limitation of this study was that the second language senders were older and less educated than the first language senders with mean ages of 21 for first language senders, and 32 for second language senders. A second point was that the two studies were not statistically compared. Finally, as raised by the authors, because only Hispanic samples were used it is still unknown if this would be generalisable to other cultures (Evans & Michael, 2014).

Levitan, An, et al. (2015) and Levitan, Levine, et al. (2015) conducted a study that tested the ability of first language (American English), and second language (Mandarin Chinese) English speakers to both deceive as well as detect deception. Within this study, participants were not able to see one another, but were able to hear as well as question each other. In contrast to the previous findings the results of this study did not find an effect for language in the ability to deceive as well as detect deception.

### **3.6. Conclusion of Literature**

This chapter was based on the discussion of the theoretical framework discussed in the previous chapter. It aims to provide an overview of the results found in deception detection studies, with a specific focus on second language speakers. To accomplish this, the current chapter starts with a general discussion of deception cues, as well as the influence of emotional leakage and cognitive load. Here it is argued that there is not a universally diagnostic cue for deception. But because of the emotional and cognitive strain of lying, there should be an observable difference between honest and deceptive behaviour. In addition, previous results of studies that measured deception detection

accuracy and biases are discussed. As mentioned above previous findings indicate that people are not very accurate in detecting deception, and that they have a tendency to be truth biased. From this foundation, the discussion moves on to include the influences of other biographical information. Within this section the possible influences of age, gender, race and culture (including beliefs about deception) are discussed, where age is argued to not provide a relevant variable for the current study. The argument made by this study up to this point was that these factors could possibly influence deceptive messages or judgments, but that it should not influence the results as much as participants' language status. The chapter continues to describe the effects that speaking in a second language could have on participants, and finally discusses deception studies that included second language speakers. Before completely concluding, the discussion that follows addresses the background of the current study that was conducted within the context of South Africa.

### **3.7. The Current Study**

To date, as far as the researcher could find, there are few studies conducted on deception with participants speaking in their second language. The researcher was also not able to find South African relevant published literature and statistics with regard to deception detection. Colonel Weber of the South African Police Services replied to an email, saying that they did not have any available statistics. This is because observations of nonverbal behaviour are not accepted by the South African Court, and therefore not provided during their structured training (S.-J. Weber, personal communication, May 06, 2014). Studies that made use of polygraphs were purposefully not considered, as the current study explored the ability of unaided receivers to detect deception. This study was conducted because this area of research could benefit from results gathered within the South African context and cultural setting. This study aimed to add to the current research by using a South African population for the sample. This is advantageous because of the rich cultural and linguistic context of South Africa.

According to Statistics South Africa (2012) only 9.6% of South Africa's population identified their home language as English. The other languages that form part of this statistic are: IsiZulu 22.7%, IsiXhosa 16.0%, and Afrikaans 13.5%, Sepedi 9.1%, Setswana 8.0%, Sesotho 7.6%, and the remaining 4 languages were represented by under 5% each. However, English is the lingua franca of the country (Khokhlova, 2015): It is the language used during business, politics, or education, and it is very widely used in the media ("About SA - South Africa's people," n.d.; Statistics South Africa, 2012). Most South Africans need to speak in their second language (English) daily, to some extent, for any form of common understanding of each other, be it with varied proficiency.

Khokhlova (2015) argues that because of the racial isolation of the apartheid era, it is possible to distinguish English accents according to racial identification:

White, Black, Coloured, and Indian South Africans use English, with varying degrees of sophistication, but as a result of their isolation from one another [during the apartheid era], native English, Afrikaans English, Black English, Coloured English, and Indian English are distinguishable from one another, each containing lexical items unknown to people of other groups[...] and each exhibiting characteristic pronunciations and even grammatical structures (Khokhlova, 2015, p. 202).

This study was conducted with students attending the University of South Africa (Unisa). Unisa is the largest university in Africa, as well as the only dedicated Open Distance Learning institution (ODL) in the country (Unisa at a glance, 2013).

In 2013 the student population amounted to 400,000 students, 62.3% of whom identified as female. In terms of racial identification; 5.6% identified as Coloured, 7.5% as Indian, 18.6% as White, 68.1% as African, and 0.2% had no information. The university's age composition, in terms of students, consisted of: 24 or younger (26.2%), 25-39 (58%), 40-49 (12.8%), and 50 or older (3%). Full-time students comprised 13.1% of the population and 86.9% were part-time (Unisa at a glance, 2013). In 2010, 91.7% of Unisa students were South African (van Zyl & Barnes, 2012).

The context of South Africa is advantageous in comparison to previous research in three major ways. The population of receivers have daily contact with others in their second language, and although their proficiency might vary, this evades the limitation as found by previous research (Da Silva & Leach, 2013; Snelling, 2013). The second advantage is that it is a different population as used by Evans and Michael (2014) and thus may help to add to the current field of research. Finally, the sample of the current study had more experience in communicating in their second language, in that most people who speak their first language are not understood by the majority of the population.

Another advantage is that this study was conducted in a rich cultural setting, with a focus on cross-cultural deception detection. Some behaviours, which are considered to be culture specific, could in turn influence cross-cultural deception detection (Williams, n.d.). Researchers have found that gaining specific information about the normal behaviour of a specific cultural group could help to moderate any potential lie bias. Although only knowing that there are behavioural differences could make people even less accurate. The researcher argued that the receivers within this study might, because of their experience, implicitly know what those behavioural differences are, and this could moderate any potential cross-cultural bias (Castillo & Mallard, 2012). Although it is more likely that, when there are differences in fluency, the receivers might be more influenced by their own additional cognitive load and results would be similar as previous studies reported (Lev-Ari & Keysar, 2010).

### **3.7.1. Hypotheses.**

There are several hypotheses that are drawn from the literature discussed above. This study made several in terms of the overall data, as well as about the participants' (senders and receivers), gender, race, and linguistic status. These are organised according to the research questions, and provide a suggestion of what the researcher believed the data would show.

- Receivers are not able to judge veracity with more accuracy than chance. And receivers are less confident when making judgments on deception messages.
- The gender of the senders and receivers does not have a significant effect on veracity judgments.
- The race of the senders and receivers does not have a significant effect on veracity judgments
- Receivers who are first language English speakers have a higher accuracy than receivers who are second language English speakers.
- Deception cues that receivers claim to use in their judgments conform to reported stereotypical beliefs about deception.

### **3.8. Conclusion**

The purpose of this chapter was to provide an overview of the literature within deception detection studies. This was intended to provide the main findings within this topic specifically when considering second language speakers. To provide this overview, the discussion needed to first describe deception detection studies as a broad foundation. This introduced previous findings in terms of the accuracy and biases that have been commonly found in deception research. In

considering this, both emotional leakage and cognitive load warranted discussion because of their relevance to IDT, in addition to their uses within previous deception studies as separate theoretical foundations. Other factors that were discussed were age, gender, race, cross-cultural studies, and second language speech. These were highlighted to have special importance within the current study, as the research questions looked at the possible influences of gender, race and speaking in a second language. The chapter thus broadly discusses the previous studies that have included second language speech, and concludes with a brief introduction to the context of the study.

The following chapter provides an overview of the research method that was followed during this study. It accomplishes this by discussing the study within two distinct phases. The first phase was concerned with creating the research instrument. Therefore, the discussion of this phase concerns the sampling, and video recorded interviews of participants who volunteered as senders. The second phase was concerned with the creation of the research instrument in the form of an online survey. Likewise, the sampling and measuring of the deception detection accuracies of a second sample of participants who acted as the receivers, via the online platform, are detailed. The ethical considerations for each phase are discussed separately where relevant. The chapter concludes with a discussion on the analytical processes used in order to reduce the raw data into an interpretable answer.

## **Chapter 4 – Research Method**

### **4.1. Introduction**

This chapter discusses the research design that was used within this study. The current study made use of several phases in order to coherently organise the research activities. This chapter is divided into three distinct sections. These sections are concerned with the first and second phases of the study, as well as the data analytical approaches and techniques that were employed in order to answer the research questions. This chapter begins with an overview of the design and chapter outline, after which the first phase is described. This is followed by discussions on the second phase, and the methods of data analysis used. To ease the reading of this chapter the diagram below (Figure 4.1) shows a broad visual map of how the study was divided into the various activities.

### **4.2. Research Design**

This study explored accuracies and biases of deception detection within a South African context. Exploratory studies are usually undertaken to either orientate the researcher to a new topic of interest, or when the issue is relatively new (Babbie, 2008; Terre Blanche et al., 2006). An exploratory approach, which used a quasi-experimental design, was undertaken in this study, as this is a relatively new topic in the South African context. Furthermore, as noted in the literature review, there are, universally, limited studies on deception detection that address second language speakers. As used within this study; quasi-experimental designs includes studies where there are no control group for comparison (Babbie, 2008; Terre Blanche et al., 2006), although attempts are made to keep conditions equivalent, as well as that the independent variables are manipulated (Terre Blanche et al., 2006).

During the first phase of the study the research instrument was created. The purpose of the instrument was to measure accuracy and bias in deception judgments from a sample of students (receivers). The research instrument took the form of a survey that consisted of 24 videos as stimuli. The videos were recordings of second language English speakers (senders), who lied or told the truth about two separate video clips that they had watched (Ekman & Friesen, 1974). During the second phase of the study, the research instrument was transformed into an online survey, using the online platform Surveygizmo. The survey platform was used to send secure website links, for the survey, to the sample of students (receivers). After the receivers completed the survey, the data from the second phase were examined to determine the deception detection accuracies and potential biases of the receivers.

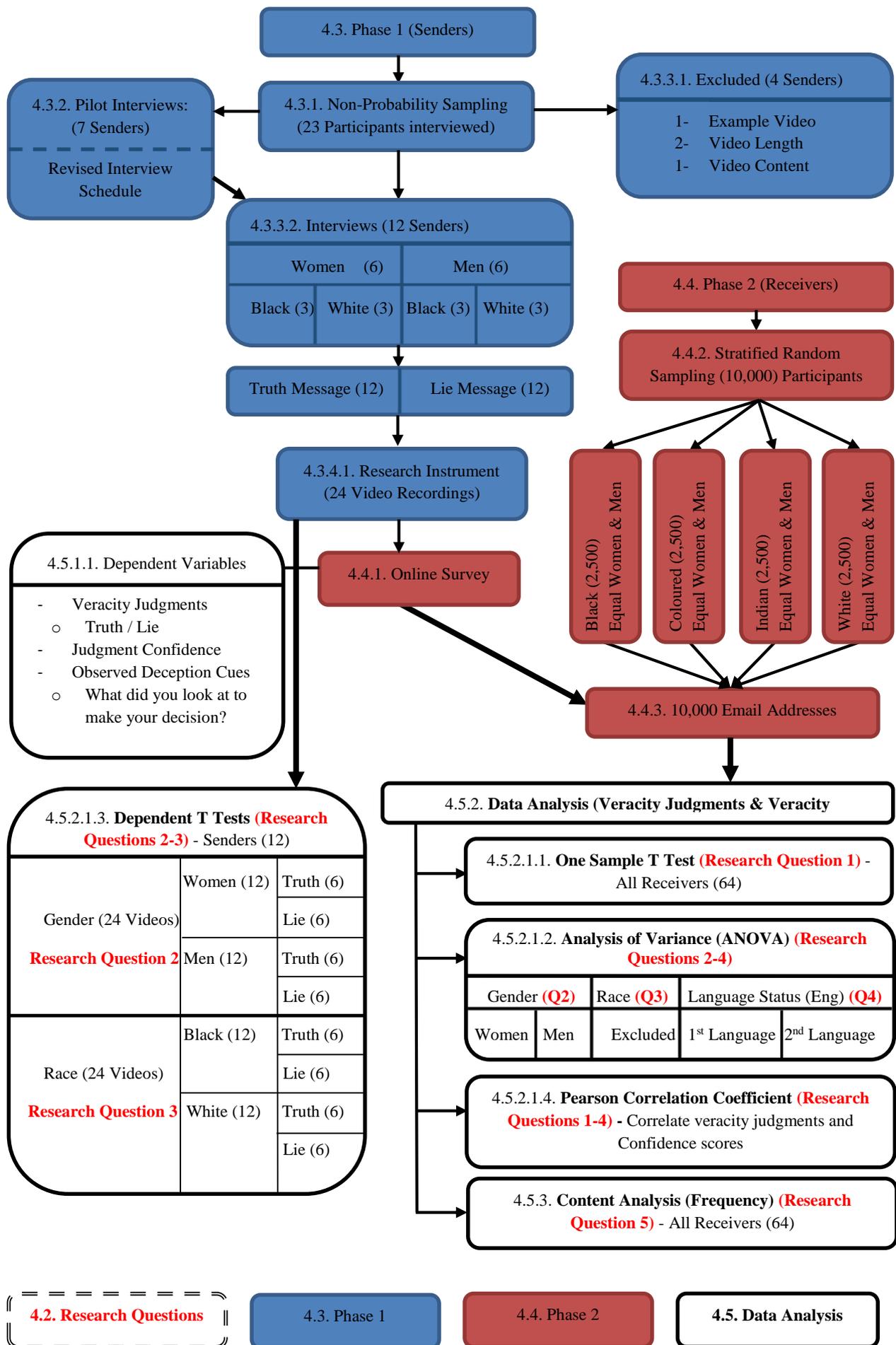


Figure 4.1 Visual overview of the research design

Responses to research questions 1-4 were analysed by using inferential statistics to compare the mean scores of the receivers. Inferential statistics are used to make inferences from data (Gerber & Hall, 2015). The group of statistical techniques that were employed are known as parametric statistics. Parametric statistics assume that the data is normally distributed, as well as that the variance is the same across the data. The data should also be independent, in that the scores of one participant do not influence the scores of another (Field, 2009). The answers to Research question 5 were analysed using Content Analysis, where the number of nonverbal cues mentioned was counted and subsequently discussed according to their relative importance (see Table 4.1).

Table 4.1 Statistical Techniques According to Research Question

Research Question(s)	Sample Independent Variable	Statistical test
Question 1	Receivers – All	One Sample t-test.
Questions 2-4	Receivers – Gender * Race * Language status	Analysis of Variance (ANOVA)
Question 2	Senders – Gender	Dependent Sample t-test
Question 3	Senders – Race	Dependent Sample t-test
Questions 1-4	Receivers – Confidence Levels * Veracity Judgments	Pearson correlation coefficient
Question 5	Receivers – Deception Cues	Content Analysis

Ethical considerations for the study are discussed within each of the two phases to improve ease of reading.

### 4.3. Phase 1 – Research Instrument

In the first phase the research instrument, which consisted of 24 video recordings of participants (senders) who provided truthful and deceptive messages, was developed. A structured interview schedule was constructed and piloted in order to elicit responses. After the pilot interviews, the interview schedule was revised and used to interview the participants again. The video recordings of truthful and deceptive messages elicited from the revised interview schedule were included in the research instrument. All the interviews were video recorded and the relevant recordings were edited for research instrument.

In order to provide a description of the method followed during the first phase, the researcher first discusses the sampling and pilot interviews that were conducted. This is followed by a description of the recordings of senders that were included in the research instrument, as well as those that were excluded. The procedure that was taken to create the recordings is then discussed, followed by the ethical considerations of the first phase.

#### **4.3.1. Sampling.**

During the first phase of the study non-probability sampling was used to obtain participants. Non-probability sampling refers to sampling procedures that are not governed by statistical random selection (Babbie, 2008; Terre Blanche et al., 2006). This phase of the study required sampling enough participants to create video recordings for the research instrument. To accomplish this, quota sampling was used. Quota sampling is a form of non-probability sampling that intends to increase the representativeness of a sample (Babbie, 2008). This study aimed to use 12, voluntary second language English speaking students, in order to create the video recordings for the research instrument. This study was also interested in potential gender and racial differences that could also influence veracity judgments. Therefore, the sample size of 12 was divided equally into 4 categories (gender \* race).

Participants were accessed by advertisements posted on notice boards at one of the University of South Africa's (Unisa) satellite campuses in Pretoria. Therefore, the study depended on volunteers who were willing to participate. In addition, snowball sampling was used. Snowball sampling refers to the sampling method where one participant refers the researcher to another possible participant (Terre Blanche et al., 2006). In this study, participants and students were asked to refer, or bring along, a friend. One-hundred-rand monetary compensation was offered as motivation to participate. They were also told that they would be informed of the results from the study.

In order to participate in this phase of the study the participants needed to comply with four criteria:

- A South African
  - o Living in South Africa

This was because this study focused specifically on the South African context. It was assumed that in order for the stimuli recordings to be consistent with the everyday experience of the

receivers, the videos had to involve participants who were South African and who were living in South Africa.

- A student at the University of South Africa (Unisa)

Although a previous meta-study found that education does not seem to play a role in deception detection (Hartwig & Bond, 2014), students were purposefully chosen for this study. The first reason for this was the assumption that students share similarities in the way that they speak, in that education might have a mediating effect on behaviour. The second reason was that the participants had to be second language speakers (elaborated on below). It was assumed that student's linguistic ability would vary, but that they would have some ability with the English language that is necessary to participate in tertiary education.

- A second language English speaker

In South Africa English is treated as the lingua franca (Khokhlova, 2015), even though it is only spoken by 9.6% of the population as a first language. In South Africa there are 11 officially recognised languages (Statistics South Africa, 2012), thus, because English is treated as the lingua franca, it has become the most spoken language. The majority of the population could be argued to have daily interactions that likely included speaking or hearing English at some point. Therefore, the focus of this study was to look at the veracity judgments of receivers when viewing second language speakers.

- A first language speaker of either Afrikaans or IsiZulu (criteria removed after pilot interviews).

The study originally focused on controlling for the first language of the participants in the first phase of the study, because race and language are intertwined in South Africa (Khokhlova, 2015). The researcher used the country's demographics in order to sample appropriately. The sample originally included only black Zulu speaking individuals and white Afrikaans speaking individuals, whose second language was English.

This requirement became problematic when considering the socio-political climate of the country, and the xenophobic outbreak in South Africa during the beginning of 2015. During this time there were incidents of violence against foreigners, which was exacerbated by high ethnic tensions (linked to spoken language), within South Africa (this occurred around the time of the pilot interviews) ("I had to intervene - Zwelithini," 2015). Although this study was not directly affected by the violence or resulting tension, the language related requirement for the study was halted when

the interview schedule was revised. As a result, black participants spoke a wide variety of languages, and white participants spoke only Afrikaans.

#### **4.3.2. Interview schedule and pilot interviews.**

To create the research instrument, a structured interview schedule was developed, to elicit specific information from the participants. A structured interview schedule has clearly defined questions with a specific question order and content. This type of interview was conducted for the interviews to be similar (Foxcroft & Roodt, 2005). This assisted in developing the research instrument recordings to follow a similar trend.

The pilot interview schedule, as well as the revised interview schedule, consisted of four questions. The first two questions were designed to help the participants to become comfortable during the interview. The answers gained from the third and fourth questions were intended to be used in the research instrument. Answers gained from the third question were used as a baseline to show the receivers a sample of honest behaviour before viewing the veracity messages (Ekman & Friesen, 1974). This also helped to provide some ecological validity to the judgments, as it showed the receivers what the senders looked like while being honest (Matsumoto et al., 2011; Remland, 2009). The final question was intended to elicit the veracity description which the receivers were asked to judge.

During the pilot interviews; the first question asked the participants about their favourite ice-cream. This was assumed to be an unexpected question within this interview context, and was intended to break the ice for the interview. The second question asked about their hobbies. This question, upon which they could elaborate, concerned a personal activity. It was assumed that this would encourage them to give longer responses while being filmed. The third question asked what movies they enjoyed watching. This question was chosen as the baseline as it was about a similar activity that was required in the veracity question (i.e. watching a 'performance' on a screen and describing it afterwards). This could have helped them frame the structure of the answers for the following questions. The final question asked the participants to describe the video that they had watched the moment before. This question was asked twice, once after each of the two videos that they had watched. Before asking this question, the participants were instructed to either tell the truth, or lie about the video. This question was thus designed to elicit the veracity message that would be judged by the receivers (see Appendix B).

The pilot interviews were conducted with seven students from the University of South Africa, who participated voluntarily. During the interviews the participants consistently gave very short responses. A specific problem was the length of the answers on the third question that was intended to be used as the baseline. All, except for two senders' messages, were less than 13 seconds. This was problematic because the baseline video clips for the study intended to use the first 20 seconds of each participant's answer to this question. For this reason, the interview schedule was subsequently revised to include questions more relevant to the sample. This was to gain longer descriptions from the participants.

The revised interview schedule took the same format as described above, however, the content of the questions changed. The first question asked about the student's worst exam experience. The assumption was that because of the amount of stress placed on students during examinations, that students would likely have a memorable negative experience. As well as that, even if they did not have a negative experience with examinations, they would also be able to discuss the absence of it during the interview. The second question asked the participants about their favourite subject. Again because of a shared academic experience it was assumed that the participants would be able to provide a long description. Both these questions were designed so that participants could also discuss their high school experiences. This would have helped, especially if the students were in their first year of studies, and had limited experience in tertiary education. The third question was changed slightly, in that it still asked about the movies that the participants enjoyed, but asked them to rather describe their favourite movie. This question thus asks specifically for a description, where the participants would not merely provide a movie title or genre, as found in the pilot interviews. The final question remained focused on the description of the video that they were watching, only the wording was changed slightly (see Appendix C).

The revised interview schedule resulted in considerably longer descriptions from the participants than the original schedule. The total interview length of the pilot interviews was on average seven minutes and 36 seconds, whereas the interviews with the revised schedule were on average 10 minutes and 47 seconds. Using the new schedule, the answers on the baseline question were consistently longer than 30 seconds, with only two videos that were recorded to below 30 seconds.

### **4.3.3. Senders.**

During this phase of the study 16 students from the University of South Africa participated voluntarily. The truth and deceptive messages from 12 of the 16 participants were selected to be included in the research instrument, as described in the quota above. The truthful message from another participant was used as an example video for the online survey, and was, therefore, not included in the analysis. The final three were excluded from the instrument.

#### ***4.3.3.1. Senders that were excluded.***

Of the three participants that were excluded from the study, two gave descriptions that were again too short. The third participant was excluded from the research instrument as her deceptive story was considered too violent for the purpose of this study.

#### ***4.3.3.2. Senders included in the research instrument.***

In terms of the demographics of the senders that were included, the instrument was purposefully designed to include an equal number of participants across gender and race. This was so that comparisons could be made across the gender and race of the senders. A total of 12 senders were selected because of time considerations (length of the videos), as well as the number of senders who fell into each category. Considering diversity, three participants, who fell into each gender (Female / Male) \* race (Black / White) category (Table 4.2) were included.

Both the truthful and deceptive messages from each sender were included, resulting in a total of 24 recorded messages. This was because it was assumed that some senders could appear more honest / deceptive than others. This also helped to keep the balance of the number of messages that fell into each category in order for the scores on the messages to remain comparable (Table 4.2). This, however, resulted in the research instrument taking approximately 40 minutes to complete because of the length of the veracity videos.

Table 4.2 Senders by Gender and Race

	Race		Total Senders	Messages (Truth/ Lie)
	Black	White		
Women	3	3	6	12
Men	3	3	6	12
Total Senders	6	6	12	24
Messages (Truth/ Lie)	12	12	24	

Senders were all second language English speakers, thus complying with the third sampling criterion. As the fourth sampling criterion was removed the black senders spoke a variety of first languages. The six senders, who self-identified as black, spoke the following as a first language: Tswana/Setshwana=2, IsiXhosa=2, Xitonga=1 and Sesotho=1. The six senders, who self-identified as white, spoke Afrikaans as a first Language. The ages of the participants ranged between 18 and 34, with the average age of 25.

The purpose of the example video was to ensure that receivers understood the instructions of the online survey by providing a practical example, before they commenced with the survey questions. As the majority of South Africans, as well as Unisa students, can be identified as black (Statistics South Africa, 2012; *Unisa at a glance*, 2013), the example video was that of a black participant. Only one example message was selected in order not to make the research instrument overly complex. The truthful message was purposefully selected because the purpose of this study was to discover if there was a lie bias towards second language speakers, and not to determine the effects of the initial viewing order of veracity messages.

#### 4.3.4. Procedure.

Participants (senders) were greeted by the researcher and given a short briefing about the study and its purpose. They were given an opportunity for questions, after which they began completing the biographical information and informed consent forms (Appendix D), as well as the video release form (see Appendix E). They were then asked to sit in front of a Sony vx430HD camera.

The researcher asked the participants if the recording could begin. With their permission, the video camera was switched on, and the interview began using the above described interview schedule (see Appendixes B and C). The first three interview questions were asked as described above. The participants were not limited according to time, in order not to break the flow of their message, and were thus allowed to answer the question until they were satisfied (Warren et al., 2009).

After the baseline question (third question) the participants were shown a video clip that was between one and two minutes long. Each participant saw a different video that contained unique details. This was to prevent their stories from being predictably similar. The videos were about various topic, and are freely available on YouTube.

After they viewed the video clip they were asked to describe what they had watched (question 4) (see Appendixes B and C). The participants were allowed to finish their description in their own time, in order to not break the flow of their message (Warren et al., 2009). The first description of every participant was answered honestly. This was because the honest / lie description order could have affected the way in which participants recalled the videos. Investigating the possibility of this was not the purpose of this study, and thus kept similar across the senders.

After the honest descriptions the second video clip was shown to the participants. Before they were asked to describe the second video, the participants were instructed that they should lie during their next answer. They were told that the previous question would be asked again, and that they should provide a deceptive answer. The only limitation that was placed on the lie was that it must not include any information of the two videos that they had watched. They were given a moment to think of a lie, and then asked to describe the video (question four again) (see Appendixes B and C).

Finally, the participants were debriefed in terms of the procedure of the study. They were told that the recordings would be checked to see which would be included. The selected videos were edited to create the research instrument. The research instrument would then be shown to a second sample of participants (receivers) online. After which the answers from the receivers were analysed to discover if any biases influenced their judgments. Finally, the participants were asked if they had any questions. They were paid R100, and asked to sign a proof of receipt (see Appendix D).

During the interviews the senders' full bodies were filmed. The researcher was seated in front of the participants. The camera was pointed towards the participants at all times, and positioned in front and just to the right of the researcher. The sessions were completed within 30 minutes.

The camera angles for the senders varied slightly between senders as the recordings were made during weekends over the course of a couple of months (Feb 2015 - June 2015). It was thus not possible to keep the equipment stationary in order to show every sender in the exact same way. However, the recordings are all of the full front view of senders; but a difference in angle is noticeable. This variation was not considered to have a significant effect on the way in which the senders were perceived. In their study, Dominic, Jarman, and Lytle (2015) found that camera angles did not affect the credibility of the person being recorded. Sean Brand Multimedia was contracted to assist with the recording and editing of the video material. A confidentiality agreement was included in the contract.

#### **4.3.4.1. Research instrument.**

The research instrument comprised of 24 videos, 2 video recordings (one honest and one deceptive) for each of the 12 senders. In turn each recording consisted of two parts. The first part was a baseline segment that showed the first 20 seconds of the participants' answers to the third question, which required them to describe their favourite movie. This question was intended to show what the participants looked like while being honest. The second segment was one of the answers to the fourth question, that is, the honest or deceptive message. The two segments were edited to play consecutively but were separated by a fade effect. "A *fade* is a transition of gradual decrease (fade-out) or increase (fade-in) of visual intensity" (Cerneková, Pitas, & Nikou, 2006, p. 82). This was in the form of a short fade out (from the baseline video), and fade in effect (to the veracity video), meant to indicate the end and the beginning of the video segments.

The average video lengths, including the baselines, were 84.1 seconds (Longest: 213s, Shortest: 37s). The time of the honest recordings (without baseline) averaged 74 seconds (1Min, 14Sec) and ranged between 17 seconds (0Min, 17Sec) and 148 seconds (2Min, 28Sec). The deceptive recordings (without baseline) averaged 54 seconds (0Min, 54Sec) and ranged between 22 seconds (0Min, 22Sec) and 193 seconds (3Min, 13Sec).

As promised in the advertisement, senders, whose recordings were included, were informed of the overall study results after the analyses were done. They were also provided with a description of

what the score indicated within the context of deception detection (see Appendix F). The senders whose recordings were not included were informed as soon as that decision not to include the videos was finalised.

#### **4.3.5. Ethical considerations for the first phase.**

The major ethical consideration for this phase of the study was that the participants (senders) were recorded and that the recordings would be shown to another sample of participants (receivers) over the internet. The researcher asked voluntary students to participate in this part of the study. They were informed about the content of the study and they were informed that they would be filmed beforehand (Ekman & Friesen, 1974). The students had to give written consent, sign a video release form, and could stop the study at any time. Their identities were kept separate from the created video material to protect their anonymity. Access to the documents was limited to the researcher, and access to the video material was exclusive to the researcher and supervisor (excluding the instances where they were used in the survey).

Ethical clearance to conduct video recorded interviews with the sample of Unisa students was gained from Unisa's Department of Psychology Ethics Committee, as well as the Senate Research and Innovation and Higher Degrees Committee (Ref: 2015\_RPSC\_006). This included showing the recordings to the second sample of students (see Appendixes G1 and G2).

#### **4.4. Phase 2 – Veracity Judgments**

During the second phase the online survey, which was created on the online platform Surveygizmo, the video recordings (created in the first phase) were used (see Appendix H). The video recordings acted as stimuli in order for the second sample of participants (receivers) to make veracity judgments. These judgments were scored, and the correct judgments were analysed in order to answer the research questions. In this study, correct judgments refer to receivers correctly classifying deceptive messages as deception, and honest messages as honest.

The description of the second phase of this study begins with a discussion of the methodological considerations in creating the online survey. After which the sampling procedure, as well as the survey administration for the second phase is described. Finally, the ethical considerations for the second phase are discussed.

#### **4.4.1. Online survey.**

The research instrument was transformed into an online survey using Surveygizmo. An online survey method was chosen for this study mainly because of accessibility (Cohen & Swerdlik, 2009). Since the population of Unisa students are dispersed in terms of geography (Unisa at a glance, 2013), it was considered more efficient to contact students via online methods, instead of face to face contact sessions. This also allowed participants to participate in their own time. The format and additional considerations of the survey are discussed below.

The survey began with an informed consent page that gave a generic description of the study. In the description as much information as possible about the study was provided. However, in order to protect the integrity of the data some information was omitted: It was not indicated that the survey assessed bias based on gender, race or language proficiency. This was to ensure that the receivers did not change the way in which they answered questions based on this knowledge (Babbie, 2008; Baron et al., 2009). Information that was included related to the format of the survey, as well as the amount of time and internet data that were needed to complete the survey. The receivers were informed that the study was voluntary, as well as that they were able to withdraw at any time before submitting the final answers. Receivers were asked to consent to participate in the study by clicking an “I Agree” button (see Appendix H).

The following pages consisted of the video and question pages, beginning with the example question. Each video and subsequent question page were created separately, but formed a page pair so that each answer would correspond to each message that was viewed. This was done so that the pages could be presented neatly (see Appendix H). The survey was created to be ‘forward only’, and thus the receivers were not able to go back to change their answers. This ensured that only their first answers were recorded.

Each question’s video page was shown first, and only included the embedded video. Embedding refers to “any type of multimedia file that you can insert... into the Web page” (ITBusinessEdge, n.d.). As discussed in the first phase, the first 20 seconds of every video showed the sender describing their favourite movie. In order to avoid confusion, the word “Baseline” was inserted next to this segment. After the fade effect (discussed earlier) the senders answered the fourth (veracity) question. In the example video the word “Baseline” was replaced with the words ‘Truth/Lie?’. The ‘Truth/Lie?’ text was only included in the example video to ensure that the receivers understood the instructions. For the subsequent 24 recordings no description was provided after the fade effect.

This was to ensure that the receivers would not be influenced by word use or order (see Appendix H).

The videos themselves were embedded on the page at a height of 480 pixels, and width 853 pixels (this is somewhat wider than a horizontal A5 paper). The video controls were removed from the videos. These included the play/pause button (video control buttons), progress bar, sound controls, and settings. This was done so that the receivers would not be able to jump back and forth through the videos, but rather had to watch it in its entirety. However, with more advanced knowledge the receivers could have controlled the videos using keyboard keys, which could not be disabled. It was assumed that very few of the receivers would have this technical knowledge. The videos were also prevented from playing in full screen as this would have influenced the quality of the videos, and possibly the amount of data that the survey would have needed.

At the bottom of every video page was a “Next” button that needed to be clicked in order to proceed to the question page. The receivers could replay the recordings as many times as they wished as long as they remained on that page. It was possible for a video to play automatically, and change the page when it was finished, but this was deliberately not set because of the slow and occasional unreliable internet speed in South Africa (Vermeulen, 2015). This would have been problematic because participants needed to actually view the recordings on which their judgments were based (see Appendix H).

Each question page included two questions that required an answer before the receivers could continue. The first was a dichotomous question that asked the receivers if they believed that the sender was honest or deceptive. This was a binary choice that required the receivers to commit to the option that most closely resembled their view. Although this type of question does not record their more subtle beliefs (Terre Blanche et al., 2006), it was the dichotomous response in which this study was interested. The second question was scaled, and asked the receivers how confident they were in the first answer. The question was placed on a slider bar which scored out of 100, in increments of 10 (see Appendix H). Scaled questions measure more subtle opinions, which can be useful to see if there are minor variations in the beliefs of the receivers (Terre Blanche et al., 2006).

For every participant who completed the survey, the video - question page pairs started with the example question pages. After which each of the subsequent 24 page pairs were shown in a randomised order that was generated by the survey platform. This was to reduce bias that could arise from the video-question pair page order (Babbie, 2008). The question numbering was set so

that each receiver saw consecutive numbers (1, 2, 3, 4 etc.) on the randomly ordered pages (e.g. 3, 1, 4, 2). The page order of each receiver's survey was recorded, but due to limited responses was not pursued as an avenue for analysis in the current study (see Appendix H).

After answering the final video question page, receivers were asked to provide a short description regarding the behaviour(s) / evidence upon which they based their judgments. A short open-ended question was used to gather this information. Open-ended questions allow participants to answer unrestrictedly in their own words (Foxcroft & Roodt, 2005). This question was asked after all the veracity questions were answered. Thus, the answers only included the cues that the participants claimed they had noticed. As the participants were trying to detect deception for a period of time before answering this question, their answers gave valuable insight into the behaviours that they believed were important. This allowed for an analysis to be conducted on the textual information that the participants provided.

Finally, receivers were asked certain biographical questions. They were asked to indicate their gender, race and age in years. As well as the languages they regarded as their first, second, or third language (if applicable). Three scale questions asked receivers to indicate their proficiency in English with regards to 'Reading and Writing', 'Speaking' and 'Understanding'. The self-reported scales had an inherent bias, in that the receivers could have over- or under-estimated their linguistic ability. These questions assumed that the receivers had some insight as to their abilities. It was also assumed that they would present themselves accurately, instead of trying to make themselves appear more positive (Baron et al., 2009). The answers from these questions were thus not considered in the data analysis and discussion.

In order to determine how receivers accessed the survey, they were asked on what device they completed the survey (computer, tablet or mobile), and if they encountered any problems that may have been of interest to the study (e.g. problems with the survey, sound, video). However, because of a limited response-rate this question could not be utilised and was not considered within the data analysis and discussion of the results.

Finally, the participants were directed to a 'Thank You Page', which gave a short debriefing of the study. It stated that the purpose of the study was to see how judgments are made on second language speakers. It also stated that the study was interested in gender and race as potential sources of bias. The participants were able to see what percentage of their judgments were correct in terms

of the total, the truthful messages, and the deception messages. These scores were also briefly explained within the larger context of deception detection (see Appendix H).

#### **4.4.2. Sampling.**

The total sample size, as granted by the ethical application was 10,000. The main reason for such a large sample was due to the response-rate of online surveys. The average response-rate on online surveys is typically lower (approximately 11%) than other methods (Manfreda et al., 2008). This response-rate involves the number of participants who make an active choice to participate or not. Within the context of the current study, an added consideration needed to be given to the number of students who had seen the emails in order to be able to make this choice. In Mbatha and Naidoo (2010) the researchers asked 110 Unisa communication students how much they interacted with their *myLife* student email accounts. Of the students, 50.9% replied that they had ‘no’ or ‘low’ interaction with the account, 12.7% replied ‘satisfactory’ interaction, whereas 36.3% replied ‘high’ to ‘very high’ interaction with the account. This supports findings by Roberts (2011) (as cited in Molepo & Mothudi, 2014); that the majority of students at Unisa do not have access to their *myLife* accounts, or that they are unable to open these accounts. In consideration of these previous findings, a sample of 10,000 was considered so that, even with a lower response-rate, there would be enough participants in the study.

In this phase probability sampling was employed by conducting a two tiered sampling method that combined stratified sampling and simple random sampling methods. Probability sampling refers to sampling methods that depend on some form of random selection of participants. With stratified sampling, the population is divided into homogeneous groups (strata) in advance, after which a sample database is drawn (Babbie, 2008; Terre Blanche et al., 2006). This combination was to ensure that the sample has a greater chance of being representative of the population when the population consists of relevant subgroups (Terre Blanche et al., 2006). Simple random sampling refers to the method of sampling where each potential participant in the population (in this study, in each stratum) is assigned a random number, which assists in drawing a sample from the population (Babbie, 2008; Terre Blanche et al., 2006). The second phase of the study made use of the Unisa student email database, and a stratified random sample was drawn to select potential participants.

The sampling criteria that were used during this phase of the study were:

- Participants needed to be South African
  - o Living in South Africa

This was because this study focused specifically on the South African context. It followed that the videos had to have been shown to South Africans who were currently living in South Africa. It was thus required to make sure that the receivers were living in South Africa: Because Unisa is an ODL institution the students could have been living anywhere in the world (Unisa at a glance, 2013).

- Students from the University of South Africa

Unisa is an open distance learning institution, which means that the majority of its educational programs are studied by students who are not able to go to contact universities (because of work or financial reasons), or who prefer to study according to their own pace.

Unisa has had a drive to have a stronger online presence, by trying to increase students' access to the internet, electronic media, and the online learning environment ("Our future," 2012). The participants needed to be students as it was assumed that they would have the basic computer skills and access, required to complete the online survey. Although no advanced skills were necessary, it was required that participants had some basic experience with how a computer and the internet function, and thus be able to access the survey.

The second reason was that it was assumed that student's linguistic ability would vary, but that, both first and second (English) language speakers would have some ability with the English language as it is required to participate in tertiary education.

- Aged between 18 and 45

Although age was not found to be a significant determinant of deception judgments accuracy (Aamodt & Custer, 2006), the age limit of 45 was introduced because findings have suggested that older participants may introduce other mediating factors (Sweeney & Ceci, 2014).

Therefore, access to the complete database, only consisted of students who were registered for 2015, who were South African and between the ages 18-45. The database was then divided into four strata, according to the race of the students, thus creating four databases, one for each of the racial categories (black, coloured, indian, and white). Each of the four categories was subdivided according to gender. This created eight categories: Race \* gender. Since Unisa only provides captured data for preferred tuition language between Afrikaans (Afr) and English (Eng), the data set could merely be subdivided according to those two languages. The only category that consisted of a large enough number of students within each was the white racial category. Therefore, only this

category was further subdivided (Table 4.3). As the language chosen was the ‘preferred language’, it was assumed that the majority of the white students, who indicated English as their preferred language, were English students. It is therefore possible that this stratification may not have reflected an accurate representation of the student’s first languages.

A simple random sampling technique was used to select random samples of student from each stratum. Simple random sampling ensures that each student (within each stratification), has an independent, and equal chance of being selected (Babbie, 2008; Terre Blanche et al., 2006). The random number generator, which was included in Microsoft Excel 2013, was used to create a random number for each student. This was completed separately within each of the ten stratifications: Race \* gender \* language. The students’ emails were then sorted numerically according to the random numbers allocated. The first 1,250 emails were selected (625 emails for both Afrikaans and English white students). These emails were then combined into a single database that included the entire sample of 10,000 emails (Table 4.3).

Table 4.3 Sampling of Receivers by Gender and Race

	Gender		Total
	Women	Men	
Black	1,250	1,250	2,500
Coloured	1,250	1,250	2,500
Indian	1,250	1,250	2,500
White			
Afrikaans	625	625	1250
English	625	625	1250
Total	5,000	5,000	10,000

The sample database was checked to make sure that it did not include any students who volunteered during the first phase. One such name did appear, and it was subsequently removed from the sample list, and replaced with the following student’s email address from the same category.

#### **4.4.3. Administering the research instrument.**

After the online survey was completed and checked, the online survey platform was used to email a secure website link to the sample of potential receivers. The email briefly described the study and its purpose, and included a secure link to the survey (see Appendix I). After the receivers clicked the link they were shown the information and consent page that provided details of the survey. It briefly explained the nature of the study and provided them with the expected time that participation would take (approximately 40min) (see Appendix I).

Email messages were sent on two occasions, the first was an introduction, and the second was sent as a reminder. Reminder emails are intended to increase the number of responses that one receives, and could significantly increase the response-rates (Babbie, 2008). The first email, which was sent on 29 July 2015, included a broad introduction and invitation to participate in the study. The closing date for the survey was 31 August 2015 (see Appendix I). A total of 10,000 emails were sent to the selected email addresses, and no emails were rejected by the email server, suggesting that they were delivered. The emails were sent as 'HTML only'. 'HTML only' means that the email contained some elements of computer programming, similar to those of websites. This allows the email text to be bold, italics, or in different fonts, it can even include pictures or other media. The limitation of these emails is that the email server may misinterpret the messages, or send it to the 'junk' folder (Notenboom, 2006).

Because of the poor response-rate the closing date for the survey was extended to 28 September 2015, which was within the two-month limit as set by the Senate ethical application. A reminder email was sent on 1 September 2015, to elicit more responses. A total of 9,943 reminder emails were sent out to potential participants who had not previously completed the survey (49 had completed the survey and 8 people had unsubscribed from the email list). No emails were rejected by the email server, suggesting that they were delivered. The information of the second email was almost identical to the first. An additional request, which was aimed at students who had seen the survey but not completed it, asked the students to consider completing the survey when they had the time (see Appendix J). No compensation was offered for completing the survey. The email was sent as 'text only' because of the concern that the email may be sent to the 'junk file'. A 'text only' email refers to an email that does not have the option of changing the font or colour of the text, because it does not include the necessary programming language in such emails (Notenboom, 2006).

Surveygizmo is not capable of scheduling the sending of the total amount of emails in segments over a period of time. This created the possibility that some of the introduction emails could have

been labelled as spam, due to the large number of emails sent out at the same time. There was no indication of this as the participants who clicked the link or completed the survey were widely spread across the database. However, as there were no markers to indicate if any of the emails were labelled as spam, this may have occurred. Using email distribution software such as MailChimp could have provided a solution, but due to budget considerations this option was not possible.

#### **4.4.4. Ethical considerations for the second phase.**

The ethical considerations for this phase of the study included that the researcher deliberately omitted some information concerning the purpose of the study. In communicating with the receivers, the researcher was deliberately vague about the purpose of the study. Receivers were told that their ability to detect deception would be tested. But there was no mention of second language bias, or that the effects of gender or race would be considered. This was to ensure that the receivers did not focus more on these aspects of the senders than they would have otherwise. This is sometimes known as the Social Desirability bias that refers to a tendency to answer questions in a socially acceptable or desirable way (Baron et al., 2009; Foxcroft & Roodt, 2005). These omissions were not considered harmful to the participants, as it was intended to encourage participants to focus more on detecting deception than on other aspects such as race or gender.

This study used a 50/50 division of truth-and-lie tellers, as well as that the same senders were shown twice. Since the receivers might have attempted to anticipate the answers, the researcher needed to give false background information to keep receivers from attempting to anticipate answers. Therefore, the receivers were told that some senders did not lie and that some did not tell the truth and that the senders could choose the type of message that they delivered. This was intended to introduce a bit of doubt to their veracity choices. Although the question option was binary, this information was intended to make the participants think about every choice, and not rely on their previous answers to influence what they chose.

Ethical clearance was gained from Unisa's Department of Psychology Ethics Committee, as well as Senate Research and Innovation and Higher Degrees Committee (Ref: 2015\_RPSC\_006), in order to gain access to students' email addresses (see Appendix G1, G2). This was for the purpose of sending the secure survey link to be opened by the students. The original application only included access to the email addresses of up to 120 students. The response-rates of online surveys are notoriously quite low (Manfreda et al., 2008), and therefore, a second application, to increase

the total sample size to 10,000, was made before the data collection for the second phase. This application was granted on 19 June 2015, before the collection commenced.

#### **4.5. Data Analysis**

The purpose of analysing data is to reduce the raw information into a specific answer (Terre Blanche et al., 2006). The data analysis was conducted in order to answer each of the five research questions in this study. Inferential statistics were used to analyse the answers to questions one to four. The group of techniques, which were used to compare the mean scores on the survey, are referred to as parametric statistics. The answers to research question 5 were analysed by means of Content Analysis. The number of times that certain coded terms were used were totalled and discussed according to their relative importance.

This discussion begins by discussing the dependent and independent variables that were considered in this analysis. The characteristics of both senders and receivers were examined and are described. An account of every test used to answer the research questions follows. The discussion of the tests used within this study is organised according to the research questions. However, to avoid repeating information, the research questions that used the same techniques are grouped together in this discussion.

##### **4.5.1. Variables.**

Variables can be viewed as attributes that have been grouped in a logical way (Babbie, 2008). These attributes need to comprise two or more values (e.g. gender or age) (Terre Blanche et al., 2006). There are several types of variables, but this study was specifically interested in dependent and independent variables. Many variables can be treated as dependent or independent variables, those considered in this study are discussed below.

Variables that are measured are referred to as dependent variables (DVs). The DV's value is dependent on the specific value of the Independent Variables (Babbie, 2008; Baron et al., 2009; Terre Blanche et al., 2006). Independent variables (IVs) are seen to cause different results in the dependent variables (Babbie, 2008; Terre Blanche et al., 2006). IVs are assumed to be a given when conducting the analysis, and are manipulated in experiments / quasi-experiments in order to view if they do have an effect on the DV, and what that effect entails (Babbie, 2008; Baron et al., 2009; Terre Blanche et al., 2006).

#### **4.5.1.1. *Dependent variables.***

The Dependent Variables that were considered for the analysis of the research questions were: The veracity judgments (Truth / Lie), the confidence level that was reported for each veracity judgment, as well as the perceived deceptive cues as reported by the receivers.

The senders in this study were all selected based on the criteria that they were second language English speakers. The main aim of the analysis was to explore the possibility of a lie bias towards second language speakers, as well as if gender, race, or language status affected the receivers' judgments. In order to accomplish this in the analysis several constructs were created by averaging specific scores across the dataset. This was to see if there were differences in accuracy, or if there were biases in the responses. The comparisons made across the receivers' responses are discussed in each of the Independent variables. The constructs created to make comparisons across senders are focussed on below.

- The veracity judgments

In the survey receivers made judgments by deciding if a video portrayed a truthful or deceptive message. If they chose correctly it was scored as 1, if they chose incorrectly it was scored as 0. In this study, there was a 50 / 50 base-rate for truth and deceptive messages (12 truthful messages, and 12 deceptive messages). Therefore, in total, the receivers should score close to 0.5 (50%) just by guessing. This suggests that, if the receivers scored 50% for all the messages, they could have been guessing. If they scored around 0.6 (60%) for truth messages, and 0.4 (40%) for deceptive messages (averaging to a total of 50%), it would suggest that they were truth biased. This trend was found in previous deception detection studies (Bond & DePaulo, 2006). If the opposite occurred, that is if receivers scored 40% for correct judgments for the truthful messages and 60% for correct judgments of the deceptive messages it would suggest that they were lie biased. This was suggested by previous studies that considered second language speakers (Da Silva & Leach, 2013).

In order to measure the receiver's performance with regard to the veracity judgments three overarching constructs were created (i.e. Total, Truth, Lie). This was accomplished by averaging the scores of each receiver; that is, the judgments across all the messages (Total), all the judgments of messages that were truthful (Truth), and all the judgments of messages that were deceptive (Lie). The same logic was followed in creating constructs that would measure the effects of the sender's gender or race on the judgments made by receivers (Table 4.4).

Table 4.4 Compilation of Constructs According to the Gender and Race of Senders

Additional Construct	Description: These constructs were created by averaging receiver's judgments.
Total * Gender (Female / Male)	Across all the messages according to the sender's gender. Thus, a construct was created for all the messages by Females (Female Total) and a construct for all the messages created by Males (Male Total).
Truth * Gender (Female / Male)	Across all the truthful messages according to the sender's gender. The same logic was followed as the first gender construct above.
Lie * Gender (Female / Male)	Across all the deceptive messages according to the sender's gender. The same logic was followed as the first gender construct above.
Total * Race (Black / White)	Across all the all messages according to the sender's race. Thus, a construct was created for all the messages by black senders (Black Total) and a construct for all the messages created by white senders (White Total).
Truth * Race (Black / White)	Across all the truthful messages according to the sender's race. The same logic was followed as the first racial construct above.
Lie * Race (Black / White)	Across all the deceptive messages according to the sender's race. The same logic was followed as the first racial construct above.

Making the distinction between veracity (Total, Truth, Lie), and biographic information of the senders (gender, race) is useful for several reasons. The veracity constructs provided two distinct indications. The constructs of the Total scores provided an indication of judgment accuracy (the

correct classification of both truthful and deceptive messages). Thus, the higher the Total, the more accurate the receivers were (as described above). Considering the correct Truth or Lie constructs provided insight into a possible truth or lie bias (also discussed above). In combining these constructs with the sender's gender or race could provide valuable insight into the effects of each. Both of these corresponding constructs could then be used to test for differences in judgment scores. These differences could in turn serve as indications of biases because of the biographical information of the sender, or the veracity of their message.

For example, a comparison of the Total scores for the messages from female and male senders would provide an indication about the effects of the gender of senders on the ability of receivers to make correct classifications. But these scores can also be influenced by extreme or even moderate biases. Therefore, if female and male senders are judged more truthful or deceptive than the other it could aggregate to a similar or drastically different Total scores, but with an underlying veracity bias because of the gender of senders.

- Veracity Confidence

The receivers were also asked how confident they were about the veracity judgments they made. This was asked in order to find out if there were more nuanced beliefs about the veracity of the messages, as well as how strongly receivers were committed to their choice. Greater confidence could indicate stronger biases. Confidence scores were compared across the gender, race and language status of the participants.

Receivers' confidence levels were measured on a self-reported scale question. This question was scored out of a 100 (in increments of 10). The means of the answers were used to conduct the analyses. This variable could also be used to indicate if the receivers' confidence scores were correlated with the accuracy of their beliefs. Previous studies have suggested that accuracy and confidence are not related (Colwell et al., 2012; Vrij et al., 2010). This, however, can also give an indication of different deception stereotypes that could be relevant for future research.

Similar to the veracity judgments, the means of the confidence scores were calculated in order to create several constructs that could be used in the analyses. These constructs followed a similar pattern as the veracity judgments, so that the correlations between the two types of scores could be calculated (discussed later). Therefore, overall constructs were created for confidence ratings on all the messages (Confidence Total), only ratings on truthful messages (Confidence Truth), or only ratings on deceptive messages (Confidence Lie). In addition, constructs were created with the

confidence scores according to the veracity of the message and biographical information about the sender.

- Perceived Deception Cues

The deceptive cues that receivers claim to notice could suggest a tentative view as to why there are certain tendencies within veracity judgments on second language speakers. If the cues mentioned are similar to those reported by previous studies (Castillo, 2011; Global Deception Research Team, 2006), then it may be feasible for future research to concentrate on other aspects of veracity judgments.

**4.5.1.2. Independent variables.**

To determine if there was an overall bias; the overall veracity construct (Total, Truth, Lie) scores of the receivers, were examined to see if there was a general towards second language speakers. Other independent variables that were scrutinised related to the biographical information of the receivers. As discussed in the sampling sections, participants were sampled according to certain biographical criteria that were used in the analyses.

The independent variables that were considered included the receivers' gender, race, and language status (first or second language speakers). Thus, comparisons could be made between female and male receivers, as well as comparisons between first and second language English speakers. Such comparisons were also made according to the receivers' self-reported race.

**4.5.2. Statistical techniques.**

The statistical techniques used within this study can be described in broad terms as descriptive statistics and inferential statistics. The descriptive statistics made use of frequencies, averages and standard deviations to provide a description of the biographical information and veracity constructs. This furnishes a background picture of the information that is used within this study. The inferential statistics made use of a group of techniques referred to as parametric tests, as described earlier. The parametric tests that were used to analyse the data are elaborated on in the discussions relating to the various research questions.

During the data analyses a nonparametric test was also used to compare the means between variables. Nonparametric tests refer to statistical techniques that do not assume that the data are normally distributed, in addition to being useful should other assumptions be violated. This group

of techniques lose some information as they require the data to be changed so as to adhere to the assumptions of normality to conduct the analysis. However, they have the advantage of being useful when groups are small (Field, 2009). It was necessary to make use of a nonparametric technique when analysing the variable 'race' of the senders. This is more thoroughly discussed within the section concerned with answering the third research question.

#### **4.5.2.1. Parametric techniques (research questions 1-4).**

Parametric statistics were used during this study because they assume that the data are normally distributed, as well as that the variance is the same (homogeneous) across the data. They further assume that the data are independent, in that the scores of one participant did not influence the scores of another. The assumption of independence is true for all the techniques used in this study, except for the dependent t-test discussed below (Field, 2009).

The specific tests that were used to address the research questions were: One sample t-test, Analysis of Variance (ANOVA), Dependent Sample t-test (along with the non-parametric counterpart: Wilcoxon sign-rank), and Pearson correlation coefficient. Effect size of significant results was measured by making use of Cohen's d. Below follows a short description of the function of each test with reference to the research question they were meant to answer.

##### **4.5.2.1.1. Question 1: One Sample t-test.**

In this study a One Sample t-test was conducted to see if the overall scores differed from chance. This technique is used when the mean scores, that are compared, are known, but the standard deviation for one of the means is not (Terre Blanche et al., 2006). In this study the mean of the sample was the mean score that was obtained from the sample of receivers, and the second mean, used in the equation was the score that could be attained by chance alone (50%). The standard deviation of the receivers was calculated from their scores. The second mean was calculated from the probability of getting a correct answer from only two choices, which amounts to 50%. Therefore, the second standard deviation could not be calculated.

The One Sample t-test assumes that the standard deviations are the same even if the samples are from different populations (one sample that volunteered in this study, the second is a hypothetical mean calculated from chance). This assumption sacrifices some of the accuracy of the calculation, because it cannot be assured that the standard deviations are truly the same. However, makes it possible to measure the scores against chance (Terre Blanche et al., 2006).

The hypothesis, relating to the first question, was that receivers would not be able to detect deception with more accuracy than dictated by chance. According to Burgoon (2015), as biases become stronger, accuracy becomes weaker. The overall scores from the receivers would give an indication of the accuracy levels in this study. Testing the judgments on the truthful and deceptive messages separately can give an indication of possible bias.

This test was conducted on the veracity constructs' scores of all the receivers, in terms of how accurate they were in Total (all 24 the veracity messages), in terms of the number of correct truthful messages (12 Truth messages), as well as the number of correct deceptive messages (12 Lie messages). To accept the null hypothesis (that accuracy is measured at chance level); an 'ideal' result would reflect that the accuracy was not measured significantly above or below chance level (50%). This result leaves 'room' for a truth or lie bias in that the truth judgments are correct significantly below chance level (i.e. 40%), and deceptive messages are correct significantly above chance level (i.e. 60%), in the case of a lie bias, or vice versa, in the case of a truth bias.

#### 4.5.2.1.2. *Questions 2-4: Analysis of variance (ANOVA).*

An Analysis of Variance (ANOVA) was conducted in this study to investigate the effects of the receiver's gender, race, and language status on veracity judgment accuracy or bias in addition to the effect on the receivers' confidence scores. An ANOVA can be used to compare the means of two or more variables to determine if the independent variables have an effect on the dependent variables (Gerber & Hall, 2015). In this study an ANOVA was used to see the effects of the interaction between all three independent variables: (gender {Female / Male} \* race \* language status {First / Second Language}), on the veracity constructs (Total, Truth, Lie) and confidence constructs (Confidence Total, Confidence Truth, Confidence Lie) described above. However, due to the limited response-rate the variable concerned with receivers' race was removed from the analysis. This is discussed in more depth later in the dissertation.

Similar to a t-test, an ANOVA tests if the means of the samples are different. This helps to indicate if the independent variables had an effect on the dependent variable constructs. Therefore, the analysis was performed to determine whether there were any statistically significant differences between the means of the variables. This analysis was able to indicate if any of the variables, or an interaction between the variables, had a significant effect on the accuracy, bias, or confidence of the receivers. The ANOVA is robust against violations of normality, meaning that the test is still accurate if the assumption of normality is violated (Field, 2009). Therefore, even with the weak

response-rate in this study, this meant that the measure could still be said to accurately reflect the results. However, with a more representative sample, it is possible that a different trend would become evident.

This study hypothesised that the gender (question 2) as well as race (question 3) of the receivers would not have a significant effect on receivers' judgments. In order for the hypotheses, relating to these questions, to be true the ANOVA's for gender and race would not show significant differences between the means.

With regards to the receiver's language status (question 4), the hypothesis stated that first language English speaking receivers would be more accurate in their judgments than second language speakers. To accept the hypothesis, the ANOVA on the language status should detect a significant difference between the first and second language mean scores. As stated above the variable for receivers' race was removed, the implications of which are discussed more extensively within the discussion on the research question and limitations.

#### *4.5.2.1.3. Questions 2-3: Dependent Sample t-test.*

To investigate the possible effects of the sender's gender and race on veracity judgments, a Dependent Sample t-test was used to analyse the data in terms of the constructs that were described before. A Dependent Sample t-test was used in this study when the questions (senders' veracity messages) were judged by the same participants (receivers) (Field, 2009). The means of the two scores (i.e. those relating to receivers' veracity statements) were compared to see if the receiver's judgments differed significantly because of the senders' gender or race.

The hypotheses, with regards to the second and third questions, were that there would be no significant difference between the veracity mean scores relating to sender's gender and race. To test this, the Total, Truth, or Lie mean scores were calculated according to gender and race. The Total score provides an indication as to whether accuracy differs because of the sender's gender and race, and the Truth and Lie mean scores provide an indication of potential judgment bias.

The first test was conducted on the mean scores from all the receivers on the constructs Female Total and Male Total. This was followed by comparisons between the means concerned with Female Truth and Male Truth, as well as Female Lie and Male Lie. The second set of comparisons followed the same logic by comparing the means of the racial groups (black and white senders).

However, due to limitations in the response-rate, as alluded to thus far, a Wilcoxon sign-rank test was performed in relation to the variable concerned with the receivers' race, in order to support findings from the Dependent T-test. The Wilcoxon sign-rank test is a non-parametric test that can be used on smaller datasets, or if the data from a variable violates one or more assumptions required by the parametric counterparts. This test transforms the data into a ranked dataset that is used during the analysis. Because of this transformation some information is lost and thus possibly makes the measure less accurate, but with the advantage that the analysis could provide a possible answer (Field, 2009).

In order for the null hypothesis to be accepted the analysis should reveal no difference between the mean scores. This would indicate that the receivers did not differ in the way that they judged the senders across gender or race. Since this test assesses the differences between only two means, the interaction between the gender and race of the senders was not investigated. This would have required multivariate statistics, as well as a larger sample of data than that of the current study.

#### 4.5.2.1.4. *Questions 1-4: Pearson correlation coefficient.*

To test the effect of the receivers' confidence level on the judgment accuracy or bias, it was necessary to use a Pearson correlation coefficient. The Pearson correlation coefficient is a bivariate correlation, meaning that it measures the strength between two variables (Field, 2009).

The Pearson correlation coefficient is used when one is interested to find out the strength of a linear association between two variables. The question, in which this study was interested was: If the mean of the confidence variable increases is there a corresponding increase in the correct veracity judgments? The test results may show a positive relationship (i.e. as one score increases, the second increases), no relationship (i.e. no association between scores), or a negative relationship (i.e. as one score increases, the second decreases). The result of this type of measure is an 'r' score that ranges between 0 (no correlation) and 1 (perfect correlation). The symbol of the 'r' score (-1 or +1) indicates the strength of a negative or positive relationship (Field, 2009).

The correlations were conducted with the interest of determining, whether there was a relation between how confident receivers were about their choices (first variable) and how accurate their judgments were (second variable). As well as if there was an interaction based on truthful or deceptive messages. Therefore, the Confidence Total construct mean score was correlated with the Total mean scores, to determine whether there was a relationship between the two. In addition, the

test was used to determine if there was a correlation between veracity judgment mean scores (Truth and Lie) and Confidence mean scores (Truth and Lie).

This study hypothesised that receivers would be less confident when making veracity judgments on deceptive messages. For this to be correct the Confidence Lie construct mean score should be lower than the Confidence Truth mean score, in order to reflect this reaction.

#### **4.5.3. Content analysis (research question 5).**

To answer the final research question, content analysis was done to find out which cues receivers believed were diagnostic of deception. Content analysis is used to ascertain the number of times that codes are used within textual data (Leech & Onwuegbuzie, 2007). This was implemented to infer the (assumed) relative importance of the mentioned cues that were seen as diagnostic of deception by the receivers. The importance of certain terms is assumed because important concepts are not always mentioned and therefore would not appear often in a frequency analysis. The terms are relative in importance in that certain codes are used more relative to others. Thus, when conducting the content analysis, the textual data in this study was analysed to detect the relative importance of the various terms, as well as their possible combinations.

Within this analysis each behaviour or possible behavioural cue was coded individually with only one term (with some exceptions). In addition, each code was used only once per receiver (if the relevant term was present present). Most of the codes used were thus mutually exclusive, meaning that the same data was not coded twice. There were codes that were used on the same data, which are described in the analysis.

After the coding was finalised, a frequency distribution for each code was compiled. This type of analysis assists one to infer the relative importance of certain codes, based on the number of times they were used (Leech & Onwuegbuzie, 2007). In the current study, this did not, however, show the relative importance that the concept had for any specific receiver, except that it was mentioned – this was due to, the coding convention used during this study. It nevertheless gave an indication of the assumed relative importance that the concept had for the total sample of receivers. For this reason, the frequency counts were not used, because they would provide a false certainty about the importance of the codes that would not necessarily be found within this study. Rather the relative importance of the codes was reported by means of a bar chart. The focus of this analysis thus provides the reader with an overview of what the receivers claimed to have influenced their

judgments, in addition to the importance of the codes relative to the other codes. After which the codes were then grouped together to provide an overview of what the receivers considered to be important.

In conducting this analysis this study attempted to find similar trends as found in previous studies (Al-Simadi, 2000; Castillo, 2011; Global Deception Research Team, 2006). However, the results could not be ‘directly’ compared, due to different coding conventions used. However, it could show that certain types of cues were similarly mentioned. If more stereotyped behaviours were mentioned it could indicate that more specific research is needed into this matter, and their effects on judgment accuracy in a variety of conditions.

#### **4.6. Conclusion**

This chapter provided an overview of the study in terms of the research design and method used. The study was described in two phases, each phase comprised a section of the data collection process. The first phase described how truthful and deceptive videos were created by recording truthful and deceptive messages from the first group of participants who acted as the senders within this study. The second phase described the process of creating the online survey, and collecting the veracity judgments from the second group of participants who were the receivers for this study. The third section of this chapter explained the data analytical process that was followed in order to make sense of the data that were collected. Within this section the data analytical techniques were described as to how the answers to each research question were analysed. The chapter concluded with a description of the content analysis that was conducted on the textual data collected in the online survey. In this way, the method chapter provided an overview of the design of the study, how the study was conducted, and how the raw information was analysed to answer research questions. This is furthermore visually depicted in the diagram used in the beginning of this chapter (Figure 4.1).

The following chapter provides the results of the data analysis. For this reason, the chapter begins by describing the receivers within this study by means of descriptive statistics. The study response-rate and demographical information of the receivers are reviewed. The distribution of the constructs that were used in the current study to describe the accuracy, and bias judgments, alongside the scores indicating receiver’s confidence levels in making these choices, are addressed. To ease the reading of the chapter the constructs are not described in terms of gender and language status distribution as their discussions find more relevance within the answers to each research

question. Inferential statistics were used to summarise the answers to the research questions (one to four). The chapter concludes with the results of the content analysis of the answers to the final research question.

## **Chapter 5 – Results**

### **5.1. Introduction**

This chapter describes the process and results from the data analyses of this study. In order to accomplish this task, the data were downloaded (in the form of an excel spread sheet), and cleaned. After which the data was combined by creating the relevant constructs introduced in the method chapter, and analysed according to the approach described in the method chapter. From the analyses the current chapter provides an answer to each of the research questions. The chapter begins by describing the sample of receivers who participated in the study. Specific concerns about the receivers include the survey response-rate and the demographic information of those who completed the survey. This is followed by the descriptive statistics that relate to the veracity (Total, Truth, Lie) and confidence (Confidence Total, Confidence Truth, Confidence Lie) constructs described in the previous chapter. In addition, the constructs were organised according to the gender and race of the senders, in order to explore the possible effects of those variables (the descriptive statistics of these combinations are not elaborated on below).

After the description of the constructs, the chapter continues with the results obtained from the inferential statistics. To simplify the discussion, the analyses are described in terms of the research questions. Therefore, the answers gained from the analysis for the first research question are discussed first. After which the answers for questions two to four, in terms of the ANOVA, are expounded. This is followed by the other analytical approaches used for questions two to four. This chapter concludes with the answer to the final research question that was analysed by means of content analysis.

### **5.2. Descriptive Statistics**

#### **5.2.1. Demographical data.**

As described above the data were downloaded, cleaned, and constructs were created before they were analysed. The downloaded data contained the entire data base, of collected data from the receivers, including answer from the surveys that were partially completed. From this database it could be seen that 389 of the sample who were emailed clicked a link within the email (either the link to the survey or unsubscribe link), of those 296 participants started with the survey. Ultimately 11 of the students who were emailed unsubscribed from the email list, 232 of the students who had started, withdrew before completing the survey and finally, 64 participants completed the survey within the allowed timeframe. This resulted in a response-rate of 0.64%.

Receivers (N = 64) were between the ages of 18 and 44, with a mean age of 28.36 (SD=7.004) (Table 5.1).

Table 5.1 Descriptive Statistics Concerned with the Age of Receivers

Variable	n	Minimum	Maximum	M	SD
Age	64	18	44	28.36	7.004

Of the total receivers, 31 female (48.4%) and 33 males (51.6%) (Table 5.2). Participants identified their race as: Black = 6 (9.4%), Coloured = 11 (17.2%), Indian = 11 (17.2%), White = 33 (51.6%), Asian (included within the ‘Other’ category) = 1 (1.6%) and Other = 2 (3.1%). First language English speakers were N = 38 (59.4%) and N = 26 (40.6%) claimed to be second language English speakers (Table 5.2). The majority, N = 22 of the second language English speakers identified Afrikaans as their first language. Other languages that were identified were: Tswana = 1, Zulu = 1, Swati = 1, and North Sotho = 1.

Table 5.2 Frequency Scores of the Demographics of Receivers

Variable	n	Label	Count	%
Gender	64	Female	31	48.4%
		Male	33	51.6%
Race	64	Black	6	9.4%
		Coloured	11	17.2%
		Indian	11	17.2%
		White	33	51.2%
		Other	3	4.7%
Language Status	64	First Language	38	59.4%
		Second Language	26	40.6%

### **5.2.2. Constructs.**

In creating the relevant constructs, the scores of receivers on the specific messages were aggregated according to several predetermined combinations. Each veracity judgment had only the possibility of being scored as zero (0) or one (1), thus the aggregated scores all ranged between 0 and 1. As described above, this aggregation included the judgments on all 24 message; 'Total', judgments on the 12 'Truth' messages, and judgments on the 12 'Lie' messages. The same method of aggregation was followed in order to create the constructs for the Confidence scores. This created a mean score for the Confidence Total construct (the mean confidence score indicated by the receivers over all of the messages). Thus in aggregate the confidence scores ranged between 0 and 100. Combinations of the Confidence scores followed the same logic as the above, additionally creating a Confidence Truth and a Confidence Lie construct.

The constructs are described separately below. The average scores on the constructs concerned with the veracity judgments are described first. After which the constructs concerned with the confidence scores are described. The constructs that were created regarding the senders' gender and race are not considered here as they would add nothing to the current description except for adding an unnecessary layer of complexity.

#### **5.2.2.1. Veracity construct.**

The mean of the receivers' Total score on the veracity message was 0.525 (SD = 0.104). A high Total score implies that the receivers were more accurate in making veracity judgments, a low score implies that the receivers were less accurate. The mean of the receivers' Truth scores was 0.552 (SD = 0.192). A high Truth score implies that the receivers were more correct in making truthful judgments, a low score implies that the receivers made less correct judgments. Finally, in terms of the Lie construct, the mean score was 0.499 (SD = 0.17). A high Lie score implies that the receivers were more correct in making deception judgments, a low score implies that the receivers made less correct judgments (Table 5.3). This is also indicated visually in Figure 5.1.

The mean of the receivers' correct scores for the truthful example video was 0.359 (SD = 0.484).

Table 5.3 Descriptive Statistics of the Veracity Constructs as Scored by the Receivers

Construct	M	SD	n	Minimum	Maximum	Median	Mode	Range
Total	0.5254	0.1036	64	0.25	0.75	0.5208	0.5833	0.5
Truth	0.5521	0.1916	64	0.0833	0.9167	0.5833	0.5833	0.8333
Lie	0.4987	0.1703	64	0.0833	1	0.5	0.4167	0.9167

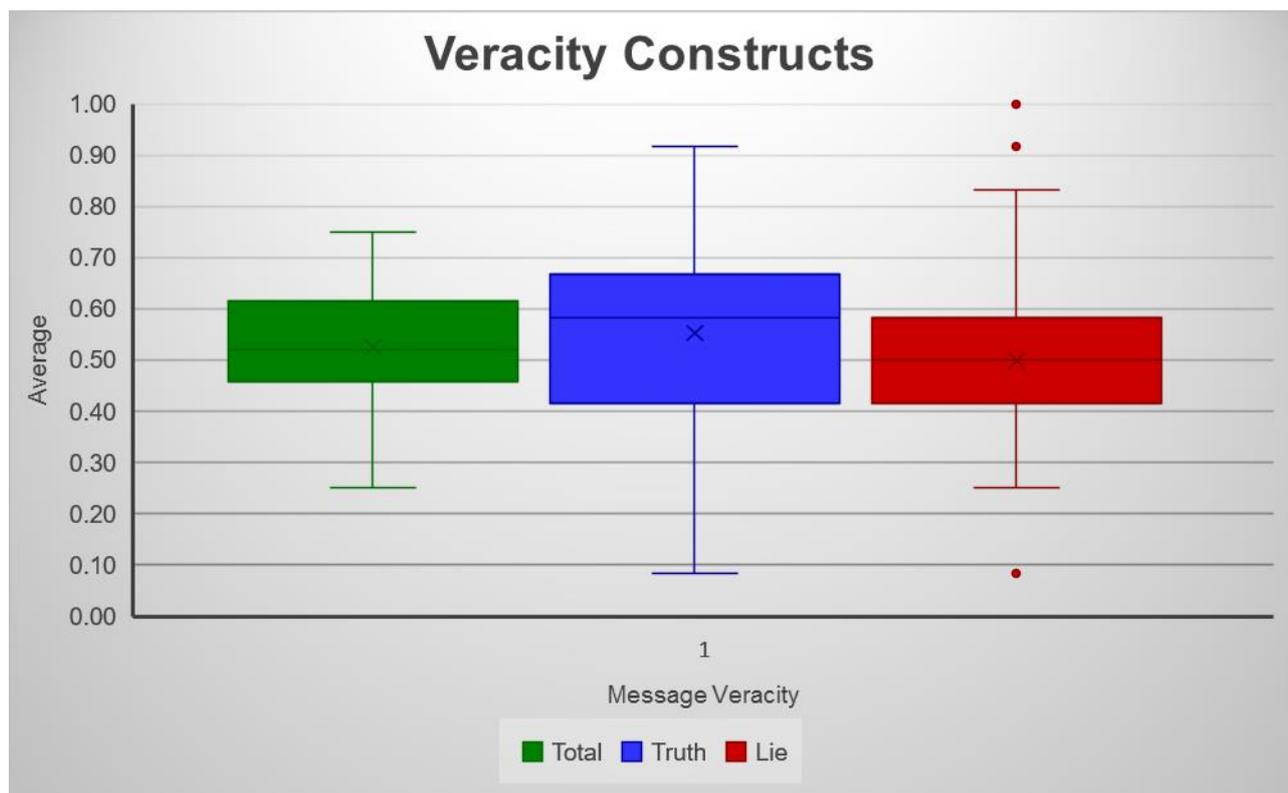


Figure 5.1 Average frequency of receivers making correct veracity judgments

#### 5.2.2.2. Confidence construct.

The mean of the receivers' 'Confidence Total' score was 67.891 (SD = 19.183). The mean of the receivers' 'Confidence Truth' score was 67.565 (SD = 18.547). The mean of the receivers' 'Confidence Lie' scores was 68.216 (SD = 20.435) (Table 5.4). High 'Confidence' scores indicate that receivers were more confident in their ability to correctly judge the senders' messages, whereas low 'Confidence' scores indicate less confidence. This is also indicated visually in Figure 5.2.

The mean of the receivers' 'Confidence' score relating to their veracity answers concerning the truthful example video was 67.66 (SD = 24.35).

Table 5.4 Descriptive Statistics of the Confidence Constructs as Scored by the Receivers

Construct	M	SD	n	Minimum	Maximum	Median	Mode	Range
Confidence								
Total	67.8906	19.183	64	23.75	100	68.3333	45.8333	76.25
Confidence								
Truth	67.5651	18.5469	64	20.8333	100	69.1667	51.6667	79.1667
Confidence								
Lie	68.2162	20.435	64	21.6667	100	70	78.3333	78.3333

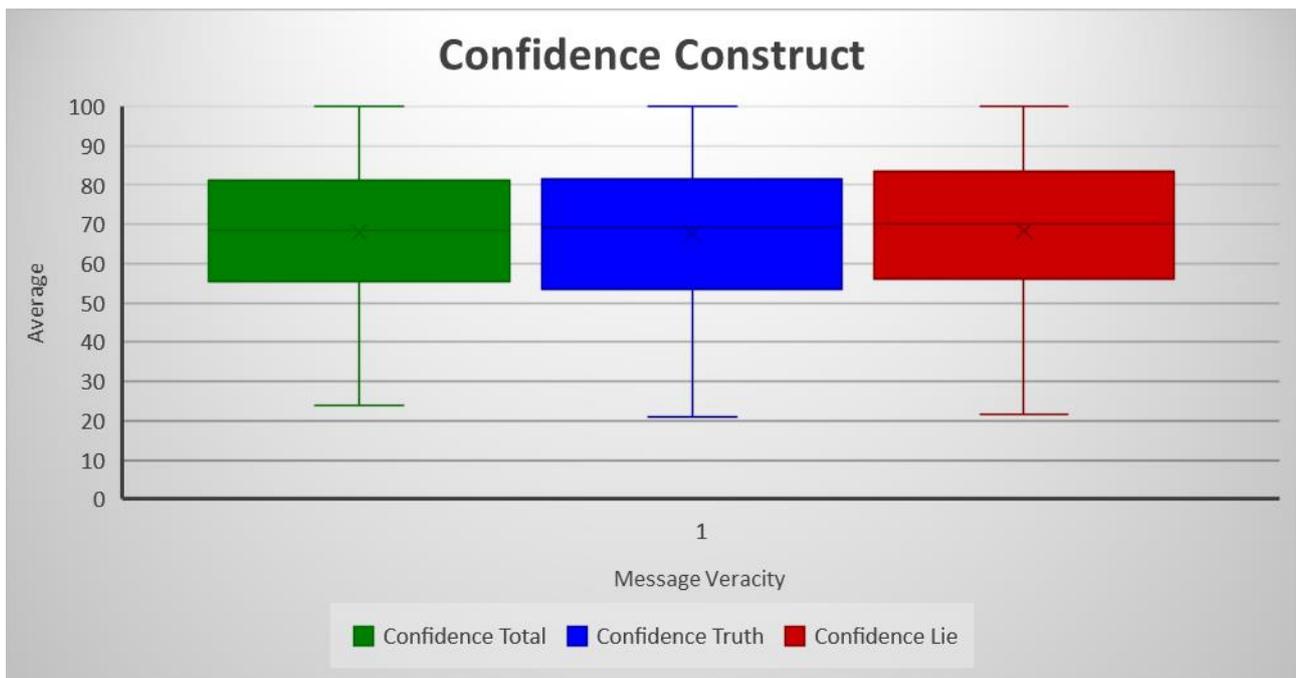


Figure 5.2 Average confidence on deception judgments as reported by the receivers

### 5.3. Inferential Statistics

As described in the method chapter, the analytical approach in this study used inferential statistics to compare and correlate the variables. The results are described according to the research questions. This eases the effort of reading this chapter, as well as provides a clear indication of the argument followed throughout this study.

The data were analysed at a 5% level of significance. Normality of the distribution of means were tested with a Shapiro Wilk's test. According to Gerber and Hall (2015) data distributions that fall below a significance value of 0.01 should not be considered as normal. This assumption was only violated during one instance, which was mentioned and discussed during the relevant analysis. Homogeneity of variance is tested by making use of Levene's test. If Levene's test fell below a significance value of 0.01 the variance is considered not to be homogeneous (Field, 2009).

### 5.3.1. Research Question 1: Are second language speakers more likely than chance to be judged as deceptive?

#### 5.3.1.1. One sample t-test.

A One sample t-test was conducted to see if the average scores of the three constructs (Total, Truth, Lie) deviated significantly from chance (0.5). The Total mean score did not deviate significantly from the hypothetical chance mean,  $t(63) = 1.961$ ;  $p = 0.054$ ,  $d = 0.494$ . However, the construct did measure just above the 0.05 significance cut off used within the current study. The Truth mean score (0.552) deviated significantly from the hypothetical chance mean (0.5),  $t(63) = 2.175$ ;  $p = 0.033$ ,  $d = 0.548$ . The Lie mean score (0.499), did not deviate significantly from the hypothetical chance mean (0.5),  $t(63) = -0.061$ ;  $p = 0.951$  (Table 5.5). In sum, these results suggest that receivers were generally truth biased.

Table 5.5 One-Sample T-Test Comparing the Veracity Constructs to Chance

Construct	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Total	1.961	63	.054	.025391	-.00048	.051261
Truth	2.175*	63	.033	.052083	.004226	.099941
Lie	-.061	63	.951	-.001302	-.043832	.041228

Note: \* =  $p \leq .05$

### **5.3.1.2. Pearson correlations.**

There was no significant correlation between the receivers' Total and Confidence Total mean scores,  $r = 0.008$ ,  $N = 64$ ,  $p = 0.953$ . There was no significant correlation between the receivers' Truth, and the Confidence Truth mean scores,  $r = -0.158$ ,  $N = 64$ ,  $p = 0.213$ . There was no significant correlation between the receivers' Lie, and the Confidence Lie mean scores,  $r = 0.206$ ,  $N = 64$ ,  $p = 0.103$ . In sum, these results suggest that the receivers' veracity judgments and confidence in their judgments were not related.

## **5.3.2. Research Questions 2 and 4 (Gender and language status of receivers).**

### **5.3.2.1. ANOVAS.**

An ANOVA was used to test for the possible differences between the means of receivers' veracity judgments (Total, Truth, Lie), in addition to confidence scores (Confidence Total, Confidence Truth, Confidence Lie), as influenced by their gender and language status. Due to the limited response-rate described earlier, the receiver's race was removed as a variable from this analysis.

#### **- Veracity Judgments**

The results indicate that there were no significant differences as a result of the gender and language status of receivers with regards to their Total mean scores,  $F(1,63) = 3.236$ ,  $p = 0.077$ . There were no significant differences as a result of the interaction between the receivers' gender and language status in terms of their Truth mean scores,  $F(1,63) = 0.609$ ,  $p = 0.438$ . When considering the gender and language status variables separately, only the receiver's language status tested as significant in this measure  $F(1,63) = 8.067$ ,  $p = 0.006$ ,  $d = 0.7075$  (Table 5.6). This indicates that there was a difference in the way that first language speakers judged the truthful messages ( $M = 0.605$ ), and how the second language receivers judged the truthful messages ( $M = 0.474$ ) (Figure 5.3).

There were no significant differences as a result of the interaction between the receiver's gender and language status in terms of their Lie mean scores,  $F(1,63) = 1.826$ ,  $p = 0.182$ . When considering the gender and language status variables separately, a significant difference was found as a result of the receivers' language status,  $F(1,63) = 4.052$ ,  $p = 0.049$ ,  $d = -0.5185$ , just below the significance threshold (0.05) (Table 5.7). This indicates that there was a difference in the way that first language speakers judged the deceptive messages ( $M = 0.46$ ), and how the second language receivers judged the deceptive messages ( $M = 0.55$ ) (Figure 5.3).

The implication of these results are that the gender of the receivers did not seem to influence their accuracy or bias of their veracity judgments. The receivers' language status did not seem to influence their level of accuracy in terms of their veracity judgments. However, first language English speakers had a tendency to correctly judge truthful messages as truthful, more often than correctly judging deceptive messages, suggesting that they were truth biased. Whereas second language English speakers had a tendency to correctly judge deceptive messages as deceptive, more often than correctly judging truthful messages, suggesting that they were lie biased.

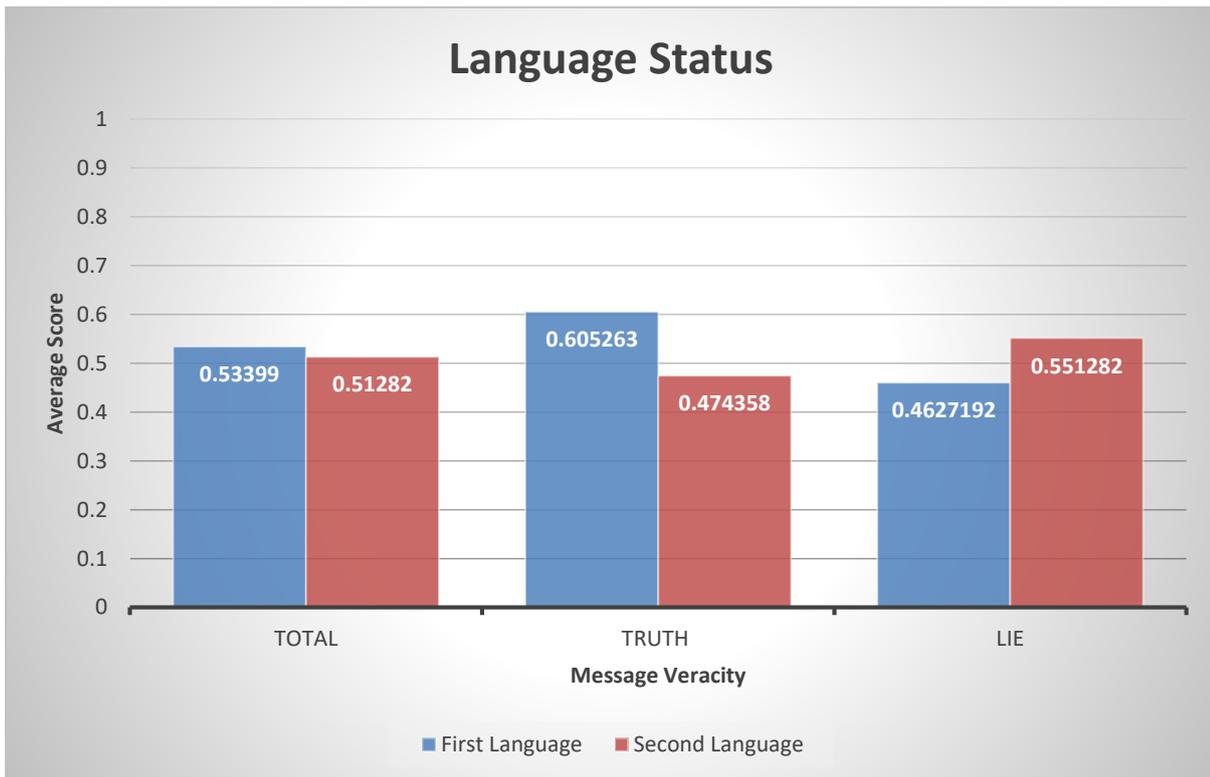


Figure 5.3 Average correct veracity judgments by receivers according to their language status

Table 5.6 ANOVA Measuring the Difference between Gender and Language Status on the Truth Construct

Source	Type III Sum			F	Sig.	Partial Eta Squared
	of Squares	df	Mean Square			
Corrected Model	.287	3	.096	2.838	.045*	.124
Intercept	17.859	1	17.859	529.143	.000	.898
Gender	.006	1	.006	.165	.686	.003
Language Status	.272	1	.272	8.067	.006*	.119
Gender * Language Status	.021	1	.021	.609	.438	.010
Error	2.025	60	.034			
Total	21.819	64				
Corrected Total	2.313	63				

Note: \* =  $p \leq .05$

Table 5.7 ANOVA Measuring the Difference between Gender and Language Status on the Lie Construct

Source	Type III Sum			F	Sig.	Partial Eta Squared
	of Squares	df	Mean Square			
Corrected Model	.242	3	.081	3.048	.035*	.132
Intercept	15.657	1	15.657	592.781	.000	.908
Gender	.093	1	.093	3.537	.065	.056
Language Status	.107	1	.107	4.052	.049*	.063
Gender * Language Status	.048	1	.048	1.826	.182	.030
Error	1.585	60	.026			
Total	17.743	64				
Corrected Total	1.826	63				

Note: \* =  $p \leq .05$

- Confidence scores

The results indicate that there were no significant differences as a result of the gender and language status of receivers with regards to their Confidence Total mean scores,  $F(1,63) = 0.0144$ ,  $p = 0.905$ . There were no significant differences as a result of the receivers' gender and language status in terms of their Confidence Truth mean scores,  $F(1,63) = 0.000$ ,  $p = 0.995$ . There were no significant differences as a result of the receiver's gender and language status in terms of their Confidence Lie mean scores,  $F(1,63) = 0.048$ ,  $p = 0.828$ . The implications of these results are that neither the gender, nor the language status, of the receivers seemed to influence their confidence in their veracity judgments.

**5.3.3. Research Question 2: Is there a difference in judgments or confidence when the gender of the sender is taken into account?**

This section is concerned with the influence of senders' gender on the receivers' mean veracity judgments, and confidence scores. As measuring the effect that the gender of receivers had on their veracity judgments, and confidence scores, was answered by the results of the ANOVAS described above.

#### **5.3.3.1. *Dependent t-tests.***

A Dependent t-test was conducted to test if there was a significant difference between the receivers' mean scores as a result of the gender of the senders in the recorded videos. This test was conducted because the difference in mean scores in relation to the two groups of senders (Female and Male) would depend on judgments from each of the receivers.

There was no significant difference between the Female and Male Total mean scores,  $t(63) = 0.434$ ;  $p = 0.666$ . There was no significant difference between the Female and Male Truth mean scores,  $t(63) = -1.332$ ;  $p = 0.188$ . There was no significant difference between the Female and Male Lie mean scores,  $t(63) = 1.834$ ;  $p = 0.071$ . In sum, these results suggest that the gender of the senders did not influence the veracity judgments of the receivers.

#### **5.3.3.2. *Pearson correlations.***

There was no significant correlation between the Females' Total and Confidence Total mean scores,  $r = -0.004$ ,  $N = 64$ ,  $p = 0.977$ . There was no significant correlation between the Males' Total and Confidence Total mean scores,  $r = -0.25$ ,  $N = 64$ ,  $p = 0.845$ . In sum, these results suggest that the gender of the senders did not influence the confidence that receivers placed on their accuracy.

### **5.3.4. Research Question 3: Is there a difference in judgments or confidence when the race of the sender is taken into account?**

The effect that the race of receivers had on their veracity judgments, and confidence scores, could not be investigated due to sampling limitations. This would have formed part of the ANOVAS described above. This section is concerned with the influence of senders' race on the receivers' mean veracity judgments, and confidence scores.

#### **5.3.4.1. *Dependent t-tests.***

A Dependent t-test was conducted to test if there was a significant difference between the receivers' mean scores as a result of the race of the senders in the recorded videos. This test was conducted because the difference in mean scores in relation to the two groups of senders (Black and White) would depend on judgments from each of the receivers.

There was no significant difference between the Black and White Total mean scores,  $t(63) = 0.286$ ;  $p = 0.776$ . There was no significant difference between the Black and White Truth mean scores,  $t(63) = -1.68$ ;  $p = 0.098$ . There was a significant difference between the Black and White Lie mean scores,  $t(63) = 2.851$ ;  $p = 0.006$ ,  $d = 0.3766$  (Table 5.8). This indicated that there as a difference between means scores of the judgments made on deceptive messages of black senders ( $M = 0.536$ ) and the deceptive messages of white senders ( $M = 0.461$ ). However, this test violated the assumption of normality as indicated by the Shapiro-Wilk test that was found to be significant  $p = 0.003$  (Table 5.9). Consequently, a Wilcoxon Signed Rank test was performed on these results and again found a significant relationship,  $z = -2.845$ ,  $p = 0.004$ . In sum, these results suggest that the race of the senders for the most part did not influence the veracity judgments of the receivers. However, there was a tendency to judge black senders as more deceptive (lie bias).

Table 5.8 Paired Sample t-Test by Sender Race

Pair	Constructs	t	df	Sig. (2-tailed)
Pair 1	Black Total - White Total	.286	63	.776
Pair 2	Black Truth - White Truth	-1.680	63	.098
Pair 3	Black Lie - White Lie	2.851	63	.006*

Note: \* =  $p \leq .05$

Table 5.9 Shapiro-Wilk Test for the Paired t-Test by Sender Race (Table 5.8)

Pair	Constructs	W	P
Pair 3	Black Lie - White Lie	0.939	0.003*

Note: \* =  $p \leq .01$

#### 5.3.4.2. *Pearson correlations.*

There was no significant correlation between the Black Total and Black Confidence Total mean scores,  $r = -0.052$ ,  $N = 64$ ,  $p = 0.684$ . There was no significant correlation between the White Total and White Confidence Total mean scores,  $r = 0.083$ ,  $N = 64$ ,  $p = 0.515$ . In sum, these results

suggest that the race of the senders did not influence the confidence that receivers placed on their accuracy.

## **5.4. Content Analysis**

### **5.4.1. Research Question 5: What are the perceived deceptive cues that receivers looked for to base their veracity judgments?**

As described in the method chapter, a Content Analysis was conducted in order to discover which nonverbal cues influenced the veracity judgments of receivers. The cues that were reported by the receivers were coded according to the behaviours that were described. A total of 41 codes were used to describe various aspects of nonverbal displays that were observed. Each code was used only once per relevant description. Therefore, even if receivers mentioned the same display more than once, the code was only used for the instance as a whole. The codes were mutually exclusive, meaning that each code only described one aspect that was of concern, with some exceptions described below. In addition, several categories of codes were also created. These categories are referred to as 'Nonverbal behaviours', 'Strategic observations', and 'Vocal indicators'. Within this analysis only the codes that were used most often are considered in the description, after which each of the categories is described.

From the responses, almost all of the receivers claimed to look at more than one behavioural cue. These instances were coded as 'multiple cues'. However, this code does not form part of the discussion, because it was not mentioned directly by receivers. Instead it is used to supplement the argument around the other coded behaviours later in the discussions.

An examination of the specific codes that were assigned revealed that four codes made up the bulk of the reported cues. The terms that were mentioned the most was in relation to the code 'Body language'. This code was assigned where receivers made direct use of the terms 'body language', 'body movement', 'mannerisms', 'behaviour' or 'body gestures'. The second most frequently coded terms referred to the senders' eyes. Receivers made references to 'eye movements', 'eyes', 'looking around a lot', in addition to references to where the senders' looked, or the amount of movements the senders' eyes made. Of these receivers, a small portion specifically referred to looking at the senders' 'Eye contact'. The third code focussed on terms referring to the senders' 'Facial expression', and were coded for terms referring to the senders' 'faces', 'facial expressions', 'facial features', and 'focus on the lips'. From the receivers, who mentioned that they looked at facial expressions, or the face of receivers, some specifically mentioned 'smiling', 'smirk', 'looking

serious', 'feigning emotions', or that they looked at the senders' 'eyebrows'. Finally, the action referred to frequently by receivers were in relation to the senders' 'hands'. These references were coded for 'hands', 'hand movements', amount of 'hand movements', 'fingers'. From the codes on 'Hand movements', specific references to 'Hand gestures' were additionally made (Table 5.10).

Table 5.10 Content Analysis (Most Frequent)

Code	Frequency
Body language	10
Looking at the eyes	9
Eye contact	4
Facial expression	6
Smiling	3
Hand movements	6
Hand gestures	3

Although the following nine cues were not used frequently, they provided relevant explanations for believed deceptive cues. The coded behaviours (not in order of frequency) were in relation to the senders' 'confidence (behavioural)', if they 'smiled', and whether or not they 'fidgeted'. More strategic methods were also mentioned, in that receivers claimed to look for signs relating to the code 'cognitive load', in that senders appeared to think too deliberately about a topic. Receivers also made use of the baseline video, as some mentioned that they compared the senders' behaviour to the baseline. Others stated that they looked for evidence of behavioural change, amount of detail in the stories, if the stories made sense, and finally some made a vague reference to the sender's 'descriptions' in terms of the story details (Table 5.11).

Table 5.11 Content Analysis (Relatively Frequent)

Code	Frequency
Logical flow	5
Compare to baseline	4
Behavioural changes	4
Description	4
Fidgeting	3
Confidence (Behaviour)	3
Cognitive load	3
Smiling	2
Story Detail	2

Cues that were mentioned the least (of those included in this description) included: Movements / actions of the senders’ legs, as well as their composure. Judgments were made, by the receivers, as to whether the senders’ behaviours matched the story that they were telling. Audible cues that were considered included the number of pauses, how confident they sounded, as well as the pace and tone of the senders’ voice (Table 5.12). A full list of codes can be found in Appendix K.

Table 5.12 Content Analysis (Least Frequent)

Code	Frequency
Leg movements	
Pauses (Voice)	
Composure	
Behaviour matching the story	
Confidence (Voice)	
Speech pace	
Tone of voice	

#### 5.4.1.1. Categories.

In terms of the overall codes, most could be divided into one of three categories, which are not necessarily mutually exclusive. These can be referred to as: ‘Nonverbal behaviours’, ‘Strategic observations’, and ‘Vocal indicators’. Nonverbal behaviours refer to those behaviours that could be seen by the receivers. Strategic observations included those descriptions where the receivers used the information that they had access to, not as a passive observer, but rather more actively. These included comparing the senders’ behaviours between the baseline video and the veracity message, or judging if their behaviours matched the stories that they were telling. Finally, Vocal indicators include cues such as ‘pauses’ and ‘voice tone’, specifically those behaviours that could be heard (Table 5.13). These categories are elaborated on below.

Table 5.13 Categories of Nonverbal Cues Related to Deception

Names	Frequency
Nonverbal behaviours	
Strategic observations	
Vocal indicators	

This analysis seemed to indicate that the ‘Nonverbal behaviours’ of senders, which comprised the visual observations of receivers, were the most influential (according to the claims of receivers) (Table 5.13). The four codes that were mentioned the most in this study were classified as

nonverbal behaviours, namely: 'Body language', 'Eyes', 'Facial expressions', and actions relating to the senders' 'Hands'. Other behaviours that were also found to be important were related to 'Fidgeting', 'Confidence (Behavioural)', 'Smiling', and behaviours that were related to the senders' 'Legs'. Behavioural cues mentioned less often within this category were in relation to senders' 'Composure', 'Body posture', and if their movements could be described as 'Strained'. Although other nonverbal behaviours were additionally mentioned (see Appendix K), the above codes were used most often.

Receivers in this study further took an approach to deception detection that can be described as strategic, which was combined into the second most coded category (Table 5.13). The frequency counts for this category did not include the code concerned with multiple cues. The main reason for this decision was that it was not actively mentioned by the receivers. Codes used specifically for this category were in relation to how logical the receivers perceived the message to be (if it made sense), or comparing the senders' behaviour between the baseline and veracity messages. In addition, receivers actively judged if the senders' behaviour changed through the messages. Receivers made judgments on the descriptions, or looked for evidence of 'Cognitive load'. This also included if the senders' behaviours matched the story that they told (i.e. behaving the way that the receivers expected, in relation to their description). Other codes, which additionally provided an indication of 'Strategic observations', related to judging the length of the story, or the timeline that was followed, as well as making use of more than one behavioural cue (not included in the frequency table above). Moreover, one receiver recognised the content of a truthful description, and based their judgment on their additional contextual information.

Vocal cues were coded the least (Table 5.13). These cues referred to: 'Pauses', how 'Confidence (Voice)' the senders sounded, the 'Pace' at which they spoke, or the 'Tone' of their voice. To a lesser extent receivers mentioned cues that referred to the 'Vocabulary use', the 'Volume' of the senders' voices, speech fillers, and voice pitch. Some of the least coded beliefs that were mentioned considered if the story seemed 'strained' or if the sender stuttered.

## **5.5. Conclusion**

This chapter provides a description of the results obtained from the analysed data. In accomplishing this goal, the chapter starts by describing the response-rate and demographical information of receivers, as well as the relevant descriptive statistics of the constructs that were created to answer

the four research questions. The results were then described. In order to improve the legibility of this chapter the results are discussed in the order set out by the research questions.

The first four research questions' answers were analysed by making use of inferential statistics. The results from Question 1 indicated that receivers made more correct truth judgments on truthful messages than was predicted by chance. The findings regarding Question 2 did not find differences between receiver judgments and the gender of either receivers or senders. The answers to Question 3 could not be fully explored due to a limited sample size. However, a slight difference was found in the way that receivers made judgments on the deceptive messages of black and white senders. This suggested that a lie bias was present. However, the analysis violated the assumption of normality, and a Wilcoxon Signed rank test was conducted which confirmed the result. The results pertaining to the fourth research question found that there was not a difference between Total constructs of first and second language receivers. However, first language receivers were more likely to make more truth judgments, and second language receivers performed closer to chance on both the truthful and deceptive messages. This suggests that the language status of the receivers did not seem to affect their judgment accuracy (Total score). But, there was an influence on the way that the truthful and deceptive messages were judged.

The discussion relating to the final research question contained the explanation of the Content Analysis that was conducted. It was found that receivers mostly provided vague descriptions of 'body language', the 'eyes', the 'facial expressions' and actions concerning senders' 'hands'. It was also possible to group the cues into three more general categories. These categories are referred to in order of most mentioned to least; 'Nonverbal behaviours', 'Strategic observations', and 'Vocal indicators'.

The following chapter interprets these findings within the larger context of deception detection literature, the South African context, as well as considering methodological influences and limitations. The discussion chapter follows a similar pattern as the results chapter in order to discuss findings relevant to each of the research questions. The discussion concludes this dissertation with an elaboration on possible recommendation for future studies.

## **Chapter 6 – Discussion**

### **6.1. Introduction**

The overall purpose of this study was to explore the possibility of a lie bias towards second language speakers within the context of South Africa: Thus augmenting the literature within the field of deception studies, in addition to providing results relevant to the South African context. Answers to the research questions in the current study can therefore be used to inform future studies, or provide a possible indication of areas where caution needs to be taken in the interpretations of deception judgments. This exploration was guided by making use of IDT as a theoretical framework, in addition to an examination of results of previous studies in this field. From these sources overarching hypotheses were developed that were subsequently tested and answered (see below).

The current chapter interprets the answers obtained from the data analyses, as well as the literature review, in order to provide coherent answers for the research questions. Towards this goal, this chapter follows a similar format as the previous chapter, and starts by discussing some of the relevant issues regarding the response-rate and the biographical information. Subsequently findings from each of the research questions are discussed in light of the theoretical framework and literature review. This discussion begins by providing an answer to the overall research question (Are second language speakers more likely than chance to be judged as deceptive?). This is followed by the answers to each of the succeeding questions. This dissertation concludes with an outline of the limitations of the study and recommendations for future work within this topic field.

### **6.2. Response-Rate and Biographical Information**

The response-rate for the current study was 0.64% (64 of the total 10,000 emails sent), far below what was expected. From the 64 receivers who replied, all were between the ages of 18 and 44, which was within the selection criteria for the sample. Age was, however, not used as a variable in the data analyses of the current study, as described in the method chapter. From the literature review, it was not expected that age would have an effect on deception judgments, although it remains an avenue for further research within this context. In terms of the gender of receivers, the sample were divided into female participants (48.4%) and male participants (51.6%). This was considered sufficient to make use of the desired parametric tests to indicate if there was a difference in deception detection accuracy, or bias, due to the gender of the receivers. However, the variable considering the racial identification of the receivers did not receive the desired attention within this

study due to the limited responses. The self-reported language status of the receivers was divided into first language speakers (59.4%), and second language speakers (40.6%). A parametric test was used to indicate if there was a difference in the deception detection accuracy, or bias, due to the language status of the receivers. In terms of the response-rate it appeared that issues relating to access, or interest, in the survey could have influenced participation. This poses a limitation on the current study, and is thus elaborated on more thoroughly within the limitations section. In addition, the very low response-rate requires the reader to be cautious in interpreting the results found by this study, as an increased sample size could have resulted in different findings.

Several constructs were also described in the initial section of the results chapter that was broadly concerned with the receivers' veracity judgments and confidence. The average of the score relating to the Total veracity construct was 0.525, close to the 0.5 score, as alluded to in the literature review. Furthermore, the receivers in the current study seemed to be truth biased towards the senders. This finding is discussed more thoroughly below, as it forms the foundation of answering the first research question. When examining the receivers' confidence scores relating to all the messages (Confidence Total), the truthful messages (Confidence Truth) and the deceptive messages (Confidence Lie), it was found that these three confidence constructs were consistently between 67%-68%. Because of the lack of variance between the scores, no significant differences were found between the various combinations in the results. Therefore, this aspect of the data is not included in this discussion, because it does not add value to this research project. However, what could be derived was that the receivers consistently reported to be moderately confident in their ability to detect deception.

The research questions are discussed below in the order in which they were asked. The first research question, which addresses the possibility of a lie bias towards second language speakers, is therefore, discussed first. This is followed by the discussions of the research questions that consider the possibility of differences ascribed to gender (research question 2), race (research question 3), and the first or second language status of the receivers (research question 4). Research question five, which considers the observed deception cues as mentioned by the receivers, discusses the findings in relation to previous studies. This chapter concludes with the limitations and recommendations for future work.

### **6.3. Research Questions**

This section of the discussion chapter focusses on the answers provided in the results chapter, and places those findings within the context of the wider literature as described throughout this study.

However, as mentioned above, the results relating to receivers' confidence are not discussed. The confidence scores throughout this study were consistently high enough to suggest that the receivers felt confident in their ability to make veracity judgments. This finding provides evidence contrary to the hypothesis predicted by the current study. The hypothesis predicted that receivers would be less confident when making judgments on deceptive messages, which was not the case according to the findings of this study. Nonetheless, in line with previous literature (Solodukhin, 2015; Vrij et al., 2010; Vrij & Mann, 2001) these scores were also consistently found not to be significantly related to the veracity judgments. This suggests that receivers consistently overestimated their own ability to make correct judgments. This does not however suggest that the receivers' confidence scores were not influenced by confounding variables. These may become more apparent in studies with larger sample sizes, or those making use of scaled veracity question as suggested by Burgoon (2015).

In continuation of this discussion, the research questions are answered sequentially. The dissertation concludes with a discussion on the limitations found during the investigation, as well as recommendations for further studies. These, which are also placed within the context of South Africa, emphasise the results that were obtained from this study.

### **6.3.1. Research Question 1: Are second language speakers more likely than chance to be judged as deceptive?**

The first research question investigated if second language speakers would be judged as deceptive more often than by chance. The hypotheses made two distinct assumptions. This first was that the accuracy of receivers would not differ significantly from chance. This hypothesis was based on previous arguments, as discussed in the second and third chapters, and was supported by the results from the current study. The second was that receivers would be less confident when making judgments on deceptive messages, however this prediction was not confirmed in the current study.

As previous research suggests it may be possible to detect deception from behavioural displays, however this is not a simple process. Some of these studies suggest that there are differences between the behaviours of senders when telling a truthful story versus telling a deceptive story (DePaulo et al., 2003; Porter & ten Brinke, 2010; ten Brinke et al., 2012). Another study also indicated a difference in these two veracity conditions between senders speaking in their first language as compared to their second language (Caldwell-Harris & Ayçiçeği-Dinn, 2009). However, differences in behaviour, as a result of first and second language speech, was not consistently found in deception studies (Castillo, 2011). The above findings suggested the

possibility that deception, as well as speaking a second language, could have an observable behavioural difference.

As indicated in the results chapter this study found that the accuracy (Total construct) of receivers did not deviate significantly from chance. This was in line with the expectations of the current study, in that the receivers were not more accurate than dictated by chance. This has been found to be a common theme in deception literature (Bond & DePaulo, 2006; Morgan et al., 2013; O'Sullivan, 2003; Wright et al., 2012), which additionally translated into studies which investigated second language speakers (Da Silva & Leach, 2013; Evans & Michael, 2014; Leach & Da Silva, 2013; Snelling, 2013; Solodukhin, 2015). An unexpected result of this study was that the receivers were truth biased towards the second language senders. This truth bias was measured with the Truth construct score, which was found to be significantly higher than chance. The effect size, which was measured in this instance was low to medium. A low effect size indicates that the significant difference was weak, thus the scores might not be useful in practice, as it remains close to chance. The truth bias found in the current study was also in line with previous literature considering second language speakers (Snelling, 2013; Solodukhin, 2015), as well as those that did not consider second language as a factor (Bond & DePaulo, 2006; Morgan et al., 2013; O'Sullivan, 2003). The truth bias that was found in this study however, also seems to contradict some studies that investigated deception with second language speakers. Previous studies, which considered second language speakers, revealed a lie bias (Castillo, 2011; Da Silva & Leach, 2013; Evans & Michael, 2014), this was not supported by the current findings. In addition, the correct judgments on deceptive messages (Lie construct), which could suggest a lie bias, did not significantly differ from chance. This is consistent with some findings from second language studies (Leach & Da Silva, 2013). The results from the current study seem to confirm the typical results found in deception research as reported by previous studies that did not include second language speakers (Bond & DePaulo, 2006; Morgan et al., 2013; O'Sullivan, 2003). Thus, the findings supported the first hypothesis, in that the receivers' judgments were not measured to be more accurate than chance. Furthermore, the findings suggest that a truth bias was present in the judgments of the second language speakers. However, findings did not support the second hypothesis as no difference was found between the Confidence Truth scores, and Confidence Lie scores. A difference may however become apparent if larger samples are used.

The finding which indicates that receivers were truth biased, seems to be consistent with the theoretical assumptions made by this study. IDT makes the assumption that receivers will usually be truth biased. Furthermore, there needs to be an event that elicits suspicion before receivers

consider the possibility that senders might be lying. There could be behavioural indicators that they associate with lies, for example, inconsistent information. Thus, it could be argued that the reason why receivers were not successful in making veracity judgments is because they did not recognise deceptive cues (Burgoon & Buller, 2014).

As described in the method chapter, the first research question technically provides an answer for the entire purpose of the current study. However, in taking into account the rich context of South Africa, the impacts of other variables are also of interest to possibly provide more detail within this context. These variables are discussed below in order to answer each of the remaining research questions.

### **6.3.2. Research Question 2: Is there a difference in judgments or confidence when the gender of the receiver / sender is taken into account?**

The second research question attempted to discover if there was a potential bias that can be attributed to the gender of either the senders or receivers. Previous literature reports mixed findings in this regard. Literature, which investigated the gender difference in the ability to read nonverbal behaviour, suggests that a gender bias could be evident in deception studies. Literature, in this regard, suggests that different gender roles, gender socialisation, and motivation may play a role in deception detection (Baron et al., 2009; Hodges et al., 2011). However, other studies found that these factors only ‘seem to indicate’ a gender bias, and that these differences are not evident in deception detection research (Hall, 2011; Remland, 2009). Based on these studies, as well as those discussed later, the hypothesis was that there would not be a significant effect because of the gender of the participants.

Findings from the current study supported the predicted hypothesis, in that gender did not seem to affect the results. As indicated in the results chapter, the gender of the receivers did not appear to have any significant effect on receivers’ level of accuracy (Total construct), or bias (Truth and Lie constructs). These results are consistent with findings from various previous studies (Aamodt & Custer, 2006; Heijboer et al., n.d.; Levitan, An, et al., 2015; Levitan, Levine, et al., 2015; Solodukhin, 2015). However, this did not support results from Tilley et al. (2005) who found that the accuracy of women was higher, than that of men, in detecting deception on electronic media platforms. This could possibly suggest that different mechanisms are in place during this type of detection task, which is more in tune with the perception of women. Nonetheless, more research within the South African context is needed in order to provide a clearer contextualised picture in this field.

With regard to the gender of senders, the results from the current study did not find significant differences in accuracy (Total construct), or bias (Truth and Lie constructs) of receivers. This supports existing literature (Levitan, An, et al., 2015; Levitan, Levine, et al., 2015; Tilley et al., 2005). In contrast however, Heijboer et al. (n.d.) found that there was a lie bias against male senders, and a truth bias towards female senders. This was not evident within the current sample, although more research is needed within the South African context in order to gain more information on this matter. One avenue for future research on this specific topic could address gender differences in participants from different cultural backgrounds. This could provide evidence for, or against, the above argument of differences as a result of gender socialisation (Baron et al., 2009; Hodges et al., 2011).

### **6.3.3. Research Question 3: Is there a difference in judgments or confidence when the race of the receiver / sender is taken into account?**

The third research question was aimed at discovering if there would be a difference in accuracy or bias as a result of the sender or receiver's race. Previous literature, in terms of this variable, suggests that receivers' judgments are influenced by various potential stereotypes, which could lead to judgment biases. Vrij and Winkel (1991) found that the nonverbal behaviours of senders were different depending on the senders' racial identification. According to their findings, behaviours that are associated with different racial identifications could also be mistakenly recognised as possible cues of deception. Their findings gained some support in the research of Vrij and Winkel (1994) that indicated that a lie bias was detected because the above-mentioned behaviours were mistaken for cues of deception. Identifiable racial indicators (e.g. skin colour, accent), was not found to be related to deception judgments. The authors suggested that a racial bias could become evident within countries with clearer racial prejudice (Vrij & Winkel, 1994). The hypothesis that guided this question predicted that the race of the senders and receivers would not have a significant effect on veracity judgments.

Due to the limited response-rate, the analysis concerning the racial identification of the receivers could unfortunately not be conducted within the current study. Previous studies on this particular variable did not find a significant relationship between the receivers' racial identification and their accuracy or bias (Solodukhin, 2015; Vrij & Winkel, 1994). However, stereotypical beliefs have been found to strongly influence decision making (Baron et al., 2009). Therefore, more research is needed in this area, and specifically in South Africa, in order to provide clearer results on this matter.

The results of the current study found that the racial identification of the senders did not significantly affect the accuracy (Total construct), or truth bias (Truth construct) of the receivers. However, a significant difference was found in the number of correct deception judgments that were made (Lie construct) in that black senders were judged as deceptive more often than white senders. However, the effect size was small with regards to this result, and deception judgments were close to chance (0.5), which is common in deception studies (Bond & DePaulo, 2006). Caution is advised for interpreting this result, as the assumption of normality of the data distribution was violated. In spite of this violation, a Wilcoxon sign-rank test confirmed a significant difference.

These results thus partially support previous studies that examined the racial identification of participants. However, the findings did not seem to support the argument made by Lloyd (2015) that more accurate judgments would be made towards the dominant racial group. This is however, the opposite of what was found in this study, as both black participants (South African racial majority) and white participants (South African racial minority) (Statistics South Africa, 2012), were judged at chance level. Again, a larger sample could provide a clearer picture.

#### **6.3.4. Research Question 4: Is there a difference in judgments or confidence when the first- / second language status of the receiver is taken into account?**

The fourth research question investigated whether the receivers' linguistic ability would influence their judgment accuracy or bias. Within this study, the receiver's linguistic ability was measured by dividing the sample between first and second language English speakers. It was hypothesised that first language English speakers would be more accurate in their judgments based on the assumption that they would not have the additional cognitive burden of making sense of the messages that were delivered in English. This prediction is supported by IDT that maintains that increased cognitive demand distracts receivers from making correct interpretations (Buller & Burgoon, 1996). In addition, this would influence the number of truthful judgments receivers make as predicted by IDT's first proposition (Burgoon & Buller, 2014).

Findings relating to the fourth research question suggest that there was no difference in the level of accuracy (Total construct) between the first and second language receivers. This provides evidence that does not support the predictions made by the current study. Although interestingly, when considering the correct truthful judgments (Truth construct) and correct deceptive judgments (Lie construct) separately, there was a distinct difference between the first and second language receivers' scores. This does not support the findings from Snelling (2013), who argued that the

linguistic ability of receivers does not make a significant difference. The results from the current study suggest that first language receivers were truth biased as they correctly judged 60.5% of the truthful messages, and 46% of the deceptive messages (Figure 5.3). This supports the findings found in previous studies that did not consider second language speakers (Bond & DePaulo, 2006). In contrast, second language receivers made judgments that suggested that they were lie biased as they made correct judgments on 47% of truthful messages, and 55% of deceptive messages (Figure 5.3). This supports findings from some previous studies that focussed on second language speakers (Da Silva & Leach, 2013; Evans & Michael, 2014). The current findings, which considered the results from both first and second language receivers, furthermore support the results of the research by Cheng and Broadhurst (2005). As previously discussed Cheng and Broadhurst (2005) found that judgments, which included first language participants (both senders and receivers), tended to be more truth biased, whereas the condition that included second language participants (both senders and receivers) seemed to be more lie biased. These findings provide some evidence for the argument put forth by Lev-Ari and Keysar (2010) that the bias found in studies, that include accented speech, could occur because of an increase in the receiver's cognitive load.

As described throughout this dissertation, Lev-Ari and Keysar (2010) contended that listening to someone who has an accent (specifically speaking in a second language), requires receivers to think more intensely about the message. This additional cognitive load, of the receiver, in turn influences their veracity judgment. According to their study, the authors found that when senders speak with a stronger accent (interpreted as causing more cognitive load), the receivers tended to make more deceptive judgments (Lev-Ari & Keysar, 2010). Vrij and Winkel's (1994) study also suggested that the fluency and the style in which participants spoke affected the way that judgments were made.

Interpersonal Deception Theory maintains that receivers' judgments are influenced by their own cognitive load. This could lead to more biased judgments due to the amount of information they already need to manage (Burgoon et al., 2008). From the argument made earlier in this study, this effect could lead to increased stereotypical beliefs, as suggested by the research results of Biernat et al. (2003). Although the current study was not able to measure stereotypical beliefs, the anecdotal evidence does suggest that this type of bias becomes more possible, or evident, during second language encounters. The evidence from the current study suggests that cognitive load influences the judgment bias of receivers. However, the analyses did not find evidence for the fundamental attribution bias, as this could arguably have indicated stronger differences because of the gender or race of participants (Gilbert, 1989). Even though the results from the current study do not provide evidence to support an argument for the fundamental attribution bias, it becomes a possibility that

warrants further investigation within deception studies. Particularly those studies that involve second language speakers, or situations where receivers experience higher cognitive load than normal (O'Sullivan, 2003).

Results from Sweeney and Ceci (2014) provide some evidence to support the argument that increased cognitive load affects judgment bias. Although their study was specifically concerned with age differences, their sample allowed for some interpretation with regards to the effects of cognitive load. As reported earlier, the authors found that older participants' performance was lower on some of the deception detection tasks. The current study argues that this could provide evidence for the effects that cognitive load has on receivers. This is mainly driven by the association that has been found between old age and decline in cognitive abilities (Louw & Louw, 2009).

Taking the above perspective into account, there are some assumptions that can be made about deception detection, which could in turn be applied to some of the previously discussed findings. The first assumption is that the receivers' cognitive load can be increased by listening to accented speech (i.e. the sender is a second language speaker) as it requires greater cognitive processing than listening to a first language speaker (Lev-Ari & Keysar, 2010). As previous studies suggest, this could possibly become more evident in contexts where receivers are not accustomed to listening to second language speech (Da Silva & Leach, 2013; Leach & Da Silva, 2013; Snelling, 2013). Alternatively, the receiver's cognitive load could be increased by her/him trying to make sense of a message that is in their own second language (receiver as second language speakers). The second assumption, is that the receivers' cognitive load does not necessarily influence their judgment accuracy, but may influence their judgment bias as found in the current study (seemingly by making more deceptive judgments). Previously discussed findings, which provide some support for this assumption, found a lie bias towards second language speakers in that there were differences in the judgments made by receivers towards first and second language speakers. Within these studies (including the current study) it was suggested that speaking in a second language could increase the cognitive load of the senders, and therefore make them appear more deceptive. But these studies are also open to the current argument that the increased cognitive load experienced by the receivers listening in their own second language (Solodukhin, 2015), or by listening to the senders speaking in their second language (Da Silva & Leach, 2013; Evans & Michael, 2014; Leach & Da Silva, 2013; Snelling, 2013), could have biased their judgments. These notions could have several implications for future research or methodological recommendations. These are discussed at the end of this chapter.

However, the above argument also provides some anecdotal implications for the Interpersonal Deception Theory. The updated version of IDT excluded a previous proposition that was seemingly not supported by studies within the field of deception detection. This proposition suggested that the communication skill of receivers would increase their deception detection accuracy (Burgoon & Buller, 2014). The proposition was removed because the meta-analysis by Bond and DePaulo (2008) found that there were no individual differences in the ability of receivers to detect deception (Burgoon & Buller, 2014). As mentioned on several occasions, the current study did not find any differences in judgment accuracy across the relevant research questions. However, the distinct difference in bias (truthful and deception judgments) alluded to above could suggest that receivers' communication ability may be an influential factor within these interactions. This is suggested because the communication skill of receivers has the potential to assist them in managing the additional cognitive load experienced within these interactions, and thus might function to buffer the lie bias evident within the above results (Buller & Burgoon, 1996). However, more studies, using different methods of inducing cognitive load, are required to provide evidence for this argument and development of IDT.

In contrast however, the studies conducted by Levitan, An, et al. (2015) and Levitan, Levine, et al. (2015) did not find a difference in the ability of first and second language senders or receivers, which could suggest that a mechanism, other than cognitive load, could be more influential in judgment bias. Snelling (2013) suggested that such a mechanism could be the familiarity that participants have with second language speech. While other authors suggest that increased cognitive load could increase the possibility of other biases influencing the receivers' judgments (Vrij & Winkel, 1994). Although these arguments were not supported in the current study, they should form part of future investigations in order to provide a more comprehensive answer to the issue.

Finally, some caution in interpreting these results needs to be reiterated. Within this study the sample of second language English speakers consisted mostly of receivers who spoke Afrikaans as a first language. This presents a possible bias within the sample of participants, as South Africa recognises 11 official languages (Statistics South Africa, 2012), and the majority of the second language English speaking group in this study consisted of only one language group. The argument made in answer to this research question is that the bias present in the findings is the result of higher cognitive load. Thus, even though the argument expects that the results would not be affected by any particular accent or language, caution is still advised in interpreting these results.

### **6.3.5. Research Question 5: What are the perceived deceptive cues that receivers looked for to base their veracity judgments?**

The fifth research question aimed to discover which behavioural cues were perceived as indicative of deception for this specific sample of receivers. As this study was based on the theoretical foundation of IDT, it shared the assumptions made by the theory. One assumption pertinent to this question is that there are no universal behavioural indicators of deception (Buller & Burgoon, 1996; Burgoon & Buller, 2014). However, the absence of universally diagnostic cues does not imply that there are no behavioural indicators of deception. This is because differences between honest and deceptive behaviours have been found (Castillo, 2011; DePaulo et al., 2003; Porter & ten Brinke, 2010; ten Brinke et al., 2012). Rather it implies that these behavioural cues change over time. From this foundation one can extrapolate that there are no inherently correct beliefs about deceptive cues, however there are behavioural cues that are not related to deception. In addition, stereotypical beliefs about deception could lead to biased judgments, which might not affect the receivers' judgment accuracy. Thus, biased beliefs could then further be influenced by stereotypical beliefs. Stereotypes (Vrij & Winkel, 1994), and false beliefs about deceptive behaviour may then involve, or be influenced by, behaviours that have been found not to be related to deception at all (Buller & Burgoon, 1996; Burgoon & Buller, 2014). This justification for measuring beliefs about deceptive cues holds true even with the argument that there are no behaviours related to deception in any way, as put forth by Masip and Herrero (2015b). This is because behavioural cues could be used incorrectly to legitimise incorrect suspicions or accusations. Therefore, from the discussion above, this study expected to find that receivers would claim to base their judgments on behavioural cues that are stereotypically related to deception.

In order to investigate this, a content analysis of the answers to the open question at the end of the survey, was conducted. As the answers provided by the receivers were quite short, the various cues that they looked at were coded only once per receiver. Thus, the degree of importance of a particular cue could not be determined as it was noted as to whether the cue was simply mentioned. However, the analysis did provide some measure on how relatively important these terms were to the sample of receivers as a whole. One of the advantages of this type of analysis is that it can provide a quick and understandable overview of a topic. However, the information from a content analysis can often be superficial, and lack the depth. This is because it is limited to recorded material, such a question asked in a survey, and cannot provide information beyond that question (Babbie, 2008).

As described in the fourth chapter, the results from the current study could unfortunately not be compared directly with the results of previous studies (Al-Simadi, 2000; Castillo, 2011; Global Deception Research Team, 2006; Hurley et al., 2014). The main reasons for this lack in comparative ability are twofold. The first reason is attributed to differences in codes used by Hurley et al. (2014), the Global Deception Research Team (2006) and those of the current study. The second reason is because a structured questionnaire of the deception cues was not used as reported in previous studies (Al-Simadi, 2000; Castillo, 2011; Global Deception Research Team, 2006; Hurley et al., 2014). Despite these limitations, some interpretation of the findings is however possible.

The results from the content analysis suggested that there were 41 different types of observations made by the receivers in terms of potential deception cues. However, this discussion will not consider every code, as only a few behaviours were coded on enough occasions to warrant discussion for the purpose of the current study. Rather, only behaviours that were used frequently, or that had special interest for the current study, are discussed. The discussion of the various codes begins with the three most frequently mentioned cues. These related to: ‘body language’, ‘eyes’, and ‘facial expression’. The code that considers multiple cues is discussed later in this section as these cues were not directly mentioned by the receivers, but rather inferred when receivers claimed to look at more than one behaviour. After discussing the individual codes, the remaining discussion refers to three overall categories that could be created from the codes. These are ‘nonverbal behaviours’, ‘strategic observations’, and ‘vocal indicators’ in which behaviours could be classified (A complete list of the codes can be found in Appendix K).

The code that was mentioned by most of the participants was ‘Body language’. By itself this coded behaviour does not refer to specific actions, although it might be used to legitimise intuitive beliefs about deception. There were some receivers who gave examples of what they meant, referring to actions such as gestures, or fidgeting (which were also coded as actions in themselves), where others used only vague descriptions. For this reason, this code requires further investigation to determine what participants meant by referring to ‘Body language’. One needs to consider if the receivers were referring to specific behaviours, their intuitive senses, or their own assumed experience in making veracity judgments. A deeper investigation needs to be undertaken to gain more clarity regarding the meaning of the concept of body language.

An alternative explanation of the vague answers could be gained from the way in which the survey question was asked. The question asked what the receivers looked for to base their

judgments (Appendix H). In order to be more specific a short explanation, which provided a topic framework or the answer, was added to the question. The explanation read: “This could include the person's behaviour, believability of the story, etc. Please give as complete answer as possible” (Appendix H, p. 161). Because the explanation that was provided gave vague suggestions, it could have influenced the answers provided by the receivers. However, in their study on perceptions of deception cues the Global Deception Research Team (2006, p. 62) asked their participants: “How can you tell when people are lying”. In their analysis of the answers the code ‘Body movements’ was found in slightly more than 25% of their sample. Furthermore, in the study conducted by Hurley et al. (2014) unspecified beliefs around ‘body language’ were coded in 18.6% of the sample. This provides some evidence to the statement above that suggests that more in-depth studies are needed. This could possibly investigate if receivers look at specific behaviours, or take a more intuitive approach to lie detection.

This analysis found that reference to sender’s eyes was the second most coded behaviour within this study. However, the receivers who mentioned eye behaviour in the current study seldom mentioned specific actions. Those actions that were mentioned the most related to holding eye contact, although receivers again seemed to prefer vague descriptions. In previous studies it was found that looking at the sender’s eyes did not provide strong evidence to support its relation to deception (DePaulo et al., 2003; Wiseman et al., 2012). This behaviour could thus potentially increase judgment bias. That being so, beliefs about behavioural cues that relate to the person’s eyes were found consistently in previous studies (Castillo, 2011; Global Deception Research Team, 2006; Hurley et al., 2014) across multiple cultures. Research conducted by the Global Deception Research Team (2006), found a pervasive belief around the world that liars avert their gaze. In turn, Castillo (2011) found that beliefs about eye contact that seemed to be present across two different cultures (Columbian and Australian).

The third most coded behaviour was in reference to the ‘Facial expressions’ of senders. Again, this comprised mostly vague references to behaviours that were not specifically mentioned. This was also found in the research conducted by Hurley et al. (2014). However, during the current study there were occasional references to ‘smirks’ or explicit references to facial features such as movements of the eyebrows or lips. Specific references to ‘smiling’, was also noted a number of times, consistent with previous studies (Hurley et al., 2014). Most of the receivers who noted ‘smiling’ or ‘grinning’ also mentioned facial expressions, providing a little more specificity to the term. Previous studies indicated that smiling or smirks could be indicative of deception, notably ‘duping delight’ as referred to by Ekman (2009). In addition, Castillo (2011) found that both

Colombian and Australian participants believed that senders smile more frequently when they are being deceptive than when they are telling the truth.

In terms of the overall codes (including those described above) three categories were created. These were specifically in relation to 'Nonverbal behaviours', 'Strategic observations', and 'Vocal indicators'. During the final literature review it was found that these categories shared similarities with those created in Hurley et al. (2014). The authors used exploratory factor analysis using survey data with regards to beliefs around deception. The themes created in this factor analysis were labelled "Emotion & Arousal", "Nonverbal Behaviour", and "Verbal Content" (Hurley et al., 2014, p. 27). Similarly, the codes relating to the themes that they found corresponded roughly to those in the current study. That is, if one considers that the codes relating to 'Nonverbal Behaviour' referred to behaviours that could be seen. Those relating to 'Emotion and Arousal' relate to the strategic observations in the current study (with some Vocal cues in the mix). Finally, those that related to 'Verbal Content' needed to be heard (Hurley et al., 2014). These similarities provide some basis for comparison, although as stated earlier this type of direct comparison is methodologically problematic.

From this analysis one might surmise that the behaviours that were believed to be more important were mentioned the most. In the current study these behaviours referred to the visual, 'Nonverbal behaviours', that needed to be seen. This is consistent with the visual bias described earlier (Burgoon et al., 2008) in addition to results in previous studies (Hurley et al., 2014). In determining credibility receivers claimed to actively look at 'Body language', 'Eyes', 'Facial expressions', and the senders' 'Hands'. These behaviours, which were mentioned either vaguely, or to specific actions, but have been found in previous studies not to be indicative of deception. However, they could influence the perception of receivers who constantly focus on those behaviours.

The visual area seemed to be more important than what the receivers hear, and involves behaviours that are orientated towards the senders' faces. The combined references to eyes and the face were coded more often than those relating to body language, additionally the face was suggested as an area of interest by Ekman (2009). However, codes for specific actions related to the senders' Head, 'Blinking', and 'Eyebrows' were coded the least (of the nonverbal behaviours), thus presenting the possibility of an alternate explanation. One such explanation is that receivers possibly look at regions of the body that are perceived to be more expressive in everyday

communication, rather than only areas around the face. This argument is further supported from the evidence that the code considering sender's hands was the fourth most mentioned belief.

To a lesser extent receivers seemed to take an active stance in determining the veracity of the senders' messages. Although receivers had access to a limited amount of information at the time, they claimed to have used behaviours that could be classified as 'Strategic observations'. This included examining the baseline videos in order to compare the senders' behaviours exhibited during their veracity messages. Receivers claimed that they have paid attention to multiple behavioural cues – this suggests that they scrutinised multiple channels of possible deceptive indicators. These endeavours were possibly not very elaborate as they had very limited access to information. However, this provides some evidence against the idea that this type of research method involves only passive observations (Levine, 2014a; Levine, Clare, Blair, et al., 2014), as their answers were indicative of active reflections. Nonetheless, the critique by Levine, Clare, Blair, et al. (2014) remains, in that this method does not make enough information available to receivers to provide a more ecologically valid measure. It does however provide some support for the ALIED theory, that access to more information could make receivers more accurate in detecting deception (Street, 2015, 2016). This topic however requires more research in order to provide a more defined answer.

This active attempt to discern between honest and deceptive messages further finds some support in the attempt of receivers to consider the logical flow of the messages. This code has additionally found some evidence within the discussions of the Global Deception Research Team (2006). The authors found that 25% of their sample reported that they would make more deception judgments if the stories were incoherent. Hurley et al. (2014) found that 15.5% of participants mentioned beliefs that senders contradicting themselves, or that their behaviours would change (11.2%) throughout the interaction if they were deceptive. This further suggests that receivers do not act as though they are passive observers, but make use of the available knowledge to form a conclusion.

There were, in addition, various codes that seemed to relate to the cognitive load of senders while they delivered the veracity messages. These included the codes related to 'cognitive load' and 'pauses'. The Global Deception Research Team (2006) found that speech fillers (using the 'uhm' sound), or pauses were considered, by their participants, to indicate deception. Findings by Castillo (2011) indicated that receivers looked for longer, or more frequent pauses, to indicate deception.

This concurs with Hurley et al.'s (2014) study, that found frequent references to errors in speech, contradictions, and hesitations.

In this study, 'Vocal indicators' were mentioned the least, making this group of beliefs seemingly less important than other behaviours. In contrast Hurley et al. (2014) found that cues relating to the current study's descriptions of 'Vocal indicators' were mentioned more often. Previous studies have also indicated that cues that are heard influence judgments strongly. Thus, vocal indicators, which receivers might be unaware of at the time, may have a stronger subconscious influence than other behaviours. This may especially be so when considering that more accurate deception detection seems to be strongly influenced by whether or not senders can be heard (Bond & DePaulo, 2006; Bond et al., 2014; Sweeney & Ceci, 2014). This could additionally have resulted because of cultural differences when considering past results (Hurley et al., 2014).

Finally, some of these codes could also indicate that senders were perceived as nervous. Previous studies have shown that nervousness was a stereotypical belief about deception (Castillo, 2011; Global Deception Research Team, 2006; Hurley et al., 2014). In the current study, indications of nervousness were mentioned in the form of fidgeting, or the senders' verbal and nonverbal confidence. In light of these codes, some similarities were found in previous studies. The Global Deception Research Team (2006) and Hurley et al. (2014) reported that some receivers mentioned nervousness directly, that liars changed their posture, or stuttered more often than truth tellers. Castillo (2011) also found that many speech errors and hesitations were mentioned by participants as indicators of deceitful messages. However, the author also found culture differences between Colombian and Australian participants with regards to their views on gestures, vocal pitch, and upper body movements.

Unfortunately, the current study could not capture more detail on cultural differences, or culture specific beliefs about deceptive nonverbal behaviour. As differences were found as a result of culture within previous studies (Al-Simadi, 2000; Castillo, 2011), the rich context of South Africa could provide some insight into the views of the different cultural participants. However, due to the low response rate, an overall analysis was conducted. This exercise was thus useful in determining the generic beliefs of South African students. However, the findings lacked the nuanced differences that were originally sought within this study.

The analyses of nuanced differences could be useful when studying the various beliefs held by different cultures within South Africa. Furthermore, such research could also be informative when

investigating what participants mean when they refer to different nonverbal aspects, such as ‘body language’ or ‘facial expressions’. This would assist in identifying if there are particular behaviours that inform these judgments, or if a more intuitive approach is taken, which translates into specific behavioural references when asked if specific behavioural indicators are used. However, if an intuitive approach is used, listing the possible behaviours in a survey format might not provide the answers one would be searching for, as any behaviour, after the fact, could be used to legitimise veracity judgments. The current argument is that such results may consist of a combination of these two aspects, because both vague and specific descriptions were used. However, more research, which uses a research approach that allows for a more in-depth understanding of how these beliefs are constructed or experienced, is needed in this field, specifically within the context of South Africa. This could, in turn, stimulate further research to investigate how biased judgments occur and what could influence them.

#### **6.4. Limitations and Recommendations**

Within this study there were several limitations that need to be discussed in terms of interpreting the results, and to inform future research that has a similar content or uses comparable methods. In this section, the limitations in interpreting the results, are addressed. Followed by a discussion that addresses the limitations of the method used within this study. Throughout this section, recommendations are made for future studies. The recommendations form part of the limitations in order not to fall into the trap of highlighting a problem, and not providing possible solutions. This discussion begins with the limitations regarding the response-rate found within this study, and describes possible issues of interest and access. After which some of the limitations in regards to the research instrument are described that could have provided more relevant information.

The major limitation of the current study was the very poor response-rate (0.64%). There are various possible reasons that can be inferred for the response-rate gained in the current study, however this discussion suggests that potential participants did not see the survey invitations. Because this survey was taken online, access to the survey was thus restricted on two layers; that is, access to a myLife email account (Unisa student email), and access to a reliable internet connection. With regards to the first possible barrier; the study by Mbatha and Naidoo (2010) suggests that around 50.9% of Unisa students may not have access to their myLife email account. The second possible barrier was suggested by the limitations of internet access in South Africa (Vermeulen, 2015), and builds on the possible issue with regards to access to the survey. The reason for this suggestion is that previous studies that used online methods reported response-rates slightly above 10% (Manfreda et al., 2008). The rationale, in planning the current study, was that students would

have a strong online presence: Unisa is an open distance institution and students geographically dispersed, contact is at times exclusively via electronic methods (“Our future,” 2012, *Unisa at a glance*, 2013). Therefore, even when considering the results from Mbatha and Naidoo (2010), that 50.9% of Unisa students do not make adequate use of their myLife email accounts, a large number of respondents was still possible. However, the response-rate that was achieved by the current study was measured at 0.64%, far below that of literature indications. This could be because of a complex interaction between student access, interest, and the survey time (which amounted to around 40 minutes). As only 389 of the 10,000 students who were emailed clicked on the email link (3.89%), it is possible that the number of students who had access to (or knowledge of) the myLife email accounts, provided by Unisa, is far below what previous authors found (Mbatha & Naidoo, 2010). The 64 participants who completed the survey made up 16.5% of the total 389 participants who clicked on the survey link. This response-rate (while higher than literature indicators), is closer to the above reported response-rate of 11% (Manfreda et al., 2008). This suggests that the majority of students who were contacted may not have had adequate access to their myLife accounts, or had little reason to access these accounts even though they are mandatory upon registration. This is partly supported by Roberts (2011) (as cited in Molepo & Mothudi, 2014), who claimed that the majority of Unisa students do not have access to their myLife accounts. The possibility exists that up to 96% of the students (9,611 of the sent emails) may not have seen the invitation within the data collection timeframe. Two possible solutions, to keep in mind for future studies, are to have an extended data collection time period, in addition to accessing other communication methods, such as private email addresses and social media. As the limitations of access was not under the control of the researcher, only people who had internet access could be reached. Therefore careful consideration of this method is recommended when researchers deliberate various sampling methods (Babbie, 2008).

Because of the weak response-rate, discussed above, the sample of receivers was not large enough to fully analyse the answers to all the research questions within this study, and thus limited the ability of this study to generalise the findings. This is specifically evident in the research question that addressed the racial identification of receivers, in addition to interpretations of the language compilation of receivers. The racial compilation of the students was limited, and biased towards participation from white students. This raises specific questions about access, as well as interest in participating in the current study, or online studies in general. As the demographical information was asked at the end of the survey, unfortunately no explanations could be gained about the demographics of the students who discontinued the survey. The main reason that these questions were at the end of the survey was to divert attention away from the linguistic ability of the

receivers. However, possible future research could request the demographical questions first, and ask the questions that may bias results at the end of the survey. This would provide information about which participants discontinued and if the sample bias could have occurred because of issues surrounding access or interest.

Some of the limitations of the research instrument were alluded to in the beginning of this section. However, a more detailed description is required for future studies that intend using online surveys. One such limitation is that standard testing conditions cannot be ensured due to the use of an online survey method. This, is a known limitation of self-report measures (Babbie, 2008), however, needs to be taken into account within the study design. Theoretically, this limits the interpretation of the scores obtained within this study, as the conditions for each receiver cannot be kept constant. This is a risk of online studies: One sacrifices the control over participant's environments. However, the benefit is that the researcher has access to a large sample.

The baseline videos, in the current study, seemed to be of limited use. This resulted in a very time consuming survey. This could have contributed to the attrition of receivers, and consideration should be given to possibly omitting baseline videos, or changing their role within this type of study. One argument is that the receivers did make use of the baseline videos, as described during the content analysis. Previous studies have found that baseline videos provided a significant benefit, however the benefit gained from including baseline videos might be of limited use as the literature indicated that there was only a 3.65% gain in correct answers (Bond & DePaulo, 2006). In the current study the survey would have been eight minutes shorter had the baseline videos been removed. Thus, one recommendation is that more studies should investigate the method of using baseline videos, and the influence that these have on judgment accuracy or bias. This could inform future work as to whether it is necessary to include baseline videos within such studies.

In terms of the order of the questions, as mentioned above, it may have been more advantageous to ask the demographical questions first, rather than last, in order to gain a profile of the 232 receivers who withdrew their participation. The aim of the current study was to ask all the biographical questions at the end of the survey so as not to influence the receivers' attention to the linguistic aspects of the study (the receivers were asked to self-report on their linguistic ability). However, it must be noted that self-reported questions are sensitive to bias. Self-report measures are methodologically flawed in that it is assumed that receivers have a realistic and objective view of their competence (Babbie, 2008). A linguistic measure could have been useful in measuring the senders' and receivers' linguistic abilities, but the researcher was unable to find a measure that

provides relevant information about speech ability. A possible solution to this problem could have been to ask the biographical information first, and to include a linguistic ability measurement after the survey was completed. However, one needs to first determine if written measurements also access the linguistic ability in spoken language. The way that this was mitigated within the current study was to make use of the crude differentiation between the receiver's self-identification as first or second language English speakers. Although this divide did not provide information about the linguistic ability of receivers, it did suggest that some linguistic mechanisms are influenced within deception research. This provides justification for further studies on deception detection and the influence that the cognitive load experienced by the receivers might have on judgment bias.

Finally, one of the obvious limitations related to the ecological validity of the study in that only students were used within the investigation. This has been a common critique within deception studies (Hartwig & Bond, 2014; Porter & ten Brinke, 2010). The main reasons for using students within this study was because: (a) it was assumed that higher education students would have the necessary technical skills and access to complete an online survey and (b) they were likely to have some ability and experience of understanding, and communicating in English, as required by South African higher education institutions. According to a meta-study by Hartwig and Bond (2014) there was no difference between using a student population and ecologically valid populations during this type of study. Providing some support that making use of student samples do provide comparable results within this type of study. However, more studies concerned with deception detection are needed in the South African context in order to gain a broad understanding of how deception is judged within culturally diverse contexts. This understanding could be useful in creating ecologically valid instruments for future research.

## **6.5. Conclusion**

The purpose of this study was to discover if a lie bias would be found within a South African sample. In order to accomplish this, the study was conducted in two phases. The first phase was concerned with creating the research instrument. It consisted of 24 video recorded truthful and deceptive messages from 12 second language senders. The second phase involved gathering data in the form of deception judgments and confidence scores from a second sample of 64 receivers via an online survey. As English is the lingua franca in South Africa (Khokhlova, 2015), and only spoken by 9.6% of South Africans (Statistics South Africa, 2012), this context was well suited for such an investigation. However, in attempting to discover if there would be a lie bias towards second language speakers, variables concerned with gender and the linguistic ability of the receivers were additionally investigated. This was to provide more nuanced answers to the findings of the current

study, which was likewise the basis of the rationale in asking receivers what behavioural indicators they used to make deception judgments.

The findings from the current study were unfortunately limited due a very poor response-rate. As a result, only anecdotal evidence could be provided, however some conclusions could be derived from the data analysis. The findings suggested that there was no lie bias towards second language speakers. Furthermore, the findings indicated that there was no difference in the judgments of receivers due to gender differences. Anecdotal evidence was found to suggest that the race of the sender did not influence receiver's accuracy or correct truth scores. However, there seemed to be a difference in the way in which deceptive judgments were made. The linguistic ability of receivers indicated a significant effect on the way that they made veracity judgments. That is first language receivers tended to be truth biased, and second language receivers tended to be lie biased in their judgments towards the senders. However, this finding was also restricted because of the low response-rate. The argument that was made from the results is that receivers become biased as a result of their own cognitive load. This provides some support for the same argument as described by Lev-Ari and Keysar (2010). However, this does not imply that stereotypical beliefs about gender and race (in addition to other stereotypes) do not influence deception judgments. In contrast, it is possible that the stereotypical beliefs of receivers could become stronger with higher levels of cognitive load (Biernat et al., 2003). This is an avenue that should be explored in studies that have larger samples.

The above argument provides support for two distinct directions for future research. The first is that more studies are needed to provide a more detailed explanation of the effects that the cognitive load of receivers have on their accuracy or bias in detecting deception. The second direction, which follows from this position, is to investigate the communication ability of receivers that might mitigate the influence of their own cognitive load. As suggested, the conversation ability of the receivers would possibly not assist them to be more accurate at detecting deception, as discussed in the updated version of IDT (Burgoon & Buller, 2014). However, this ability could assist in mitigating the lie bias found by the results within this study.

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## Appendix A

### Interpersonal Deception Theory

1. “Context features of deceptive interchanges systematically affect sender and receiver cognitions and behaviors; two of special importance are the interactivity of the communication medium and the demands of the conversational task.” (Burgoon & Buller, 2014, p. 352)
2. “Relational features of deceptive interchanges systematically affect sender and receiver cognitions and behaviors; two of special importance are familiarity and relationship valence.” (Burgoon & Buller, 2014, p. 352)
3. “Interactive contexts and positively toned relationships are associated with higher expectations that a sender is truthful.” (Burgoon & Buller, 2014, p. 353)
4. “Deceivers’ fear of detection is positively influenced by how familiar receivers are with general deceptive behavior or knowledge of the sender; it is inversely related to receivers’ expectations for truthfulness and how relationally familiar (acquainted) they are with the deceiver.” (Burgoon & Buller, 2014, p. 353)
5. “Interactive contexts heighten strategic activity and lessen nonstrategic activity over time.” (Burgoon & Buller, 2014, p. 354)
6. “Target benefit alters strategic and nonstrategic activity during deception such that:
  - a. Deceiving for self-gain prompts more, and qualitatively different, strategic activity than deceiving for the benefit of others; and
  - b. Deceiving for self-gain prompts more nonstrategic behavior associated with concerns over detection and increased strategic activity to avoid detection than deceiving for the benefit of others.” (Burgoon & Buller, 2014, p. 354)
7. “Deceiver motivation to behave strategically is:
  - a. Inversely related to receiver expectations for truthfulness,
  - b. Positively related to relational familiarity with the target, and
  - c. Positively related to communicator skill.” (Burgoon & Buller, 2014, p. 354)

8. "Receivers are more likely to judge senders as credible when
  - a. The context is interactive,
  - b. Senders are skilled communicators,
  - c. Receivers are truth biased, and
  - d. Sender communication adheres to the receiver's expectations for normality."(Burgoon & Buller, 2014, p. 355)
  
9. "Receivers are less likely to detect deception when
  - a. the context is interactive,
  - b. senders are skilled communicators,
  - c. receivers are truth biased,
  - d. sender communication follows expected pattern, and
  - e. receivers are unfamiliar with sender information and behaviour. (Burgoon & Buller, 2014, p. 355)
  
10. "Receiver suspicion prompts change in receiver strategic and nonstrategic behavior." (Burgoon & Buller, 2014, p. 356)
  
11. "Senders attune to receiver suspicion." (Burgoon & Buller, 2014, p. 356)
  
12. "Sender perception of suspicion is positively related to
  - a. receiver deviations from expected behavior, and
  - b. receiver behavior signaling disbelief, uncertainty, or the need for additional information." (Burgoon & Buller, 2014, p. 356)
  
13. "Receiver suspicion (perceived or actual) evokes changes in the sender's strategic and nonstrategic behavior" (Burgoon & Buller, 2014, p. 356)
  
14. "Deception and suspicion displays change over time." (Burgoon & Buller, 2014, p. 356)
  
15. "Reciprocity is the dominant interaction adaptation pattern between senders and receivers during interpersonal deception." (Burgoon & Buller, 2014, p. 356)
  
16. "Terminal judgments of sender credibility and receiver detection accuracy are a function of:
  - a. Last receiver cognitions (suspicion, truth biases), and

b. Last sender behaviour displays.” (Burgoon & Buller, 2014, p. 357)

17. “Senders’ perceptions of deception success are a function of

a. Perceived suspicion and

b. Last receiver behavioural displays.” (Burgoon & Buller, 2014, p. 357)

## **Appendix B**

### **Interview Questions (Pilot Questions)**

1. What is your favourite ice-cream?
2. What hobbies do you have?

#### **Video Baseline:**

3. What kind of movies do you like to watch?

#### **Video Question:**

4. Could you describe to me what was happening in this video?

## **Appendix C**

### **Interview Questions (Final Questions)**

1. Tell me about your worst exam experience? (What it was and why it was the worst)
2. Tell me a bit about your favourite subject? (What it was and what it was about)

#### **Video Baseline:**

3. In about 2 minutes' time describe your favourite movie. (What was it, who played in it, what was it about?)

#### **Video Question:**

4. Could you describe to me in detail what was happening in this video?

## Appendix D

### Research Procedure (Sender Information Form)

#### Biographical Information of the Senders:

Please only provide your name and contact details if you want feedback on your performance. This information is not necessary for the purpose of this study.

Original video Number (Admin):	Watched:
Name and Surname (Optional):	
Email / Cell (Optional):	
Pronunciation Test Score:	

#### Biographical Questions

Please answer the following information in full.

Gender:	
Age:	
Race (Please circle the appropriate answer):	Black, Chinese, Coloured, Indian, White, Other:
Home language:	
Second Language:	
Third Language:	

*Senate Research and Innovation and Higher Degrees Committee Reference Number:  
2015\_RPSC\_006*

### Sender's Informed Consent Forms:

Dear Participant

Thank you for volunteering and for your cooperation. Your participation will allow the researcher to expand on the research within this field.

Please be aware that the selection of participants in this study is based on the following criteria: You have to be a South African, a current student at UNISA, as well as currently living in South Africa. In addition, you have to be able to speak and understand English to some degree.

The purpose of this study is to determine how well South African university students are able to detecting deception, and if there is a second language bias in how participants are judged. Therefore, the reason for this meeting is to create the recordings that will be used towards the purposes of this study. These recordings will be judged as either honest or deceptive by a sample of UNISA students.

During this session, your full image will be recorded with a video camera. Your identity and the information that you provide will be stored anonymously and be kept confidential as far as possible. The recordings will be stored safely by the researcher, and not be directly linked with your personal information. Your participation in this study will take at most 1 hour.

You will first be given some biographic questions to answer, as well as a short language pronunciation test. After which a video camera will begin to record, and you will be asked some baseline questions. This will take the form of three relatively easy questions, and it is expected that you answer them honestly. Please refrain from giving information that could potentially identify you to a stranger. After which you will be shown a short video clip, and asked to describe it honestly. There will be a short break, and you will be shown another video. Here you will be asked to lie about the content. The session will be concluded with some extra information as well as opportunity for questions. During the session, only the researcher, cameraman and the current participant will be in the room. The video clips will not consist of any potentially harmful footage.

For your participation, you will receive R100 after the session is concluded. If you would like feedback on your participation you will be required to provide your name and surname, as well as either your email address or cell phone number. This information will be held confidentially, and will be deleted one week after feedback was provided, to ensure that you've had time for any queries. No other forms of compensation will be provided. The researcher and the University of South Africa will not accept any responsibility of any loss or injury sustained by volunteering for this study.

Please be advised that this study is voluntary, and you may stop participation at any time for any reason. If you do wish to stop participation you will unfortunately not qualify to receive the R100. There will be no other penalties for stopping participation, as well as that the video recording will be deleted, and not be used in any way. It is believed that participation in this study will not lead to any harm. But for any reason, if the researcher judges that the study might become harmful, participation will automatically be stopped for further investigation. This could lead to participation being stopped completely. If this occurs, it will be handled in the same manner as when the participant wishes to stop voluntary participation.

In case of a problem or query please send an email to the researcher:

Herman Janse van Vuuren

Hermanjvvuuren@gmail.com

I \_\_\_\_\_ hereby give my consent to participate in this study, as well as agree to be recorded. I know that the recording could be used for current and future research. I further agree that I have read and agreed with the above description and participate through my own free will.

\_\_\_\_\_

Participant

\_\_\_\_\_

Date

\_\_\_\_\_

Researcher

\_\_\_\_\_

Date

I \_\_\_\_\_ hereby sign that I have received the payment of R100 from the researcher for my participation within the current study.

\_\_\_\_\_

Participant

\_\_\_\_\_

Date

\_\_\_\_\_

Researcher

\_\_\_\_\_

Date

## Appendix E

### Video Release Form

#### **Video Recording Release Consent Form:**

**Date:** \_\_\_\_\_

**Research Title:** Second Language Bias and Accuracy of Deception Judgments

**Researcher:** Mr Hermanus Hendrik Janse van Vuuren

**Supervisor:** Mrs J. K. Moodley

**Description:** The current study looks at the potential bias that could be related to deception decisions made about second language speakers.

**Contact and Ethical Information:** Please contact the researcher; Hermanus Hendrik Janse van Vuuren, [Hermanjvuuren@gmail.com](mailto:Hermanjvuuren@gmail.com), with any questions related to the research. This study was reviewed and ethically cleared by the Department of Psychology Ethics Committee. Permission was also granted to video record interviews, distribute an online survey, and access to student emails by Unisa Senate Research and Innovation and Higher Degrees Committee (SRIHDC) on 20 January 2015. Permission was granted from 25 January 2015 to 31 December 2015. SRIHDC Reference Number: 2015\_RPSC\_06.

**Release Statement:** I understand that in signing the release statement that the data and recordings will only be used for academic and educational purposes. In addition, the final project will involve scrutiny of academics, research participants and students. I know what the risks and contributions are of my participation in this study and consent to be involved.

I consent to the use of the video recorded footage as well as allow that these would be displayed to a target audience. This includes the viewing for the purpose of this project, and in addition potential training, research, or academic viewing of the footage.

**Anonymity:** The researcher undertakes not to include or directly link the participant's personal or contact information with the video recordings. Personal information like names and contact information will only be kept on written consent forms, and not be included in this research study or future use of the material. The researcher also undertakes to only use the recorded material for research purposes, and that the material will not be released to the media, unauthorised persons, social media sites etcetera.

**Consent:** I \_\_\_\_\_ give my consent in relation to the video recorded material in the following:

That the material is used for future research

That the material is used for future training purposes

That the material may be shown to other academics and students.

That direct quotes may be used from the recordings in documents and publications.

**Indemnity:** I indemnify the researcher and the University of South Africa, including its employees harmless and safe against any prosecution due to the use of the video material in which I appear or am quoted.

I am signing this release form voluntarily and out of my own freewill.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Researcher: Hermanus Hendrik Janse van Vuuren

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Thank you for your participation in this project.

*Senate Research and Innovation and Higher Degrees Committee Reference Number:  
2015\_RPSC\_006*

## **Appendix F**

### **Sender Email**

Dear Student

Thank you again for participating in my study on second language deception detection. I have collected all the data, and as promised this email is meant to inform you of the overall results.

The purpose of the study was to see if a person would be judged as lying more often than judged as being honest while they are speaking in their second language (English). The way this study tried to accomplish this, was to have students give one truthful and one deceptive message while being video recorded. This was the part of the study in which you participated. The videos were then edited, so that only the honest or deceptive part of the messages could be seen, and were developed into an online survey. A secure link to the survey was then sent to a second group of students, who were then asked if they believed whether the messages in the videos were lies or truths. The correct judgments were scored. The scores gathered from the videos were thus then the opinions of the second group of how truthful (or deceptive) the messages were.

In-line with the literature, as well as our previous discussion, most of the people who made these judgments seemed to have guessed (in this study if they scored close to 50% it was just as good as a guess). This is apparent from the average score (52%) that was attained. The average score on truthful messages was 55%, and the average score on deceptive messages was 50%. Thus, there seems to have been a slight tendency to make more truth judgments when making judgments on truthful messages. But when looking at the total score, the tendency to make truth judgment appears to be less.

One of the limitations of this study is that it did not use more natural methods of conversing, we don't normally have camera(s) pointed at us, and we are not always forced to tell a complete truth or lie. But from the results as well as the wider literature on the topic, it appeared that people tended to guess when forced to make veracity choices, and it seems that speaking in a second language could also have an effect on these judgments.

If you have any more questions, please feel free to contact me.

Regards

HH J.v. Vuuren

Senate Reference: 2015\_RPSC\_006

## Appendix G

### Ethical Clearances

#### 1. Department of Psychology Ethical Clearance.



#### Ethical Clearance for M/D students: Research on human participants

*The Ethics Committee of the Department of Psychology at Unisa has evaluated this research proposal for a Higher Degree in Psychology in light of appropriate ethical requirements, with special reference to the requirements of the Code of Conduct for Psychologists of the HPCSA and the Unisa Policy on Research Ethics.*

**Student Name:** Hermanus H Janse van Vuuren      **Student no.:** 48258415

**Supervisor/promoter** Janice Moodley      **Affiliation:** Department of Psychology, Unisa

**Title of project:**

Second Language Bias and Accuracy of Deception Judgements

The proposal was evaluated for adherence to appropriate ethical standards as required by the Psychology Department of Unisa. The application was approved by the departmental Ethics Committee of the Department of Psychology without further conditions.

*Signed:*

A handwritten signature in black ink, appearing to read "P Kruger".

**Prof P Kruger**  
[For the Ethics Committee      ]  
[ Department of Psychology, Unisa ]

Date: 4 November 2014

**When the research commences the following provisos apply:**

- 1) *The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.*
- 2) *Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the Psychology Department Ethics Review Committee. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.*
- 3) *The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.*

## 2. Senate Ethical Clearance 1.

### RESEARCH PERMISSION SUB-COMMITTEE OF SRIHDC

26 January 2015

Ref #: 2015\_RPSC\_006  
Mr Hermanus Janse van Vuuren  
Student #: 48258415  
Staff #:

Dear Mr H Janse van Vuuren,

**Decision: Research Permission  
Approval**

---

**Name:** Mr Hermanus Janse van Vuuren  
Department of Psychology  
College of Human Sciences  
UNISA  
hermanjvuuren@gmail.com  
073 384 9774

**Supervisor:**  
Mrs Janice Moodley  
moodljk@unisa.ac.za

**A study titled: "Second language bias and accuracy of deception judgements."**

---

Your application regarding permission to conduct research involving UNISA staff in respect of the above study has been received and was considered by the Research Permission Subcommittee of the UNISA Senate Research and Innovation and Higher Degrees Committee (SRIHDC) on 20 January 2015.

It is my pleasure to inform you that permission has been granted for this study to *access Unisa students' email addresses, to conduct video recorded interviews and to distribute an online survey* to the target audience, for the period between 25 January 2015 and 31 December 2015.

You are requested to submit a report of the study to the Research Permission Subcommittee (RPSC@unisa.ac.za) within 12 months of completion of the study.



**Note:**

*The reference number [2015\_RPSC\_006] should be clearly indicated on all forms of communication with the intended research participants.*

We would like to wish you well in your research undertaking.

Kind regards,



**PROF L LABUSCHAGNE**  
**EXECUTIVE DIRECTOR: RESEARCH**

**Tel:** +27 12 429 6368 / 2446

**Email:** [llabus@unisa.ac.za](mailto:llabus@unisa.ac.za)

### 3. Senate Ethical Clearance 2.

#### RESEARCH PERMISSION SUB-COMMITTEE OF SRIHDC

19 June 2015

Ref #: 2015\_RPSC\_006

Mr H Janse van Vuuren

Student #: 48258415

Staff #:

Dear, Mr H Janse van Vuuren

**Decision: Research Permission**  
**Approval for the period June 2015**  
**to 31 December 2015**

---

**Principal Investigator:**

**Mr H Janse van Vuuren**  
College of Human Sciences  
School of Social Sciences  
Department of Psychology  
UNISA  
hermanjvvuuren@gmail.com  
073 384 9774

Supervisor: Ms. Janice Moodley  
moodjk@unisa.ac.za

**A study titled: "Second language bias and accuracy of deception judgements."**

---

Your application regarding permission to increase the sample size of UNISA students who will be involved in the research study, in respect of the above study has been received and was considered by the Research Permission Subcommittee (RPSC) of the UNISA Senate Research and Innovation and Higher Degrees Committee (SRIHDC) on 12 June 2015.

It is my pleasure to inform you that permission has been granted for the study to:

1. Extend the sample size from 120 students and distribute an online questionnaire to 10 000 target students.
2. You are requested to submit a report of the study to the Research Permission Subcommittee (RPSC@unisa.ac.za) within 12 months of completion of the study.



The personal information made available to the researcher(s)/gatekeeper(s) will only be used for the advancement of this research project as indicated and for the purpose as described in this permission letter. The researcher(s)/gatekeeper(s) must take all appropriate precautionary measures to protect the personal information given to him/her/them in good faith and it must not be passed on to third parties.

*Note:*

*The reference number 2015\_RPSC\_006 should be clearly indicated on all forms of communication with the intended research participants and the Research Permission Subcommittee.*

We would like to wish you well in your research undertaking.

Kind regards,



**PROF L LABUSCHAGNE**  
**EXECUTIVE DIRECTOR: RESEARCH**

Tel: +27 12 429 6368 / 2446  
Email: [labus@unisa.ac.za](mailto:labus@unisa.ac.za)



University of South Africa  
Preller Street, Muckleneuk Ridge, City of Tshwane  
PO Box 392 UNISA 0003 South Africa  
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150  
[www.unisa.ac.za](http://www.unisa.ac.za)

## Appendix H

### Survey

# Deception Detection Survey

#### Informed Consent

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■ 2

Thank you for volunteering and for your cooperation. Your participation will allow the researcher to expand on the knowledge within this field.

Please be aware that to participate in this study you have to be a South African, a current student at Unisa, currently live in South Africa and between the ages 18 and 45. The information that you provide will be stored anonymously and kept confidential. As well as that access to the results are password protected.

In today's day and age, it is important to be able to see when someone is lying to you. With so much information it is important to decide what to believe and when. This study is about your ability to see if someone is telling you the truth, or lying. During this study you will be asked to judge 24 recordings of students who either lied or told the truth about a video that they were watching. The students in the videos were recorded twice, and each time they had a choice to either lie or tell the truth. Thus, you will see two recordings of every student that was recorded, and both videos could either be true or false. You will not be able to go back to previous answers in order to change them. This is to ensure that only your first responses are stored.

The study will begin with an example-question, this is so that you will be able to test your sound and screen quality. With each question you will first be shown the recording of one student. The first 20 seconds of every recording will show the student describing their favourite movie. This question was answered truthfully, and it is included so that you could see what the person looks like while telling the truth. The word "Baseline" will show next to this part of every recording. While the recording is playing there will be a fade out effect, which would indicate that the student is about to describe a video clip that they have been watching during that interview. This second part of the recording is the ONLY part that you need to judge as either honest or deceptive. You will be asked two questions about every recording. The first question asks if the student is honest or deceptive. The second question asks about how confident you feel about your answer. Both these questions must be answered to be able to continue to the next recording. The final part of the study would ask some biographic details, after all the questions have been answered. After which you will be shown how well you did in the survey as a percentage mark.

The study is expected to take approximately 40 minutes to complete. You would be able to pause the assessment and continue another time, but it is highly recommended that you try to finish it in one sitting. As well as that this survey does include video material, and thus it is advised that you use a WIFI connection instead of mobile data. The study should take less than 90 mb of data to complete.

Please be advised that this study is voluntary, and you may opt out of participating before submitting at any time for any reason without consequence. By completing this survey, you agree that the information you provide may be used for research purposes, including dissemination through peer-reviewed publications and conference proceedings.

No compensation will be provided for participation within the study, and the internet usage would be at your own cost. The researcher and the University of South Africa will not accept any responsibility for any loss or injury sustained by volunteering for this study.

Permission and ethical clearance were obtained from the Department of Psychology Ethics Committee, as well as Unisa Senate Research and Innovation and Higher Degrees Committee (SRIHDC Reference Number: 2015\_RPSC\_006). If you have any questions, you can email the researcher.

In case of a problem or query, please send an email to the researcher:

Researcher: HH Janse van Vuuren

Researchsurveystudy@gmail.com

Supervisor: JK Moodley

Unisa Senate Reference Number: 2015\_RPSC\_006

Shortname / Alias: Consent Variable name: Consent

3

I hereby give my consent and cooperation to participate in this study, and agree that I have read and taken note of the information provided above. \*

I Agree

TimeIntro Action: Hidden Value

Value: Populates with the length of time since the survey taker started the current page

#### Example

---

Page description:

Remember to give the video enough time to buffer before you play.

169

TimeExample Action: Hidden Value

Value: Populates with the length of time since the survey taker started the current page

#### Example Questions

---

Shortname / Alias: ExampleQuestion Variable name: ExampleQuestion

77

This person was: \*

Truthful (Honest)  Lying (Deceptive)

**SAVED** Min = 0 Max = 100  
**DATA** Shortname / Alias: ExampleConfidence Variable name: ExampleConfidence  
78  
How confident do you feel about your answer \*

Unconfident  Completely Confident

Comments

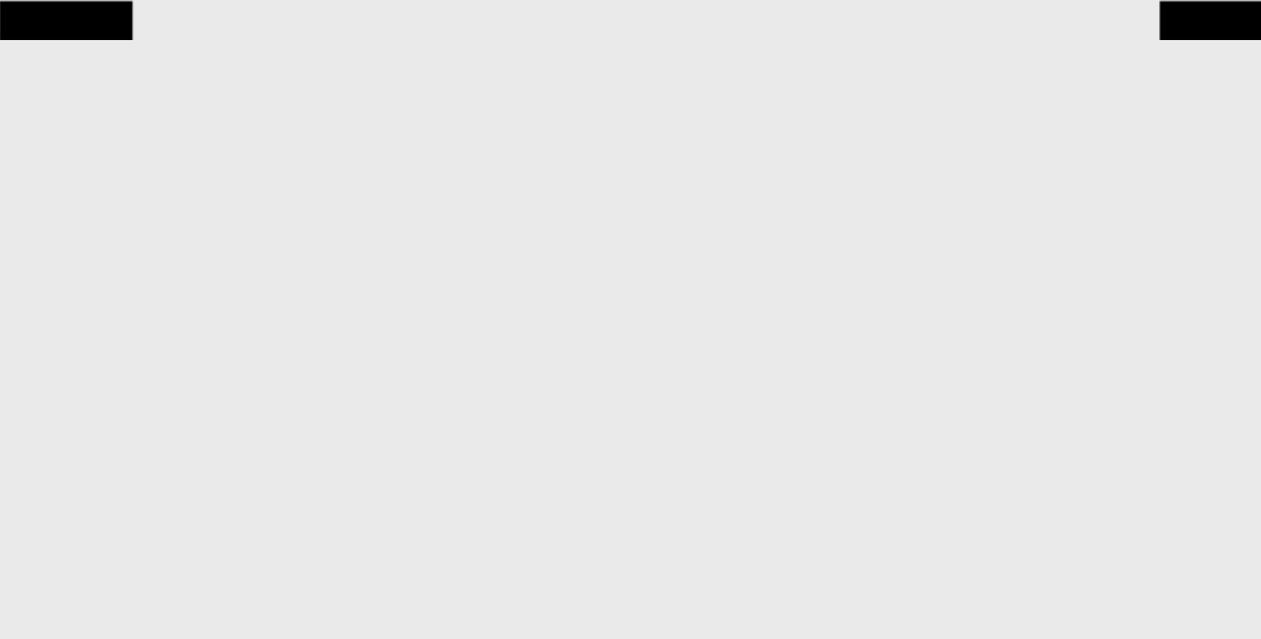
**TimeExampleQ Action: Hidden Value**  
Value: Populates with the length of time since the survey taker started the current page

**Video**

---

**Page description:**  
Remember to give the video enough time to buffer before you play.

168



**TimeV1 Action: Hidden Value**  
Value: Populates with the length of time since the survey taker started the current page

**Question**

---

As the questions of the survey took on a similar format as the above, those pages were omitted from this appendix. Thus, the following page was placed after the last question was answered.

**VALIDATION** Min = 0 Max = 100

**Q24** Shortname / Alias: C24 Variable name: C24

**Q24** 155

How confident do you feel about your answer \*

Unconfident



Completely  
Confident

Comments

TimeQ24 Action: Hidden Value

Value: Populates with the length of time since the survey taker started the current page

### Deception Cues

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**VALIDATION** Min character count = 1

**Q24** Shortname / Alias: Qual Variable name: Qual

**Q24** 218

What did you look for to decide if the person was telling the truth or lying? \*

This could include the person's behaviour, believability of the story, etc. Please give as complete answer as possible.

TimeDeceptCue Action: Hidden Value

Value: Populates with the length of time since the survey taker started the current page

### Biographical Information

---

**Q24** Shortname / Alias: Gender Variable name: Gender

**Q24** 4

Gender \*

- Female
- Male

**VALIDATION** Min = 18 Must be numeric Whole numbers only Positive numbers only

**Q24** Shortname / Alias: Age Variable name: Age

**Q24** 5

What is your current age in years? \*

Shortname / Alias: Race Variable name: Race ,var6O11Othr

6

Choose the race you identify with. \*

- Black
- Indian
- White
- Coloured
- Other (required)

Validation Min. answers = 2 (if answered)

Shortname / Alias: Language Variable name: FirstLanguage ,SecondLanguage ,ThirdLanguage

41

Please indicate what languages you are able to understand (Choose at least two): \*

	English	Afrikaans	Zulu	Xhosa	Southern Sotho	Tswana	Northern Sotho	Venda	Tsonga	Swati	Ndebele
First (Home) Language	<input type="radio"/>										
Second Language	<input type="radio"/>										
Third Language	<input type="radio"/>										
Enter another option	<input type="radio"/>										

Comments

Validation Min = 0 Max = 100

Shortname / Alias: Read & Write Variable name: ReadWrite

275

Please give an indication of your fluency in READING and WRITING English. \*

Not Fluent  Very Fluent

Validation Min = 0 Max = 100

Shortname / Alias: Speak Variable name: Speak

276

Please give an indication of your fluency in SPEAKING English. \*

Not Fluent  Very Fluent

**Validation** Min = 0 Max = 100

**Item** Shortname / Alias: Understand Variable name: Understand

277

Please give an indication of your fluency in UNDERSTANDING English. \*

Not Fluent

Very Fluent

Comments

**Item** Shortname / Alias: Device Variable name: Device ,var71O109Othr

71

Which device did you use for this survey? \*

Computer

Tablet

Mobile

Other (required)

Random Page Path Action: Hidden Value

Value: 1

TimeBio Action: Hidden Value

Value: Populates with the length of time since the survey taker started the current page

TimeSurvey Action: Hidden Value

Value: Populates with the length of time since the survey taker started the survey

Show/hide trigger exists.

**Item** Shortname / Alias: Problem Variable name: ProbSurveyQuestion ,ProbConnection ,ProbVideo ,ProbSound ,ProbTime ,var72O115Othr ,var72O115

72

Did you experience any problems with the survey in regards to the following (optional):

Survey / Survey Questions

Internet Connection

Video

Sound

Time

Other (required)

**10000** Hidden unless: Question "Did you experience any problems with the survey in regards to the following (optional):" is one of the following answers ("Survey / Survey Questions", "Internet Connection", "Video", "Sound", "Time", "Other (required)")

**5000** Shortname / Alias: ProbSpecify Variable name: ProbSpecify

**73**

Please specify the problem (optional):

## Thank You!

---

**112**

Thank you for participating in this study.

Various previous studies have found that people are not very good at just seeing when someone is lying to them. On average, people score around 54% on similar types of studies (around 60% for truth and 40% for lies), which means that they usually do not know when someone is lying to them just from nonverbal behaviour. People normally find out that someone is lying to them because of extra information.

The purpose of this study was to see if there was a difference in how people made these kind of judgments of second language speakers. There seems to be a distrust of people when they are speaking in their second language, and this study was designed to test this idea in South Africa. This was not included in the first description because people change how they answer based on this, and here we needed your first reaction.

Thus far no studies have really looked at a context like South Africa, and specifically to the languages that people communicate with. In terms of the scores I do not expect that there would be too much of a difference between South Africans and the previous research. This study does however try to see if there could be various biases in regard to the race, gender and language proficiency of the person speaking, as well as the person making the judgements.

The score you achieved was:

**Quiz Type:** Pass/Fail (A score of 0% passes)

**Pass Message:** [quiz("score")]

**Fail Message:** quiz\_failmessage

Truth Correct:

**Quiz Type:** Pass/Fail (A score of 0% passes)

**Pass Message:** [quiz("score")]

**Fail Message:** quiz\_failmessage

Lie Correct:

**Quiz Type:** Pass/Fail (A score of 0% passes)

**Pass Message:** [quiz("score")]

**Fail Message:** quiz\_failmessage

1

If you are interested in reading more on nonverbal communication or deception detection some popular books would be:

Barbara Pease & Allen Pease - The Definitive Book of Body Language

Paul Ekman - Telling lies

If you have any questions about the research please direct them to:

HH Jv Vuuren

Researchsurveystudy@gmail.com

Senate Research and Innovation and Higher Degrees Committee Reference Number: 2015\_RPSC\_006

## **Appendix I**

### **Receivers email 1**

Dear Student

I am currently completing my Masters in Research Psychology at Unisa. I obtained your email address from the Unisa database. My study is about the ability of students to see if someone is lying to them or not, by watching a series of video clips. I would like to invite you to participate in this study by completing an online survey.

The survey takes approximately 40 minutes to complete and you will need a reliable internet connection. I recommend that you use a WIFI connection instead of mobile data (the study should take about 90mb of data). As well as preferably not completing the survey using a mobile phone. After completing the survey, you will see a percentage score that shows how accurate your judgments were.

The survey is voluntary, and there is no compensation for participating. I do not ask you for personal information that could identify you. The survey is anonymous, and will remain confidential. You will only be able to complete the survey once, and submissions will close on 31 August 2015.

Please click on the link in order to complete the survey.

<LINK>

Permission and ethical clearance was obtained from the Department of Psychology Ethics Committee, as well as Unisa Senate Research and Innovation and Higher Degrees Committee (SRIHDC Reference Number: 2015\_RPSC\_006). If you have any questions, you can email the researcher.

Thank you for your time.

Regards

HH Jv Vuuren

Researchsurveystudy@gmail.com

## Appendix J

### Receivers email 2

Dear Student

This is a final reminder to participate in the study in order to see if you are able to detect if someone is honest or deceptive. If you started the assessment, I would like to invite you to finish before the closing date. The assessment will close on 28 September 2015.

The background and introduction to the study:

I am currently completing my Masters in Research Psychology at Unisa. I obtained your email address from the Unisa database. My study is about the ability of students to see if someone is lying to them or not, by watching a series of video clips. I would like to invite you to participate in this study by completing an online assessment.

The study takes approximately 40 minutes to complete and you will need a reliable internet connection. I recommend that you use a WIFI connection instead of mobile data (the study should take about 90mb of data). As well as preferably not completing the assessment using a mobile phone. After completing the study, you will see a percentage score that shows how accurate your judgments were.

The study is voluntary, and there is no compensation for participating. I do not ask you for personal information that could identify you, the study is anonymous, and will remain confidential. You will only be able to complete the study once.

Please click on the link in order to complete the assessment.

<LINK>

Permission and ethical clearance was obtained from the Department of Psychology Ethics Committee, as well as Unisa Senate Research and Innovation and Higher Degrees Committee (Senate Reference Number: 2015\_RPSC\_006). If you have any questions, you can email the researcher.

Thank you for your time.

Regards

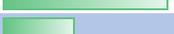
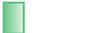
HH Jv Vuuren

Researchsurveystudy@gmail.com

## Appendix K

### Content Analysis Code list

#### Content Analysis

Coded Terms	Totals	Categories
Multiple Cues		Strategic (Not Active)
Body language		Nonverbal
Looking at the eyes		Nonverbal
Eye contact		Nonverbal
Facial expression		Nonverbal
Smiling		Nonverbal
Hand movements		Nonverbal
Hand gestures		Nonverbal
Loical flow		Strategic
Compare to baseline		Strategic
Behavioural Changes		Strategic
Description		Strategic
Fidgeting		Nonverbal
Confidence (Behaviour)		Nonverbal
Cognitive Load		Strategic
Story detail		Strategic
Leg movements		Nonverbal
Pauses (Voice)		Vocal
Composure		Nonverbal
Behaviour matching the story		Strategic
Confidence (Voice)		Vocal
Speech pace		Vocal
Tone of voice		Vocal
Body posture		Nonverbal
Strained movements		Nonverbal
Giggling / Laughter		Nonverbal
Length of the story		Strategic
Arm movements		Nonverbal
Head movements		Nonverbal
Chronology		Strategic
Vocabulary use		Vocal
Volume		Vocal
Blinking		Nonverbal
Eyebrows		Nonverbal
Adaptor		Nonverbal
Speech filler		Vocal
'Gut Feeling'		N/A
Contextual Information (Recognized the video)		Strategic
Pitch (Voice)		Vocal
Story 'strained'		Vocal
Stuttering		Vocal