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Date 4/23/2014

IDENTIFYING DECEPTIVE CUES IN NONVERBAL COMMUNICATION

by

Michael N. Ballard

A thesis

submitted in partial fulfillment

of the requirements for the degree of

Master of Arts in the Department of Anthropology

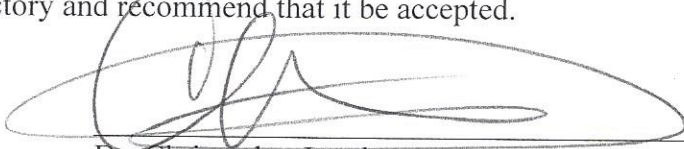
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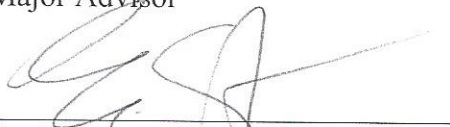
Committee Approval

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The members of the committee appointed to examine the thesis of MICHAEL N. BALLARD find it satisfactory and recommend that it be accepted.



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RE: Your application dated 5/24/2013 regarding study number 3933: Cross-Cultural Patterns in Deceptive Behavior

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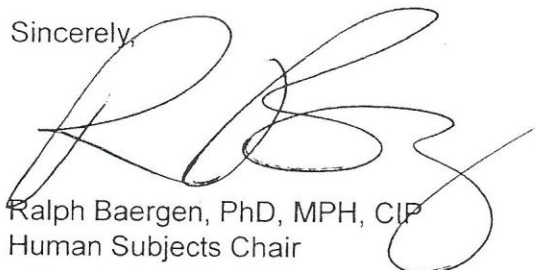
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You may conduct your study as described in your application effective immediately. The study is subject to renewal on or before 5/28/2014, unless closed before that date.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Patricia Hunter (208-282-2179; fax 208-282-4723; email: humsubj@isu.edu) if you have any questions or require further information.

Sincerely,



Ralph Baergen, PhD, MPH, CIP
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February 27, 2013

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RE: Your application dated 2/13/2013 regarding study number 3875M: Cross-Cultural Patterns in Deceptive Behavior

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This is to confirm that your application is now fully approved. The protocol is approved through 2/27/2014.

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Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Patricia Hunter (208-282-2179; fax 208-282-4723; email: humsubj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

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ABSTRACT

Law enforcement officers in the US rely on their abilities to identify deceptive cues during the interview and interrogation process. This research identifies the value law enforcement officers in the US place on individual cues associated with deception. Much of the training related to identifying deceptive cues revolves around eye contact and bilateral eye movements. This research tests these methods. The results show that bilateral eye movements and eye contact do not directly reflect deception. Statement lengths were observed to differentiate between truthful and deceptive statements.

Chapter 1

Introduction

The purpose of my research is to identify deceptive patterns that are common across cultures. If law enforcement and security officers know which deceptive behaviors are innate they will be better equipped to detect deception. This ability of better deception detection will allow officers to better articulate what they see in reports for their investigations. Officers who receive training early in their career identifying correct deceptive patterns will likely be more successful in the interview process for the duration of their career.

Officers interact with people from a variety of different backgrounds. For the last 15 years I have worked as a Sheriff's Deputy, Police Officer, as well as Detective. During my time as an officer I have attended several training classes directed towards better communication for law enforcement. These schools have included methods for interviewing, interrogating, and detecting deception. Despite having these classes, the experiences that I have had conducting interviews have made me far more proficient as an interviewer in detecting deception. Law enforcement and security personnel rely on their personal training and experience to obtain information from people who are often reluctant to provide pertinent information to further investigations. One of the areas that could use improvement for the vast majority of these professionals is in detecting deception. Very little time is devoted to the detection of deception in formal training settings. For most officers to become proficient in this aspect of their job requires years of experience. Even then they often are unable to articulate what they are witnessing in

an interview. Few officers are truly good at recognizing when someone is being deceptive.

In this study I will describe differences representative of nonverbal communication. This will include how deception is a biological tool. Deception has a biological origin that gives the deceiver an advantage over the receiver of the signal sent. As a receiver of the deceptive signal it is beneficial to be able to decipher deceptive signals. I will also address in the literature review the roll that nonverbal communication plays in deception. The majority of communication between humans is done on a nonverbal level. Nonverbal communication is influenced by cultural learning. Nonverbal communication is more difficult to suppress during communication than is verbal communication. Due to the enormous numbers of signals being sent during communication the sender of the signal is less likely to be able to control the majority of the signals being sent. These uncontrollable signals are often called leakage, and often reveal the underlying messages the sender does not want the receiver to be aware of. To decode these signals the receivers must have specific cultural knowledge. However, signals that are connected to emotional displays are often recognized cross-culturally. This is likely a biological adaptation. Deception that involves emotional responses is likely to be more identifiable between people in different cultures.

The purpose of this study is to identify patterns of deceptive behaviors that are recognized cross-culturally. The research section of this thesis will begin by describing a survey of 33 law enforcement officers. Law enforcement officers have been identified as having a higher accuracy rate in detecting deception than does the general public. The results of this survey will help identify the deceptive signals that officers associate with

deception. The second part of the research section of this thesis will address eye movement patterns that law enforcement officers are taught to assess in the process of detecting deception. This research will compare eye movement patterns of people who have been raised in the United States to people who have been raised outside the United States. The final section of this thesis will provide the data from both the survey of officers and the research of eye movement patterns. This section will also include the statistical analysis used to draw my conclusions.

Research Questions

Which nonverbal behaviors are recognized by law enforcement officers to have a higher correlation to deception? Do eye behaviors related to deception have an innate quality? Which of those behaviors are culturally influenced?

Definitions

Body leakage: Nonverbal behaviors that provide evidence of the correct emotional state or thought contrary to what the person wishes to display.

Caveat: To distinguish by clarifying or providing a warning.

Culture: “Learned systems of meaning, communicated by means of natural language and other symbol systems.” (Ting-Toomey 1999: 9)

Deception: An intentional effort to cause another to accept something that the communicator knows not to be true.

Deceptive omissions: Withholding information that lead another to accept that which is untrue.

Deep Structures: A theory proposed by Noam Chomsky to describe how language is processed in the mind prior to being connected to grammatical and phonological rules or gestures.

Eye drift: A shift or movement of the eye to a position other than eye contact.

Gaze: Eye contact between two people.

Gaze aversion: Eye movements which intentionally move in a direction to prevent eye contact. (This is an interchangeable term with gaze avoidance)

Gaze avoidance: Eye movements which intentionally move in a direction to prevent eye contact. (This is an interchangeable term with gaze aversion)

High context culture: Edward T. Hall described a number of characteristics of a high context culture. These cultures tend to send and receive a much higher volume of information in their communication. Often these include additional senses such as olfaction, in which people who communicate tend to be closer in proximity to use these senses. These cultures include countries such as Italy, Japan, Saudi Arabia, etc.

Innate: A characteristic that has been present from birth.

Kin: An individual physical movement related to nonverbal communication. A kin can be compared to a phone in verbal linguistics (Birdwhistell 1952:77).

Lie: An intentional incorrect statement used to mislead another.

Low context culture: Edward T. Hall described a number of characteristics of low context cultures. Some of these include information that is given in small slow quantities. Cultures that communicate in low context often have to explain things in greater detail and less is inferred. These cultures include countries such as the United States of America, Canada, Great Britain, and other northern European countries.

Mutual gaze: Eye contact between two people at the same time.

Non-parametric: An assumed data. Due to the minimal sample size of a study conclusions are not representative of a total population. Further studies including larger sample size would be necessary to confirm the results.

Proxemics: "Interrelated observations and theories of man's use of space as a specialized elaboration of culture." (Hall and Hall 1990: 1)

Signal: “A signal is an indicator that serves as a means of communication.” (Givens 2008: 9)

Surface Structures: A theory proposed by Noam Chomsky to describe how language is displayed when connected to grammatical and phonological rules or gestures.

Study Significance

Law enforcement officers rely on their ability to detect deception during interviews, in which they are gathering information from potential witnesses and suspects. Because of their job requirements, law enforcement officers need to have an increased ability to detect deception. This two-part study identifies behaviors that officers are commonly taught to recognize as highly probable indicators of deception, as well as behaviors that have a lower indication of deception. The second part of this study focuses on neurolinguistic bilateral eye movements that have been correlated to deception and eye contact (Rhoads 2004: 62-65). For approximately 30 years law enforcement literature has focused on deceptive indicators comprised of patterns in eye movements and contact (Wicklander-Zulawski 1984:17-18). This study provides evidence that neurolinguistic eye movements are not reliable as indicators of deception. Eye contact was also found not to be a reliable indicator of the study participants telling lies versus telling the truth. This study suggests that officers have been misled for decades in their training about deception. Law enforcement agencies across the United States spend vast amounts of money to educate their officers in recognizing behaviors associated with lying. The research described in this thesis contributes new information that points to a new way of understanding deceptive behavior that has important ramifications for law enforcement training.

Chapter Two

Literature Review

This chapter is a review of the major topics surrounding deception and nonverbal communication. These topics include: deception in biology, nonverbal communication patterns, proxemics, deception and nonverbal communication training for law enforcement and security, abilities to detect deception, deceptive displays in nonverbal communication, cultural influences of nonverbal communication in deception, and eye movements and their relationship to deception.

There are three major questions that researchers in deception are trying to answer (Knapp and Hall 2010: 435). The first is what behaviors are more likely observed in people who are deceptive versus people who are honest? The second is what emotional and mental channels are involved with deception? The last question is what level of accuracy do people have in recognizing deception? These questions have been an important aspect for law enforcement officers training. Officers use their knowledge to obtain confessions and navigate the direction of questioning in interviews. Typically, researchers of this subject include psychologists, sociologists, medical researchers, and anthropologists. The cultural differences and biological aspects of deceptive behaviors make linguistic anthropology an excellent field from which to study this subject. Approaching this topic through a holistic anthropological study will allow for a broader understanding of what roll deception plays in human communication.

Deception and Biology

Deception has been used as a biological tool in the survival and fitness of species.

Animals across the planet display examples of deception. Human deception involves both biological and cultural aspects (Smith 1987: 50). The role that deception plays has changed over time. As early as 1942 the biology of deception between humans and animals was compared. Ira S. Wile compared how beetles fake their own death to the same behavior in soldiers in war. Both share a common goal in their deceptive behavior, to preserve their own life (Wile 1942: 294). In 1972 Susanne K. Langer described that the use of deception is unique to humans because of their advanced intellectual abilities. Several scholars over the years have avoided comparing the use of deception in humans to that of animals because they believe the cognitive processes in humans make the use of deception so much different. In 1979 Roy Rappaport described that the only other primates that display deceptive abilities similar to humans are apes (Rappaport 1979: 225). Since Rappaport's work, many researchers have begun to identify similarities in the use of deception throughout a variety of species. Euclid O. Smith in 1987 wrote about how deception has been useful as a process for adaptation in biology (Smith 1987: 51).

Smith argues that researchers often approach deception from the wrong direction (1987: 52). Rather than look for the evidence that animals are aware of the actions that they are undertaking in a deceptive manner, Smith argues that researchers should look at the end result of what the deception accomplishes or what purpose it serves. These behaviors can best be described as strategizing for the benefit of the deceiver. Smith argues that these strategies revolve around maximizing fitness (an evolutionary process which allows a species to survive and reproduce) for the deceiver. Not all deception is for fitness maximization. However, the vast amounts of deception gravitate around it.

Deception is not successful if it is used frequently (Smith 1987: 52). Deception has to be unnoticeable by the signal receiver. For instance if a particular military force uses a deceptive tactic against another military force, the first time that tactic is used it is likely to be effective. If the same tactic is used repeatedly the tactic will no longer be effective and could produce negative consequences for using the same tactic again. The enemy will likely be ready and have created a deceptive strategy to counter it.

There are at least four elements that can impact how deception is displayed (Smith 1987: 53). The first is “relative cost/benefit analysis.” When the cost to benefit is unbalanced the display of deception is likely to be affected. If an animal is starving it is likely to use deception at a different level to acquire the food needed to sustain survival. The second element is “ontogenetic development.” As individuals mature they are likely to identify certain behaviors of deception that are common in their social groups. As a result of recognizing specific behaviors they are likely to engage in similar behaviors themselves that they can consciously control. The third element is “ecological constraints.” Ecological constraints govern specific behavioral indicators that are not likely to change. For example, often people will sweat when they become nervous. They are not likely to be able to change that behavior. However, they may find ways to conceal it. The final element is the “pattern of social organization.” Social organization for humans is directly related to culture. An example of deception in humans that is impacted by culture is the use of makeup. Makeup is often used to accent features or make someone appear more attractive, younger, older, etc.

Displays of deception are different in individuals who live in close proximity with each other and who are familiar with one another (Smith 1987: 54). It is more difficult to

deceive members of a small social group than those residing in a large social group.

Learned deception in animals has theoretically started from one of three areas which include: mating behavioral strategies, conflict between parents and their children, or “social play” among partners (Smith 1987:60).

With the use of fMRIs, deception has been studied from the perspective of what is happening inside the human brain. As the brain accesses memories of something that is truthful, the regions of the brain that are activated are lower function areas of the brain (Spence 2004: 7). These areas are often called “slave systems.” As someone creates a deceptive response the same “slave” regions of the brain are activated. However, many other areas of the brain are activated as well. The prefrontal cortex contains higher brain functions. This is where the majority of the additional brain activity takes place during deception. The prefrontal cortex is responsible for many behaviors that influence adaptation. Neurodevelopment disorders, such as autism, often impact a person’s ability to use deception. The ability to use deception appears to be part of the normal developmental process (Spence 2004: 6).

One of the interesting things about the deception study using fMRIs was that the lies used in the research were of low risk (Spence 2004: 8). When people lie, the level of risk that is involved affects how deception is displayed. For example, Scott Peterson, who was convicted of killing his pregnant wife and dumping her body in the San Francisco Bay, did several interviews on television as he pleaded for people to help find her. The level of risk of him being caught and the consequences of his actions were so high that it impacted his behavioral output. In several interviews he is seen attempting to

exercise behavioral control over his physical responses. In one interview he attempts to cry. Although tears are present his facial expressions are not consistent with the physical response of crying. He is also observed in a statue position in another interview as he attempts to control his physical responses. For anyone watching the behavior is unusual. Most research on deception uses low risk lies. This is because truly high risk lies are difficult to simulate. In the fMRI studies, researchers consistently found that there was a 200 millisecond delay in deceptive responses versus honest responses (Spence 2004: 9). This is attributed to the extra brain activity that is involved in the process to fabricate a response. When someone lies, previous information that relates to the lie has to be accessed in the brain. The creative functions of the brain are also accessed to create a new response that has not yet happened. This is also where many researchers get caught up in the belief that deception is unique to humans. It is often difficult to find evidence to support the idea that animals can think of something that has not happened yet or is not in their immediate presence (displacement).

Comparing primates to humans, many similarities in cognitive function and brain activities have been observed (Iriki and Sakura 2008: 2232). Research involving Japanese macaques has shown similarities in the use of tools. Macaques have demonstrated the ability to use tools. The prefrontal cortex in these monkeys has demonstrated some similarities to humans for problem solving. These monkeys were trained to use a rake to retrieve food, use a rake to retrieve a longer rake to retrieve food, and use a camera attached to the end of a rake and a monitor to locate food. Similar cognitive abilities are believed to be the driving force for adaptation. As animals adapt to their changing environment the activity in the prefrontal cortex helps in that adaptation

process. Deception is no different. Deception has been shown to be successful in fitness and believed to be one of these driving forces for adaptation.

It has been observed that gibbons, baboons, chimpanzees, orangutans and macaques all have a region of the brain called area 10 in the prefrontal cortex (Semendeferi, et al. 2001: 224). In all of these primates the prefrontal cortex is located at the front of the brain. It controls executive (high) functions of the brain. Although the size and shape of this region differs between species it demonstrates that the regions needed for the ability to knowingly deceive is present in all of these primates.

Interestingly, both chimpanzees and humans first look at the eyes of the animal or human that they are looking at, then the gaze proceeds to the mouth (Kano, et al. 2012: 397).

Species across the world display various methods of deception. To survive the changing environments and expand into new areas of the world, plants and animals are often required to adapt. Deception functions as a system for adaptation. Although many researchers have argued in the past that deception is unique to humans, it is not. Other animals have similar cognitive functions that allow them to use deception. Deception has been an effective biological function throughout recorded history and will continue to be a part of our existence. Humans are not likely to decode all of the secrets of deception. Learning behaviors that are culture specific, humans can become more effective at detecting deception in certain populations.

Nonverbal Communication Patterns in Humans

Psychologist Michael Argyle described signals as what humans use to communicate through different channels (Argyle 1988: 77). Channels are pathways

through which information is sent and received. Each channel that we receive signals from has a unique function. Nonverbal expressions are signals that consist of facial gestures, body gestures and postures, gaze, proxemics, appearance, and olfaction. Several signals are discrete and often sent on a subconscious level. Nonverbal signals express the emotional state and attitude of the person sending the signal (Argyle 1988: 71-73). It is challenging to know whether or not a nonverbal signal was consciously meant to be communicative. Emotional displays in facial gestures are usually spontaneous. When facial gestures are not spontaneous, it is usually a result of social rules being imposed by the sender. These gestures are attempts to conform to social norms or to hide true emotions. People often are not consciously aware of the nonverbal signals that they send. Argyle divides nonverbal communication into five categories (Argyle 1988: 5). These include: display of emotions, displaying interpersonal attitudes, reinforcing and bolstering verbal communication, expression through appearance, and rituals.

Scholars have debated about the amount of our communication that is made up of nonverbal cues. For example, Steven Rhoads argues that nonverbal communication consists of approximately two thirds of communication in our interactions with other people (Rhoads 2004: 55). According to Knapp and Hall, nonverbal and verbal communication are so interconnected that they are impossible to separate (2010: 5). Behavioral and verbal signals function similarly in many aspects of our communication process. The majority of words have arbitrary signs that are unrelated to the meaning of the word (Pinker 2007: 75). Many signals of nonverbal communication are 'iconic.' The relationship of the signal and the meaning are closely related. For example, the running

posture while seated is often a signal for someone being uncomfortable in a meeting, lecture, or interview. According to Wicklander-Zulawski, this posture has attached meaning to the need for them to escape the situation they are in (Wicklander-Zulawski & Associates 2013: 19). When someone is reluctant to disclose certain information they often fold their arms and tuck their hands away. The posture is closely related to securing their person in these particular situations. Both verbal and nonverbal communication share common elements where the control of those signals by the conscious mind varies (Knapp and Hall 2010: 6-7).

People have the ability to receive and interpret most nonverbal signals correctly. Some people have much better ability to recognize and correctly interpret nonverbal communication (Knapp and Hall 2010: 62). Our fluency of using these signals varies from person to person. Others will not understand various aspects of communication they observe until they have had time to digest what they witnessed. What is it that makes these people's abilities so much better than other people's? Our interactions with others determine what types of nonverbal communication cues we are more likely to identify. As people receive reactions to our behaviors we become more self-aware. Without reactions that occur on a frequent basis their ability to interpret symbols of nonverbal communication would diminish. Research has shown parents are able to correctly identify more nonverbal cues than those that are not parents (Knapp and Hall 2010: 65). A variety of experience improves a person's ability to increase their knowledge of nonverbal communication.

William Condon found that our verbal communication flows in a rhythm (Knapp and Hall 2010: 242). Our body movements follow the same rhythm that is generated in

our speech. When we engage in conversation with other people their body motion follows in the same rhythm as ours. As they begin to speak our body motions follow theirs as well. If a disagreement or tension in the conversation arises the rhythms separate and no longer follow each other (Knapp and Hall 2010: 251). If people from different cultures attempt to communicate and struggle understanding the message, it can be seen in the separate rhythms. Conflicts often arise when someone misreads what is being communicated.

Eibl-Eibesfeldt conducted research that filmed the behaviors of blind and deaf children from two to ten years of age (Knapp and Hall 2010: 34-36). The culmination of the research showed that the emotions of laughing, smiling, crying, sadness, anger, pouting, fear, and surprise were consistent with children without sensory deprivation. Deaf and blind children wanting to be held would stretch their arms out the same as non-disabled children. Blind children exhibited some of the same behaviors of embarrassment by using the same gesture to look away from the person who embarrassed them. When comparing people who became blind as a result of an accident the results showed more similarities in gestures to people with no sensory deprivation than those who were blind from birth. Blind and deaf children's facial expressions would appear more suddenly and leave quickly. Following the fleeting expression the face would have a blank look. Children with sight appeared to follow social rules to mask adverse emotions. Brand new infants have all the movement in facial muscles adults have to express emotions. Within the first few months of life infants are able to display emotions of surprise, interest and joy. Negative emotions other than pain are not observed in young infants. By seven months children are able to display anger. The expression of

pain from birth bears evidence that it is innate and has a biological origin. Infant gestures of pain include the lowering of their eyebrow, wrinkles on the sides of their nose in a vertical manner, tightly closed eyes, open mouth with their tongue cupped. In the first twelve to twenty-one days of life infants are able to imitate four actions observed in adults: mouth opening, lip protrusion, tongue protrusion, and finger movements in sequence.

Animal communication is nearly all about their internal state and intentions (Argyle 1988: 27-48). Our communication differs when it involves people, things, or events outside of our presence. Communications about events in the past or future also differ from that of animals. Nonverbal communication expresses attitudes and emotions of an animal's interpersonal status. It also conveys the role of: dominance, sexual interaction, parental-infant signals, and other associative behavior. Lemurs can only express five facial gestures. Macaques and monkeys have thirteen facial expressions and there are twenty for chimpanzees. The posture that animals exhibit indicates the attitude and emotion of the individual animal (Argyle 1988: 43).

Proxemics

Proxemics is another system that is important to understand in its relation to nonverbal communication. The word proxemics was first used by Edward T. Hall to describe distances between people as they communicate (Hall and Hall 1990: 1). Edward Hall shares an example of "critical distances" in lions in the circus (Hall and Hall 1990: 12). Lion tamers use this knowledge to create the perception of controlling the lions for their audiences. The lions begin to stalk people when they pass the line separating the boundary in "critical distance." When the person backs out beyond that line the lion

stops stalking the prey. For the show the lion tamers cross the “critical distance” and the lion begins stalking them. As the lion tamers crack their whip they step back across the line and the lion stops the stalking.

Many cultural similarities can be found in nonverbal communication. Some aspects of nonverbal communication appear to be innate while the majorities are not. Eibl-Eibesfeldt believed that the research that he had conducted found evidence of universal proxemics and facial behavior (Knapp and Hall 2010: 52-56). He also believed that there were many gestures with a strong correlation between different cultures. Two of the most common gestures that are seen in various cultures are the eyebrow flash and facial displays of emotion. In almost all cultures the eyebrow flash is a sign of interest, confirmation, or an emphasis of something being said. However, in Japanese culture it is considered offensive to use the eyebrow flash. Japanese people have culturally trained themselves not to use eyebrow flashes. There are some other cultures that use the eyebrow flash as a negative gesture. One of the most convincing correlations to innate facial gestures came from a study conducted by Ekman in which he used photographs of different facial gestures relating to emotions of sadness, fear, surprise, anger, disgust, and happiness (Ekman and Friesen 2003: 21-32). They were shown to various people that belonged to twenty-one different countries. The results of research showed that there was a high level of consistency between recognizing the same emotional displays. Ekman also used photographs of facial expressions from the people of New Guinea, who had limited contact with the outside world. When shown to Americans they were able to accurately identify the emotional gesture in the picture. Ekman believed there were universal facial gestures attached to emotions (Ekman and Friesen 2003: 23-28). Facial

gestures that relate to emotions appear to have an innate quality. However, they can be altered by cultural influence (Knapp and Hall 2010: 55).

Understanding the range of context particular cultures exhibit is important. The context of communication differs in degrees from high to low context (Hall and Hall 1990: 6). Regions of the world that are considered to be high context cultures include: Latin America, Southern Europe, the Arab countries, most of Asia, most of the cultures in Africa, and Native American cultures in North America. The low context cultures consist of: North America, Northern Europe, Scandinavia, Australia, and in some aspects Israel. Low context cultures have a narrow meaning attached to their communication. They tend to give short focused bits of information. In contrast high context culture interlaces more content when they communicate (Hall and Hall 1990: 6-9). High context cultures use more facial expressions and gestures to send larger amounts of information during communication. High context cultures tend not to provide a lot of background when explaining things because of how information flows. People involved in the conversation are expected to be versed in the background of the subject. According to Hall and Hall, advertising in high context cultures, like France, often use one or two words in their advertisements. They assume that people already know about their products. In low context cultures a great deal of time is devoted to the background of a subject to make sure everyone understands (Hall and Hall 1990: 23-24). In businesses of low context cultures the focus is directed toward one issue at a time as they try to create plans or overcome problems. In high context societies they tend to communicate about several subjects and will shift to different subjects frequently.

Low context cultures tend to use more distance between themselves and the

people they communicate with. In communication there are four basic zones that define the relationship between two people communicating (Hall and Hall 1990: 116 - 125). These zones include: intimate, personal, social, and public. For the low context culture found in the United States these zones are broken down into the following distances: intimate space ranges from 0 to 18 inches, personal space ranges from 1.5 to 4 feet, social space ranges from 4 to 12 feet, and public distances range from 12 feet on. The German culture is a slightly lower context than the United States. In that culture those distances will be expanded a little farther. The opposite is true for high context cultures, where they tend to close that distance. It is common for someone in a high context culture, who is a personal acquaintance, to communicate within 1.5 feet of the other person. Close proximity with the people engaged in conversation for most high context cultures allows high volumes of information to be passed back and forth. Often when they speak they are so close that their visual range changes and they can often see greater detail in the person's face they are communicating with. People are more likely to recognize nonverbal cues that accompany what is being said. The human face generates a vast array of gestures that are closely tied to emotions that are attached to what is being communicated. More of these emotions become apparent when the parties engaged in communication are closer. Olfaction plays a bigger part in communication when these social distances are closer (Hall and Hall 1990: 45-50). Other senses also play a larger role when the proxemics of two people is closer. Olfaction is a fundamental part of communication (Hall and Hall 1990: 49-50). High context cultures can smell cologne or perfume, body odor, breath, hair products, detergents used to wash clothing, as well as soaps the other person they are communicating with has used. Men in the Mediterranean

use much stronger cologne than Americans. Olfaction adds a large element to the cultural identity of people in Southern Europe and Latin America that we are missing in the United States by the emphasis we place on masking odors.

Touch is used in communication at close distances. Examples of this can be seen in how we shake hands. In Germany and the United States handshakes are done with a greater distance between the people (Hall and Hall 1990: 142). Men shake with a firm grip to show their masculinity. In France people stand closer when they shake hands. They also grip the other person's hand gently, similar to the Japanese and Koreans. The same is true in the Middle East. They believe that a firm grip is a sign of confrontation. In many places in Latin America when shaking hands, the free hand will grab the forearm of the other person (Argyle 1988: 61).

The higher context level of a culture, usually the higher amount of touching occurs during communication (Hall and Hall 1990: 60-63). These cultures include all of the Latin American cultures, Southern European cultures, Russia, and many parts of Asia. “Non-touch cultures” consist of all of the Northern European cultures, the United States and Australia. Other countries that fall into this same category are Japan and Canada. There are countries that fall in between “touch” and “non-touch.” These include France, India, Ireland and China. In a study conducted by Ken Cooper he focused on the amount of times people touch in conversation over the time period of an hour (Morain 1978: 15). He found that in San Juan, Puerto Rico, they touch over 180 times each hour. In Paris, France, it was approximately 110 times, in Florida twice, and in London, England, it did not occur. As different cultures interact more often due to better communication technologies and our increased mobility, it is extremely important to understand the

boundaries of proxemics. If someone from a “non-touch culture” must interact with someone from a “touch culture” boundaries may be crossed that are detrimental in the needed progress. In “non-touch cultures” laws often reflect what is culturally acceptable. In the United States each state has a law to prohibit battery. Battery is defined as the unlawful touching of another person. For someone from a “touch culture” to spend time in the United States it would be important to understand these barriers. For people of the same sex to hold hands in the United States sends the message that they are homosexual. However, in Iraq holding hands is a gesture of respect and friendship among people of the same sex (Axtell 1998: 102). This has proved to be a problem for Americans who have served closely with Iraqi soldiers where there is a miscommunication between cultural norms.

Our use of proxemics in the environment is an important balancing act that has both physical features as well as psychological ones (Hall and Hall 1990: 101-129). Psychologically we need a certain distance in our culture to support the mental health of society. High and low context cultures vary a great deal with regards to what is needed to support the mental health of the people in those societies (Hall 1966: 146-164). As our population density increases it becomes more important to understand the use of space to maintain physical and mental health. Just as social conversations of Latin-based cultures are closer, the use of building space is similar. It is common to find in large cities, in Latin-based cultures, buildings close together with little open space separating them. Low context people who travel to high context cities and stay for an extended period of time often find themselves depressed. They experience an overwhelming amount of sensory input that they are not used to. The opposite would be true of a high context

person spending an extended amount of time in a low context environment (Hall 1966: 156-158). They are likely to feel a lack of sensory input. What happens to countries like Germany (low context) and France (high context) which are next to each other? As the population of one culture moves closer to and are influenced more by the other culture, they take on similar attributes. This can also be seen in the use of space in building planning.

Eye contact is important in cultural communication (Argyle 1988: 57 - 58). In both Northern and Southern Europe strong eye contact is maintained during conversation. In many Asian cultures eye contact is avoided because they consider it disrespectful. Hispanic women use direct eye contact, even when it is with men they do not know. Native Americans believe it is impolite to use direct eye contact with someone that is older or unknown to them (Braroe 1975: 114).

The use of eye contact is much different between cultures. In the United States it is common for people communicating to look at each other, to break eye contact momentarily, and then engage in the eye contact again. Latin American countries in general share a much higher level of eye contact than that of people in the United States (Axtell 1998: 67). Both European and Latin American cultures view breaking eye contact during communication as sending the message that the listener is no longer interested in the subject matter at hand, and consider it to be disrespectful.

Usually people are in tune with changes in gesture. Paul Ekman and Wallace Friesen identified that the human eye is capable of recognizing gestures within 1/60 of a second (Argyle 1988: 133, 274). In a study they conducted they had test subjects watch a blank movie screen. For one frame that would only show for 1/60 of a second he flashed

a picture of a particular facial gesture that was tied with emotion. After watching this he questioned the test subjects. They would tell him that there was nothing they saw. However, when he asked if there were any feelings that were attached to the film the majority of the time they would describe the facial expression that flashed on the screen. When a person sees something they like, their pupils will dilate to absorb as much information as possible (Morain 1978: 10).

Gestures often provide the most information in communication. Gesture can be separated into three major categories: instinctive, coded, and acquired (Axtell 1998: 4). Instinctive gestures are usually controlled by the subconscious mind. They include nervous gestures like biting finger nails, shifting uncomfortably in a chair, or scratching. Coded or technical gestures include a system of gestures that are given a particular meaning. These include aircraft controller signals, military salute, and sign language. Acquired gestures (folk gestures) are learned by observation. Deaf infants begin signing within the first ten months of their life. This happens at the same time babies that can hear begin using sounds (Axtell 1998: 4). High context cultures use more acquired gestures than low context cultures. Low context cultures, like the United States, often do not recognize the use of gestures by another person. Paul Ekman identified primary emotions that are attached to gestures. These gestures include: happiness, sadness, anger, fear, and surprise (Ekman et al. 1987: 716-717). All cultures recognize these primary emotions. Cultures relate them to basic needs like sleep, food, and sex.

There are different kinds of gestures that can be broken down into three categories: autistic (or nervous), technical, and folk gestures (Morain 1978: 11). We tend not to be able to control autistic gestures with our conscious mind. They are the most

honest system of communication for interaction with other people. They consist of the primary emotions Ekman describes (Ekman et al. 1987: 716-717). Although our conscious mind at times can control some of these gestures it takes more effort and often does not affect all of the different systems communicating at the same time. Facial gestures that express happiness include the mouth curling into a smile, the eye brows rising in alertness and the forehead wrinkling. A false signal can be created by our conscious mind by creating a smile. However, the lack of consistency in the upper face makes it easily recognized as false. The eyebrows may not rise to wrinkle the forehead. Sadness is easily recognized throughout cultures because the face does the opposite of a happy gesture. Forehead tension is released, the eyebrows sag losing alertness, and the lower facial muscles relax. Anger is expressed by the facial muscles pushing toward the center of the face. The eyebrows lower, the eyes affix on something, the upper lip raises, and the nose scrunches up. These are the main emotions indexing gestures that are recognized cross-culturally (Ekman and Friesen 2003: 82-88).

Deception and Nonverbal Communication Training for Law Enforcement and Security

Police officers are trained to establish a baseline of gestures for the people they interact with (Vrij and Mann 2005: 72). They often will find some type of subject matter that is non-confrontational and is comfortable for the other person to talk about. Gestures that accompany this type of communication establish a baseline pattern for what is normal. If the interviewee deceptively omits information, or provides deceptive information, the nonverbal cues will deviate from baseline gestures. Steven Rhoads identifies common nonverbal gestures that are likely to change with deception (Rhoads

2004: 56-57). These include: real or fake crying, change in skin color, increased swallowing, pulling at the ears, playing with the hair or grooming, darting eyes, excessive or decreased gaze, watery or bloodshot eyes, clearing the throat, sighing, excessive drinking, attempting to repeatedly drink from an empty cup, biting lips, quivering lips, unnecessary smiling, upper teeth smile, erratic shifts in posture, muscle spasms, stomach noises, turning away, biting or cleaning fingernails, cleaning of clothes gesture, playing with jewelry, bouncing legs or foot, etc.

Officers often incorrectly identify deception due to the training they receive (Vrij and Mann 2005: 73). According to Vrij and Mann, behaviors such as gaze aversion, unusual posture shifts, and creating barriers with the hands (such as covering the mouth or eyes) at times may actually not be deceptive. Saul Kassin and Christina Fong conducted a study involving non-law enforcement participants (1999: 507-511). These participants were trained to detect the same deceptive cues law enforcement officers were from the Reed method. The participants were tested on their abilities to detect deception following their training. The results to correctly identify deceptive statements were substantially worse as a result of their training.

Abilities to Detect Deception

In multiple human studies of deception, detection of deception takes place approximately 50 percent of the time in any given population. This is as long as the receiver is familiar with the culture of the deceiver. When the receiver is not familiar with the culture of the deceiver, the ability to detect that deception is greatly reduced (Bond and Atoum 2000: 388).

Behaviors that deviate from normal are indicators that investigators use to identify

deception (Givens 2008: 1, 6). One of the most prevalent signals that people can articulate is that “something is wrong.” Those feelings can follow from the observation of verbal cues, nonverbal cues, or both. Many researchers, like Givens and Navarro (Givens 2008, Navarro 2009), believe that people can deceive others with their use of words; however, their body language can provide cues to their deception. Other researchers like Rhodes and Dyer believe that verbal evidence may be more reliable in the detection of deception.

There are two parts to recognizing deception (Schafer and Navarro 2003: 60). The observer must be aware of behaviors that deviate from what is normal, both verbal as well as nonverbal. The second part is that these types of behaviors must be recognized as deceiving or truthful. People who are hesitant to provide a full disclosure of information may exhibit similar behaviors to a deceptive person. However, those signals may not be the same as someone who is lying. The ability to be able to identify the difference between the two is something that can be enhanced with practice.

Most research shows people are only accurate half of the time when attempting to identify deception (Vrij and Mann 2005: 75-77). Multiple studies carried out by several groups of researchers have shown that professionals who deal with deception on a regular basis are only slightly better in detecting deception than is the average person (Vrij and Mann 2005: 76, 77). Some of the results of these tests have shown that college students can detect deception correctly approximately 53 percent of the time. Police officers and polygraph examiners are correct approximately 56 percent of the time in detecting deception (Vrij and Mann 2005: 76, 77). Members of the Secret Service were correct approximately 64 percent of the time, and officers that were selected by their departments

as having an outstanding ability to interrogate suspects and obtain confessions were correct approximately 70 percent of the time. Judging emotions, however, is usually extremely high for people in general (Knapp and Hall 2010: 73). This might account for why deception is much easier to detect when the stakes are high for being caught.

Some research has uncovered experts in deception detection. On repeated video tests of deception these experts are extremely accurate in assessing deception. Out of 112 law enforcement officers, only two were consistent in their ability to detect deception (Bond 2008: 345). Both of them were female officers who scored approximately 90 percent accuracy in their ability to detect deception. With the number of experts who are able to detect deception at a high level so few and far between, the key to identifying deception is not likely to be a simple solution. If law enforcement officers have been identified as having a higher accuracy rate than the general population, even if it is marginal, this would indicate that some type of learning has taken place in which officers can identify deceptive cues. It is not likely that law enforcement officers' formal training is responsible for the increased ability to detect deception. Kassin and Fong's study provides evidence of this. It is more likely that culture specific learning for experience has a greater influence over an officer's ability to detect deception.

Variables Affecting Deception Detection

There are a variety of variables that can affect the ability to detect deception. These can include, but are not limited to: how expressive someone is, what gender they are, or which ear they hear from. Expressive people tend to be more difficult to identify when they are deceptive due to how spontaneous their gestures are (Vrij and Mann 2005: 73-74). For people who are naturally self-conscious they exhibit the opposite affect and

appear deceptive regardless. Speech pauses are believed to indicate deception. However, speech pauses have been found to be associated more with truthful statements (Benus et al. 2006: 4).

Research has shown that in general women have a better ability to accurately judge nonverbal cues than men (Knapp and Hall 2010: 75). There are boundaries within which this increased ability is applicable. When deciphering the emotions connected to cues in facial expressions, women tend to be more accurate than males. One exception to emotional displays has to do with anger. Males more accurately identify anger that is associated with these cues from other males. The research that has been conducted in deception has shown that women do not judge deception more accurately than men. Men are more likely to accurately identify dominance or the status of others.

According to research conducted by Malcolm and Keenan the left ear has a better ability to recognize deception in speech than the right ear. This suggests some truth to the argument that bilateralism in the human brain is likely to play a role in detecting deception. Bilateral eye movements may also be affected by deception, as Rhodes and Wicklander-Zulawski describe in their training for law enforcement, which will be covered in greater detail later (Malcolm and Keenan 2005: 107).

People who are deceptive often believe that others can recognize their deceptive signals, more than they actually do. This transparent belief can be used by investigators to extract truth (Schafer and Navarro 2003: 63). A “four-domain model” can be used to help focus investigators on detecting deception. This process can help identify clusters of deceptive body language instead of trying to decipher individual meanings of individual cues (Schafer and Navarro 2003: 64). The first of the four categories is “comfort” or

“discomfort.” This is one of the most important cues to quickly identify deceptive patterns. Signals of stress accompany deception. The second category is “emphasis.” Where emphasis is placed is important in determining deception. Also the lack of emphasis can be telling. The third category is “synchrony.” As people communicate their movements begin to mirror each other when they are in agreement. As one person begins to nod the other will as well. If synchrony does not exist between the two, the conversation lacks open lines of communication (Knapp and Hall 2010: 242, 243). The final category is “perception management.” This can be exhibited by yawning to an excessive degree or falling asleep. Perception management can also be demonstrated when the person has to bring someone of high social standing to testify for them (Schafer and Navarro 2003: 64, 65).

People are more likely to recognize truth than deception due to a “truth bias” (Vrij and Mann 2005: 76). There are four reasons for this bias. Generally people interact with truthful responses in regular communication. This is likely to cause people to believe what is observed to be true. The second explanation provided is that social etiquette dictates that people should not be suspicious in conversations with the people they communicate with. People who question others around them often are seen as irritating. For law enforcement officers the honesty of a person’s statement has to be questioned to detect signs of deception. The third explanation is misunderstandings people have of deception. Many people believe that a suspect who lies to police officers will exhibit signs of nervousness. The last explanation is that many people cannot tell if they are actually observing a deceptive response. In these circumstances they usually will give the person the benefit of the doubt.

Deceptive Displays in Nonverbal Communication

Deception does not contain a set of universal symbols that are present in all situations. There is, however, common indicators that can be identified (DePaulo et al 2003: 106). Three communicative processes likely to reflect deception include emotions, trying to control behavioral cues, and the complexity of the content of information given (Vrij and Mann 2005: 75-77). People who are motivated to lie are less willing to disclose information (DePaulo et al 2003: 106). The amount of detail is usually different from that of someone telling the truth. Someone who is lying tends to be tense in their demeanor and often appears to be overly polished.

As discussed earlier, high risk deception exhibits different behavioral cues than low risk deception. These responses are often caused by fight or flight responses that are present in different cultures. Normal people that feel threatened experience a fight or flight response to deal with the circumstance that they are confronted with (Navarro 2009: 187). Suspects experience these same normal emotional responses when threatened in an investigation. Those threats can consist of being incarcerated for an extended period of time, the threat of arrest, the threat of people's perceptions being changed toward them, etc. In an attempt to deceive the interviewer the suspect will either lie, which is a fight response, or they will elude questions that will implicate their involvement. Elusive responses are a flight response (Schafer and Navarro 2003: 60). Honest people will treat the interview as a search for facts. Dishonest people make efforts to survive the situation. The more anxiety someone has about being caught in a lie, the more likely their body language will demonstrate leakage of their deceit (Schafer and Navarro 2003: 60). Polygraph examiners and Computer Voice Stress Analyzer

operators rely on this anxiety to accurately detect deception.

There are many systems of nonverbal communication that cannot be controlled by the conscious mind (Knapp and Hall 2010: 6-7). Some of these areas include: heart rate, breathing, temperature, hydration of the mouth, and pupil dilation. These systems play an important role in communication. When someone sees something they like, their pupils will dilate to absorb as much information as possible to process. This is often observed when people are attracted to each other. People that are nervous often have an increase in heart rate that affects their appearance (Ekman, Levenson, and Friesen 1983: 1208-1210). This prepares the person for an adrenaline dump and allows the body to send the needed blood and oxygen to the parts of the body to deal with whatever it is that is making the person nervous. The consequences of increased heart rate are not all internal. Often we see the blood in the skin either increase or decrease. When it increases we see redness and when the blood decreases the skin turns pale. These physical changes are important in communication. Other physiological changes that are used as communication signals that are not controlled by our conscious mind include: goose bumps, sweating, dry mouth, sighing, watery or bloodshot eyes, etc.

Often when an officer attempts to establish a baseline of behavior, he does so using small-talk at the beginning of the interview. Deceptive behavioral cues during small-talk are different from cues observed during interrogations (Vrij 1995: 70).

There are various types of motivational levels when people are being deceptive (Ekman 1988: 166). Most researchers only distinguish between low motivation and high motivation when it comes to lying. An example of a low motivation lie could be someone telling a child that they will give them a treat if they are good, but having no

real commitment to carrying through with the promise. Someone who has assaulted a child and is now being interviewed by the police has a high motivation not to tell the truth. Reasons for this can include: they are likely to spend an extensive amount of time in prison where they become targets of other inmates who have children; another reason can be because of the concern for people's perceptions to change toward them. The physical indicators of the two different lies are likely to be drastically different in how obvious the signals will be for detection. The receiver in communication also has a bearing on the lies that are told and the signals that are sent. The difference between a lie told by a child to their parents, a friend exaggerating a story to another friend, or a murderer hiding the details of his crime are drastically different.

Suspects that plan their responses to questions exhibit different cues than spontaneous responses (Dyer 2007: 12, 15). When someone is made aware of the cues that are revealing deception, they often will intentionally change some of those cues in attempts to contain the body leakage. Humans are able to control their nonverbal behavior to various degrees (Knapp and Hall 2010: 6). Not all of these signals can be masked and body leakage will likely present itself in another manner. The amount of fabricated information in a lie may also have a direct impact on the signals that are displayed by the liar (Dyer 2007: 15).

"Job stoppers" are tattoos above the collar of a shirt (Givens 2008: 2). For police officers or government officials they can be an indicator of the unwillingness to cooperate. Job stopper tattoos can be an indicator for deceptive omissions for law enforcement officers. Other tattoos, such as gang affiliation and prison tattoos, can indicate the same.

The Pointed Finger is a signal that is often seen as confrontational. Similar to the suffix –“ly” on English adverbs in verbal communication, it helps the receiver identify the emphasis in a statement. What is being said at this point in a statement is important. This is often where deceit will be found (Givens 2008: 10). One of the most famous incidents in which people recognize this in relation to deceit involves President Clinton. As he was being questioned about his sexual involvement with Monica Lewinsky, he pointed his finger at the camera, and with a stern voice said, “I did not have sexual relations with that woman.” He later admitted to the American public that his statement was false. Another famous example of this includes Rafael Palmeiro, the Major League Baseball player for the Baltimore Orioles. When he was questioned in a Congressional hearing about steroid use, he adamantly replied, “I was telling the truth then, and I am telling the truth now.” During his testimony he pointed his finger at the Congressional board. When tested for steroids, the results were positive (Givens 2008: 11). Although the pointed finger is a relatively common cultural behavior, many different cultures associate a pointed finger toward someone else as a signal for aggression (Givens 2008: 13).

In examining President Clinton’s interviews further, there are several other indicators of deception. A dry throat is an indicator of deception (Rhoads 2004: 56). He repeatedly reached for a pop can to drink from. When he finished the pop he continued to pick it up and put it to his mouth as if he was drinking still. However, each time he put it down a clang could be heard because the can was empty. Barriers are also a frequent sign of deception. They can be anything from folded arms, crossed feet, bags, or other items (including drinks) that separate the interviewee from the interviewer. Some people

will use computer screens or doors as a barrier (Schafer and Navarro 2003: 63).

President Clinton also displayed incidents of gaze avoidance as some questions were answered. He would look down at his clasped hands. Clasped hands can also be a signal of deceit. It is an example of self-touch (Knapp and Hall 2010: 9, 32). Self-touch is often a way in which people psychologically calm themselves during a stressful event. Our hands express more in their movement than any part of our body. Givens describes “self-stimulating” signals are an accurate sign of deception (Givens 2008: 29).

Shoulder shrug is an indicator of deception. “...Like Pinocchio’s growing nose, shoulders grow higher when we tell a lie” (Givens 2008: 33). This is a frequently observed signal from children. When I ask my son if he has done a good job cleaning his room, and he knows he has not, the shoulder shrug usually accompanies his response.

Lips are also telling of deception. They tighten as lies are told. They will usually roll in as well (Givens 2008: 35). Lies that carry dire consequences will often cause body leakage, such as sweat, to appear. The first place sweat is seen in relationship to deceit is on the upper lip (Rhoads 2004: 56).

Anger is one of the most identified signals of deception. Nonverbally it is best seen on the lower half of the face and the distortions around the eyebrows (Givens 2008: 14, 15). Confrontation is a method many liars use as an attempt to gain control of an interview and persuade the interviewer to change the questions being asked.

Some people become aware of the deception leakage that their body language exhibits, and will change their behavior to conceal it. This is referred to as statue or nonverbal lockdown (Givens 2008: 15). This is where they will do the opposite of

demonstrating suspicious behavior, where they will instead exhibit little to no movement. This unusual behavior can also reveal much about the state of mind of the interviewee. Sociopathic liars do not feel remorse for what they have done. If there is a deceptive indicator present, this is likely to be it for the sociopathic liar.

Having a deadpan face is another example of a nonverbal lockdown (Givens 2008: 16, 17). Scott Peterson gives an example of this during one of his interviews. He was believed by many to have a small smirk when he was being interviewed. The corner of his lips was partially elevated. This signal is easily confused with a happy emotional state. Researchers have shown that people often believe they can identify emotion when it is not truly present in a deadpan face.

Aggressive anger is a deceit signal. This is used to conceal the truth. Some of the physical signals that accompany these displays are eyebrow lowering, increase in the volume of the voice and the speed. Sometimes lips will snarl and the eyes will lock in contact as a display of power (Knapp and Hall 2010: 13). These displays in many ways are similar to the bluff charges of gorillas or the growling of dogs. Their intent is to place the interviewer into a submissive role.

Open postures are an indicator of honesty (Wicklander-Zulawski & Associates 2013: 19). When objects that create barriers between two people speaking are moved aside this is a cue of openness that exists between the two individuals.

Fidgety movements can be deviating behaviors that indicate dishonesty (Rhoads 2004: 57). These will be seen in adjusting overall positions, in the movement of the hands, playing with objects (like jewelry), or shuffling of the feet.

Flight gestures are often an indicator of deception (Wicklander-Zulawski & Associates 2013: 18-19). These can include the suspect continually looking at their watch or telling you they only have a certain amount of time to speak. Another indicator is the positions of the person. If they shift their body to face the door this is a flight gesture. Another flight gesture is the running position. This is when someone tucks one leg under their chair and extends the other, as if they are in a starting position of a race.

Territorial displays are cues of honesty and comfort. An example of these is spreading arms across the back of a couch or chairs that are next to the person (Schafer and Navarro 2003: 73-80). Other cues of honesty can include palms up and “gravity defying” emphasis, like elevating the toes as a point is emphasized.

Increased blinking rate or eyelid flutters are often a signal of deception (Schafer and Navarro 2003: 65). Other indicators of stress can include biting fingernails, grooming, lip biting, lip quivers, hand grasping the neck or touching the face, false smiles, hand gripping an armrest, interlaced fingers, rapid paced leg kicks, eye rolling, or shifting positions to answer questions (Schafer and Navarro 2003: 73-80).

Researchers like Rebecca Dyer and Steven Rhodes believe that there are often more verbal cues of deception than there are nonverbal ones. Some behaviors are easier to conceal deception behind. Some people focus on facial expression to identify deception. However, researchers have found that these expressions are likely to misdirect the receiver. Dyer argues that people become more accurate in detecting deception when they do not have a face to look at for deceptive cues (Dyer 2007: 11).

Observers often see cues that conflict with one another (Knapp and Hall 2010:

14). When this happens the receiver will use the cues that they believe are more genuine to judge the trustworthiness of the statement. One study showed that most people initially rely on nonverbal communication to decipher the truth in a statement (DePaulo et al 1978: 313-323). However, the more difficult it becomes to recognize deception, the more they rely on verbal cues for accuracy.

At times a signal sender may exhibit cues similar to those of deception when they believe that the person that they are speaking with is not going to believe them regardless of the level of honesty. They are also likely to purposefully withhold information if it is likely to embarrass them (Schafer and Navarro 2003: 60).

Cultural Influences of Nonverbal Communication in Deception

There is extensive research on nonverbal communication and deception in the United States. However, there is little research available that compares deceptive patterns in different cultures. Nonverbal communication shares many commonalities across cultures. Many of these nonverbal signals appear to have innate qualities. As an example, open hands in greetings are common signals across many cultures (Knapp and Hall 2010: 52). Submissiveness is often demonstrated in a variety of cultures with a lowered posture (Knapp and Hall 2010:52-53). Eyebrow flashes are often an indicator of honesty. These cues are when the eyebrows are raised for approximately one-sixth of a second. In most cultures these are demonstrated as a friendly gesture.

According to Ekman and Friesen there are three sources of nonverbal behavior: inherited neurological programs, experiences common to all members of the species, and individual and cultural experiences (Ekman and Friesen 1969: 49-98). Neurological

programs, like facial expressions, can be changed through cultural norms (Knapp and Hall 2010: 32-54). An example of this can be found in Japan. For the vast majority of the world eyebrow flashes (where the eyebrow quickly raises and lowers) are extremely common. As described earlier, in Japan they are believed to be offensive and inappropriate.

Much of the literature on body language makes inferences to what individual body movements means (Givens 2008: 20). These direct relationships in meaning are not accurate and often misleading. Nonverbal signals hardly ever have a single meaning. They are given meaning through the culture they are found in. They have to be looked at in the context of the conversation as well as the other clusters of cues that are presented at the same time. As someone is speaking, the lips, hands, shoulders and eyes will provide evidence of truth or deception.

Deceptive stereotypes between Chinese and Japanese participants were studied, and it was found that the most frequent nonverbal cue to identifying deception was gaze aversion (Yeh et al. 2013: 336). Several other beliefs are shared between cultures about deceptive cues. However, separate cultures and genders have differing beliefs about which gestures are more accurate in detecting deception (Yeh et al. 2013: 340). Self-touch and hand gesture closely followed gaze aversion for Japanese participants in these studies. The Chinese participants believed that frequent hand gestures were the highest indicator of deception. This was closely followed by long stories, then frequent shifts in posture.

Eye Movements and Their Relationship to Deception

A common saying relating to nonverbal communication is *the eyes are the*

window to the soul. The eyes send and receive large amounts of information. Pupil constriction and dilation are important when studying the eyes for nonverbal communication. Pupil behavior often communicates the level of involvement a person has in the conversation. It also demonstrates how attentive the person is to the speaker. Pupil dilation and constriction also communicate the level of interest the person has in what is being observed or discussed (Knapp and Hall 2010:10).

Pupils regulate the amount of light our eyes can process. In bright sunlight the pupils constrict to limit the amount of light to prevent the overload of light. In dark places the opposite is true. Pupils dilate to allow as much light in as possible. Pupils often react the same in emotional situations (Knapp and Hall 2010: 355-358). When someone sees an attractive person, the pupils will dilate to allow the eyes to receive as much information as possible. It often demonstrates the level of arousal someone is experiencing (Knapp and Hall 2010: 437). Arousal at times is observed with deceptive behavior. However, like other deceptive behaviors, arousal does not always accompany deception. Pupils can also provide evidence to deceptive behavior. Pupils have been observed to dilate for longer periods of time when someone is being deceptive (DePaulo et al. 2003: 74-118). Navarro describes that in response to threats the limbic system will cause the pupils to constrict and the body to turn away from the threat (Navarro 2009: 64-65).

Emotional displays are often communicated with the eyes although researchers do not always agree whether eye movements indicate deception. One of the most recognized emotions observed in the eyes is that of pain (Knapp and Hall 2010:39). It is most identifiable by tightly closed eyes. Often deceptive behaviors in the face are held

for longer or shorter periods of time. Ekman and Friesen described these behaviors as "facial emblems." These are emotional behaviors in the face that display emotions that the communicator is not truly feeling (Knapp and Hall 2010: 295).

Birdwhistell identified kinesic markers that connect nonverbal behaviors with speech patterns (Knapp and Hall 2010:243). One of these patterns described was that of eye blinking. Blinking at the start or end of certain words accompanied by a head sweep was often found with the use of compound words. These words were often ones which use a hyphenation in English. Excessive blinking was previously believed to be related to deception. When DePaulo reviewed different studies on blinking behaviors as they relate to deception, she found that deceptive people do not blink at an increased rate (DePaulo 2010: 68-69).

Gaze (used interchangeably with eye contact) serves various roles in communication (Knapp and Hall 2010: 337). The movements of our eyes regulate information being passed between participants in the communication. Eye contact displays our emotional state and monitors reactions. It identifies the relationship between the parties involved and identifies cognitive activity. This occurs when we are ready to communicate information. At times gaze becomes an obligation for communication to occur. Eye contact will occur more often in fluent speech. In speech where some type of hesitancy occurs the amount of eye contact will decrease (Knapp and Hall 2010: 336). The proximity of people communicating affects the amount of mutual gaze experienced in communication.

Eye contact often assists in communicating which person should speak (Knapp

and Hall 2010: 11). These indicators associated with eye contact often display when a person is finishing their speech and allowing the other person to reply. Often increased eye contact is observed during these periods of transition (Knapp and Hall 2010: 17). One of the most common behavioral indicators associated with ending a conversation is to break eye contact.

Gaze often displays how information is stored in the human brain (Rhoads 2004: 62). To simplify the way we receive signals every person has sight, sound, touch, taste, and smell. Although everyone can use all of these senses people have a dominant channel to receive information. When someone has to think in depth about something, their eyes will shift in a direction that sends signals about how that information is stored. Research has shown that people who are sight dominant will look up and to the side, sound dominant people will look directly to the side, and people who are feeling dominant will look down. By establishing which side a person looks to when they retrieve information a base line for behavior can be established. Deception can be detected when the eyes shift to the opposite side of their base line (Rhoads 2004: 62-65).

According to Wicklander-Zulawski truthful responses are observed by eye contact 40 to 60 percent of the time in the United States (2013: 21). Good eye contact during the discussion of difficult topics is an indicator of truth. The deceptive indicators of the eyes include fast eye shifts, closed eyes, “aggressive eye contact,” etc. Interviewers are trained with this method to be aware of gaze that exceeds or falls below these boundaries of normal behavior. These patterns are consistent with fight or flight responses when being confronted. Flight behavior for gaze is recognized by gaze avoidance. Increased gaze is consistent with the fight behavior. Closed eyes and excessive blinking are other

behaviors associated with flight.

Gaze avoidance is different from gaze patterns (Givens 2008: 5). Gaze avoidance is avoiding normal eye contact. Gaze patterns are influenced by culture. Gaze patterns are the normal amounts of eye contact during conversations. Gaze avoidance is often an indicator of deception (Givens 2008: 5). Some researchers believe that this is one of the most telling signs of deception. Rehm and Andre conducted a study on eye behavior during conversation. One of the observations made was that gaze aversion occurred frequently while lies were being told (Rehm and Andre 2005: 251). When investigators reconstructed the events on the day of 9/11/2001 they observed a common cue from each of the hijackers as they passed security personnel (Givens 2008: 5). Each of them was seen looking away from the security personnel.

According to Vrij and Mann approximately 75 percent of police officers associate gaze aversion and grooming gestures with deception (Vrij and Mann 2005: 72-73). As described earlier, gaze aversion is the most commonly recognized indicator of deception across cultures. DePaulo found that deceptive people and honest people do not differentiate in the amount of eye contact (DePaulo 2010: 76).

Samantha Mann and other researchers conducted a study at an international airport where passengers were interviewed about their travels (Mann et al. 2012 (a): 211-212). They found that eye contact increased when people were being deceptive. The reasoning given for the increased eye contact is due to the communicator looking for cues to how their lie is being accepted by the receiver. Giffin and Oppenheimer found that people stare at objects longer when they give a false label for the object (2006: 946-947). Thus, duration of gaze may be an important variable to consider.

One of the largest areas of debate for deception detection has been in the area of neurolinguistic eye movements. The human brain processes information differently from one side versus the other according to many researchers (Knapp and Hall 2010: 5). Law enforcement training companies have focused on this technique of deception detection for many years (Wicklander-Zulawski & Associates 2013: 22, Rhoads 2004: 62). The origins of neurolinguistic eye movements can be found in the hypnosis literature of John Grinder, Judith DeLozier, and Richard Bandler (Grinder et al. 1977: 34-35). They describe how the different hemispheres control the opposite sides of the body. Evidence of this can be found in stroke victims. They argue that bilateralism controls the direction of the eyes during the thought process. If we are looking at a clock for the positioning of the gaze, the 10:30, 12:00, and 1:30 would reflect thoughts associated to imagery. The 9:00 and 3:00 positions reflect thoughts connected to auditory information. The 4:30, 6:00, and 7:30 positions reflect thoughts connected to kinesthetic information stored in the brain and therefore are useful in understanding eye movement in general.

Grinder, DeLozier, and Bandler go on to describe that the left hemisphere of the brain controls the right side of the body (Grinder et al. 1977: 34-35). People who are right-handed tend to utilize that side of the brain more. The left hemisphere controls factual information. People who are left-handed tend to utilize the right hemisphere of the brain more; the right hemisphere, controls creative information. They describe how initial eye movement is connected to this bilateralism when processing information in the brain. Rhoads expands on Grinder, DeLozier, and Bandler's description of neurolinguistic eye movements. He describes that factual information is retrieved from the left hemisphere of the brain and fabricated information is accessed in the right

hemisphere of the brain. If we are looking at someone who is **right-handed** (or left brain dominant) when their eyes move to the 10:30 position, they would be creating visual information. If their eyes shifted to the 1:30 position, they would be recalling factual visual images. When the eyes move to the 9:00 position the person would be creating audio information. If the eyes moved to the 3:00 position, they would be remembering audio information. Rhoads draws a correlation between accessing information from the right hemisphere of the brain as being deceptive and information retrieved from the left side of the brain as being factual or truthful (Rhoads 2004: 62-65). People who look to the 7:30 are feeling dominant people. As they access this information they are recalling factual information. If feeling dominant people look up to the 3:00 position, they are being deceptive. For anyone who is left-handed the opposite of this information is true according to Rhoads (Rhoads 2004: 63-65).

Research involving airplane passengers' travels was used to test bilateralism in neurolinguistic eye movements (Mann et al. 2012 (*b*): 162-163). This research project included participants from various cultures. They found that there was little correlation between looking left versus looking right during deceptive statements. They found that out of 204 participants in the research, only approximately six percent displayed deceptive behavior consistent with deception in neurolinguistic eye movements.

These researchers applied the same principles to a second research project. These included 31 participants, both males and females (Mann et al. 2012 (*b*): 164-165). These participants were asked to describe jobs they have had, which consisted of both real and not. Of the two questions researchers asked, they found that only three people of 235 participants, displayed deceptive neurolinguistic eye movements.

In conclusion this chapter identified deceptive cues that are biological in nature and that are likely to be observed cross-culturally. These include, but are not limited to: behavioral indicators of stress, fight or flight responses, emotional states that do not reflect what is said by the deceiver, and eye movements that include gaze avoidance and deceptive neurolinguistic eye movements. In the following chapter I will discuss the methods of my two research studies. The goal of these two research studies is to identify the value of particular deceptive indicators.

Chapter Three

Methods

The methods portion of my research includes two different approaches that I used to study deception detection. The first method utilized was to identify patterns of behavior most likely to be associated with deception. This portion of the thesis was conducted by way of an online survey provided to law enforcement officer participants. Officers chose behaviors they identified with as indicators that they believed to be indicative of deception. The second method analyzed videotaped eye movements during deceptive and truthful statements.

Survey of Law Enforcement Officers

As described in the literature review section above as well as research conducted by Vrij (Vrij and Mann 2005), law enforcement officers have an increased ability to detect deception over that of the general population. For this reason, law enforcement officers were selected for the survey portion of my research due to this increased ability in deception detection. Although Central Intelligence Agents and Secret Service Agents have been identified as being more accurate in detecting deception than any other previously identified group, these groups are inaccessible for the purpose of this particular survey, due to the time and access issues. I have made previous mention of those law enforcement officers identified as having a greater ability in obtaining confessions or as having increased deception detection abilities. Those officers had been sought out to participate in this survey. However, upon attempting contact various law enforcement agencies, cooperation was found to be minimal. Due to this hurdle, law enforcement officers had to be contacted on an individual basis to participate in this

research via my own social networks.

In identifying the behaviors likely to be indicators of deception, several sources were used to define said behaviors, including those identified by Rhoads (2004) in *Subconscious Communication for Interviewing and Interrogation*, Wicklander Zuluwsky & Associates (2013) in *Seminar on The Reid Method of Criminal Interviews and Interrogation*, and Givens' (2008) book *Crime Signals: How to Spot a Criminal Before You Become a Victim*.

An online survey was created on surveymonkey.com listing behaviors that have been identified as being related to deception. These behaviors will be described in greater detail later in this chapter. Surveymonkey.com was utilized due to the ease of accessibility of the survey for law enforcement officers from a variety of locations. This website was also accessible at any time of day and would provide the results and/or statistical analyses immediately upon completion of the survey. This website was also chosen as it was found to be the most cost efficient manner in which I would be able to provide this survey for completion by various participants in the time allotted to conduct the research. The survey prepared on surveymonkey.com was accessible on the website from February 1, 2013 until July 31, 2013.

All law enforcement officer participants surveyed in this portion of my research were born and schooled in the US. Law enforcement officers in the US have previously been used for research in detecting deception. Initially my survey was going to include officers from Italy and Israel, as well as officers from the US, as I believed this would have allowed culture specific comparisons in the detection of deception to be drawn. These different countries were selected due to the types of cultures that interact in these

areas. In the literature review chapter, the United States was identified as being a low context culture, Italy a high context culture, and Israel a mix of high and low context cultures due to Israel being a melting pot influenced by a variety of European and Middle Eastern cultures. Despite officers in both Italy and Israel agreeing to participate in this survey, the officers from these countries did not complete surveys prior to the closing date. There is no representation of cultural differences outside of the United States in the survey.

The survey identified which country the law enforcement officer, their parents, and their grandparents were raised in. The participants were asked how long they had been law enforcement officers, since prolonged experience as a law enforcement officer was likely to influence their increased ability in identifying deception. Participants were asked about the type of training they had in detecting deception, since an officer's abilities to detect deception are likely to be influenced by training they have received. Participants were asked what type of law enforcement experience they have; i.e. corrections, patrol, investigations, etc., since the type of law enforcement experience an officer has may be influential in the ability to detect deception. The various cultural populations that particular officers interact with on a regular basis have the potential to impact the types of deceptive characteristics that officers encounter. For example, individuals will be deceptive with **patrol** officers in cases in when they are likely to incriminate themselves by answering questions truthfully. **Probation** officers, on the other hand, interact with populations who have more to risk regarding loss of freedoms if they participate in acts the general population can do legally (i.e., drinking alcohol or frequenting certain establishments). **Corrections** officers are likely to gain experience in

detecting deception in instances in which deception is displayed by way of behaviors between inmate populations as well as staff. The survey also ascertained how valuable individual behaviors were in detecting deception based on a six point Likert scale, which were inclusive of the following options: no indicator of deception, low, moderate, between moderate and high, or high indicator of deception. Officers were also allowed to choose unknown. Only one choice per question was allowed in this section of the survey. The deceptive behaviors include the following:

Signals of the head and face

Flushing of skin color, paling of skin color, observable pulse in the head, neck or throat, movement of “Adams Apple,” hand covering the throat, pulling or tugging on lips, twirling mustache or beard, grooming mustache or beard, sniffing, pulling or tugging at nose, twirling hair, grooming hair, pulling or tugging at ears, lack of perspiration when it should be expected, perspiration on upper lip, and perspiration on forehead.

Signals in the eyes

Little to no eye contact, closing eyes, a sudden movement of the eyes (darting eyes), covering eyes, excessive eye contact, bulging or protruding eyes (bug-eyed), excessive blinking, squinting, watery eyes, having a dull or fixed stare (glassy eyes), tired, staring out a window or door, crying, fake crying, often checking watch, and falling asleep.

Signals of the mouth

Dry mouth, excessive drinking of available beverage, excessive swallowing, putting things in their mouth, gum chewing, thickened/slurred speech, stuttering, twisting the mouth, upper teeth smile, unexplained smiling, heavily exhaled breath, yawning, sighing, clearing throat, and chain smoking.

Signals of the lips

Licking lips, lip biting, sound of “clicking” from dehydration, white dried saliva in the corners of the mouth, lip quivers, lips squeezed tightly together, and puckered lips.

Signals of the body

Creating barriers between themselves and others, hiding behind barriers, belching, moaning, goose bumps, unexplained increase in perspiration, unexplained decrease in perspiration, muscle spasms, passing gas, change in breathing, stomach growling, and chest tapping.

Signals of the hands and arms

Elbows pulled in to the body, arms held tightly across the body, brushing away, cleaning clothing, hand tucked tightly in armpits, concealing the hands, sudden hand movements, frequent hand movements, nail biting, inspecting fingernails, playing with jewelry or clothing, scratching, hands gripped together tightly, clenching fist, holding tightly onto an object, tapping fingers or hands, rubbing hands, checking pockets, patting pockets, self-pinching, and wiping sweat.

Signals of the feet and legs

Frequent foot movements, foot bouncing, raising toes, raising heel, tapping foot, leg bouncing, and double leg crossing.

Signals of posture

Sudden shifts in posture, frequent shifts in posture, running position (one foot tucked back and the other forward), arms folded leaning back, arms folded leaning forward, feet forward and crossed, feet tucked under the chair, leaning forward in the chair in a confrontational manner, turning away, pulling away, and stiff posture.

Signals of proxemics

A person's position is too close to the interviewer. If the person's position is too close to the interviewer, at approximately what point is that position too close? A person's position is too far from the interviewer. If the person's position is too far from the interviewer, at approximately what point is that position too far? Participants in the study were also asked to include other nonverbal indicators of deception not previously described in the survey.

I predict the eyes will be identified as the highest indicator of deception because this variable is discussed at greater lengths in law enforcement training than any other behavior. Posture should fall closely behind eye behavior due to literature relevant to law enforcement training discussing a high probability of deception regarding posture. I also posit that law enforcement officers are likely to observe changes in posture before other movements because it presents the highest degree of observable cues to the interviewer. I predict that signals of the hands will follow posture next on the scale of indicators for deception due to those behaviors being in the visual range of an officer during interviews. I predict that signals of the legs and feet will be found to be the least influential of all other indicators of deception due to how far out of the visual range they are for officers in interviews, as view of the legs are generally concealed by tables during the interview process.

Research Study of Eye Movements Related to Deception

The second research project focused on eye movements displayed in both deceptive and truthful statements for comparative purposes. Several eye behaviors will be evaluated for this research, including the frequency of eye contact, gaze aversion,

bilateral eye movement in neurolinguistics, emotional recollection to eye movements, and blinking.

Each of the research subjects were provided a detailed description of the research to be conducted and asked to sign a consent form, which allowed the utilization of participant personal information gained by way of a questionnaire as well as videos in this research. Each participant was supplied with a questionnaire that asked the following questions: What countries were you raised in? What countries were your parents raised in? What is your gender? What is your spoken native language? What other languages do you speak fluently? The last section of the questionnaire asked for the individual to provide four titled experiences (stories) and whether or not the experiences were deceptive or truthful. The questionnaires were filled out and sealed in an envelope. My assistant, DonnaChynel Ballard and I did not see the content of the questionnaires before the envelopes were sealed. DonnaChynel, who is also my wife, was tasked with assisting me with the interviews of female participants in this research project. Each of the envelopes was then given a subject number that the participant was identified by during the course of this research.

Each participant was then video recorded during the interview. The interviews were later designated by way of five parts for the purpose of comparative analysis on the Noldus system. The Noldus XT System is a behavioral research computer program that assists in analyzing behavioral cues in video or audio recordings of people. It was used to code the different observations in the interview. In the first part of the interview participants were asked basic questions about themselves and provided truthful responses, similar to the small talk at the beginning of a law enforcement interview in

which a baseline for truth is generally obtained. Furthermore, this section of an interview also provides law enforcement officers with a control for levels of stress and types of responses that are considered normal responses for the person being interviewed. This part of the interview is supposed to be free of stress related questions in which the person is most likely to engage in deceptive behavior. The other four interview designations were separated as the four experiences told to the interviewer. Two of the experiences were actual events that the participant had experienced at some point in his/her life, while the two other experiences were deceptive responses as required by interview guidelines. For the deceptive stories, research subjects would create an experience that did not happen to them, but attempted to tell the event as if it had actually occurred. The instructions provided to the participant regarding the experiences were provided to the interviewer in no more than two to five minutes in length. The stories were told in the same order as they had listed them in their questionnaire. Each participant was provided a small note paper to write the title of their stories in the order they had written them on their questionnaire to reference prior to telling the experience. Each participant was also provided four cards with the numbers “1,” “2,” “3,” and “4” written on them. At the beginning of each story the participant was asked to lift up the card into the view of each of the two cameras and then place the card down prior to telling the story.

Participants in this study who spoke more than one language or who was raised in cultures outside of the United States were asked to tell these stories in each language they spoke fluently, in the order that they had listed on their initial list. Due to deception having both a biological and cultural aspect this would provide evidence of deceptive eye movements that are affected by culture. If the same behaviors are observed in both

English and foreign language stories the behavior is more likely to have a biological connection. It should be noted that translations of these particular interviews were not sought. No verbal cues were analyzed in relationship to the observed behaviors so translations were not made of foreign language stories.

The videos recorded during the interviews were downloaded to the Noldus System. Each research subject was initially analyzed individually, and then compared with the other research subjects. The interviews were separated into a control behavior, experience one, experience two, experience three, and experience four. Each of their eye movements were marked with a position based on the hours of a clock. The different positions were labeled: 12 o'clock, 1:30, 3:00 o'clock, 4:30, 6:00 o'clock, 7:30, 9:00 o'clock, 10:30, closed, and excessive blinking.

This research included 23 participants. These were nonparametric tests due to the total number of participants included. The participants included ten females and thirteen males. The research subjects consisted of twelve individuals who were born and raised in the United States while the other ten individuals were born and raised outside of the United States. The other cultures included France, Germany, Spain, Canada, Mexico, Burma, Western Samoa, and American Samoa. Each subject was given an identifying number. For those born and raised in the United States, they were identified as subjects numbered U1 through U13. U3 was not assigned due to an oversight error on the interviewer's behalf. For those born and raised outside of the United States, they were identified as N1 through N10.

The interviews were conducted in rooms with limited distractions. Professor Elizabeth Cartwright's laboratory, room 268 of the Anthropology Department located on

the third floor of Graveley Hall South, was used for 18 of the interviews. Five of the other interviews could not be completed at that location. For those five participants a small room was used in two separate homes with limited distractions, two of which were in Chubbuck, Idaho, while the other three were in South Jordan, Utah. All of the individuals who participated in this interview were seated in a chair that does not freely move. The participants were seated across from the researcher or research assistant (interviewer) who directed the interview. Next to the researcher or research assistant was camera one that was zoomed in on the face of the participant. Camera one and the interviewer were approximately six feet from the participant. Camera two was placed on approximately a 45 degree angle from the front of the participant. Camera two was also approximately six feet from the participant.

The room was set up to have limited distractions. Windows in the rooms were covered to prevent the participant from looking outside. The participant was turned away from the door which accessed the room. Dr. Cartwright's laboratory is located on the eastern most end of the building where limited foot traffic and noise are heard from the room. It should be noted that there was some distractions that could not be prevented such as wind blowing the blinds in the windows occasionally. Due to the temperature in the room it was necessary to keep the window open at times to maintain temperature regulation in the room. Another notable distraction was street noise. Due to the room's location next to a major thoroughfare on the Idaho State University campus, traffic was heard, and most notably in the instance of buses passing by. In instances where the participants could not be interviewed in Dr. Cartwright's lab, they were subsequently interviewed elsewhere.

The results of the behavioral cues were analyzed for the following: gaze duration, bilateral eye movement, regional eye transitions, eye fixations, and blinking behaviors. These differences will also be analyzed by their relationship to gender and culture.

This research should reveal differences in the frequency of gaze between cultures. Truthful stories should reflect cultural norms. Deceptive patterns in the United States should show deviation from the 40 percent to 60 percent average as described by Wicklander and Zulawski for the research subjects from the United States. Excessive blinking should be observed during deceptive stories more often than truthful stories. If neurolinguistic behaviors that are taught to police officers are correct, bilateral movements will correlate with deceptive stories versus truthful stories. Deceptive stories versus truthful stories should have differing patterns. Eye fixations are likely to increase during deceptive stories due to the increased duration which the thought process undergoes during these circumstances.

The following chapter will describe the results of the two studies conducted for this research. The first results include the findings from the survey of law enforcement officers. The results identify which behaviors are better indicators of deception. The second study in chapter four will identify deceptive eye patterns versus truthful ones. These results include the length of gaze, neurolinguistic bilateral eye movements, left handed versus right handed influence in eye movements, and durations of deceptive statements.

Chapter Four

Results

This chapter includes the results of the law enforcement survey and eye behaviors associated with deception versus truth. A caveat should be included with the results of these research projects. Both portions of this research include non-parametric testing. Before conclusions should be drawn from this thesis, more testing should be done to include larger numbers of participants.

Results of Law Enforcement Officer's Survey

The survey was used as a means of finding the connectivity between behavior and deception. Nonverbal behaviors were evaluated for deceptive likelihood based on officer preference of selected levels as designated between *no indicator* and *high indicator*, to include a category for *unknown* on a five point Likert scale. For those officers who did not know whether or not a behavior was associated with deception as indicated in the survey, all *unknown* values were not included in the final analysis. All other responses that placed value on these behaviors were included in the results. Officers who advised that there was no value or *no indicator* resulted in the numerical value of zero. Officers who responded by placing a value between no value or *no indicator* and *moderate indicator* was given the value of one. Responses of *moderate* were given the value of two. Responses between *moderate* and *high indicator of deception* were given a value of three. Responses of *high indicator of deception* were given the value of four. The total number of officers that responded to the indicators of deception was multiplied by four to obtain the highest possible value as an indicator of deception. The total number of indicators scored by participant officers was then added and subsequently divided by the

total possible indicators of deception. This provided a percentage of the overall value that officers placed on the particular signal. The following were the values associated with the various signals evaluated using the Likert scale:

Signals of the head and face

Observable pulse in the head, neck or throat (73 percent); perspiration on upper lip (73 percent); perspiration on forehead (73 percent); paling of skin color (73 percent); flushing of skin color (66 percent); pulling or tugging at nose (63 percent); pulling or tugging at ears (57 percent); pulling or tugging on lips (56 percent); grooming mustache or beard (54 percent); movement of “Adams Apple” (54 percent); twirling hair (53 percent); twirling mustache or beard (53 percent); grooming hair (51 percent); hand covering the throat (48 percent); sniffing (48 percent); and lack of perspiration when it should be expected (44 percent).

Signals in the eyes

Fake crying (84 percent); little to no eye contact (82 percent); a sudden movement of the eyes/darting eyes (81 percent); covering eyes (75 percent); closing eyes (73 percent); often checking watch (68 percent); excessive eye contact (62 percent); excessive blinking (62 percent); staring out a window or door (56 percent); bulging or protruding eyes/bug-eyed (56 percent); having a dull or fixed stare/glassy eyes (52 percent); crying (48 percent); falling asleep (46 percent); tired (45 percent); squinting (44 percent); and watery eyes (37 percent).

Signals of the mouth

Excessive swallowing (78 percent); excessive drinking of available beverage (75 percent); dry mouth (74 percent); heavily exhaled breath (73 percent); chain smoking (67

percent); putting things in their mouth (64 percent); unexplained smiling (60 percent); clearing throat (59 percent); stuttering (59 percent); yawning (58 percent); twisting the mouth (53 percent); sighing (53 percent); thickened/slurred speech (43 percent); upper teeth smile (42 percent); and gum chewing (36 percent).

Signals of the lips

Lip quivers (72 percent); sound of “clicking” from dehydration (67 percent); lip biting (65 percent); white dried saliva in the corners of the mouth (65 percent); squeezes lips tightly together (61 percent); licking lips (60 percent); and puckered lips (51 percent).

Signals of the body

Creating barriers between themselves and others (80 percent); unexplained increase in perspiration (80 percent); hiding behind barriers (80 percent); change in breathing (70 percent); muscle spasms (60 percent); moaning (50 percent); chest tapping (50 percent); goose bumps (50 percent); unexplained decrease in perspiration (50 percent); passing gas (50 percent); belching (40 percent); and stomach growling (30 percent).

Signals of the hands and arms

Arms held tightly across the body (83 percent); hand tucked tightly in armpits (77 percent); concealing the hands (76 percent); brushing away (73 percent); clenching fist (72 percent); hands gripped together tightly (72 percent); elbows pulled in to the body (72 percent); nail biting (71 percent); self-pinching (69 percent); holding tightly onto an object (66 percent); rubbing hands (64 percent); cleaning clothing (64 percent); inspecting fingernails (63 percent); wiping sweat (62 percent); playing with jewelry or clothing (60 percent); scratching (58 percent); tapping fingers or hands (56 percent); sudden hand movements (55 percent); checking pockets (50 percent); frequent hand

movements (49 percent); and patting pockets (49 percent).

Signals of the feet and legs

Tapping foot (70 percent); leg bouncing (70 percent); double leg crossing (70 percent); foot bouncing (70 percent); frequent foot movements (60 percent); raising toes (60 percent); and raising heel (60 percent).

Signals of posture

Turning away (80 percent); pulling away (80 percent); sudden shifts in posture (70 percent); frequent shifts in posture (70 percent); running position (one foot tucked back and the other forward) (70 percent); arms folded leaning back (70 percent); arms folded leaning forward (60 percent); stiff posture (60 percent); leaning forward in the chair in a confrontational manner (50 percent); feet forward and crossed (40 percent); and feet tucked under the chair (40 percent);

Signals of proxemics

Person's position is too far from the interviewer (76 percent). Person's position is too close to the interviewer (44 percent).

The following questions were not included in the results due to not being able to place a related value on them as found on the Likert scale: *If the person's position is too close to the interviewer, at approximately what point is that position too close? If the person's position is too far from the interviewer, at approximately what point is that position too far?*

Individual behaviors in each of the nine categories of nonverbal signals were added, and then divided by the total possible value. This provided an overall percentage of value law enforcement officers' place on these categories. Those include: feet and

legs (70 percent); hands and arms (65 percent); eyes (62 percent); posture (62 percent); body (61 percent); mouth (60 percent); lips (60 percent); proxemics (60 percent); and signals of the head and face (58 percent); and

Each of the officers who participated in this survey was asked about any other behaviors that were not included in this survey that they felt were indicators of deception. The following were included in the behaviors identified by the participating officers; looking for an out; chewing on the interiors of the cheeks; popping knuckles; clenching jaw; covering the groin area with hands; rocking back and forth compulsively; holding head in hands; smirking while looking away; holding breath; discomfort when the interviewer changes proximity with them; picking nose; running nose; not answering; shaking head back and forth; spitting, unexplained smiling; and two officers identified neurolinguistic eye movements.

Based on my survey, the most important indicators for deception for law enforcement officers include: fake crying, arms held tightly across the body, little to no eye contact, a sudden movement of the eyes/darting eyes, creating barriers between themselves and others, unexplained increase in perspiration, hiding behind barriers, turning away, and pulling away. Two of the four highest indicators of deception identified in this survey include eye behaviors.

Results of Research Study of Eye Movements Related to Deception

This research consisted of evaluating approximately 248 minutes of eye patterns. These included 123 minutes of truthful eye patterns; 93 minutes of deceptive eye patterns; and 32 minutes of baseline/control eye patterns. Each research subject involved in this study was evaluated based on the five parts of their statement. The first is the

baseline or control behavior. The next four are separated between each individual story. Each section was evaluated based on the total time duration of individual eye behaviors observed. The overall time of each behavior observed was divided by the total time of the statement to provide a percentage. The participant's results were also combined for percentages relating to the group as a whole.

As described earlier as a part of neurolinguistic eye movements, the hand which a person uses for writing plays a large role in which side of the brain they access for recalled information versus created information. Of this group there were two subjects that were identified as left handed. Those subjects were identified as N5 and N10. Subject N4 was identified as having favored their left hand as a child. However, N4 was forced to use the right hand in school.

Eye contact was evaluated for any distinct relationship as an indicator of deception as Wicklander-Zulawski described. United States participants were observed as maintaining eye contact at a rate of 66 percent during the control/baseline phase of the interview. Truthful experiences showed eye contact was made 50 percent of the time. Eye contact during deceptive experiences shows the exact same percentage as truthful statements. Non-United States participants were observed to maintain eye contact 67 percent of the time during the baseline/control phase of the interview. During both the truthful and deceptive statements, eye contact was observed at 49 percent. Eye contact was observed 29 percent of the time while a foreign language was being spoken during both truthful and deceptive statements. In comparing left-handed versus right handed participants, the results showed that during a baseline statement eye contact was maintained at 83 percent for left-handed people. The results of left-handed percentage

only include two participants. This study needs further analysis from additional left-handed participants before drawing conclusions. For right-handed people it was observed 64 percent of the time. During truthful statements eye contact was maintained 77 percent for the two left-handed people. For right-handed people it was observed 48 percent of the time. During deceptive statements eye contact was observed 71 percent of the time for left-handed people, and for right-handed people it was observed 49 percent. Subject N4 was not included in the statistics for left-handed versus right-handed people due to the confusion to which group they would belong to.

Eye contact between male participants versus female participants differs slightly. During the baseline/control there was no difference between the two genders in the level of eye contact. Both groups made eye contact 66 percent of the time. During both truthful and deceptive stories men maintained eye contact 54 percent of the total duration. Women on the other hand, during truthful experiences, maintained eye contact 44 percent. For deceptive stories the eye contact was maintained 45 percent of the time. This research did produce outliers from the general group. Among the men U11 maintained eye contact 97 percent of the time during truthful statements and 98 percent among the deceptive statements. On the other end of the spectrum U1 maintained eye contact 21 percent of the time during truthful statements and 17 percent of the time during deceptive statements. Although both of these participants deviated the farthest from the general group both of their truthful statements and deceptive statements were similar. Among the female participants N5 maintained the most eye contact. During her truthful statements she maintained eye contact 73 percent of the time. Her eye contact during the deceptive statements was maintained at 72 percent. The lowest outliers for the

female participants included N3 and N4. N4 maintained eye contact 25 percent of the time during truthful statements and 21 percent during deceptive ones. N3 did only maintain eye contact 19 percent of the time during her truthful statements. However, her eye contact during deceptive statements was maintained at 52 percent of the time. All of these participants were included in the overall percentage for eye contact between male and female participants.

Eye drift to the left hemisphere of the brain was observed by eye movements to the right side of the face. Right hemisphere movements were identified by eye drifts to the left side of the face. Evaluating the total duration of bilateral eye movements during the baseline/control showed that thirteen percent of the time participants shifted their eyes to the right and eight percent to the left. Men shifted their eyes to the right twelve percent and to the left nine percent. Women's eyes shifted to the right fourteen percent and left six percent. N10 was the only left handed male, who according to the literature would access the right hemisphere of his brain more. N5 is the only female that is left handed. However, N4 is also female and was left handed as a child. During the baseline/control right handed people looked to the right fourteen percent of the time and seven percent to the left. Left handed people looked equally to the left and right at five percent of the time.

The 22 participants were evaluated for bilateral movements according to the neurolinguistic movements related to deception. N4 was evaluated separately from the others due to not being able to clearly label this one right or left handed. Of the 21 combined participants, thirteen correctly displayed bilateral movements relating to which hand they preferred during the baseline/control phase of the interview. The participants

who displayed the opposite of which hand they preferred included: U2, U4, U6, U8, N2, N3, and N8. N4 displayed bilateral movements that favored the right hemisphere. Both N4 and N9 displayed equal access to both hemispheres. During the truthful statements in English thirteen of the 21 participants displayed eye movements consistent with the correct hemisphere in relationship to which hand they use. The participants that favored the incorrect side included: U5, U4, U6, U8, N2, N3, and N8. During deceptive statements only seven of the 21 participants evaluated demonstrated correct responses relating to neurolinguistic eye movements. U12 displayed equal access to both hemispheres during both truthful and deceptive statements. Evaluating bilateral eye movements while a foreign language is being spoken display the same results for both truthful and deceptive statements. Of the eight people who spoke a foreign language, four of them represented eye movements that were correctly correlated to being left or right handed. The other four did not.

Eye movements associated with truthful statements in the left hemisphere were observed to deviate from fourteen percent in English to 27 percent in other languages. Eye fixations associated with the right hemisphere were observed to deviate from thirteen percent in English to 21 percent in other languages. During deceptive statements eye fixations associated with the left hemisphere were observed to be 20 percent in English and 29 percent in other languages. The right hemisphere was observed to deviate from fourteen percent in English to only 15 percent in other languages during deceptive statements.

The most salient indicator of deception that could be observed during this research is found in the length of the stories. Only deceptive stories that were longer or

shorter than the two truthful statements given by a participant were included in the statistics. Truthful stories deviate from deceptive ones 82 percent of the time. Sixty-six percent of the time deceptive stories are shorter in length than truthful ones. Sixteen percent of deceptive stories are longer than truthful ones. These results were not expected. Previous researchers have identified that deceptive statements deviate in length from truthful statements, but I didn't realize how prevalent these results would be. Of all the United States participants, the total time duration of true statements was 141.12 seconds. Their deceptive statements totaled 112.92 seconds. Both native and nonnative participants who spoke English totaled 127.61 seconds of truthful statements and 97.03 seconds of deceptive. Foreign language speakers totaled 87.10 seconds for truthful statements and 65.04 for deception. United States male participants totaled 176.99 seconds for truthful statements and 144.70 for deceptive ones. United States female participants totaled 90.91 seconds during truthful statements and 68.45 for deceptive statements. Foreign male participants totaled 111.49 seconds of truthful statements and 77.67 seconds for deceptive ones, while speaking English. Foreign female participants totaled 111.3 seconds of truthful statements and 78.22 seconds for deceptive ones, while speaking English. Foreign male participants totaled 82.89 seconds of truthful statements and 64.8 seconds for deceptive ones, while speaking foreign languages. Females who spoke a foreign language totaled 91.30 seconds of truthful statements and 65.27 seconds for deceptive ones.

In the next chapter I will describe what conclusions can be draw from the survey and neurolinguistic deceptive eye movements. Chapter five also addresses where the short comings of this research are and where future research relating to this subject

material should focus.

Chapter Five

Conclusion

Survey

In this chapter I will review the findings from the law enforcement survey and the neurolinguistic deceptive eye movements study. This chapter also identifies potential problems that could have affected the results of this research and what future steps should be taken for future related studies.

Law enforcement officers who participated in this survey identified which signals they consciously value in detecting deception. Due to the overall number of officers that participated, these results are non-parametric. However, they do provide evidence of what is happening with the training they receive. Of all the behavioral cues identified in this survey only nine were identified at 80 percent or above for their relationship to deception. These signals include: little to no eye contact (82 percent); a sudden movement of the eyes/darting eyes (81 percent); fake crying (84 percent); creating barriers between themselves and others (80 percent); hiding behind barriers (80 percent); unexplained increase in perspiration (80 percent); arms held tightly across the body (83 percent); turning away (80 percent); and pulling away (80 percent).

The most identified signal was fake crying. This could be due to the behavior already being deceptive in nature without observing the context in which it is seen. The behaviors which include creating or hiding behind barriers, arms held tightly across the body, and turning or pulling away, are all examples of attempting to distance themselves from the interviewer. These signals are easily identifiable from a distance. The behavior that I found most interesting was the third highest behavior identified in the survey, little

to no eye contact. As I will describe below, eye contact does not deviate between truthful and deceptive stories. If officers are relying on eye contact to identify deceptive statements, they often are being misled.

The final question in this survey asked for behaviors that have not already been identified that the officers know to be related to deception. Two officers identified deceptive movements related to neurolinguistics. Law enforcement officer's training has been inundated with this literature for approximately 30 years. One of the short comings of the law enforcement community is they often do not conduct research within their own professional group. They rely on the trainers to make sure that what they teach is sound. Often these trainers are not staying up to date on the latest scientific developments.

Eye movements

Law enforcement officers are taught to identify behavioral patterns that deviate from the norm to identify deception. As Wicklander-Zulawski have described normal eye contact ranges from 40 percent to 60 percent (Wicklander-Zulawski & Associates 2013: 21). As observed above in the results from eye behavior, eye contact was maintained at an average rate of 66 percent of the time for participants from the United States and 67 percent for participants from outside of the United States. If a law enforcement officer was to establish whether or not the interviewees were being honest during this section of their interviews, they would most often be led to believe that the participant is deceptive, according to Wicklander-Zulawski. Officers are also taught to establish a baseline of behavior in an interview with simple, non-confrontational questions. If officers were to use this section of an interview to establish normal eye behavior, they would more often than not believe that all additional eye behaviors are

deceptive. The participants in this research confirmed that eye contact during deception does not deviate from truthful statements under low stress situations. If officers are relying on eye contact during interviews, it is more likely to be the result of the stress of the situation, rather than the result of a deceptive statement.

Cultural and/or language differences do not directly affect the difference in the amount of eye contact during deceptive statements versus truthful ones. The discrepancy between eye contact while English is being spoken versus other languages may be the result of a number of reasons. These may include: they are not a native speaker of the language and do not understand what is being said; they are not displaying nonverbal cues that are consistent with theirs; culturally their level of eye contact differs from that of people in the United States, etc.

Gender did not yield notable differences during the baseline/control portion of the interview. However, during both the truthful and deceptive parts of the interview, eye contact was slightly different between genders. Males maintained eye contact during both truthful and deceptive stories twelve percent lower than the baseline control phase. Females displayed 22 percent less eye contact during the truthful statements and 21 percent less during deceptive ones. This again shows no substantial difference for either gender between truthful and deceptive statements. However, eye contact in general differs between the genders.

Evidence of deception relating to bilateral eye movements was sparse. The literature supporting bilateral changes for deception should have revealed that the participant's amount of eye shifts to one direction during truthful statements should favor one side. During deceptive statements, eyes should shift to the other side. Eye

movements consistent with the left versus right hemispheres do not appear to have a substantial cultural influence. Evidence of bilateral movements during deceptive versus truthful statements is lacking in both native United States participants as well as foreign participants. Bilateral eye movements between men and women show only a two percent discrepancy to the right and a three percent discrepancy to the left. Neither of the percentages is substantial. Of all 22 participants only N10 displayed eye behaviors associated with neurolinguistic bilateral eye movements during truthful and deceptive statements. This provided evidence that neurolinguistic eye movements as an indicator of deception should not be relied on. What was observed, when looking at total duration of bilateral movements, was that the participants tend to favor one side or the other. Participants who are right handed tend to look to the right side. Left handed participants tend to favor looking to the left side.

According to this research project, one area has produced evidence that could help identify deceptive statements at a higher rate than the general public and police officers, which is the length of the stories or experiences shared. Eighty-two percent of the time deceptive stories differ from truthful experiences in length. The majority of deceptive stories are shorter in length. However, there are some that are longer in length. If officers evaluate the statements that fall on the two ends of the spectrum, they would likely see an increase in their accuracy rates in detecting which parts of the statements are deceptive in nature. Despite cultural or gender influences, deceptive statements tend to be shorter in length. Deceptive story lengths are likely to be a result of having to create a story in the moment to make it believable. Small details are not likely to be included because of the level of thought that has to go into creating the story. Deceptive stories

that are shorter in length are possibly related to stories that were created in anticipation of having to share a false story. To make the story more believable the deceiver is likely adding as many small details as possible. In either case the lack of preparation or over preparation for deceptive statements causes them to deviate from truthful ones. Future research relating to deceptive statements should include stories that are created during the interview versus stories that were created prior to the interview.

One aspect that has been described before relates to high stress situations that provided more nonverbal body leakage to identify deceptive cues. It has been my experience that many suspects who have been involved in criminal activities for long durations tend not to display increased stress even when their future is at risk. Identifying deceptive statements through story length will likely assist law enforcement officers as well as account for the aforementioned variables.

Although deception is a useful biological tool, it does not have universal signals selective to it alone. It has been a useful tool due to the elusiveness in detecting it. Those with culture specific learning are likely to identify cues that correlate with deception. However, incorrect instruction is likely to mislead those who rely on it. Law enforcement has been identified as being above average in detecting deception. As seen with Vrij's (Vrij and Mann 2005) research different types of law enforcement officers vary on their abilities to correctly identify deception. Law enforcement needs to take a more active role in researching the information disseminated to its personnel. Reliance on incorrect information is likely to steer interviews and investigations in areas that will tie up valuable time.

Future directions for the survey portion of this research should include larger

numbers of officers. If officers are surveyed from countries that include high and low context cultures a variety of differences is likely to be identified. Officers who have been raised and serve in areas that have a wide variety of influences from different culture groups will also likely recognize different deceptive signals. Officers surveyed in the United States needed to be separated into regions to separate differences across the country. These surveys should also extend to officers in other countries. Officers who serve in high context versus low context cultures should be analyzed. Officer's longevity on the job should also be analyzed. This is likely to show what culture-specific learning takes place over time to identify deceptive cues.

Deception research on eye behaviors should include increased sample sizes. Those should include more left handed people. More non-United States participants should be evaluated for differences between high and low context cultural influences. Visual patterns should be analyzed in conjunction with verbal patterns. Interviews in the future should better control the room in which they are videotaped. The area in front of the participant should be closed off so that visually there is nothing for the eyes to fixate on. Future research should also analyze other body language in conjunction with eye patterns in order to draw correlations to other forms of leakage. Eye patterns should also be analyzed between high risk deceptive behaviors versus low risk deceptive behavior.

This research can serve as a benefit to law enforcement officers throughout the United States. The survey of officers should be used as a starting point for additional research. Behavioral cues that officers have identified as deceptive should be evaluated similarly to the neurolinguistic eye movements in this research. Cues that closely accompany deceptive behaviors are likely to be identified. Law enforcement officers

would be able to learn which cues are more reliable and potentially can increase their accuracy rates of identifying deception earlier in their carrier. Bilateral deceptive eye movements have been taught for an extensive time. This research confirms that these behaviors cannot be relied upon. However, officers who rely on statement lengths are likely to increase their accuracy rate in identifying deception.

Appendix

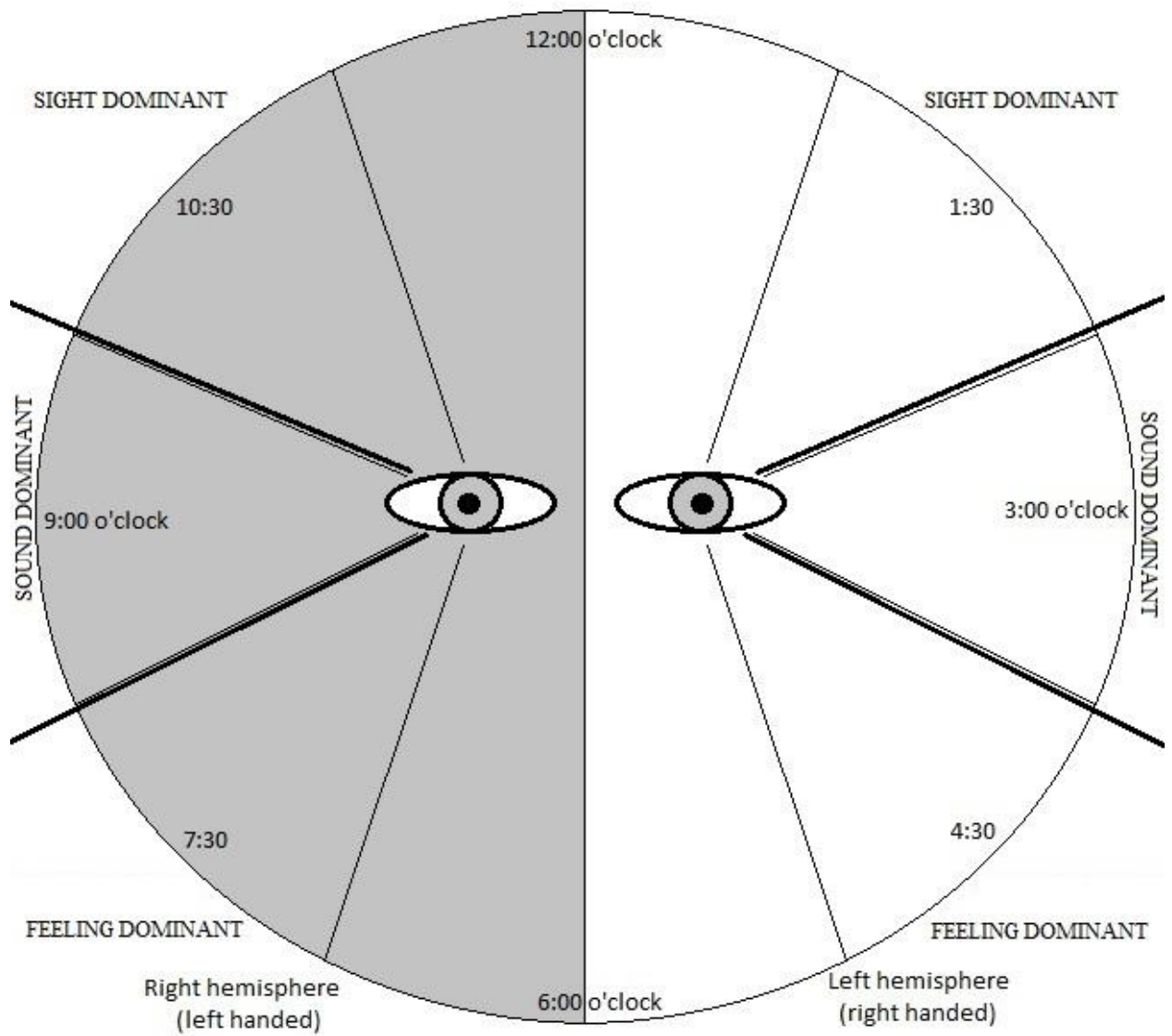
	Head and face							Eyes					
	Overall Responses	No Indicator	Low Indicator	Moderate	Moderate/High	High Indicator		Overall Responses	No Indicator	Low Indicator	Moderate	Moderate/High	High Indicator
Flushing of skin	31	0	2	12	12	5	Little to no eye contact	33	0	0	8	8	17
Observable pulse	30	1	1	8	10	10	Closing the eyes	32	0	2	10	9	11
Movement of "Adam's Apple"	31	1	6	14	7	3	A sudden movement of the eyes (Darting eyes)	32	0	1	5	11	15
Hand covering throat	22	2	4	11	4	1	Covering eyes	30	0	1	9	9	11
Pulling on the lips	28	0	6	12	7	3	Excessive eye contact	29	1	5	7	11	5
Twirling mustache or beard	30	0	8	14	5	3	Bulging or protruding eyes (Bug-eyed)	27	1	9	4	9	4
Grooming mustache or beard	28	0	9	10	4	5	Excessive blinking	29	0	5	8	10	6
Sniffing	27	2	8	9	6	2	Squinting	28	4	8	8	7	1
Pulling at nose	28	0	5	9	8	6	Watery eyes	26	4	10	9	2	1
Twirling hair	31	1	7	12	9	2	Having a dull or fixed stare (Glassy eyes)	24	3	5	6	7	3
Grooming hair	30	1	8	13	5	3	Tired	29	7	4	10	4	4
Pulling on ears	29	2	6	9	6	6	Staring out a window or door	32	1	4	17	6	4
Lack of perspiration when it should be expected	28	5	4	13	5	1	Crying	29	3	6	13	4	3
Perspiration on upper lip	32	0	2	8	13	9	Fake crying	33	0	1	5	8	19
Perspiration on forehead	33	0	2	7	16	8	Often checking watch	31	1	1	12	9	8
Total column	438	15	78	161	117	67	Falling asleep	26	6	8	2	4	6
Value	4	0	1	2	3	4	Total column	470	31	70	133	118	118
	1752	0	78	322	351	268	Value	4	0	1	2	3	4
				Sum	1019			1880	0	70	266	354	472
Total Value Percentage	0.58 %						Total Value Percentage	0.62 %				Sum	1162

	Mouth							Lips					
	Overall Responses	No Indicator	Low Indicator	Moderate	Moderate/High	High Indicator		Overall Responses	No Indicator	Low Indicator	Moderate	Moderate/High	High Indicator
Dry mouth	31	1	0	10	8	12	Licking lips	32	0	6	13	7	6
Excessive drinking of available beverage	30	1	0	8	10	11	Lip biting	30	0	4	12	6	8
Excessive swallowing	29	0	2	4	11	12	Sound of "clicking" from dehydration	29	0	6	6	8	9
Putting things in their mouth	28	1	2	12	6	7	White dried saliva in the corners of the mouth	30	0	7	8	5	10
Gum chewing	29	6	9	10	3	1	Lip quivers	30	0	2	7	14	7
Thickened/slurred speech	26	3	8	9	5	1	Squeezes lips tightly together	31	0	6	12	6	7
Stuttering	31	1	5	13	6	6	Puckered lips	25	1	7	10	4	3
Twisting the mouth	29	0	9	11	5	4	Total column	207	1	38	68	50	50
Upper teeth smile	21	2	8	7	3	1	Value	4	0	1	2	3	4
Unexplained smiling	28	0	7	9	6	6		828	0	38	136	150	200
Heavily exhaled breath	30	0	1	10	10	9					Sum	524	
Yawning	28	3	3	9	8	5	Total Value Percentage	0.6 %					
Sighing	29	1	8	8	10	2							
Clearing throat	31	0	4	17	5	5							
Chain smoking	27	0	4	8	8	7							
Total column	427	19	70	145	104	89							
Value	4	0	1	2	3	4							
	1708	0	70	290	312	356							
				Sum	1028								
Total Value Percentage	0.6 %												

	Body							Hands and Arms					
	Overall Responses	No Indicator	Low Indicator	Moderate	Moderate/High	High Indicator		Overall Responses	No Indicator	Low Indicator	Moderate	Moderate/High	High Indicator
Creating barriers between themselves and others	33	0	1	4	10	18	Elbows pulled in to the body	32	1	2	8	10	11
Hiding behind barriers	33	0	1	6	6	20	Arms held tightly across the body	33	1	1	3	9	19
Belching	25	3	12	4	3	3	Brushing away	27	1	4	3	7	12
Moaning	25	0	10	9	4	2	Cleaning clothing	29	2	2	10	8	7
Goose bumps	25	2	8	6	6	3	Hand tucked tightly in armpits	33	1	2	7	7	16
Unexplained increase in perspiration	32	0	0	6	13	13	Concealing the hands	31	0	2	8	8	13
Unexplained decrease in perspiration	24	1	5	11	6	1	Sudden hand movements	27	2	5	8	10	2
Muscle spasms	21	1	4	6	5	5	Frequent hand movements	29	3	6	11	7	2
Passing gas	20	1	7	7	4	1	Nail biting	31	2	1	7	11	10
Change in breathing	32	0	3	7	10	12	Inspecting fingernails	28	0	3	11	10	4
Stomach growling	23	7	6	6	3	1	Playing with jewelry or clothing	31	0	4	13	11	3
Chest tapping	23	1	8	6	4	4	Scratching	28	2	5	9	6	6
Total column	316	16	65	78	74	83	Hands gripped together tightly	31	0	2	11	7	11
Value	4	0	1	2	3	4	Clenching fist	31	0	4	7	9	11
	1264	0	65	156	222	332	Holding tightly on to an object	30	1	2	12	7	8
					Sum	775	Tapping fingers or hands	29	1	5	13	6	4
Total Value Percentage	0.61 %						Rubbing hands	29	0	2	14	8	5
							Checking pockets	30	1	11	9	5	4
							Patting pockets	29	2	7	12	6	2
							Self pinching	25	0	3	8	6	8
							Wiping sweat	28	1	4	9	9	5
							Total column	621	21	77	193	167	163
							Value	4	0	1	2	3	4
								2484	0	77	386	501	652
											sum	1616	
							Total Value Percentage	0.65 %					

	Feet and legs							Posture					
	Overall Responses	No Indicator	Low Indicator	Moderate	Moderate/High	High Indicator		Overall Responses	No Indicator	Low Indicator	Moderate	Moderate/High	High Indicator
Frequent foot movements	32	0	5	14	9	4	Sudden shifts in posture	30	0	3	12	8	7
Foot bouncing	30	0	3	10	6	11	Frequent shifts in posture	30	0	2	10	9	9
Raising toes	21	0	3	7	7	4	Running position (one foot tucked back and the other forward)	26	0	3	9	6	8
Raising heel	22	0	4	9	6	3	Arms folded leaning back	30	2	2	5	8	13
Tapping foot	30	0	1	13	9	7	Arms folded leaning forward	28	1	4	11	5	7
Leg bouncing	30	0	1	12	7	10	Feet forward and crossed	30	4	9	10	5	2
Double leg crossing	28	1	3	9	6	9	Feet tucked under the chair	30	7	10	9	2	2
Total column	193	1	20	74	50	48	Leaning forward in the chair in a confrontational manner	30	4	8	8	6	4
Value	4	0	1	2	3	4	Turning away	31	0	0	9	9	13
	772	0	20	148	150	192	Pulling away	31	0	0	10	7	14
					sum	510	Stiff posture	29	0	2	14	9	4
Total Value Percentage	0.7 %						Total column	325	18	43	107	74	83
							Value	4	0	1	2	3	4
								1300	0	43	214	222	332
											sum	811	
							Total Value Percentage	0.62 %					

	Proxemics					
	Overall Responses	No Indicator	Low Indicator	Moderate	Moderate/High	High Indicator
Person's position is too close to the interviewer	27	3	7	11	5	1
Person's position is too far from the interviewer	28	0	1	6	12	9
Total column	55	3	8	17	17	10
Value	4	0	1	2	3	4
	220	0	8	34	51	40
				sun	133	
Total Value Percentage	0.6 %					



RESEARCH SUBJECT	CONTROL % OF EYE CONTACT	TRUE % OF EYE CONTACT	DECEPTIVE % OF EYE CONTACT	NON-ENGLISH TRUE % OF EYE CONTACT	NON-ENGLISH DECEPTIVE % OF EYE CONTACT	% LEFT HEMISPHERE CONTROL	% RIGHT HEMISPHERE CONTROL	% LEFT HEMISPHERE TRUE	% RIGHT HEMISPHERE TRUE	NON-ENGLISH % LEFT HEMISPHERE TRUE	NON-ENGLISH % RIGHT HEMISPHERE TRUE	% LEFT HEMISPHERE DECEPTIVE	% RIGHT HEMISPHERE DECEPTIVE	NON-ENGLISH % LEFT HEMISPHERE DECEPTIVE	NON-ENGLISH % RIGHT HEMISPHERE DECEPTIVE	LEFT/RIGHT HANDED
U1	46	21	17	-	-	29	10	48	6	-	-	29	6	-	-	right
U2	58	40	49	-	-	11	6	2	20	-	-	0	23	-	-	right
U4	61	42	48	-	-	10	6	11	18	-	-	8	15	-	-	right
U5	46	32	39	26	28	17	3	50	4	54	9	44	6	60	7	right
U6	68	54	58	-	-	19	0	10	19	-	-	12	3	-	-	right
U7	71	50	53	-	-	12	2	11	10	-	-	15	2	-	-	right
U8	58	43	36	-	-	14	7	16	21	-	-	11	20	-	-	right
U9	85	78	86	-	-	7	4	14	4	-	-	6	4	-	-	right
U10	69	41	34	-	-	11	15	27	11	-	-	34	8	-	-	right
U11	75	72	63	-	-	8	0	13	5	-	-	19	0	-	-	right
U12	89	97	98	-	-	5	2	1	1	-	-	1	1	-	-	right
U13	61	36	29	-	-	19	9	21	5	-	-	25	9	-	-	right
N1	63	48	56	33	33	1	24	22	13	12	37	15	14	7	27	right
N2	51	34	33	15	12	17	10	10	11	23	23	8	10	21	19	right
N3	77	19	52	-	-	10	3	24	25	-	-	20	14	-	-	right
N4(g)	69	25	21	19	22	8	8	12	15	31	7	15	19	21	15	L/R
N4(s)	-	-	-	10	9	-	-	-	-	33	13	-	-	34	15	L/R
N5	90	84	73	72	73	6	3	6	8	13	11	13	10	12	11	left
N6	72	45	56	-	-	21	3	39	5	-	-	23	9	-	-	right
N7	36	36	27	9	12	18	12	33	10	22	25	58	5	31	33	right
N8	61	53	29	15	0	20	14	5	39	46	19	14	50	89	0	right
N9	75	71	70	40	40	8	8	17	3	38	3	16	6	59	13	right
N10	75	70	69	46	59	4	16	9	13	14	24	19	7	19	12	left

The following charts display baseline/control behaviors and truthful one in white and deception in gray:

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Control Behavior	U1	Eye contact	2.12	29.74	12.9832	14	64.70	19:41:11.00	19:42:15.70	Left	Left	46%
Control Behavior	U1	12:00	0.43	0.43	0.927371	1	64.70	19:41:11.00	19:42:15.70	6.491601	6.23	1%
Control Behavior	U1	1:30	0.98	1.97	1.85474	2	64.70	19:41:11.00	19:42:15.70			3%
Control Behavior	U1	3:00	0.83	3.33	3.70949	4	64.70	19:41:11.00	19:42:15.70	Right	Right	5%
Control Behavior	U1	4:30	0.93	0.93	0.927371	1	64.70	19:41:11.00	19:42:15.70	12.055831	18.98	1%
Control Behavior	U1	6:00	0.39	2.74	6.4916	7	64.70	19:41:11.00	19:42:15.70			4%
Control Behavior	U1	7:30	2.38	11.92	4.63686	5	64.70	19:41:11.00	19:42:15.70			18%
Control Behavior	U1	9:00	0.90	6.33	6.4916	7	64.70	19:41:11.00	19:42:15.70			10%
Control Behavior	U1	10:30	0.73	0.73	0.927371	1	64.70	19:41:11.00	19:42:15.70			1%
Control Behavior	U1	Closed	2.19	6.57	2.78211	3	64.70	19:41:11.00	19:42:15.70			10%
U1 Story 1	U1	Eye contact	1.72	37.83	8.29146	22	159.20	19:43:03.98	19:45:43.18	Left	Left	24%
U1 Story 1	U1	12:00	1.02	8.14	3.01508	8	159.20	19:43:03.98	19:45:43.18	3.015073	10.40	5%
U1 Story 1	U1	1:30	0.40	0.40	0.376884	1	159.20	19:43:03.98	19:45:43.18			0%
U1 Story 1	U1	3:00	1.13	2.27	0.753769	2	159.20	19:43:03.98	19:45:43.18	Right	Right	1%
U1 Story 1	U1	4:30	1.55	7.73	1.88442	5	159.20	19:43:03.98	19:45:43.18	10.175884	58.22	5%
U1 Story 1	U1	6:00	1.98	43.53	8.29146	22	159.20	19:43:03.98	19:45:43.18			27%
U1 Story 1	U1	7:30	2.66	53.16	7.53769	20	159.20	19:43:03.98	19:45:43.18			33%
U1 Story 1	U1	9:00	0.74	4.43	2.26131	6	159.20	19:43:03.98	19:45:43.18			3%
U1 Story 1	U1	10:30	0.63	0.63	0.376884	1	159.20	19:43:03.98	19:45:43.18			0%
U1 Story 1	U1	Closed	0.53	1.07	0.753769	2	159.20	19:43:03.98	19:45:43.18			1%
U1 Story 2	U1	Eye contact	1.36	44.87	7.92418	33	249.87	20:13:34.13	20:17:44.00	Left	Left	18%
U1 Story 2	U1	12:00	1.02	8.20	1.92101	8	249.87	20:13:34.13	20:17:44.00	3.121651	15.07	3%
U1 Story 2	U1	1:30	1.37	9.57	1.68089	7	249.87	20:13:34.13	20:17:44.00			4%
U1 Story 2	U1	3:00	0.87	1.73	0.480254	2	249.87	20:13:34.13	20:17:44.00	Right	Right	1%
U1 Story 2	U1	4:30	0.94	3.77	0.960507	4	249.87	20:13:34.13	20:17:44.00	14.88787	136.69	2%
U1 Story 2	U1	6:00	1.55	45.03	6.96368	29	249.87	20:13:34.13	20:17:44.00			18%
U1 Story 2	U1	7:30	2.84	107.89	9.12482	38	249.87	20:13:34.13	20:17:44.00			43%
U1 Story 2	U1	9:00	0.98	16.60	4.08216	17	249.87	20:13:34.13	20:17:44.00			7%
U1 Story 2	U1	10:30	1.74	12.20	1.68089	7	249.87	20:13:34.13	20:17:44.00			5%
U1 Story 3	U1	Eye contact	1.30	38.86	11.3231	30	158.97	19:57:25.91	20:00:04.88	Left	Left	24%
U1 Story 3	U1	12:00	0.78	1.57	0.754874	2	158.97	19:57:25.91	20:00:04.88	9.81336	22.70	1%
U1 Story 3	U1	1:30	0.97	5.83	2.26462	6	158.97	19:57:25.91	20:00:04.88			4%
U1 Story 3	U1	3:00	0.56	2.23	1.50975	4	158.97	19:57:25.91	20:00:04.88	Right	Right	1%
U1 Story 3	U1	4:30	0.91	14.63	6.03899	16	158.97	19:57:25.91	20:00:04.88	15.47491	58.70	9%
U1 Story 3	U1	6:00	1.55	37.13	9.05848	24	158.97	19:57:25.91	20:00:04.88			23%
U1 Story 3	U1	7:30	1.66	49.90	11.3231	30	158.97	19:57:25.91	20:00:04.88			31%
U1 Story 3	U1	9:00	0.73	5.10	2.64206	7	158.97	19:57:25.91	20:00:04.88			3%
U1 Story 3	U1	10:30	0.92	3.70	1.50975	4	158.97	19:57:25.91	20:00:04.88			2%
U1 Story 4	U1	Eye contact	1.08	27.04	4.89998	25	306.07	20:04:03.46	20:09:09.54	Left	Left	9%
U1 Story 4	U1	12:00	1.22	2.44	0.391998	2	306.07	20:04:03.46	20:09:09.54	0.783996	3.26	1%
U1 Story 4	U1	1:30	1.56	1.56	0.195999	1	306.07	20:04:03.46	20:09:09.54			1%
U1 Story 4	U1	3:00	0.52	1.03	0.391998	2	306.07	20:04:03.46	20:09:09.54	Right	Right	0%
U1 Story 4	U1	4:30	0.67	0.67	0.195999	1	306.07	20:04:03.46	20:09:09.54	7.447967	78.45	0%
U1 Story 4	U1	6:00	0.89	9.77	2.15599	11	306.07	20:04:03.46	20:09:09.54			3%
U1 Story 4	U1	7:30	2.25	51.85	4.50798	23	306.07	20:04:03.46	20:09:09.54			17%
U1 Story 4	U1	9:00	1.93	23.11	2.35199	12	306.07	20:04:03.46	20:09:09.54			8%
U1 Story 4	U1	10:30	1.16	3.49	0.587997	3	306.07	20:04:03.46	20:09:09.54			1%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% Per Minute
Base line	U2	Eye contact	2.80	36.38	12.4603	13	62.60	10:42:01.58	10:43:04.18	Left	Left	58%
Base line	U2	12:00	0.87	2.60	2.87545	3	62.60	10:42:01.58	10:43:04.18	2.87545	4.02	4%
Base line	U2	1:30	1.34	4.02	2.87545	3	62.60	10:42:01.58	10:43:04.18			6%
Base line	U2	7:30	0.79	0.79	0.958482	1	62.60	10:42:01.58	10:43:04.18	Right	Right	1%
Base line	U2	9:00	1.21	6.07	4.79241	5	62.60	10:42:01.58	10:43:04.18	6.709374	6.99	10%
Base line	U2	10:30	0.13	0.13	0.958482	1	62.60	10:42:01.58	10:43:04.18			0%
Base line	U2	Closed	0.70	0.70	0.958482	1	62.60	10:42:01.58	10:43:04.18			1%
Base line	U2	Excessive bl	1.70	11.91	6.70937	7	62.60	10:42:01.58	10:43:04.18			19%
Story 1	U2	Eye contact	1.77	26.55	12.4388	15	71.99	10:43:22.88	10:44:34.87	Left	Left	37%
Story 1	U2	12:00	1.60	1.60	0.829256	1	71.99	10:43:22.88	10:44:34.87	11.60958	18.33	2%
Story 1	U2	1:30	0.14	0.28	1.65851	2	71.99	10:43:22.88	10:44:34.87			0%
Story 1	U2	3:00	1.31	2.62	1.65851	2	71.99	10:43:22.88	10:44:34.87	Right	Right	4%
Story 1	U2	4:30	1.54	15.43	8.29256	10	71.99	10:43:22.88	10:44:34.87	0.829256	1.31	21%
Story 1	U2	6:00	0.80	5.60	5.80479	7	71.99	10:43:22.88	10:44:34.87			8%
Story 1	U2	9:00	1.31	1.31	0.829256	1	71.99	10:43:22.88	10:44:34.87			2%
Story 1	U2	Closed	1.64	3.29	1.65851	2	71.99	10:43:22.88	10:44:34.87			5%
Story 1	U2	Excessive bl	1.39	15.31	9.12182	11	71.99	10:43:22.88	10:44:34.87			21%
Story 2	U2	Eye contact	1.35	25.57	15.8704	19	71.83	10:44:31.94	10:45:43.77	Left	Left	36%
Story 2	U2	12:00	0.13	0.13	0.835282	1	71.83	10:44:31.94	10:45:43.77	13.364512	11.21	0%
Story 2	U2	1:30	1.10	1.10	0.835282	1	71.83	10:44:31.94	10:45:43.77			2%
Story 2	U2	3:00	0.52	3.10	5.01169	6	71.83	10:44:31.94	10:45:43.77	Right	Right	4%
Story 2	U2	4:30	0.78	7.01	7.51754	9	71.83	10:44:31.94	10:45:43.77	0.835282	0.50	10%
Story 2	U2	6:00	1.40	15.45	9.18811	11	71.83	10:44:31.94	10:45:43.77			22%
Story 2	U2	9:00	0.50	0.50	0.835282	1	71.83	10:44:31.94	10:45:43.77			1%
Story 2	U2	Closed	0.37	0.73	1.67056	2	71.83	10:44:31.94	10:45:43.77			1%
Story 2	U2	Excessive bl	1.82	18.22	8.35282	10	71.83	10:44:31.94	10:45:43.77			25%
Story 3	U2	Eye contact	2.04	26.50	12.6079	13	61.87	10:45:06.81	10:46:08.67	Left	Left	43%
Story 3	U2	1:30	1.55	6.18	3.87935	4	61.87	10:45:06.81	10:46:08.67	11.63806	15.15	10%
Story 3	U2	3:00	0.15	0.30	1.93968	2	61.87	10:45:06.81	10:46:08.67			0%
Story 3	U2	4:30	1.44	8.67	5.81903	6	61.87	10:45:06.81	10:46:08.67	Right	Right	14%
Story 3	U2	6:00	1.22	9.77	7.7587	8	61.87	10:45:06.81	10:46:08.67	1.939676	1.57	16%
Story 3	U2	7:30	1.17	1.17	0.969838	1	61.87	10:45:06.81	10:46:08.67			2%
Story 3	U2	9:00	0.40	0.40	0.969838	1	61.87	10:45:06.81	10:46:08.67			1%
Story 3	U2	Closed	0.44	0.88	1.93968	2	61.87	10:45:06.81	10:46:08.67			1%
Story 3	U2	Excessive bl	1.60	7.98	4.84919	5	61.87	10:45:06.81	10:46:08.67			13%
Story 4	U2	Eye contact	2.45	58.90	14.6269	24	98.45	10:45:59.23	10:47:37.68	Left	Left	60%
Story 4	U2	12:00	1.22	1.22	0.609453	1	98.45	10:45:59.23	10:47:37.68	13.407953	20.55	1%
Story 4	U2	1:30	0.60	0.60	0.609453	1	98.45	10:45:59.23	10:47:37.68			1%
Story 4	U2	3:00	0.89	8.02	5.48507	9	98.45	10:45:59.23	10:47:37.68	Right	Right	8%
Story 4	U2	4:30	0.99	11.94	7.31343	12	98.45	10:45:59.23	10:47:37.68	0	0	12%
Story 4	U2	6:00	0.70	6.31	5.48507	9	98.45	10:45:59.23	10:47:37.68			6%
Story 4	U2	Closed	0.57	1.72	1.82836	3	98.45	10:45:59.23	10:47:37.68			2%
Story 4	U2	Excessive bl	0.97	9.75	6.09453	10	98.45	10:45:59.23	10:47:37.68			10%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% Per minute
Control	U4	Eye contact	2.10	50.00	17.597	24	81.83	11:43:06.90	11:44:28.73	Left	Left	61%
Control	U4	3:00	0.33	0.67	1.46642	2	81.83	11:43:06.90	11:44:28.73	5.13247	4.67	1%
Control	U4	4:30	0.80	4.00	3.66605	5	81.83	11:43:06.90	11:44:28.73			5%
Control	U4	6:00	1.26	18.83	10.9981	15	81.83	11:43:06.90	11:44:28.73	Right	Right	23%
Control	U4	7:30	0.45	3.17	5.13247	7	81.83	11:43:06.90	11:44:28.73	11.73136	7.96	4%
Control	U4	9:00	0.59	4.69	5.86568	8	81.83	11:43:06.90	11:44:28.73			6%
Control	U4	10:30	0.10	0.10	0.73321	1	81.83	11:43:06.90	11:44:28.73			0%
Story 1	U4	Eye contact	1.03	77.08	32.2958	75	139.34	11:44:06.59	11:46:25.93	Left	Left	55%
Story 1	U4	12:00	0.32	0.97	1.29183	3	139.34	11:44:06.59	11:46:25.93	15.50203	20.20	1%
Story 1	U4	3:00	0.56	6.73	5.16733	12	139.34	11:44:06.59	11:46:25.93			5%
Story 1	U4	4:30	0.56	13.47	10.3347	24	139.34	11:44:06.59	11:46:25.93	Right	Right	10%
Story 1	U4	6:00	0.76	31.85	18.0856	42	139.34	11:44:06.59	11:46:25.93	8.612221	6.79	23%
Story 1	U4	7:30	0.39	3.10	3.44489	8	139.34	11:44:06.59	11:46:25.93			2%
Story 1	U4	9:00	0.31	3.09	4.30611	10	139.34	11:44:06.59	11:46:25.93			2%
Story 1	U4	10:30	0.30	0.60	0.861221	2	139.34	11:44:06.59	11:46:25.93			0%
Story 1	U4	Closed	0.49	2.43	2.15305	5	139.34	11:44:06.59	11:46:25.93			2%
Story 2	U4	Eye contact	0.79	59.23	29.6748	75	151.35	11:44:43.73	11:47:15.08	Left	Left	39%
Story 2	U4	12:00	0.28	0.57	0.791327	2	151.35	11:44:43.73	11:47:15.08	17.013557	26.40	0%
Story 2	U4	1:30	0.37	0.73	0.791327	2	151.35	11:44:43.73	11:47:15.08			0%
Story 2	U4	3:00	0.54	7.00	5.14363	13	151.35	11:44:43.73	11:47:15.08	Right	Right	5%
Story 2	U4	4:30	0.67	18.67	11.0786	28	151.35	11:44:43.73	11:47:15.08	16.617864	17.64	12%
Story 2	U4	6:00	1.01	44.47	17.4092	44	151.35	11:44:43.73	11:47:15.08			29%
Story 2	U4	7:30	0.40	7.17	7.12194	18	151.35	11:44:43.73	11:47:15.08			5%
Story 2	U4	9:00	0.44	10.04	9.10026	23	151.35	11:44:43.73	11:47:15.08			7%
Story 2	U4	10:30	0.43	0.43	0.395664	1	151.35	11:44:43.73	11:47:15.08			0%
Story 2	U4	Closed	0.61	3.03	1.97832	5	151.35	11:44:43.73	11:47:15.08			2%
Story 3	U4	Eye contact	0.80	59.79	30.744	75	146.37	11:45:12.69	11:47:39.06	Left	Left	41%
Story 3	U4	1:30	0.83	0.83	0.40992	1	146.37	11:45:12.69	11:47:39.06	17.21668	22.70	1%
Story 3	U4	3:00	0.34	4.37	5.32896	13	146.37	11:45:12.69	11:47:39.06			3%
Story 3	U4	4:30	0.62	17.50	11.4778	28	146.37	11:45:12.69	11:47:39.06	Right	Right	12%
Story 3	U4	6:00	0.83	42.50	20.9059	51	146.37	11:45:12.69	11:47:39.06	16.39676	15.77	29%
Story 3	U4	7:30	0.33	4.30	5.32896	13	146.37	11:45:12.69	11:47:39.06			3%
Story 3	U4	9:00	0.42	11.47	11.0678	27	146.37	11:45:12.69	11:47:39.06			8%
Story 3	U4	Closed	0.45	4.90	4.50912	11	146.37	11:45:12.69	11:47:39.06			3%
Story 4	U4	Eye contact	0.92	100.23	29.3649	109	222.72	11:45:34.29	11:49:17.01	Left	Left	45%
Story 4	U4	12:00	0.37	1.47	1.07761	4	222.72	11:45:34.29	11:49:17.01	17.511158	42.13	1%
Story 4	U4	1:30	0.79	2.37	0.808208	3	222.72	11:45:34.29	11:49:17.01			1%
Story 4	U4	3:00	0.69	13.17	5.11865	19	222.72	11:45:34.29	11:49:17.01	Right	Right	6%
Story 4	U4	4:30	0.62	26.60	11.5843	43	222.72	11:45:34.29	11:49:17.01	14.54773	23.01	12%
Story 4	U4	6:00	1.03	49.53	12.9313	48	222.72	11:45:34.29	11:49:17.01			22%
Story 4	U4	7:30	0.40	6.87	4.57984	17	222.72	11:45:34.29	11:49:17.01			3%
Story 4	U4	9:00	0.44	14.01	8.62088	32	222.72	11:45:34.29	11:49:17.01			6%
Story 4	U4	10:30	0.43	2.13	1.34701	5	222.72	11:45:34.29	11:49:17.01			1%
Story 4	U4	Closed	0.49	6.33	3.50223	13	222.72	11:45:34.29	11:49:17.01			3%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Baseline/Control	U5	Eye contact	1.36	23.13	20.1828	17	50.54	12:35:29.81	12:36:20.35	Left	Left	46%
Baseline/Control	U5	4:30	0.85	1.70	2.37445	2	50.54	12:35:29.81	12:36:20.35	2.37445	1.70	3%
Baseline/Control	U5	6:00	1.31	10.50	9.4978	8	50.54	12:35:29.81	12:36:20.35			21%
Baseline/Control	U5	7:30	0.75	1.50	2.37445	2	50.54	12:35:29.81	12:36:20.35	Right	Right	3%
Baseline/Control	U5	9:00	0.89	7.10	9.4978	8	50.54	12:35:29.81	12:36:20.35	18.9956	15.20	14%
Baseline/Control	U5	10:30	1.10	6.60	7.12335	6	50.54	12:35:29.81	12:36:20.35			13%
French 1	U5	Eye contact	0.96	11.57	16.5119	12	43.61	12:38:18.04	12:39:01.64	Left	Left	27%
French 1	U5	4:30	1.22	3.67	4.12797	3	43.61	12:38:18.04	12:39:01.64	4.12797	3.67	8%
French 1	U5	6:00	2.05	6.16	4.12797	3	43.61	12:38:18.04	12:39:01.64			14%
French 1	U5	7:30	1.78	12.47	9.63192	7	43.61	12:38:18.04	12:39:01.64	Right	Right	29%
French 1	U5	9:00	0.71	6.40	12.3839	9	43.61	12:38:18.04	12:39:01.64	26.14379	22.20	15%
French 1	U5	10:30	1.11	3.33	4.12797	3	43.61	12:38:18.04	12:39:01.64			8%
French 2	U5	Eye contact	0.80	14.40	19.7267	18	54.75	12:39:25.68	12:40:20.43	Left	Left	26%
French 2	U5	12:00	0.47	0.47	1.09593	1	54.75	12:39:25.68	12:40:20.43	2.19186	4.61	1%
French 2	U5	4:30	2.30	4.61	2.19186	2	54.75	12:39:25.68	12:40:20.43			8%
French 2	U5	6:00	0.83	1.67	2.19186	2	54.75	12:39:25.68	12:40:20.43	Right	Right	3%
French 2	U5	7:30	1.62	19.40	13.1512	12	54.75	12:39:25.68	12:40:20.43	35.06978	33.60	35%
French 2	U5	9:00	0.65	9.07	15.343	14	54.75	12:39:25.68	12:40:20.43			17%
French 2	U5	10:30	0.86	5.13	6.57558	6	54.75	12:39:25.68	12:40:20.43			9%
French 3	U5	Eye contact	1.00	14.01	17.6541	14	47.52	12:39:55.63	12:40:43.15	Left	Left	29%
French 3	U5	4:30	2.50	2.50	1.26101	1	47.52	12:39:55.63	12:40:43.15	1.26101	2.50	5%
French 3	U5	6:00	0.77	3.07	5.04403	4	47.52	12:39:55.63	12:40:43.15			6%
French 3	U5	7:30	1.36	16.33	15.1321	12	47.52	12:39:55.63	12:40:43.15	Right	Right	34%
French 3	U5	9:00	0.76	8.33	13.8711	11	47.52	12:39:55.63	12:40:43.15	34.04723	27.93	18%
French 3	U5	10:30	0.82	3.27	5.04403	4	47.52	12:39:55.63	12:40:43.15			7%
French 4	U5	Eye contact	0.66	11.19	22.1311	17	46.06	12:40:44.77	12:41:30.83	Left	Left	24%
French 4	U5	4:30	0.81	4.07	6.50915	5	46.06	12:40:44.77	12:41:30.83	6.50915	4.07	9%
French 4	U5	6:00	0.62	5.00	10.4146	8	46.06	12:40:44.77	12:41:30.83			11%
French 4	U5	7:30	1.16	18.60	20.8293	16	46.06	12:40:44.77	12:41:30.83	Right	Right	40%
French 4	U5	9:00	0.56	3.93	9.1128	7	46.06	12:40:44.77	12:41:30.83	35.14942	25.80	9%
French 4	U5	10:30	0.82	3.27	5.20732	4	46.06	12:40:44.77	12:41:30.83			7%
Story 1	U5	Excessive Blinking	0.67	0.67	1.11313	1	53.84	12:35:59.69	12:36:53.53	Left	Left	1%
Story 1	U5	Eye contact	0.95	13.30	15.5838	14	53.84	12:35:59.69	12:36:53.53	2.22626	1.84	25%
Story 1	U5	4:30	0.92	1.84	2.22626	2	53.84	12:35:59.69	12:36:53.53			3%
Story 1	U5	6:00	1.44	8.66	6.67879	6	53.84	12:35:59.69	12:36:53.53	Right	Right	16%
Story 1	U5	7:30	2.30	18.43	8.90505	8	53.84	12:35:59.69	12:36:53.53	24.48887	29.37	34%
Story 1	U5	9:00	0.68	6.77	11.1313	10	53.84	12:35:59.69	12:36:53.53			13%
Story 1	U5	10:30	1.04	4.17	4.45252	4	53.84	12:35:59.69	12:36:53.53			8%
Story 2	U5	Eye contact	1.25	18.71	19.9956	15	44.98	12:36:32.53	12:37:17.51	Left	Left	42%
Story 2	U5	4:30	1.47	2.93	2.66607	2	44.98	12:36:32.53	12:37:17.51	2.66607	2.93	7%
Story 2	U5	6:00	0.96	6.73	9.33126	7	44.98	12:36:32.53	12:37:17.51			15%
Story 2	U5	7:30	1.30	13.03	13.3304	10	44.98	12:36:32.53	12:37:17.51	Right	Right	29%
Story 2	U5	9:00	1.60	1.60	1.33304	1	44.98	12:36:32.53	12:37:17.51	17.32951	16.30	4%
Story 2	U5	10:30	0.83	1.67	2.66607	2	44.98	12:36:32.53	12:37:17.51			4%
Story 2	U5	Closed	0.30	0.30	1.33304	1	44.98	12:36:32.53	12:37:17.51			1%
Story 3	U5	Eye contact	1.44	14.36	14.5015	10	41.38	12:37:06.95	12:37:48.33	Left	Left	35%
Story 3	U5	4:30	1.02	2.04	2.9003	2	41.38	12:37:06.95	12:37:48.33	2.9003	2.04	5%
Story 3	U5	6:00	1.18	2.37	2.9003	2	41.38	12:37:06.95	12:37:48.33			6%
Story 3	U5	7:30	2.36	21.20	13.0514	9	41.38	12:37:06.95	12:37:48.33	Right	Right	51%
Story 3	U5	9:00	0.45	0.90	2.9003	2	41.38	12:37:06.95	12:37:48.33	15.9517	22.10	2%
Story 3	U5	Closed	0.50	0.50	1.45015	1	41.38	12:37:06.95	12:37:48.33			1%
Story 4	U5	Excessive Blinking	0.47	0.47	1.14932	1	52.21	12:37:37.81	12:38:30.01	Left	Left	1%
Story 4	U5	Eye contact	1.12	20.24	20.6877	18	52.21	12:37:37.81	12:38:30.01	3.44795	2.90	39%
Story 4	U5	4:30	0.97	2.90	3.44795	3	52.21	12:37:37.81	12:38:30.01			6%
Story 4	U5	6:00	0.70	4.93	8.04521	7	52.21	12:37:37.81	12:38:30.01	Right	Right	9%
Story 4	U5	7:30	1.59	19.07	13.7918	12	52.21	12:37:37.81	12:38:30.01	21.83701	23.66	37%
Story 4	U5	9:00	0.61	3.06	5.74658	5	52.21	12:37:37.81	12:38:30.01			6%
Story 4	U5	10:30	0.77	1.53	2.29863	2	52.21	12:37:37.81	12:38:30.01			3%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Control/Baseline	U6	Eye contact	2.56	69.07	15.8869	27	101.97	12:32:23.91	12:34:05.88	Left	Left	68%
Control/Baseline	U6	12:00	0.64	1.93	1.76521	3	101.97	12:32:23.91	12:34:05.88	0	0	2%
Control/Baseline	U6	6:00	0.65	8.40	7.64923	13	101.97	12:32:23.91	12:34:05.88			8%
Control/Baseline	U6	7:30	1.22	3.67	1.76521	3	101.97	12:32:23.91	12:34:05.88	Right	Right	4%
Control/Baseline	U6	9:00	1.50	13.49	5.29562	9	101.97	12:32:23.91	12:34:05.88	8.82604	19.02	13%
Control/Baseline	U6	10:30	0.62	1.86	1.76521	3	101.97	12:32:23.91	12:34:05.88			2%
Control/Baseline	U6	Closed	0.44	3.53	4.70722	8	101.97	12:32:23.91	12:34:05.88			3%
Story 1	U6	Eye contact	1.69	32.07	19.1564	19	59.51	12:33:11.47	12:34:10.98	Left	Left	54%
Story 1	U6	12:00	0.63	0.63	1.00823	1	59.51	12:33:11.47	12:34:10.98	7.05763	6.47	1%
Story 1	U6	3:00	1.07	1.07	1.00823	1	59.51	12:33:11.47	12:34:10.98			2%
Story 1	U6	4:30	0.90	5.40	6.0494	6	59.51	12:33:11.47	12:34:10.98	Right	Right	9%
Story 1	U6	6:00	0.64	9.56	15.1235	15	59.51	12:33:11.47	12:34:10.98	5.04116	4.67	16%
Story 1	U6	7:30	1.16	3.47	3.0247	3	59.51	12:33:11.47	12:34:10.98			6%
Story 1	U6	9:00	0.60	0.60	1.00823	1	59.51	12:33:11.47	12:34:10.98			1%
Story 1	U6	10:30	0.60	0.60	1.00823	1	59.51	12:33:11.47	12:34:10.98			1%
Story 1	U6	Closed	0.51	6.10	12.0988	12	59.51	12:33:11.47	12:34:10.98			10%
Story 2	U6	Eye contact	1.62	19.43	20.6458	12	34.87	12:33:51.18	12:34:26.05	Left	Left	56%
Story 2	U6	12:00	0.37	0.37	1.72048	1	34.87	12:33:51.18	12:34:26.05	1.72048	0.50	1%
Story 2	U6	1:30	0.50	0.50	1.72048	1	34.87	12:33:51.18	12:34:26.05			1%
Story 2	U6	6:00	0.85	9.37	18.9253	11	34.87	12:33:51.18	12:34:26.05	Right	Right	27%
Story 2	U6	7:30	0.95	2.86	5.16144	3	34.87	12:33:51.18	12:34:26.05	8.6024	4.06	8%
Story 2	U6	10:30	0.60	1.20	3.44096	2	34.87	12:33:51.18	12:34:26.05			3%
Story 2	U6	Closed	0.57	1.13	3.44096	2	34.87	12:33:51.18	12:34:26.05			3%
Story 3	U6	Eye contact	1.74	22.67	18.365	13	42.47	12:34:15.77	12:34:58.24	Left	Left	53%
Story 3	U6	1:30	0.87	0.87	1.4127	1	42.47	12:34:15.77	12:34:58.24	4.23809	2.40	2%
Story 3	U6	4:30	0.77	1.53	2.82539	2	42.47	12:34:15.77	12:34:58.24			4%
Story 3	U6	6:00	0.79	10.31	18.365	13	42.47	12:34:15.77	12:34:58.24	Right	Right	24%
Story 3	U6	7:30	0.76	3.03	5.65078	4	42.47	12:34:15.77	12:34:58.24	12.71426	5.79	7%
Story 3	U6	9:00	0.55	2.76	7.06348	5	42.47	12:34:15.77	12:34:58.24			6%
Story 3	U6	Closed	0.32	1.30	5.65078	4	42.47	12:34:15.77	12:34:58.24			3%
Story 4	U6	Eye contact	1.92	32.67	18.7452	17	54.41	12:34:35.08	12:35:29.50	Left	Left	60%
Story 4	U6	12:00	0.62	1.23	2.20531	2	54.41	12:34:35.08	12:35:29.50	3.30797	2.13	2%
Story 4	U6	3:00	0.70	0.70	1.10266	1	54.41	12:34:35.08	12:35:29.50			1%
Story 4	U6	4:30	0.72	1.43	2.20531	2	54.41	12:34:35.08	12:35:29.50	Right	Right	3%
Story 4	U6	6:00	0.72	10.83	16.5399	15	54.41	12:34:35.08	12:35:29.50	11.02657	6.74	20%
Story 4	U6	7:30	0.97	3.90	4.41063	4	54.41	12:34:35.08	12:35:29.50			7%
Story 4	U6	9:00	0.53	2.10	4.41063	4	54.41	12:34:35.08	12:35:29.50			4%
Story 4	U6	10:30	0.37	0.73	2.20531	2	54.41	12:34:35.08	12:35:29.50			1%
Story 4	U6	Closed	0.40	0.80	2.20531	2	54.41	12:34:35.08	12:35:29.50			1%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Control/Baseline	U7	Eye contact	6.00	54.01	7.07436	9	75.91	11:51:50.16	11:53:06.06	Left	Left	71%
Control/Baseline	U7	12:00	0.60	0.60	0.78604	1	75.91	11:51:50.16	11:53:06.06	0.78604	1.40	1%
Control/Baseline	U7	3:00	1.40	1.40	0.78604	1	75.91	11:51:50.16	11:53:06.06			2%
Control/Baseline	U7	6:00	1.97	5.91	2.35812	3	75.91	11:51:50.16	11:53:06.06	Right	Right	8%
Control/Baseline	U7	7:30	1.56	7.78	3.9302	5	75.91	11:51:50.16	11:53:06.06	7.07436	13.98	10%
Control/Baseline	U7	9:00	1.34	4.03	2.35812	3	75.91	11:51:50.16	11:53:06.06			5%
Control/Baseline	U7	10:30	2.17	2.17	0.78604	1	75.91	11:51:50.16	11:53:06.06			3%
Story 1	U7	Eye contact	2.07	26.97	13.9318	13	55.89	11:53:05.31	11:54:01.21	Left	Left	48%
Story 1	U7	3:00	0.46	1.83	4.28671	4	55.89	11:53:05.31	11:54:01.21	4.28671	1.83	3%
Story 1	U7	6:00	1.90	20.94	11.7885	11	55.89	11:53:05.31	11:54:01.21			37%
Story 1	U7	7:30	2.90	2.90	1.07168	1	55.89	11:53:05.31	11:54:01.21	Right	Right	5%
Story 1	U7	9:00	1.04	2.07	2.14335	2	55.89	11:53:05.31	11:54:01.21	3.21503	4.97	4%
Story 1	U7	Closed	1.17	1.17	1.07168	1	55.89	11:53:05.31	11:54:01.21			2%
Story 2	U7	Eye contact	2.93	43.90	12.0762	15	74.53	11:54:02.78	11:55:17.31	Left	Left	59%
Story 2	U7	3:00	0.27	0.27	0.805077	1	74.53	11:54:02.78	11:55:17.31	1.610154	2.13	0%
Story 2	U7	4:30	1.87	1.87	0.805077	1	74.53	11:54:02.78	11:55:17.31			3%
Story 2	U7	6:00	1.92	15.37	6.44062	8	74.53	11:54:02.78	11:55:17.31	Right	Right	21%
Story 2	U7	7:30	1.38	2.75	1.61015	2	74.53	11:54:02.78	11:55:17.31	7.24569	12.25	4%
Story 2	U7	9:00	1.36	9.50	5.63554	7	74.53	11:54:02.78	11:55:17.31			13%
Story 2	U7	Closed	0.87	0.87	0.805077	1	74.53	11:54:02.78	11:55:17.31			1%
Story 3	U7	Eye contact	1.98	37.57	13.9431	19	81.76	11:59:35.78	12:00:57.54	Left	Left	46%
Story 3	U7	3:00	0.23	0.23	0.733846	1	81.76	11:59:35.78	12:00:57.54	0.733846	0.23	0%
Story 3	U7	6:00	2.73	30.00	8.07231	11	81.76	11:59:35.78	12:00:57.54			37%
Story 3	U7	7:30	3.04	6.09	1.46769	2	81.76	11:59:35.78	12:00:57.54	Right	Right	7%
Story 3	U7	9:00	0.87	5.23	4.40308	6	81.76	11:59:35.78	12:00:57.54	5.87077	11.32	6%
Story 3	U7	Closed	0.53	2.63	3.66923	5	81.76	11:59:35.78	12:00:57.54			3%
Story 4	U7	Eye contact	2.14	66.37	14.4371	31	128.84	12:00:03.23	12:02:12.07	Left	Left	52%
Story 4	U7	12:00	1.13	1.13	0.465712	1	128.84	12:00:03.23	12:02:12.07	4.191414	16.33	1%
Story 4	U7	1:30	1.20	2.40	0.931424	2	128.84	12:00:03.23	12:02:12.07			2%
Story 4	U7	3:00	0.88	2.63	1.39714	3	128.84	12:00:03.23	12:02:12.07	Right	Right	2%
Story 4	U7	4:30	2.82	11.30	1.86285	4	128.84	12:00:03.23	12:02:12.07	6.98568	15.43	9%
Story 4	U7	6:00	1.92	28.77	6.98568	15	128.84	12:00:03.23	12:02:12.07			22%
Story 4	U7	7:30	0.86	3.44	1.86285	4	128.84	12:00:03.23	12:02:12.07			3%
Story 4	U7	9:00	1.09	11.99	5.12283	11	128.84	12:00:03.23	12:02:12.07			9%
Story 4	U7	Closed	0.40	0.80	0.931424	2	128.84	12:00:03.23	12:02:12.07			1%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Control/Baseline	U8	Eye contact	2.43	51.13	14.1522	21	88.64	13:22:11.78	13:23:40.42	Left	Left	58%
Control/Baseline	U8	3:00	0.54	1.63	2.02174	3	88.64	13:22:11.78	13:23:40.42	6.73914	5.97	2%
Control/Baseline	U8	4:30	0.62	4.33	4.7174	7	88.64	13:22:11.78	13:23:40.42			5%
Control/Baseline	U8	6:00	1.96	13.70	4.7174	7	88.64	13:22:11.78	13:23:40.42	Right	Right	15%
Control/Baseline	U8	7:30	1.29	7.77	4.04349	6	88.64	13:22:11.78	13:23:40.42	8.08698	12.67	9%
Control/Baseline	U8	9:00	0.82	4.90	4.04349	6	88.64	13:22:11.78	13:23:40.42			6%
Control/Baseline	U8	Closed	0.52	5.17	6.73915	10	88.64	13:22:11.78	13:23:40.42			6%
Story 1	U8	Excessive Blinking	0.53	2.13	0.835899	4	287.12	13:22:39.38	13:27:26.50	Left	Left	1%
Story 1	U8	Eye contact	1.99	119.70	12.5385	60	287.12	13:22:39.38	13:27:26.50	9.194894	55.18	42%
Story 1	U8	12:00	0.96	2.87	0.626924	3	287.12	13:22:39.38	13:27:26.50			1%
Story 1	U8	1:30	2.19	6.57	0.626924	3	287.12	13:22:39.38	13:27:26.50	Right	Right	2%
Story 1	U8	3:00	1.23	22.14	3.76155	18	287.12	13:22:39.38	13:27:26.50	6.47822	49.46	8%
Story 1	U8	4:30	1.15	26.47	4.80642	23	287.12	13:22:39.38	13:27:26.50			9%
Story 1	U8	6:00	1.60	46.54	6.06027	29	287.12	13:22:39.38	13:27:26.50			16%
Story 1	U8	7:30	1.90	15.17	1.6718	8	287.12	13:22:39.38	13:27:26.50			5%
Story 1	U8	9:00	1.51	27.27	3.76155	18	287.12	13:22:39.38	13:27:26.50			9%
Story 1	U8	10:30	1.41	7.03	1.04487	5	287.12	13:22:39.38	13:27:26.50			2%
Story 1	U8	Closed	0.70	11.23	3.3436	16	287.12	13:22:39.38	13:27:26.50			4%
Story 2	U8	Excessive Blinking	0.43	3.00	2.13574	7	195.79	13:23:12.61	13:26:28.40	Left	Left	2%
Story 2	U8	Eye contact	2.42	75.00	9.45828	31	195.79	13:23:12.61	13:26:28.40	7.32255	24.75	38%
Story 2	U8	3:00	0.90	5.42	1.83064	6	195.79	13:23:12.61	13:26:28.40			3%
Story 2	U8	4:30	1.07	19.33	5.49191	18	195.79	13:23:12.61	13:26:28.40	Right	Right	10%
Story 2	U8	6:00	3.20	63.97	6.10212	20	195.79	13:23:12.61	13:26:28.40	6.407222	25.61	33%
Story 2	U8	7:30	1.22	12.24	3.05106	10	195.79	13:23:12.61	13:26:28.40			6%
Story 2	U8	9:00	1.26	11.30	2.74595	9	195.79	13:23:12.61	13:26:28.40			6%
Story 2	U8	10:30	1.03	2.07	0.610212	2	195.79	13:23:12.61	13:26:28.40			1%
Story 2	U8	Closed	0.87	3.47	1.22042	4	195.79	13:23:12.61	13:26:28.40			2%
Story 3	U8	Excessive Blinking	0.40	1.20	0.58448	3	307.97	13:24:07.40	13:29:15.36	Left	Left	0%
Story 3	U8	Eye contact	1.93	131.04	13.2482	68	307.97	13:24:07.40	13:29:15.36	12.27408	68.72	43%
Story 3	U8	12:00	0.37	1.47	0.779307	4	307.97	13:24:07.40	13:29:15.36			0%
Story 3	U8	1:30	0.88	7.90	1.75344	9	307.97	13:24:07.40	13:29:15.36	Right	Right	3%
Story 3	U8	3:00	1.13	21.49	3.70171	19	307.97	13:24:07.40	13:29:15.36	6.62411	43.33	7%
Story 3	U8	4:30	1.12	39.33	6.81893	35	307.97	13:24:07.40	13:29:15.36			13%
Story 3	U8	6:00	2.02	54.54	5.26032	27	307.97	13:24:07.40	13:29:15.36			18%
Story 3	U8	7:30	0.91	9.97	2.14309	11	307.97	13:24:07.40	13:29:15.36			3%
Story 3	U8	9:00	1.49	23.77	3.11723	16	307.97	13:24:07.40	13:29:15.36			8%
Story 3	U8	10:30	1.37	9.60	1.36379	7	307.97	13:24:07.40	13:29:15.36			3%
Story 3	U8	Closed	0.54	3.80	1.36379	7	307.97	13:24:07.40	13:29:15.36			1%
Story 4	U8	Excessive Blinking	0.46	2.30	1.59613	5	187.96	13:25:19.95	13:28:27.90	Left	Left	1%
Story 4	U8	Eye contact	2.23	62.31	8.93831	28	187.96	13:25:19.95	13:28:27.90	12.130556	52.74	33%
Story 4	U8	12:00	0.60	0.60	0.319225	1	187.96	13:25:19.95	13:28:27.90			0%
Story 4	U8	1:30	1.08	3.23	0.957676	3	187.96	13:25:19.95	13:28:27.90	Right	Right	2%
Story 4	U8	3:00	1.14	15.97	4.46915	14	187.96	13:25:19.95	13:28:27.90	3.830706	18.37	8%
Story 4	U8	4:30	1.60	33.53	6.70373	21	187.96	13:25:19.95	13:28:27.90			18%
Story 4	U8	6:00	2.27	47.73	6.70373	21	187.96	13:25:19.95	13:28:27.90			25%
Story 4	U8	7:30	1.22	10.97	2.87303	9	187.96	13:25:19.95	13:28:27.90			6%
Story 4	U8	9:00	3.38	6.77	0.638451	2	187.96	13:25:19.95	13:28:27.90			4%
Story 4	U8	10:30	0.63	0.63	0.319225	1	187.96	13:25:19.95	13:28:27.90			0%
Story 4	U8	Closed	0.78	3.90	1.59613	5	187.96	13:25:19.95	13:28:27.90			2%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Control/baseline	U9	Eye contact	4.90	73.57	10.243	15	86.74	12:45:02.31	12:46:29.05	Left	Left	85%
Control/baseline	U9	1:30	0.43	0.43	0.682866	1	86.74	12:45:02.31	12:46:29.05	2.731466	3.09	0%
Control/baseline	U9	4:30	0.89	2.66	2.0486	3	86.74	12:45:02.31	12:46:29.05			3%
Control/baseline	U9	6:00	0.53	3.20	4.09719	6	86.74	12:45:02.31	12:46:29.05	Right	Right	4%
Control/baseline	U9	7:30	0.83	1.67	1.36573	2	86.74	12:45:02.31	12:46:29.05	6.14579	5.97	2%
Control/baseline	U9	9:00	0.54	2.70	3.41433	5	86.74	12:45:02.31	12:46:29.05			3%
Control/baseline	U9	10:30	0.80	1.60	1.36573	2	86.74	12:45:02.31	12:46:29.05			2%
Control/baseline	U9	Closed	0.45	0.90	1.36573	2	86.74	12:45:02.31	12:46:29.05			1%
Story 1	U9	Eye contact	4.56	82.10	10.7654	18	100.32	12:45:53.31	12:47:33.63	Left	Left	82%
Story 1	U9	12:00	1.43	1.43	0.59808	1	100.32	12:45:53.31	12:47:33.63	6.57888	5.50	1%
Story 1	U9	1:30	0.36	1.08	1.79424	3	100.32	12:45:53.31	12:47:33.63			1%
Story 1	U9	3:00	0.53	1.07	1.19616	2	100.32	12:45:53.31	12:47:33.63	Right	Right	1%
Story 1	U9	4:30	0.56	3.35	3.58848	6	100.32	12:45:53.31	12:47:33.63	4.18656	5.67	3%
Story 1	U9	6:00	1.10	4.40	2.39232	4	100.32	12:45:53.31	12:47:33.63			4%
Story 1	U9	7:30	2.13	2.13	0.59808	1	100.32	12:45:53.31	12:47:33.63			2%
Story 1	U9	9:00	0.57	2.84	2.9904	5	100.32	12:45:53.31	12:47:33.63			3%
Story 1	U9	10:30	0.70	0.70	0.59808	1	100.32	12:45:53.31	12:47:33.63			1%
Story 1	U9	Closed	0.60	1.21	1.19616	2	100.32	12:45:53.31	12:47:33.63			1%
Story 2	U9	Excessive Blinking	0.57	1.13	0.728965	2	164.62	12:46:31.76	12:49:16.38	Left	Left	1%
Story 2	U9	Eye contact	1.99	125.27	22.9624	63	164.62	12:46:31.76	12:49:16.38	8.38309	9.03	76%
Story 2	U9	12:00	1.35	2.70	0.728965	2	164.62	12:46:31.76	12:49:16.38			2%
Story 2	U9	1:30	0.47	2.33	1.82241	5	164.62	12:46:31.76	12:49:16.38	Right	Right	1%
Story 2	U9	3:00	0.39	5.13	4.73827	13	164.62	12:46:31.76	12:49:16.38	13.485845	19.24	3%
Story 2	U9	4:30	0.31	1.57	1.82241	5	164.62	12:46:31.76	12:49:16.38			1%
Story 2	U9	6:00	0.43	0.43	0.364482	1	164.62	12:46:31.76	12:49:16.38			0%
Story 2	U9	7:30	0.63	6.27	3.64482	10	164.62	12:46:31.76	12:49:16.38			4%
Story 2	U9	9:00	0.48	12.04	9.11206	25	164.62	12:46:31.76	12:49:16.38			7%
Story 2	U9	10:30	0.47	0.93	0.728965	2	164.62	12:46:31.76	12:49:16.38			1%
Story 2	U9	Closed	0.42	6.80	5.83172	16	164.62	12:46:31.76	12:49:16.38			4%
Story 3	U9	Eye contact	5.73	108.95	9.42375	19	120.97	12:47:31.55	12:49:32.52	Left	Left	90%
Story 3	U9	1:30	0.37	1.87	2.47993	5	120.97	12:47:31.55	12:49:32.52	4.463876	3.51	2%
Story 3	U9	3:00	0.57	1.13	0.991973	2	120.97	12:47:31.55	12:49:32.52			1%
Story 3	U9	4:30	0.25	0.51	0.991973	2	120.97	12:47:31.55	12:49:32.52	Right	Right	0%
Story 3	U9	7:30	1.27	3.80	1.48796	3	120.97	12:47:31.55	12:49:32.52	4.95987	7.67	3%
Story 3	U9	9:00	0.55	3.87	3.47191	7	120.97	12:47:31.55	12:49:32.52			3%
Story 3	U9	Closed	0.42	0.83	0.991973	2	120.97	12:47:31.55	12:49:32.52			1%
Story 4	U9	Eye contact	2.67	202.90	17.8343	76	252.09	12:48:03.97	12:52:16.07	Left	Left	80%
Story 4	U9	1:30	0.52	2.07	0.938648	4	252.09	12:48:03.97	12:52:16.07	3.285264	6.03	1%
Story 4	U9	3:00	0.42	2.93	1.64263	7	252.09	12:48:03.97	12:52:16.07			1%
Story 4	U9	4:30	0.34	1.02	0.703986	3	252.09	12:48:03.97	12:52:16.07	Right	Right	0%
Story 4	U9	6:00	1.30	1.30	0.234662	1	252.09	12:48:03.97	12:52:16.07	14.78371	39.99	1%
Story 4	U9	7:30	0.70	16.69	5.63189	24	252.09	12:48:03.97	12:52:16.07			7%
Story 4	U9	9:00	0.62	18.12	6.8052	29	252.09	12:48:03.97	12:52:16.07			7%
Story 4	U9	10:30	0.52	5.19	2.34662	10	252.09	12:48:03.97	12:52:16.07			2%
Story 4	U9	Closed	0.37	1.87	1.17331	5	252.09	12:48:03.97	12:52:16.07			1%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Control/Baseline	U10	Eye contact	2.60	70.13	15.4583	27	102.10	19:03:38.82	19:05:20.93	Left	Left	69%
Control/Baseline	U10	12:00	0.77	0.77	0.57253	1	102.10	19:03:38.82	19:05:20.93	9.16048	14.83	1%
Control/Baseline	U10	1:30	0.56	3.90	4.00771	7	102.10	19:03:38.82	19:05:20.93			4%
Control/Baseline	U10	3:00	3.28	6.57	1.14506	2	102.10	19:03:38.82	19:05:20.93	Right	Right	6%
Control/Baseline	U10	4:30	0.62	4.37	4.00771	7	102.10	19:03:38.82	19:05:20.93	8.01542	10.97	4%
Control/Baseline	U10	6:00	0.47	1.87	2.29012	4	102.10	19:03:38.82	19:05:20.93			2%
Control/Baseline	U10	7:30	0.79	4.77	3.43518	6	102.10	19:03:38.82	19:05:20.93			5%
Control/Baseline	U10	9:00	0.85	4.23	2.86265	5	102.10	19:03:38.82	19:05:20.93			4%
Control/Baseline	U10	10:30	0.66	1.97	1.71759	3	102.10	19:03:38.82	19:05:20.93			2%
Control/Baseline	U10	Closed	0.71	3.53	2.86265	5	102.10	19:03:38.82	19:05:20.93			3%
Story 1	U10	Eye contact	1.60	25.56	11.6624	16	82.32	19:04:07.36	19:05:29.67	Left	Left	31%
Story 1	U10	12:00	5.37	5.37	0.728898	1	82.32	19:04:07.36	19:05:29.67	6.560088	7.34	7%
Story 1	U10	1:30	0.40	0.40	0.728898	1	82.32	19:04:07.36	19:05:29.67			0%
Story 1	U10	3:00	0.93	1.87	1.4578	2	82.32	19:04:07.36	19:05:29.67	Right	Right	2%
Story 1	U10	4:30	0.84	5.07	4.37339	6	82.32	19:04:07.36	19:05:29.67	8.74678	16.30	6%
Story 1	U10	6:00	2.55	20.41	5.83119	8	82.32	19:04:07.36	19:05:29.67			25%
Story 1	U10	7:30	1.65	8.27	3.64449	5	82.32	19:04:07.36	19:05:29.67			10%
Story 1	U10	9:00	0.71	2.13	2.1867	3	82.32	19:04:07.36	19:05:29.67			3%
Story 1	U10	10:30	1.48	5.91	2.91559	4	82.32	19:04:07.36	19:05:29.67			7%
Story 1	U10	Closed	0.67	7.34	8.01788	11	82.32	19:04:07.36	19:05:29.67			9%
Story 2	U10	Eye contact	1.48	102.27	16.6764	69	248.26	19:04:37.49	19:08:45.75	Left	Left	41%
Story 2	U10	12:00	0.54	2.70	1.20843	5	248.26	19:04:37.49	19:08:45.75	7.25062	21.12	1%
Story 2	U10	1:30	0.99	13.90	3.38362	14	248.26	19:04:37.49	19:08:45.75			6%
Story 2	U10	3:00	0.44	3.54	1.9335	8	248.26	19:04:37.49	19:08:45.75	Right	Right	1%
Story 2	U10	4:30	0.46	3.68	1.9335	8	248.26	19:04:37.49	19:08:45.75	16.91809	79.40	1%
Story 2	U10	6:00	1.40	29.42	5.07543	21	248.26	19:04:37.49	19:08:45.75			12%
Story 2	U10	7:30	1.84	49.57	6.52555	27	248.26	19:04:37.49	19:08:45.75			20%
Story 2	U10	9:00	0.60	16.10	6.52555	27	248.26	19:04:37.49	19:08:45.75			6%
Story 2	U10	10:30	0.86	13.73	3.86699	16	248.26	19:04:37.49	19:08:45.75			6%
Story 2	U10	Closed	0.44	13.33	7.25061	30	248.26	19:04:37.49	19:08:45.75			5%
Story 3	U10	Eye contact	1.58	44.13	15.7649	28	106.57	19:05:21.88	19:07:08.45	Left	Left	41%
Story 3	U10	12:00	0.97	0.97	0.563031	1	106.57	19:05:21.88	19:07:08.45	9.00851	19.15	1%
Story 3	U10	1:30	1.09	6.53	3.37819	6	106.57	19:05:21.88	19:07:08.45			6%
Story 3	U10	3:00	0.54	2.72	2.81516	5	106.57	19:05:21.88	19:07:08.45	Right	Right	3%
Story 3	U10	4:30	1.98	9.90	2.81516	5	106.57	19:05:21.88	19:07:08.45	9.571531	17.87	9%
Story 3	U10	6:00	1.79	19.64	6.19334	11	106.57	19:05:21.88	19:07:08.45			18%
Story 3	U10	7:30	1.26	11.33	5.06728	9	106.57	19:05:21.88	19:07:08.45			11%
Story 3	U10	9:00	0.89	6.23	3.94122	7	106.57	19:05:21.88	19:07:08.45			6%
Story 3	U10	10:30	0.30	0.30	0.563031	1	106.57	19:05:21.88	19:07:08.45			0%
Story 3	U10	Closed	0.40	4.80	6.75638	12	106.57	19:05:21.88	19:07:08.45			5%
Story 4	U10	Eye contact	1.70	35.67	12.6082	21	99.94	19:05:48.98	19:07:28.91	Left	Left	36%
Story 4	U10	12:00	0.60	0.60	0.60039	1	99.94	19:05:48.98	19:07:28.91	4.20273	6.49	1%
Story 4	U10	1:30	0.82	3.30	2.40156	4	99.94	19:05:48.98	19:07:28.91			3%
Story 4	U10	4:30	1.06	3.19	1.80117	3	99.94	19:05:48.98	19:07:28.91	Right	Right	3%
Story 4	U10	6:00	1.09	5.44	3.00195	5	99.94	19:05:48.98	19:07:28.91	19.21248	45.90	5%
Story 4	U10	7:30	2.16	21.60	6.0039	10	99.94	19:05:48.98	19:07:28.91			22%
Story 4	U10	9:00	0.93	11.13	7.20468	12	99.94	19:05:48.98	19:07:28.91			11%
Story 4	U10	10:30	1.32	13.17	6.0039	10	99.94	19:05:48.98	19:07:28.91			13%
Story 4	U10	Closed	0.73	5.83	4.80312	8	99.94	19:05:48.98	19:07:28.91			6%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Baseline/Control	U11	Eye contact	4.17	37.55	10.7931	9	49.81	11:06:32.40	11:07:22.20	Left	Left	75%
Baseline/Control	U11	12:00	0.70	0.70	1.19923	1	49.81	11:06:32.40	11:07:22.20	0	0	1%
Baseline/Control	U11	6:00	1.12	6.73	7.19539	6	49.81	11:06:32.40	11:07:22.20			14%
Baseline/Control	U11	7:30	1.21	1.21	1.19923	1	49.81	11:06:32.40	11:07:22.20	Right	Right	2%
Baseline/Control	U11	9:00	0.78	1.56	2.39846	2	49.81	11:06:32.40	11:07:22.20	4.79692	3.95	3%
Baseline/Control	U11	10:30	1.18	1.18	1.19923	1	49.81	11:06:32.40	11:07:22.20			2%
Baseline/Control	U11	Closed	0.87	0.87	1.19923	1	49.81	11:06:32.40	11:07:22.20			2%
Story 1	U11	Excessive Blinking	0.63	0.63	0.714805	1	83.85	11:07:40.04	11:09:03.88	Left	Left	1%
Story 1	U11	Eye contact	3.40	61.15	12.8665	18	83.85	11:07:40.04	11:09:03.88	1.42961	2.74	73%
Story 1	U11	12:00	1.97	1.97	0.714805	1	83.85	11:07:40.04	11:09:03.88			2%
Story 1	U11	3:00	0.90	0.90	0.714805	1	83.85	11:07:40.04	11:09:03.88	Right	Right	1%
Story 1	U11	4:30	1.83	1.83	0.714805	1	83.85	11:07:40.04	11:09:03.88	9.292465	10.99	2%
Story 1	U11	6:00	1.70	5.11	2.14441	3	83.85	11:07:40.04	11:09:03.88			6%
Story 1	U11	7:30	0.86	10.32	8.57766	12	83.85	11:07:40.04	11:09:03.88			12%
Story 1	U11	10:30	0.67	0.67	0.714805	1	83.85	11:07:40.04	11:09:03.88			1%
Story 1	U11	Closed	0.63	1.26	1.42961	2	83.85	11:07:40.04	11:09:03.88			1%
Story 2	U11	Eye contact	3.88	42.64	11.2624	11	58.60	11:08:07.40	11:09:06.00	Left	Left	73%
Story 2	U11	12:00	0.73	0.73	1.02386	1	58.60	11:08:07.40	11:09:06.00	0	0	1%
Story 2	U11	6:00	1.41	7.07	5.11928	5	58.60	11:08:07.40	11:09:06.00			12%
Story 2	U11	7:30	0.98	4.91	5.11928	5	58.60	11:08:07.40	11:09:06.00	Right	Right	8%
Story 2	U11	10:30	1.28	2.57	2.04771	2	58.60	11:08:07.40	11:09:06.00	7.16699	7.48	4%
Story 2	U11	Closed	0.67	0.67	1.02386	1	58.60	11:08:07.40	11:09:06.00			1%
Story 3	U11	Excessive Blinking	0.63	0.63	0.812194	1	73.85	11:08:34.47	11:09:48.32	Left	Left	1%
Story 3	U11	Eye contact	2.88	51.77	14.6195	18	73.85	11:08:34.47	11:09:48.32	5.685354	5.40	70%
Story 3	U11	12:00	0.45	0.90	1.62439	2	73.85	11:08:34.47	11:09:48.32			1%
Story 3	U11	1:30	1.03	1.03	0.812194	1	73.85	11:08:34.47	11:09:48.32	Right	Right	1%
Story 3	U11	3:00	0.73	4.37	4.87316	6	73.85	11:08:34.47	11:09:48.32	7.30975	10.70	6%
Story 3	U11	6:00	2.22	4.43	1.62439	2	73.85	11:08:34.47	11:09:48.32			6%
Story 3	U11	7:30	1.35	6.76	4.06097	5	73.85	11:08:34.47	11:09:48.32			9%
Story 3	U11	9:00	1.10	2.20	1.62439	2	73.85	11:08:34.47	11:09:48.32			3%
Story 3	U11	10:30	0.88	1.75	1.62439	2	73.85	11:08:34.47	11:09:48.32			2%
Story 4	U11	Excessive Blinking	0.53	0.53	1.32296	1	45.35	11:08:56.46	11:09:41.81	Left	Left	1%
Story 4	U11	Eye contact	1.51	24.22	21.1673	16	45.35	11:08:56.46	11:09:41.81	0	0	53%
Story 4	U11	12:00	1.43	1.43	1.32296	1	45.35	11:08:56.46	11:09:41.81			3%
Story 4	U11	6:00	2.04	6.11	3.96887	3	45.35	11:08:56.46	11:09:41.81	Right	Right	13%
Story 4	U11	7:30	1.13	3.40	3.96887	3	45.35	11:08:56.46	11:09:41.81	15.87547	12.01	8%
Story 4	U11	9:00	0.73	2.19	3.96887	3	45.35	11:08:56.46	11:09:41.81			5%
Story 4	U11	10:30	1.07	6.41	7.93773	6	45.35	11:08:56.46	11:09:41.81			14%
Story 4	U11	Closed	0.52	1.03	2.64591	2	45.35	11:08:56.46	11:09:41.81			2%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Baseline/Control	U12	Eye contact	13.59	67.96	3.87102	5	76.17	14:51:07.30	14:52:23.47	Left	Left	89%
Baseline/Control	U12	4:30	1.37	1.37	0.774204	1	76.17	14:51:07.30	14:52:23.47	0.774204	1.37	2%
Baseline/Control	U12	6:00	0.86	2.57	2.32261	3	76.17	14:51:07.30	14:52:23.47	Right	Right	3%
Baseline/Control	U12	7:30	1.05	2.10	1.54841	2	76.17	14:51:07.30	14:52:23.47	3.87102	3.80	3%
Baseline/Control	U12	9:00	0.57	1.70	2.32261	3	76.17	14:51:07.30	14:52:23.47			2%
Baseline/Control	U12	Closed	0.47	0.47	0.774204	1	76.17	14:51:07.30	14:52:23.47			1%
Story 1	U12	Excessive Blinking	0.67	1.33	0.678864	2	176.77	14:51:51.08	14:54:47.85	Left	Left	1%
Story 1	U12	Eye contact	42.80	171.22	1.35773	4	176.77	14:51:51.08	14:54:47.85	0	0	97%
Story 1	U12	6:00	1.03	1.03	0.339432	1	176.77	14:51:51.08	14:54:47.85			1%
Story 1	U12	7:30	0.97	0.97	0.339432	1	176.77	14:51:51.08	14:54:47.85	Right	Right	1%
Story 1	U12	9:00	0.84	1.69	0.678864	2	176.77	14:51:51.08	14:54:47.85	1.018296	2.66	1%
Story 1	U12	Closed	0.52	0.52	0.339432	1	176.77	14:51:51.08	14:54:47.85			0%
Story 2	U12	Eye contact	52.47	157.40	1.10308	3	162.49	14:52:25.30	14:55:07.79	Left	Left	97%
Story 2	U12	4:30	1.34	2.67	0.735384	2	162.49	14:52:25.30	14:55:07.79	0.735384	2.67	2%
Story 2	U12	9:00	0.93	0.93	0.367692	1	162.49	14:52:25.30	14:55:07.79	Right	Right	1%
Story 2	U12	10:30	1.47	1.47	0.367692	1	162.49	14:52:25.30	14:55:07.79	0.735384	2.40	1%
Story 3	U12	Eye contact	60.24	180.73	0.958926	3	187.71	14:52:50.03	14:55:57.74	Left	Left	96%
Story 3	U12	4:30	1.70	3.41	0.639284	2	187.71	14:52:50.03	14:55:57.74	0.639284	3.41	2%
Story 3	U12	7:30	0.80	0.80	0.319642	1	187.71	14:52:50.03	14:55:57.74	Right	Right	0%
Story 3	U12	9:00	0.43	0.43	0.319642	1	187.71	14:52:50.03	14:55:57.74	0.639284	1.23	0%
Story 3	U12	Closed	0.63	0.63	0.319642	1	187.71	14:52:50.03	14:55:57.74			0%
Story 4	U12	Eye contact	88.39	176.78	0.657102	2	180.72	14:53:24.17	14:56:24.89	Left	Left	98%
Story 4	U12	4:30	1.27	1.27	0.328551	1	180.72	14:53:24.17	14:56:24.89	0.328551	1.27	1%
Story 4	U12	6:00	1.00	1.00	0.328551	1	180.72	14:53:24.17	14:56:24.89	Right	Right	1%
Story 4	U12	9:00	1.18	1.18	0.328551	1	180.72	14:53:24.17	14:56:24.89	0.328551	1.18	1%
Story 4	U12	Closed	0.48	0.48	0.328551	1	180.72	14:53:24.17	14:56:24.89			0%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Baseline/Control	U13	Excessive Blinking	0.89	4.46	3.84098	5	78.11	13:57:19.83	13:58:37.93	Left	Left	6%
Baseline/Control	U13	Eye contact	2.67	48.01	13.8275	18	78.11	13:57:19.83	13:58:37.93	6.145577	6.87	61%
Baseline/Control	U13	12:00	1.33	1.33	0.768197	1	78.11	13:57:19.83	13:58:37.93			2%
Baseline/Control	U13	3:00	0.77	0.77	0.768197	1	78.11	13:57:19.83	13:58:37.93	Right	Right	1%
Baseline/Control	U13	4:30	0.87	6.11	5.37738	7	78.11	13:57:19.83	13:58:37.93	7.68197	14.63	8%
Baseline/Control	U13	6:00	0.93	2.79	2.30459	3	78.11	13:57:19.83	13:58:37.93			4%
Baseline/Control	U13	7:30	1.51	6.06	3.07279	4	78.11	13:57:19.83	13:58:37.93			8%
Baseline/Control	U13	9:00	1.50	3.00	1.53639	2	78.11	13:57:19.83	13:58:37.93			4%
Baseline/Control	U13	10:30	1.39	5.58	3.07279	4	78.11	13:57:19.83	13:58:37.93			7%
Story 1	U13	Excessive Blinking	0.68	2.03	2.26003	3	79.25	13:57:53.07	13:59:12.32	Left	Left	3%
Story 1	U13	Eye contact	1.70	27.27	12.0535	16	79.25	13:57:53.07	13:59:12.32	5.273396	6.11	34%
Story 1	U13	12:00	0.70	2.10	2.26003	3	79.25	13:57:53.07	13:59:12.32			3%
Story 1	U13	1:30	0.33	0.33	0.753343	1	79.25	13:57:53.07	13:59:12.32	Right	Right	0%
Story 1	U13	3:00	0.83	0.83	0.753343	1	79.25	13:57:53.07	13:59:12.32	9.79347	12.97	1%
Story 1	U13	4:30	0.99	4.94	3.76671	5	79.25	13:57:53.07	13:59:12.32			6%
Story 1	U13	6:00	1.70	22.10	9.79346	13	79.25	13:57:53.07	13:59:12.32			28%
Story 1	U13	7:30	1.07	9.67	6.78009	9	79.25	13:57:53.07	13:59:12.32			12%
Story 1	U13	9:00	1.05	2.10	1.50669	2	79.25	13:57:53.07	13:59:12.32			3%
Story 1	U13	10:30	0.60	1.20	1.50669	2	79.25	13:57:53.07	13:59:12.32			2%
Story 1	U13	Closed	0.83	6.67	6.02674	8	79.25	13:57:53.07	13:59:12.32			8%
Story 2	U13	Excessive Blinking	0.78	4.67	3.29342	6	109.31	13:58:19.58	14:00:08.89	Left	Left	4%
Story 2	U13	Eye contact	2.32	41.80	9.88025	18	109.31	13:58:19.58	14:00:08.89	2.19561	3.49	38%
Story 2	U13	12:00	1.83	1.83	0.548903	1	109.31	13:58:19.58	14:00:08.89			2%
Story 2	U13	4:30	0.87	3.49	2.19561	4	109.31	13:58:19.58	14:00:08.89	Right	Right	3%
Story 2	U13	6:00	1.76	24.64	7.68464	14	109.31	13:58:19.58	14:00:08.89	9.33134	26.60	23%
Story 2	U13	7:30	2.03	18.28	4.94012	9	109.31	13:58:19.58	14:00:08.89			17%
Story 2	U13	9:00	0.97	2.92	1.64671	3	109.31	13:58:19.58	14:00:08.89			3%
Story 2	U13	10:30	1.08	5.40	2.74451	5	109.31	13:58:19.58	14:00:08.89			5%
Story 2	U13	Closed	0.78	6.27	4.39122	8	109.31	13:58:19.58	14:00:08.89			6%
Story 3	U13	Excessive Blinking	0.53	5.83	4.73088	11	139.51	13:58:43.58	14:01:03.09	Left	Left	4%
Story 3	U13	Eye contact	2.00	50.10	10.752	25	139.51	13:58:43.58	14:01:03.09	4.73088	14.50	36%
Story 3	U13	12:00	0.50	0.50	0.43008	1	139.51	13:58:43.58	14:01:03.09			0%
Story 3	U13	1:30	0.92	1.83	0.86016	2	139.51	13:58:43.58	14:01:03.09	Right	Right	1%
Story 3	U13	3:00	0.40	0.40	0.43008	1	139.51	13:58:43.58	14:01:03.09	10.32192	34.23	0%
Story 3	U13	4:30	1.53	12.27	3.44064	8	139.51	13:58:43.58	14:01:03.09			9%
Story 3	U13	6:00	1.17	25.80	9.46176	22	139.51	13:58:43.58	14:01:03.09			18%
Story 3	U13	7:30	1.60	25.67	6.88128	16	139.51	13:58:43.58	14:01:03.09			18%
Story 3	U13	9:00	0.54	1.63	1.29024	3	139.51	13:58:43.58	14:01:03.09			1%
Story 3	U13	10:30	1.39	6.93	2.1504	5	139.51	13:58:43.58	14:01:03.09			5%
Story 3	U13	Closed	0.71	8.53	5.16096	12	139.51	13:58:43.58	14:01:03.09			6%
Story 4	U13	Excessive Blinking	0.84	5.87	5.055	7	83.09	13:59:25.19	14:00:48.28	Left	Left	7%
Story 4	U13	Eye contact	1.53	18.40	8.66572	12	83.09	13:59:25.19	14:00:48.28	5.777153	5.83	22%
Story 4	U13	12:00	0.27	0.27	0.722143	1	83.09	13:59:25.19	14:00:48.28			0%
Story 4	U13	1:30	0.45	0.90	1.44429	2	83.09	13:59:25.19	14:00:48.28	Right	Right	1%
Story 4	U13	3:00	0.17	0.17	0.722143	1	83.09	13:59:25.19	14:00:48.28	9.387863	20.73	0%
Story 4	U13	4:30	0.95	4.77	3.61072	5	83.09	13:59:25.19	14:00:48.28			6%
Story 4	U13	6:00	1.76	24.57	10.11	14	83.09	13:59:25.19	14:00:48.28			30%
Story 4	U13	7:30	1.80	14.37	5.77715	8	83.09	13:59:25.19	14:00:48.28			17%
Story 4	U13	9:00	0.92	3.67	2.88857	4	83.09	13:59:25.19	14:00:48.28			4%
Story 4	U13	10:30	2.70	2.70	0.722143	1	83.09	13:59:25.19	14:00:48.28			3%
Story 4	U13	Closed	0.74	7.40	7.22143	10	83.09	13:59:25.19	14:00:48.28			9%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Baseline/Control	N1	Eye contact	2.90	37.70	12.9557	13	60.21	19:47:33.52	19:48:33.72	Left	Left	63%
Baseline/Control	N1	1:30	0.82	6.57	7.97276	8	60.21	19:47:33.52	19:48:33.72	12.955735	14.23	11%
Baseline/Control	N1	3:00	1.67	6.67	3.98638	4	60.21	19:47:33.52	19:48:33.72			11%
Baseline/Control	N1	4:30	1.00	1.00	0.996595	1	60.21	19:47:33.52	19:48:33.72	Right	Right	2%
Baseline/Control	N1	6:00	1.92	7.66	3.98638	4	60.21	19:47:33.52	19:48:33.72	0.996595	0.60	13%
Baseline/Control	N1	10:30	0.60	0.60	0.996595	1	60.21	19:47:33.52	19:48:33.72			1%
Story 1	N1	Eye contact	2.23	40.17	16.7128	18	64.62	19:48:00.76	19:49:05.39	Left	Left	62%
Story 1	N1	12:00	0.81	2.43	2.78547	3	64.62	19:48:00.76	19:49:05.39	5.570941	9.73	4%
Story 1	N1	3:00	1.37	6.87	4.64245	5	64.62	19:48:00.76	19:49:05.39			11%
Story 1	N1	4:30	2.87	2.87	0.928491	1	64.62	19:48:00.76	19:49:05.39	Right	Right	4%
Story 1	N1	6:00	1.48	5.94	3.71396	4	64.62	19:48:00.76	19:49:05.39	8.356411	6.33	9%
Story 1	N1	7:30	0.27	0.27	0.928491	1	64.62	19:48:00.76	19:49:05.39			0%
Story 1	N1	9:00	0.69	4.13	5.57094	6	64.62	19:48:00.76	19:49:05.39			6%
Story 1	N1	10:30	0.97	1.93	1.85698	2	64.62	19:48:00.76	19:49:05.39			3%
Story 1 French	N1	Eye contact	1.31	19.60	17.5084	15	51.24	19:50:01.79	19:50:53.04	Left	Left	38%
Story 1 French	N1	12:00	1.29	6.47	5.83612	5	51.24	19:50:01.79	19:50:53.04	12.83947	11.00	13%
Story 1 French	N1	1:30	1.26	6.30	5.83612	5	51.24	19:50:01.79	19:50:53.04			12%
Story 1 French	N1	3:00	0.70	2.80	4.6689	4	51.24	19:50:01.79	19:50:53.04	Right	Right	5%
Story 1 French	N1	4:30	0.95	1.90	2.33445	2	51.24	19:50:01.79	19:50:53.04	5.83612	4.03	4%
Story 1 French	N1	6:00	1.61	9.67	7.00335	6	51.24	19:50:01.79	19:50:53.04			19%
Story 1 French	N1	7:30	0.64	1.27	2.33445	2	51.24	19:50:01.79	19:50:53.04			2%
Story 1 French	N1	9:00	0.93	1.86	2.33445	2	51.24	19:50:01.79	19:50:53.04			4%
Story 1 French	N1	10:30	0.90	0.90	1.16722	1	51.24	19:50:01.79	19:50:53.04			2%
Story 1 French	N1	Closed	0.47	0.47	1.16722	1	51.24	19:50:01.79	19:50:53.04			1%
Story 2	N1	Eye contact	1.73	43.27	14.821	25	101.21	19:48:32.72	19:50:13.93	Left	Left	43%
Story 2	N1	12:00	1.02	2.03	1.18568	2	101.21	19:48:32.72	19:50:13.93	5.92838	14.43	2%
Story 2	N1	3:00	1.15	4.60	2.37135	4	101.21	19:48:32.72	19:50:13.93			5%
Story 2	N1	4:30	1.64	9.83	3.55703	6	101.21	19:48:32.72	19:50:13.93	Right	Right	10%
Story 2	N1	6:00	2.10	21.01	5.92839	10	101.21	19:48:32.72	19:50:13.93	13.63529	19.99	21%
Story 2	N1	9:00	0.80	14.36	10.6711	18	101.21	19:48:32.72	19:50:13.93			14%
Story 2	N1	10:30	1.13	5.63	2.96419	5	101.21	19:48:32.72	19:50:13.93			6%
Story 2	N1	Closed	0.23	0.47	1.18568	2	101.21	19:48:32.72	19:50:13.93			0%
Story 2 French	N1	Eye contact	1.19	17.87	16.7901	15	53.60	19:51:11.92	19:52:05.52	Left	Left	33%
Story 2 French	N1	12:00	0.68	2.03	3.35802	3	53.60	19:51:11.92	19:52:05.52	17.90944	18.57	4%
Story 2 French	N1	1:30	0.82	1.63	2.23868	2	53.60	19:51:11.92	19:52:05.52			3%
Story 2 French	N1	3:00	1.32	10.53	8.95472	8	53.60	19:51:11.92	19:52:05.52	Right	Right	20%
Story 2 French	N1	4:30	1.07	6.40	6.71604	6	53.60	19:51:11.92	19:52:05.52	8.95472	7.22	12%
Story 2 French	N1	6:00	0.99	7.91	8.95472	8	53.60	19:51:11.92	19:52:05.52			15%
Story 2 French	N1	7:30	0.37	0.37	1.11934	1	53.60	19:51:11.92	19:52:05.52			1%
Story 2 French	N1	9:00	1.02	6.12	6.71604	6	53.60	19:51:11.92	19:52:05.52			11%
Story 2 French	N1	10:30	0.73	0.73	1.11934	1	53.60	19:51:11.92	19:52:05.52			1%
Story 3	N1	Eye contact	1.97	27.53	14.8085	14	56.72	19:49:01.52	19:49:58.24	Left	Left	49%
Story 3	N1	12:00	0.73	1.47	2.11551	2	56.72	19:49:01.52	19:49:58.24	6.34652	6.97	3%
Story 3	N1	1:30	1.20	2.40	2.11551	2	56.72	19:49:01.52	19:49:58.24			4%
Story 3	N1	3:00	1.43	4.30	3.17326	3	56.72	19:49:01.52	19:49:58.24	Right	Right	8%
Story 3	N1	4:30	0.27	0.27	1.05775	1	56.72	19:49:01.52	19:49:58.24	13.75081	11.51	0%
Story 3	N1	6:00	2.15	8.61	4.23101	4	56.72	19:49:01.52	19:49:58.24			15%
Story 3	N1	9:00	0.77	8.48	11.6353	11	56.72	19:49:01.52	19:49:58.24			15%
Story 3	N1	10:30	1.52	3.03	2.11551	2	56.72	19:49:01.52	19:49:58.24			5%
Story 3	N1	Closed	0.63	0.63	1.05775	1	56.72	19:49:01.52	19:49:58.24			1%
Story 3 French	N1	Eye contact	1.00	11.03	16.605	11	39.72	19:51:38.34	19:52:18.06	Left	Left	28%
Story 3 French	N1	12:00	0.50	0.50	1.50955	1	39.72	19:51:38.34	19:52:18.06	22.64319	13.87	1%
Story 3 French	N1	1:30	0.55	1.10	3.0191	2	39.72	19:51:38.34	19:52:18.06			3%
Story 3 French	N1	3:00	1.00	7.03	10.5668	7	39.72	19:51:38.34	19:52:18.06	Right	Right	18%
Story 3 French	N1	4:30	0.96	5.73	9.05729	6	39.72	19:51:38.34	19:52:18.06	6.03819	2.71	14%
Story 3 French	N1	6:00	1.66	11.61	10.5668	7	39.72	19:51:38.34	19:52:18.06			29%
Story 3 French	N1	7:30	0.63	0.63	1.50955	1	39.72	19:51:38.34	19:52:18.06			2%
Story 3 French	N1	9:00	0.69	2.08	4.52864	3	39.72	19:51:38.34	19:52:18.06			5%
Story 4	N1	Eye contact	1.50	37.54	20.4118	25	72.73	19:49:26.91	19:50:39.63	Left	Left	52%
Story 4	N1	12:00	0.73	0.73	0.816471	1	72.73	19:49:26.91	19:50:39.63	6.53177	7.87	1%
Story 4	N1	3:00	1.02	6.10	4.89883	6	72.73	19:49:26.91	19:50:39.63			8%
Story 4	N1	4:30	0.88	1.77	1.63294	2	72.73	19:49:26.91	19:50:39.63	Right	Right	2%
Story 4	N1	6:00	1.19	8.30	5.7153	7	72.73	19:49:26.91	19:50:39.63	17.14584	18.28	11%
Story 4	N1	9:00	0.85	16.14	15.5129	19	72.73	19:49:26.91	19:50:39.63			22%
Story 4	N1	10:30	1.07	2.13	1.63294	2	72.73	19:49:26.91	19:50:39.63			3%
Story 4 French	N1	Eye contact	1.24	13.67	15.3993	11	42.37	19:52:00.94	19:52:43.31	Left	Left	32%
Story 4 French	N1	12:00	1.02	2.03	2.79988	2	42.37	19:52:00.94	19:52:43.31	20.9991	17.40	5%
Story 4 French	N1	1:30	1.22	4.90	5.59976	4	42.37	19:52:00.94	19:52:43.31			12%
Story 4 French	N1	3:00	0.85	3.40	5.59976	4	42.37	19:52:00.94	19:52:43.31	Right	Right	8%
Story 4 French	N1	4:30	1.30	9.10	9.79958	7	42.37	19:52:00.94	19:52:43.31	8.39964	4.02	21%
Story 4 French	N1	6:00	1.05	5.24	6.9997	5	42.37	19:52:00.94	19:52:43.31			12%
Story 4 French	N1	9:00	0.67	2.02	4.19982	3	42.37	19:52:00.94	19:52:43.31			5%
Story 4 French	N1	10:30	0.67	2.00	4.19982	3	42.37	19:52:00.94	19:52:43.31			5%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R duration	% per minute
Control/Baseline	N2	Eye contact	1.70	37.50	17.7967	22	74.17	13:00:48.50	13:02:02.67	Left	Left	51%
Control/Baseline	N2	3:00	1.23	1.23	0.808942	1	74.17	13:00:48.50	13:02:02.67	6.471532	7.23	2%
Control/Baseline	N2	4:30	0.86	6.00	5.66259	7	74.17	13:00:48.50	13:02:02.67			8%
Control/Baseline	N2	6:00	1.46	16.07	8.89836	11	74.17	13:00:48.50	13:02:02.67	Right	Right	22%
Control/Baseline	N2	7:30	0.92	1.83	1.61788	2	74.17	13:00:48.50	13:02:02.67	9.70729	12.82	2%
Control/Baseline	N2	9:00	1.26	10.06	6.47153	8	74.17	13:00:48.50	13:02:02.67			14%
Control/Baseline	N2	10:30	0.47	0.93	1.61788	2	74.17	13:00:48.50	13:02:02.67			1%
Control/Baseline	N2	Closed	0.53	0.53	0.808942	1	74.17	13:00:48.50	13:02:02.67			1%
Burma 1	N2	Eye contact	0.78	9.37	10.4732	12	68.75	13:13:40.52	13:14:49.26	Left	Left	14%
Burma 1	N2	12:00	1.20	3.60	2.6183	3	68.75	13:13:40.52	13:14:49.26	13.09148	18.33	5%
Burma 1	N2	1:30	0.62	1.23	1.74553	2	68.75	13:13:40.52	13:14:49.26			2%
Burma 1	N2	3:00	1.41	7.03	4.36383	5	68.75	13:13:40.52	13:14:49.26	Right	Right	10%
Burma 1	N2	4:30	1.26	10.07	6.98212	8	68.75	13:13:40.52	13:14:49.26	16.58254	19.57	15%
Burma 1	N2	6:00	1.79	17.87	8.72765	10	68.75	13:13:40.52	13:14:49.26			26%
Burma 1	N2	7:30	1.15	10.37	7.85489	9	68.75	13:13:40.52	13:14:49.26			15%
Burma 1	N2	9:00	0.86	5.17	5.23659	6	68.75	13:13:40.52	13:14:49.26			8%
Burma 1	N2	10:30	1.01	4.03	3.49106	4	68.75	13:13:40.52	13:14:49.26			6%
Story 1	N2	Eye contact	1.00	38.88	17.9074	39	130.67	13:01:39.91	13:03:50.59	Left	Left	30%
Story 1	N2	12:00	0.83	0.83	0.459165	1	130.67	13:01:39.91	13:03:50.59	4.59165	11.67	1%
Story 1	N2	1:30	0.30	0.30	0.459165	1	130.67	13:01:39.91	13:03:50.59			0%
Story 1	N2	3:00	1.13	1.13	0.459165	1	130.67	13:01:39.91	13:03:50.59	Right	Right	1%
Story 1	N2	4:30	1.28	10.24	3.67332	8	130.67	13:01:39.91	13:03:50.59	7.8058	16.37	8%
Story 1	N2	6:00	1.89	58.44	14.2341	31	130.67	13:01:39.91	13:03:50.59			45%
Story 1	N2	7:30	1.25	11.23	4.13248	9	130.67	13:01:39.91	13:03:50.59			9%
Story 1	N2	9:00	0.64	5.13	3.67332	8	130.67	13:01:39.91	13:03:50.59			4%
Story 1	N2	Closed	1.49	4.47	1.37749	3	130.67	13:01:39.91	13:03:50.59			3%
Burma 2	N2	Eye contact	0.80	8.83	11.4951	11	57.42	13:14:28.87	13:15:26.28	Left	Left	15%
Burma 2	N2	12:00	2.02	4.03	2.09001	2	57.42	13:14:28.87	13:15:26.28	9.40504	10.47	7%
Burma 2	N2	1:30	1.82	3.63	2.09001	2	57.42	13:14:28.87	13:15:26.28			6%
Burma 2	N2	3:00	0.53	1.07	2.09001	2	57.42	13:14:28.87	13:15:26.28	Right	Right	2%
Burma 2	N2	4:30	1.15	5.77	5.22502	5	57.42	13:14:28.87	13:15:26.28	8.36003	9.00	10%
Burma 2	N2	6:00	2.42	24.24	10.45	10	57.42	13:14:28.87	13:15:26.28			42%
Burma 2	N2	9:00	1.21	8.47	7.31503	7	57.42	13:14:28.87	13:15:26.28			15%
Burma 2	N2	10:30	0.53	0.53	1.045	1	57.42	13:14:28.87	13:15:26.28			1%
Burma 2	N2	Closed	0.83	0.83	1.045	1	57.42	13:14:28.87	13:15:26.28			1%
Story 2	N2	Eye contact	1.48	37.07	14.8485	25	100.49	13:10:45.61	13:12:26.11	Left	Left	37%
Story 2	N2	3:00	0.70	1.40	1.18788	2	100.49	13:10:45.61	13:12:26.11	5.93941	14.60	1%
Story 2	N2	4:30	1.65	13.20	4.75153	8	100.49	13:10:45.61	13:12:26.11			13%
Story 2	N2	6:00	2.31	41.58	10.691	18	100.49	13:10:45.61	13:12:26.11	Right	Right	41%
Story 2	N2	7:30	1.09	3.27	1.78183	3	100.49	13:10:45.61	13:12:26.11	4.75154	7.23	3%
Story 2	N2	9:00	0.79	3.97	2.96971	5	100.49	13:10:45.61	13:12:26.11			4%
Burma 3	N2	Eye contact	0.83	7.45	7.70383	9	68.77	13:14:56.76	13:16:05.53	Left	Left	11%
Burma 3	N2	12:00	0.94	3.77	3.42392	4	68.77	13:14:56.76	13:16:05.53	9.415791	15.93	5%
Burma 3	N2	1:30	0.90	1.80	1.71196	2	68.77	13:14:56.76	13:16:05.53			3%
Burma 3	N2	3:00	0.30	0.30	0.855981	1	68.77	13:14:56.76	13:16:05.53	Right	Right	0%
Burma 3	N2	4:30	1.73	13.83	6.84785	8	68.77	13:14:56.76	13:16:05.53	13.69569	19.13	20%
Burma 3	N2	6:00	2.75	22.04	6.84785	8	68.77	13:14:56.76	13:16:05.53			32%
Burma 3	N2	7:30	1.52	3.03	1.71196	2	68.77	13:14:56.76	13:16:05.53			4%
Burma 3	N2	9:00	1.15	12.67	9.41579	11	68.77	13:14:56.76	13:16:05.53			18%
Burma 3	N2	10:30	1.14	3.43	2.56794	3	68.77	13:14:56.76	13:16:05.53			5%
Burma 3	N2	Closed	0.43	0.43	0.855981	1	68.77	13:14:56.76	13:16:05.53			1%
Story 3	N2	Eye contact	1.43	34.43	15.6689	24	89.77	13:11:16.03	13:12:45.81	Left	Left	38%
Story 3	N2	12:00	0.17	0.17	0.652869	1	89.77	13:11:16.03	13:12:45.81	6.5287	14.00	0%
Story 3	N2	1:30	0.92	2.77	1.95861	3	89.77	13:11:16.03	13:12:45.81			3%
Story 3	N2	4:30	1.60	11.23	4.57009	7	89.77	13:11:16.03	13:12:45.81	Right	Right	13%
Story 3	N2	6:00	2.47	34.63	9.14017	14	89.77	13:11:16.03	13:12:45.81	4.570089	4.83	39%
Story 3	N2	7:30	0.60	0.60	0.652869	1	89.77	13:11:16.03	13:12:45.81			1%
Story 3	N2	9:00	0.71	4.23	3.91722	6	89.77	13:11:16.03	13:12:45.81			5%
Story 3	N2	Closed	0.57	1.70	1.95861	3	89.77	13:11:16.03	13:12:45.81			2%
Burma 4	N2	Eye contact	0.74	6.67	9.76245	9	55.09	13:15:28.16	13:16:23.25	Left	Left	12%
Burma 4	N2	4:30	1.77	7.10	4.33887	4	55.09	13:15:28.16	13:16:23.25	4.33887	7.10	13%
Burma 4	N2	6:00	4.97	34.81	7.59301	7	55.09	13:15:28.16	13:16:23.25			63%
Burma 4	N2	7:30	0.73	0.73	1.08472	1	55.09	13:15:28.16	13:16:23.25	Right	Right	1%
Burma 4	N2	9:00	1.85	3.70	2.16943	2	55.09	13:15:28.16	13:16:23.25	6.5083	6.50	7%
Burma 4	N2	10:30	0.69	2.07	3.25415	3	55.09	13:15:28.16	13:16:23.25			4%
Story 4	N2	Eye contact	1.25	25.00	13.3906	20	89.62	13:11:41.33	13:13:10.94	Left	Left	28%
Story 4	N2	3:00	0.47	0.47	0.669531	1	89.62	13:11:41.33	13:13:10.94	2.678121	4.57	1%
Story 4	N2	4:30	1.37	4.10	2.00859	3	89.62	13:11:41.33	13:13:10.94			5%
Story 4	N2	6:00	2.79	50.24	12.0516	18	89.62	13:11:41.33	13:13:10.94	Right	Right	56%
Story 4	N2	7:30	0.61	3.03	3.34765	5	89.62	13:11:41.33	13:13:10.94	7.364831	9.80	3%
Story 4	N2	9:00	1.23	6.17	3.34765	5	89.62	13:11:41.33	13:13:10.94			7%
Story 4	N2	10:30	0.60	0.60	0.669531	1	89.62	13:11:41.33	13:13:10.94			1%

Observations	Subject	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Baseline/Control	N3	<Initial Eye Direction>	0.01	0.01	0.861673	1	67.67	14:22:29.12	14:23:36.80	Left	Left	0%
Baseline/Control	N3	Eye contact	3.71	51.96	12.0634	14	67.67	14:22:29.12	14:23:36.80	1.723346	1.90	77%
Baseline/Control	N3	3:00	1.00	1.00	0.861673	1	67.67	14:22:29.12	14:23:36.80			1%
Baseline/Control	N3	4:30	0.90	0.90	0.861673	1	67.67	14:22:29.12	14:23:36.80	Right	Right	1%
Baseline/Control	N3	6:00	0.98	6.83	6.03171	7	67.67	14:22:29.12	14:23:36.80	5.170043	6.97	10%
Baseline/Control	N3	7:30	1.47	1.47	0.861673	1	67.67	14:22:29.12	14:23:36.80			2%
Baseline/Control	N3	9:00	1.23	3.70	2.58502	3	67.67	14:22:29.12	14:23:36.80			5%
Baseline/Control	N3	10:30	0.90	1.80	1.72335	2	67.67	14:22:29.12	14:23:36.80			3%
Story 1	N3	Eye contact	1.59	3.18	26.9542	2	4.12	14:22:57.84	14:23:01.96	Left = 0	Left = 0	77%
Story 1	N3	9:00	0.93	0.93	13.4771	1	4.12	14:22:57.84	14:23:01.96	Right = 26.95	Right = .93	23%
Story 2	N3	Eye contact	0.63	2.53	18.1942	4	13.19	14:24:42.93	14:24:56.13	Left	Left	19%
Story 2	N3	3:00	0.50	0.50	4.54856	1	13.19	14:24:42.93	14:24:56.13	13.64567	1.40	4%
Story 2	N3	4:30	0.45	0.90	9.09711	2	13.19	14:24:42.93	14:24:56.13	Right	Right	7%
Story 2	N3	6:00	1.38	5.51	18.1942	4	13.19	14:24:42.93	14:24:56.13	18.1942	3.74	42%
Story 2	N3	10:30	0.93	3.74	18.1942	4	13.19	14:24:42.93	14:24:56.13			28%
Story 3	N3	Eye contact	0.57	2.27	18.8709	4	12.72	14:25:15.27	14:25:27.99	Left	Left	18%
Story 3	N3	12:00	1.10	1.10	4.71772	1	12.72	14:25:15.27	14:25:27.99	37.74177	5.20	9%
Story 3	N3	1:30	0.67	1.33	9.43545	2	12.72	14:25:15.27	14:25:27.99			10%
Story 3	N3	3:00	0.47	0.47	4.71772	1	12.72	14:25:15.27	14:25:27.99	Right	Right	4%
Story 3	N3	4:30	0.68	3.40	23.5886	5	12.72	14:25:15.27	14:25:27.99	14.15317	2.47	27%
Story 3	N3	6:00	0.84	1.68	9.43545	2	12.72	14:25:15.27	14:25:27.99			13%
Story 3	N3	7:30	0.78	1.57	9.43545	2	12.72	14:25:15.27	14:25:27.99			12%
Story 3	N3	10:30	0.90	0.90	4.71772	1	12.72	14:25:15.27	14:25:27.99			7%
Story 4	N3	Eye contact	0.56	2.23	27.781	4	8.64	14:25:34.97	14:25:43.61	Left	Left	26%
Story 4	N3	3:00	0.92	1.83	13.8905	2	8.64	14:25:34.97	14:25:43.61	13.8905	1.83	21%
Story 4	N3	6:00	1.45	2.89	13.8905	2	8.64	14:25:34.97	14:25:43.61	Right	Right	33%
Story 4	N3	10:30	0.84	1.67	13.8905	2	8.64	14:25:34.97	14:25:43.61	13.8905	1.67	19%

Observations	Subject	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Baseline/Control	N4	Eye contact	4.90	53.95	8.10025	11	78.72	12:56:29.51	12:57:48.22	Left	Left	69%
Baseline/Control	N4	12:00	0.88	4.38	3.68193	5	78.72	12:56:29.51	12:57:48.22	8.10024	8.12	6%
Baseline/Control	N4	1:30	0.56	2.24	2.94554	4	78.72	12:56:29.51	12:57:48.22			3%
Baseline/Control	N4	3:00	0.56	1.68	2.20916	3	78.72	12:56:29.51	12:57:48.22	Right	Right	2%
Baseline/Control	N4	4:30	1.05	4.20	2.94554	4	78.72	12:56:29.51	12:57:48.22	2.209156	5.91	5%
Baseline/Control	N4	6:00	1.13	4.51	2.94554	4	78.72	12:56:29.51	12:57:48.22			6%
Baseline/Control	N4	9:00	1.18	2.37	1.47277	2	78.72	12:56:29.51	12:57:48.22			3%
Baseline/Control	N4	10:30	3.54	3.54	0.736386	1	78.72	12:56:29.51	12:57:48.22			4%
Baseline/Control	N4	Closed	0.92	1.84	1.47277	2	78.72	12:56:29.51	12:57:48.22			2%
German 1	N4	Eye contact	0.93	10.27	11.3227	11	58.06	13:00:24.26	13:01:22.33	Left	Left	18%
German 1	N4	12:00	1.19	4.77	4.11734	4	58.06	13:00:24.26	13:01:22.33	6.17602	6.61	8%
German 1	N4	1:30	1.03	4.10	4.11734	4	58.06	13:00:24.26	13:01:22.33			7%
German 1	N4	3:00	1.13	1.13	1.02934	1	58.06	13:00:24.26	13:01:22.33	Right	Right	2%
German 1	N4	4:30	1.37	1.37	1.02934	1	58.06	13:00:24.26	13:01:22.33	11.32269	13.28	2%
German 1	N4	6:00	1.66	19.96	12.352	12	58.06	13:00:24.26	13:01:22.33			34%
German 1	N4	7:30	1.50	4.50	3.08801	3	58.06	13:00:24.26	13:01:22.33			8%
German 1	N4	9:00	1.04	4.17	4.11734	4	58.06	13:00:24.26	13:01:22.33			7%
German 1	N4	10:30	1.15	4.60	4.11734	4	58.06	13:00:24.26	13:01:22.33			8%
German 1	N4	Closed	1.06	3.17	3.08801	3	58.06	13:00:24.26	13:01:22.33			5%
German 2	N4	Eye contact	1.04	14.55	12.1771	14	68.66	13:00:59.71	13:02:08.36	Left	Left	21%
German 2	N4	12:00	1.07	6.41	5.21875	6	68.66	13:00:59.71	13:02:08.36	4.34896	5.37	9%
German 2	N4	1:30	1.03	2.07	1.73958	2	68.66	13:00:59.71	13:02:08.36			3%
German 2	N4	4:30	1.10	3.30	2.60938	3	68.66	13:00:59.71	13:02:08.36	Right	Right	5%
German 2	N4	6:00	1.84	22.05	10.4375	12	68.66	13:00:59.71	13:02:08.36	13.91667	18.46	32%
German 2	N4	7:30	1.43	9.98	6.08854	7	68.66	13:00:59.71	13:02:08.36			15%
German 2	N4	9:00	0.75	3.00	3.47917	4	68.66	13:00:59.71	13:02:08.36			4%
German 2	N4	10:30	1.09	5.47	4.34896	5	68.66	13:00:59.71	13:02:08.36			8%
German 2	N4	Closed	0.90	1.80	1.73958	2	68.66	13:00:59.71	13:02:08.36			3%
German 3	N4	Eye contact	0.79	10.24	20.0586	13	38.89	13:03:19.86	13:03:58.75	Left	Left	26%
German 3	N4	12:00	1.84	1.84	1.54297	1	38.89	13:03:19.86	13:03:58.75	12.34378	7.64	5%
German 3	N4	1:30	0.61	1.84	4.62892	3	38.89	13:03:19.86	13:03:58.75			5%
German 3	N4	3:00	0.72	1.43	3.08594	2	38.89	13:03:19.86	13:03:58.75	Right	Right	4%
German 3	N4	4:30	1.46	4.37	4.62892	3	38.89	13:03:19.86	13:03:58.75	10.8008	7.15	11%
German 3	N4	6:00	1.33	12.01	13.8867	9	38.89	13:03:19.86	13:03:58.75			31%
German 3	N4	7:30	1.10	5.48	7.71486	5	38.89	13:03:19.86	13:03:58.75			14%
German 3	N4	9:00	0.83	1.67	3.08594	2	38.89	13:03:19.86	13:03:58.75			4%
German 4	N4	Eye contact	0.97	7.77	10.0612	8	47.71	13:04:00.58	13:04:48.29	Left	Left	16%
German 4	N4	12:00	1.00	8.98	11.3189	9	47.71	13:04:00.58	13:04:48.29	5.0306	3.19	19%
German 4	N4	1:30	0.83	2.50	3.77295	3	47.71	13:04:00.58	13:04:48.29			5%
German 4	N4	4:30	0.69	0.69	1.25765	1	47.71	13:04:00.58	13:04:48.29	Right	Right	1%
German 4	N4	6:00	1.20	9.60	10.0612	8	47.71	13:04:00.58	13:04:48.29	15.0918	17.10	20%
German 4	N4	7:30	1.67	11.72	8.80355	7	47.71	13:04:00.58	13:04:48.29			25%
German 4	N4	9:00	1.28	3.84	3.77295	3	47.71	13:04:00.58	13:04:48.29			8%
German 4	N4	10:30	0.77	1.53	2.5153	2	47.71	13:04:00.58	13:04:48.29			3%
German 4	N4	Closed	1.07	1.07	1.25765	1	47.71	13:04:00.58	13:04:48.29			2%

Spanish 1	N4	Eye contact	0.87	2.60	3.22425	3	55.83	13:06:39.60	13:07:35.43	Left	Left	5%
Spanish 1	N4	12:00	1.15	6.87	6.44849	6	55.83	13:06:39.60	13:07:35.43	3.22425	5.00	12%
Spanish 1	N4	1:30	0.97	1.94	2.1495	2	55.83	13:06:39.60	13:07:35.43			3%
Spanish 1	N4	4:30	3.07	3.07	1.07475	1	55.83	13:06:39.60	13:07:35.43	Right	Right	5%
Spanish 1	N4	6:00	1.66	13.31	8.59799	8	55.83	13:06:39.60	13:07:35.43	18.27073	26.47	24%
Spanish 1	N4	7:30	1.66	14.92	9.67274	9	55.83	13:06:39.60	13:07:35.43			27%
Spanish 1	N4	9:00	1.49	7.47	5.37374	5	55.83	13:06:39.60	13:07:35.43			13%
Spanish 1	N4	10:30	1.36	4.07	3.22425	3	55.83	13:06:39.60	13:07:35.43			7%
Spanish 1	N4	Closed	0.78	1.56	2.1495	2	55.83	13:06:39.60	13:07:35.43			3%
Spanish 2	N4	Eye contact	0.98	4.90	4.40025	5	67.42	13:07:22.61	13:08:30.03	Left	Left	7%
Spanish 2	N4	12:00	1.17	7.01	5.2803	6	67.42	13:07:22.61	13:08:30.03	3.520199	7.64	10%
Spanish 2	N4	1:30	0.83	0.83	0.880049	1	67.42	13:07:22.61	13:08:30.03			1%
Spanish 2	N4	4:30	2.27	6.81	2.64015	3	67.42	13:07:22.61	13:08:30.03	Right	Right	10%
Spanish 2	N4	6:00	2.45	22.02	7.92044	9	67.42	13:07:22.61	13:08:30.03	14.08079	22.60	33%
Spanish 2	N4	7:30	1.55	15.49	8.80049	10	67.42	13:07:22.61	13:08:30.03			23%
Spanish 2	N4	9:00	1.60	4.80	2.64015	3	67.42	13:07:22.61	13:08:30.03			7%
Spanish 2	N4	10:30	0.77	2.30	2.64015	3	67.42	13:07:22.61	13:08:30.03			3%
Spanish 2	N4	Closed	1.08	3.24	2.64015	3	67.42	13:07:22.61	13:08:30.03			5%
Spanish 3	N4	Eye contact	1.00	5.00	7.67499	5	39.09	13:07:54.78	13:08:33.87	Left	Left	13%
Spanish 3	N4	12:00	1.47	5.87	6.13999	4	39.09	13:07:54.78	13:08:33.87	12.27998	9.68	15%
Spanish 3	N4	1:30	1.12	4.47	6.13999	4	39.09	13:07:54.78	13:08:33.87			11%
Spanish 3	N4	4:30	1.30	5.21	6.13999	4	39.09	13:07:54.78	13:08:33.87	Right	Right	13%
Spanish 3	N4	6:00	1.46	8.78	9.20999	6	39.09	13:07:54.78	13:08:33.87	10.74499	5.78	22%
Spanish 3	N4	7:30	0.87	2.61	4.60499	3	39.09	13:07:54.78	13:08:33.87			7%
Spanish 3	N4	9:00	0.43	0.87	3.07	2	39.09	13:07:54.78	13:08:33.87			2%
Spanish 3	N4	10:30	1.15	2.30	3.07	2	39.09	13:07:54.78	13:08:33.87			6%
Spanish 3	N4	Closed	0.99	3.97	6.13999	4	39.09	13:07:54.78	13:08:33.87			10%
Spanish 4	N4	Eye contact	0.89	6.21	8.2158	7	51.12	13:08:26.54	13:09:17.67	Left	Left	12%
Spanish 4	N4	12:00	1.06	6.34	7.04212	6	51.12	13:08:26.54	13:09:17.67	5.86843	7.74	12%
Spanish 4	N4	1:30	1.37	1.37	1.17369	1	51.12	13:08:26.54	13:09:17.67			3%
Spanish 4	N4	4:30	1.59	6.37	4.69474	4	51.12	13:08:26.54	13:09:17.67	Right	Right	12%
Spanish 4	N4	6:00	1.73	13.87	9.38949	8	51.12	13:08:26.54	13:09:17.67	16.43161	16.18	27%
Spanish 4	N4	7:30	1.13	6.81	7.04212	6	51.12	13:08:26.54	13:09:17.67			13%
Spanish 4	N4	9:00	0.97	5.84	7.04212	6	51.12	13:08:26.54	13:09:17.67			11%
Spanish 4	N4	10:30	1.77	3.54	2.34737	2	51.12	13:08:26.54	13:09:17.67			7%
Spanish 4	N4	Closed	0.77	0.77	1.17369	1	51.12	13:08:26.54	13:09:17.67			2%
Story 1	N4	Eye contact	1.08	11.91	9.0963	11	72.09	12:57:13.05	12:58:25.14	Left	Left	17%
Story 1	N4	12:00	1.65	13.18	6.61549	8	72.09	12:57:13.05	12:58:25.14	9.92323	17.18	18%
Story 1	N4	1:30	0.90	2.70	2.48081	3	72.09	12:57:13.05	12:58:25.14			4%
Story 1	N4	3:00	0.72	1.43	1.65387	2	72.09	12:57:13.05	12:58:25.14	Right	Right	2%
Story 1	N4	4:30	1.86	13.05	5.78855	7	72.09	12:57:13.05	12:58:25.14	6.61548	7.98	18%
Story 1	N4	6:00	2.08	14.55	5.78855	7	72.09	12:57:13.05	12:58:25.14			20%
Story 1	N4	7:30	0.99	3.98	3.30774	4	72.09	12:57:13.05	12:58:25.14			6%
Story 1	N4	10:30	1.00	4.00	3.30774	4	72.09	12:57:13.05	12:58:25.14			6%
Story 1	N4	Closed	1.04	7.29	5.78855	7	72.09	12:57:13.05	12:58:25.14			10%
Story 2	N4	Eye contact	1.07	12.85	8.37054	12	86.02	12:57:45.02	12:59:11.04	Left	Left	15%
Story 2	N4	12:00	1.28	16.62	9.06808	13	86.02	12:57:45.02	12:59:11.04	9.068085	14.21	19%
Story 2	N4	1:30	1.08	10.78	6.97545	10	86.02	12:57:45.02	12:59:11.04			13%
Story 2	N4	3:00	0.63	0.63	0.697545	1	86.02	12:57:45.02	12:59:11.04	Right	Right	1%
Story 2	N4	4:30	1.40	2.80	1.39509	2	86.02	12:57:45.02	12:59:11.04	8.37053	12.95	3%
Story 2	N4	6:00	2.46	22.14	6.2779	9	86.02	12:57:45.02	12:59:11.04			26%
Story 2	N4	7:30	0.90	4.48	3.48772	5	86.02	12:57:45.02	12:59:11.04			5%
Story 2	N4	9:00	1.06	3.17	2.09263	3	86.02	12:57:45.02	12:59:11.04			4%
Story 2	N4	10:30	1.33	5.31	2.79018	4	86.02	12:57:45.02	12:59:11.04			6%
Story 2	N4	Closed	1.21	7.24	4.18527	6	86.02	12:57:45.02	12:59:11.04			8%
Story 3	N4	Eye contact	1.11	12.25	12.4238	11	51.86	12:58:22.41	12:59:14.27	Left	Left	24%
Story 3	N4	12:00	0.83	8.30	11.2943	10	51.86	12:58:22.41	12:59:14.27	9.03546	6.87	16%
Story 3	N4	1:30	0.92	6.41	7.90603	7	51.86	12:58:22.41	12:59:14.27			12%
Story 3	N4	3:00	0.47	0.47	1.12943	1	51.86	12:58:22.41	12:59:14.27	Right	Right	1%
Story 3	N4	6:00	1.27	13.95	12.4238	11	51.86	12:58:22.41	12:59:14.27	12.42377	10.48	27%
Story 3	N4	7:30	1.06	6.37	6.7766	6	51.86	12:58:22.41	12:59:14.27			12%
Story 3	N4	9:00	0.70	1.40	2.25887	2	51.86	12:58:22.41	12:59:14.27			3%
Story 3	N4	10:30	0.90	2.70	3.3883	3	51.86	12:58:22.41	12:59:14.27			5%
Story 4	N4	Eye contact	1.37	24.60	15.0002	18	72.00	12:58:55.11	13:00:07.11	Left	Left	34%
Story 4	N4	12:00	0.73	5.84	6.66676	8	72.00	12:58:55.11	13:00:07.11	4.166725	8.81	8%
Story 4	N4	1:30	2.04	8.17	3.33338	4	72.00	12:58:55.11	13:00:07.11			11%
Story 4	N4	4:30	0.63	0.63	0.833345	1	72.00	12:58:55.11	13:00:07.11	Right	Right	1%
Story 4	N4	6:00	1.67	20.09	10.0001	12	72.00	12:58:55.11	13:00:07.11	3.33338	5.57	28%
Story 4	N4	7:30	1.92	3.84	1.66669	2	72.00	12:58:55.11	13:00:07.11			5%
Story 4	N4	9:00	0.87	1.74	1.66669	2	72.00	12:58:55.11	13:00:07.11			2%
Story 4	N4	Closed	1.18	7.07	5.00007	6	72.00	12:58:55.11	13:00:07.11			10%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Baseline/control	N5	Eye contact	9.34	46.70	5.77979	5	51.91	20:20:18.15	20:21:10.05	Left	Left	90%
Baseline/control	N5	4:30	0.82	1.64	2.31192	2	51.91	20:20:18.15	20:21:10.05	2.31192	1.64	3%
Baseline/control	N5	6:00	0.70	0.70	1.15596	1	51.91	20:20:18.15	20:21:10.05			1%
Baseline/control	N5	9:00	1.06	1.06	1.15596	1	51.91	20:20:18.15	20:21:10.05	Right	Right	2%
Baseline/control	N5	10:30	0.60	1.80	3.46787	3	51.91	20:20:18.15	20:21:10.05	4.62383	2.86	3%
Story 1 English	N5	Eye contact	5.66	152.79	8.86277	27	182.79	20:22:53.11	20:25:55.90	Left	Left	84%
Story 1 English	N5	1:30	1.17	2.33	0.656502	2	182.79	20:22:53.11	20:25:55.90	5.58027	15.44	1%
Story 1 English	N5	3:00	0.76	6.10	2.62601	8	182.79	20:22:53.11	20:25:55.90			3%
Story 1 English	N5	4:30	1.00	7.01	2.29776	7	182.79	20:22:53.11	20:25:55.90	Right	Right	4%
Story 1 English	N5	7:30	0.88	5.27	1.96951	6	182.79	20:22:53.11	20:25:55.90	5.58027	13.58	3%
Story 1 English	N5	9:00	0.74	7.44	3.28251	10	182.79	20:22:53.11	20:25:55.90			4%
Story 1 English	N5	10:30	0.87	0.87	0.328251	1	182.79	20:22:53.11	20:25:55.90			0%
Story 1 English	N5	Closed	0.97	0.97	0.328251	1	182.79	20:22:53.11	20:25:55.90			1%
Story 1 Spanish	N5	Eye contact	3.49	125.54	12.809	36	167.84	11:55:36.37	11:58:24.20	Left	Left	75%
Story 1 Spanish	N5	12:00	0.95	1.90	0.711613	2	167.84	11:55:36.37	11:58:24.20	6.76032	14.00	1%
Story 1 Spanish	N5	1:30	0.79	4.73	2.13484	6	167.84	11:55:36.37	11:58:24.20			3%
Story 1 Spanish	N5	3:00	0.68	6.77	3.55806	10	167.84	11:55:36.37	11:58:24.20	Right	Right	4%
Story 1 Spanish	N5	4:30	0.83	2.50	1.06742	3	167.84	11:55:36.37	11:58:24.20	9.25097	17.96	1%
Story 1 Spanish	N5	6:00	1.52	7.60	1.77903	5	167.84	11:55:36.37	11:58:24.20			5%
Story 1 Spanish	N5	7:30	0.49	1.47	1.06742	3	167.84	11:55:36.37	11:58:24.20			1%
Story 1 Spanish	N5	9:00	0.64	11.50	6.40452	18	167.84	11:55:36.37	11:58:24.20			7%
Story 1 Spanish	N5	10:30	1.00	4.99	1.77903	5	167.84	11:55:36.37	11:58:24.20			3%
Story 1 Spanish	N5	Closed	0.42	0.83	0.711613	2	167.84	11:55:36.37	11:58:24.20			0%
Story 2 English	N5	Eye contact	5.57	122.43	8.54347	22	154.50	11:53:27.51	11:56:02.02	Left	Left	79%
Story 2 English	N5	12:00	0.90	0.90	0.388339	1	154.50	11:53:27.51	11:56:02.02	5.8251	15.52	1%
Story 2 English	N5	1:30	0.76	2.29	1.16502	3	154.50	11:53:27.51	11:56:02.02			1%
Story 2 English	N5	3:00	0.97	4.83	1.9417	5	154.50	11:53:27.51	11:56:02.02	Right	Right	3%
Story 2 English	N5	4:30	1.20	8.40	2.71838	7	154.50	11:53:27.51	11:56:02.02	4.66008	11.30	5%
Story 2 English	N5	6:00	0.70	2.81	1.55336	4	154.50	11:53:27.51	11:56:02.02			2%
Story 2 English	N5	7:30	0.96	6.72	2.71838	7	154.50	11:53:27.51	11:56:02.02			4%
Story 2 English	N5	9:00	1.01	3.02	1.16502	3	154.50	11:53:27.51	11:56:02.02			2%
Story 2 English	N5	10:30	0.78	1.57	0.776679	2	154.50	11:53:27.51	11:56:02.02			1%
Story 2 English	N5	Closed	0.77	1.53	0.776679	2	154.50	11:53:27.51	11:56:02.02			1%
Story 2 Spanish	N5	Eye contact	5.49	93.40	8.72011	17	116.97	11:56:14.51	11:58:11.48	Left	Left	80%
Story 2 Spanish	N5	12:00	0.57	1.13	1.0259	2	116.97	11:56:14.51	11:58:11.48	6.66832	12.53	1%
Story 2 Spanish	N5	1:30	0.91	4.57	2.56474	5	116.97	11:56:14.51	11:58:11.48			4%
Story 2 Spanish	N5	3:00	0.63	3.13	2.56474	5	116.97	11:56:14.51	11:58:11.48	Right	Right	3%
Story 2 Spanish	N5	4:30	1.61	4.83	1.53884	3	116.97	11:56:14.51	11:58:11.48	6.66832	8.53	4%
Story 2 Spanish	N5	6:00	0.70	0.70	0.512948	1	116.97	11:56:14.51	11:58:11.48			1%
Story 2 Spanish	N5	9:00	0.64	4.50	3.59063	7	116.97	11:56:14.51	11:58:11.48			4%
Story 2 Spanish	N5	10:30	0.67	4.03	3.07769	6	116.97	11:56:14.51	11:58:11.48			3%
Story 2 Spanish	N5	Closed	0.67	0.67	0.512948	1	116.97	11:56:14.51	11:58:11.48			1%
Story 3 English	N5	Eye contact	5.85	298.29	8.5645	51	357.29	11:54:01.51	11:59:58.80	Left	Left	83%
Story 3 English	N5	12:00	0.44	0.44	0.167931	1	357.29	11:54:01.51	11:59:58.80	5.20587	28.79	0%
Story 3 English	N5	1:30	0.79	3.95	0.839656	5	357.29	11:54:01.51	11:59:58.80			1%
Story 3 English	N5	3:00	0.83	14.92	3.02276	18	357.29	11:54:01.51	11:59:58.80	Right	Right	4%
Story 3 English	N5	4:30	1.24	9.93	1.34345	8	357.29	11:54:01.51	11:59:58.80	4.36621	21.43	3%
Story 3 English	N5	6:00	0.67	5.32	1.34345	8	357.29	11:54:01.51	11:59:58.80			1%
Story 3 English	N5	9:00	0.83	19.08	3.86242	23	357.29	11:54:01.51	11:59:58.80			5%
Story 3 English	N5	10:30	0.78	2.35	0.503794	3	357.29	11:54:01.51	11:59:58.80			1%
Story 3 English	N5	Closed	0.60	3.00	0.839656	5	357.29	11:54:01.51	11:59:58.80			1%
Story 3 Spanish	N5	Eye contact	2.89	187.97	14.2667	65	273.36	12:32:04.77	12:36:38.13	Left	Left	69%
Story 3 Spanish	N5	12:00	0.35	1.73	1.09744	5	273.36	12:32:04.77	12:36:38.13	12.2914	36.68	1%
Story 3 Spanish	N5	1:30	0.66	15.10	5.04823	23	273.36	12:32:04.77	12:36:38.13			6%
Story 3 Spanish	N5	3:00	0.55	13.76	5.48721	25	273.36	12:32:04.77	12:36:38.13	Right	Right	5%
Story 3 Spanish	N5	4:30	0.98	7.82	1.75591	8	273.36	12:32:04.77	12:36:38.13	13.3888	38.44	3%
Story 3 Spanish	N5	6:00	1.06	6.37	1.31693	6	273.36	12:32:04.77	12:36:38.13			2%
Story 3 Spanish	N5	7:30	0.70	6.97	2.19488	10	273.36	12:32:04.77	12:36:38.13			3%
Story 3 Spanish	N5	9:00	0.61	18.20	6.58465	30	273.36	12:32:04.77	12:36:38.13			7%
Story 3 Spanish	N5	10:30	0.63	13.27	4.60926	21	273.36	12:32:04.77	12:36:38.13			5%
Story 3 Spanish	N5	Closed	0.43	2.17	1.09744	5	273.36	12:32:04.77	12:36:38.13			1%
Story 4 English	N5	Excessive Blinking	0.63	0.63	0.376868	1	155.85	11:54:45.01	11:57:20.85	Left	Left	0%
Story 4 English	N5	Eye contact	3.36	104.30	11.6829	31	155.85	11:54:45.01	11:57:20.85	6.40675	14.11	67%
Story 4 English	N5	1:30	0.73	2.93	1.50747	4	155.85	11:54:45.01	11:57:20.85			2%
Story 4 English	N5	3:00	0.82	6.57	3.01494	8	155.85	11:54:45.01	11:57:20.85	Right	Right	4%
Story 4 English	N5	4:30	0.92	4.60	1.88434	5	155.85	11:54:45.01	11:57:20.85	10.9292	28.30	3%
Story 4 English	N5	6:00	1.06	7.40	2.63807	7	155.85	11:54:45.01	11:57:20.85			5%
Story 4 English	N5	7:30	1.10	5.50	1.88434	5	155.85	11:54:45.01	11:57:20.85			4%
Story 4 English	N5	9:00	0.82	13.93	6.40675	17	155.85	11:54:45.01	11:57:20.85			9%
Story 4 English	N5	10:30	1.27	8.87	2.63807	7	155.85	11:54:45.01	11:57:20.85			6%
Story 4 English	N5	Closed	0.55	1.10	0.753736	2	155.85	11:54:45.01	11:57:20.85			1%
Story 4 Spanish	N5	Eye contact	2.61	80.97	14.5508	31	124.87	12:33:02.24	12:35:07.10	Left	Left	65%
Story 4 Spanish	N5	12:00	0.72	2.17	1.40814	3	124.87	12:33:02.24	12:35:07.10	8.44885	12.92	2%
Story 4 Spanish	N5	1:30	0.66	3.93	2.81628	6	124.87	12:33:02.24	12:35:07.10			3%
Story 4 Spanish	N5	3:00	0.67	6.70	4.69381	10	124.87	12:33:02.24	12:35:07.10	Right	Right	5%
Story 4 Spanish	N5	4:30	1.14	2.29	0.938761	2	124.87	12:33:02.24	12:35:07.10	11.7345	20.93	2%
Story 4 Spanish	N5	6:00	0.93	7.47	3.75505	8	124.87	12:33:02.24	12:35:07.10			6%
Story 4 Spanish	N5	7:30	0.75	3.00	1.87752	4	124.87	12:33:02.24	12:35:07.10			2%
Story 4 Spanish	N5	9:00	0.94	14.17	7.04071	15	124.87	12:33:02.24	12:35:07.10			11%
Story 4 Spanish	N5	10:30	0.63	3.77	2.81628	6	124.87	12:33:02.24	12:35:07.10			3%
Story 4 Spanish	N5	Closed	0.40	0.40	0.469381	1	124.87	12:33:02.24	12:35:07.10			0%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Baseline/Control	N6	Eye contact	3.24	68.00	13.3562	21	94.34	09:32:07.12	09:33:41.46	Left	Left	72%
Baseline/Control	N6	3:00	0.55	1.11	1.27202	2	94.34	09:32:07.12	09:33:41.46	2.54404	2.89	1%
Baseline/Control	N6	4:30	0.89	1.78	1.27202	2	94.34	09:32:07.12	09:33:41.46			2%
Baseline/Control	N6	6:00	0.47	0.94	1.27202	2	94.34	09:32:07.12	09:33:41.46	Right	Right	1%
Baseline/Control	N6	9:00	0.92	9.21	6.36011	10	94.34	09:32:07.12	09:33:41.46	12.72022	0.00023	10%
Baseline/Control	N6	10:30	1.07	10.68	6.36011	10	94.34	09:32:07.12	09:33:41.46			11%
Baseline/Control	N6	Closed	0.65	2.60	2.54404	4	94.34	09:32:07.12	09:33:41.46			3%
Story 1	N6	Excessive Blinking	0.53	6.31	8.34115	12	86.32	09:32:46.45	09:34:12.77	Left	Left	7%
Story 1	N6	Eye contact	1.40	37.69	18.7676	27	86.32	09:32:46.45	09:34:12.77	3.47548	6.94	44%
Story 1	N6	4:30	1.39	6.94	3.47548	5	86.32	09:32:46.45	09:34:12.77			8%
Story 1	N6	6:00	1.17	5.83	3.47548	5	86.32	09:32:46.45	09:34:12.77	Right	Right	7%
Story 1	N6	7:30	0.92	7.33	5.56077	8	86.32	09:32:46.45	09:34:12.77	24.32832	0.000307	8%
Story 1	N6	9:00	0.78	11.73	10.4264	15	86.32	09:32:46.45	09:34:12.77			14%
Story 1	N6	10:30	0.62	7.47	8.34115	12	86.32	09:32:46.45	09:34:12.77			9%
Story 1	N6	Closed	0.60	3.00	3.47548	5	86.32	09:32:46.45	09:34:12.77			3%
Story 2	N6	Excessive Blinking	0.33	1.63	4.84027	5	61.98	09:33:18.41	09:34:20.39	Left	Left	3%
Story 2	N6	Eye contact	2.33	37.35	15.4889	16	61.98	09:33:18.41	09:34:20.39	2.90416	3.91	60%
Story 2	N6	4:30	1.30	3.91	2.90416	3	61.98	09:33:18.41	09:34:20.39			6%
Story 2	N6	6:00	1.01	4.03	3.87222	4	61.98	09:33:18.41	09:34:20.39	Right	Right	7%
Story 2	N6	7:30	1.19	3.57	2.90416	3	61.98	09:33:18.41	09:34:20.39	12.5847	13.15	6%
Story 2	N6	9:00	0.47	0.93	1.93611	2	61.98	09:33:18.41	09:34:20.39			2%
Story 2	N6	10:30	1.08	8.65	7.74443	8	61.98	09:33:18.41	09:34:20.39			14%
Story 2	N6	Closed	0.38	1.90	4.84027	5	61.98	09:33:18.41	09:34:20.39			3%
Story 3	N6	Excessive Blinking	0.39	1.97	2.38629	5	124.06	09:33:35.62	09:35:39.68	Left	Left	2%
Story 3	N6	Eye contact	1.47	57.46	18.6131	39	124.06	09:33:35.62	09:35:39.68	2.386297	3.87	46%
Story 3	N6	12:00	0.53	0.53	0.477259	1	124.06	09:33:35.62	09:35:39.68			0%
Story 3	N6	3:00	0.23	0.47	0.954517	2	124.06	09:33:35.62	09:35:39.68	Right	Right	0%
Story 3	N6	4:30	1.13	3.40	1.43178	3	124.06	09:33:35.62	09:35:39.68	24.34011	55.64	3%
Story 3	N6	6:00	0.86	2.57	1.43178	3	124.06	09:33:35.62	09:35:39.68			2%
Story 3	N6	7:30	1.46	10.23	3.34081	7	124.06	09:33:35.62	09:35:39.68			8%
Story 3	N6	9:00	1.04	23.82	10.9769	23	124.06	09:33:35.62	09:35:39.68			19%
Story 3	N6	10:30	1.03	21.58	10.0224	21	124.06	09:33:35.62	09:35:39.68			17%
Story 3	N6	Closed	0.51	2.02	1.90903	4	124.06	09:33:35.62	09:35:39.68			2%
Story 4	N6	Excessive Blinking	0.45	4.53	4.95745	10	121.03	09:35:25.81	09:37:26.84	Left	Left	4%
Story 4	N6	Eye contact	2.50	62.52	12.3936	25	121.03	09:35:25.81	09:37:26.84	5.453185	12.27	52%
Story 4	N6	1:30	0.40	0.40	0.495745	1	121.03	09:35:25.81	09:37:26.84			0%
Story 4	N6	3:00	0.51	2.55	2.47872	5	121.03	09:35:25.81	09:37:26.84	Right	Right	2%
Story 4	N6	4:30	1.86	9.32	2.47872	5	121.03	09:35:25.81	09:37:26.84	13.38511	28.20	8%
Story 4	N6	6:00	1.81	10.83	2.97447	6	121.03	09:35:25.81	09:37:26.84			9%
Story 4	N6	7:30	1.56	6.23	1.98298	4	121.03	09:35:25.81	09:37:26.84			5%
Story 4	N6	9:00	0.71	7.07	4.95745	10	121.03	09:35:25.81	09:37:26.84			6%
Story 4	N6	10:30	1.15	14.90	6.44468	13	121.03	09:35:25.81	09:37:26.84			12%
Story 4	N6	Closed	0.53	2.67	2.47872	5	121.03	09:35:25.81	09:37:26.84			2%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Control/Baseline	N7	Eye contact	3.11	31.06	7.03911	10	85.24	15:15:29.13	15:16:54.37	Left	Left	36%
Control/Baseline	N7	12:00	2.33	6.99	2.11173	3	85.24	15:15:29.13	15:16:54.37	3.51956	10.53	8%
Control/Baseline	N7	1:30	2.11	10.53	3.51956	5	85.24	15:15:29.13	15:16:54.37			12%
Control/Baseline	N7	6:00	2.54	20.34	5.63129	8	85.24	15:15:29.13	15:16:54.37	Right	Right	24%
Control/Baseline	N7	7:30	1.33	1.33	0.703911	1	85.24	15:15:29.13	15:16:54.37	4.927381	15.43	2%
Control/Baseline	N7	9:00	3.02	12.09	2.81565	4	85.24	15:15:29.13	15:16:54.37			14%
Control/Baseline	N7	10:30	1.00	2.01	1.40782	2	85.24	15:15:29.13	15:16:54.37			2%
Control/Baseline	N7	Closed	0.87	0.87	0.703911	1	85.24	15:15:29.13	15:16:54.37			1%
Somoan 1	N7	Eye contact	1.04	11.43	9.26134	11	71.26	15:17:35.41	15:18:46.68	Left	Left	16%
Somoan 1	N7	12:00	0.71	2.13	2.52582	3	71.26	15:17:35.41	15:18:46.68	10.94522	9.13	3%
Somoan 1	N7	1:30	0.91	4.57	4.2097	5	71.26	15:17:35.41	15:18:46.68			6%
Somoan 1	N7	3:00	0.73	1.47	1.68388	2	71.26	15:17:35.41	15:18:46.68	Right	Right	2%
Somoan 1	N7	4:30	0.52	3.10	5.05164	6	71.26	15:17:35.41	15:18:46.68	18.52268	15.28	4%
Somoan 1	N7	6:00	1.48	32.51	18.5227	22	71.26	15:17:35.41	15:18:46.68			46%
Somoan 1	N7	7:30	0.69	7.55	9.26134	11	71.26	15:17:35.41	15:18:46.68			11%
Somoan 1	N7	9:00	0.77	4.60	5.05164	6	71.26	15:17:35.41	15:18:46.68			6%
Somoan 1	N7	10:30	0.63	3.13	4.2097	5	71.26	15:17:35.41	15:18:46.68			4%
Somoan 1	N7	Closed	0.77	0.77	0.84194	1	71.26	15:17:35.41	15:18:46.68			1%
Somoan 2	N7	Eye contact	0.90	1.80	1.58009	2	75.95	15:18:06.41	15:19:22.36	Left	Left	2%
Somoan 2	N7	12:00	0.67	4.03	4.74027	6	75.95	15:18:06.41	15:19:22.36	22.91129	28.12	5%
Somoan 2	N7	1:30	0.75	6.01	6.32036	8	75.95	15:18:06.41	15:19:22.36			8%
Somoan 2	N7	3:00	0.73	3.67	3.95023	5	75.95	15:18:06.41	15:19:22.36	Right	Right	5%
Somoan 2	N7	4:30	1.15	18.44	12.6407	16	75.95	15:18:06.41	15:19:22.36	11.85069	16.85	24%
Somoan 2	N7	6:00	1.68	25.13	11.8507	15	75.95	15:18:06.41	15:19:22.36			33%
Somoan 2	N7	7:30	1.34	9.37	5.53032	7	75.95	15:18:06.41	15:19:22.36			12%
Somoan 2	N7	9:00	1.26	6.30	3.95023	5	75.95	15:18:06.41	15:19:22.36			8%
Somoan 2	N7	10:30	0.40	1.19	2.37014	3	75.95	15:18:06.41	15:19:22.36			2%
Somoan 3	N7	Eye contact	2.68	8.03	2.56674	3	70.13	15:19:00.01	15:20:10.14	Left	Left	11%
Somoan 3	N7	12:00	0.30	0.30	0.855578	1	70.13	15:19:00.01	15:20:10.14	9.41137	22.13	0%
Somoan 3	N7	1:30	0.92	1.83	1.71116	2	70.13	15:19:00.01	15:20:10.14			3%
Somoan 3	N7	3:00	0.90	1.80	1.71116	2	70.13	15:19:00.01	15:20:10.14	Right	Right	3%
Somoan 3	N7	4:30	2.64	18.50	5.98905	7	70.13	15:19:00.01	15:20:10.14	9.411368	17.84	26%
Somoan 3	N7	6:00	2.40	21.58	7.70021	9	70.13	15:19:00.01	15:20:10.14			31%
Somoan 3	N7	7:30	1.84	12.87	5.98905	7	70.13	15:19:00.01	15:20:10.14			18%
Somoan 3	N7	9:00	1.59	4.77	2.56674	3	70.13	15:19:00.01	15:20:10.14			7%
Somoan 3	N7	10:30	0.20	0.20	0.855578	1	70.13	15:19:00.01	15:20:10.14			0%
Somoan 3	N7	Closed	0.23	0.23	0.855578	1	70.13	15:19:00.01	15:20:10.14			0%
Somoan 4	N7	Eye contact	1.15	5.75	6.44413	5	46.55	15:19:19.91	15:20:06.46	Left	Left	12%
Somoan 4	N7	12:00	1.07	1.07	1.28883	1	46.55	15:19:19.91	15:20:06.46	16.75474	16.23	2%
Somoan 4	N7	1:30	1.09	5.43	6.44413	5	46.55	15:19:19.91	15:20:06.46			12%
Somoan 4	N7	3:00	0.68	2.03	3.86648	3	46.55	15:19:19.91	15:20:06.46	Right	Right	4%
Somoan 4	N7	4:30	1.75	8.77	6.44413	5	46.55	15:19:19.91	15:20:06.46	16.75471	18.19	19%
Somoan 4	N7	6:00	1.33	5.30	5.1553	4	46.55	15:19:19.91	15:20:06.46			11%
Somoan 4	N7	7:30	1.73	15.55	11.5994	9	46.55	15:19:19.91	15:20:06.46			33%
Somoan 4	N7	9:00	0.70	2.11	3.86648	3	46.55	15:19:19.91	15:20:06.46			5%
Somoan 4	N7	10:30	0.53	0.53	1.28883	1	46.55	15:19:19.91	15:20:06.46			1%
Story 1	N7	Eye contact	2.03	32.41	12.8578	16	73.10	15:15:54.94	15:17:08.05	Left	Left	44%
Story 1	N7	12:00	1.61	4.83	2.41083	3	73.10	15:15:54.94	15:17:08.05	6.428891	5.40	7%
Story 1	N7	1:30	1.10	1.10	0.803611	1	73.10	15:15:54.94	15:17:08.05			2%
Story 1	N7	4:30	0.61	4.30	5.62528	7	73.10	15:15:54.94	15:17:08.05	Right	Right	6%
Story 1	N7	6:00	1.33	13.31	8.03611	10	73.10	15:15:54.94	15:17:08.05	12.85777	16.58	18%
Story 1	N7	7:30	0.94	9.45	8.03611	10	73.10	15:15:54.94	15:17:08.05			13%
Story 1	N7	9:00	1.31	6.56	4.01805	5	73.10	15:15:54.94	15:17:08.05			9%
Story 1	N7	10:30	0.57	0.57	0.803611	1	73.10	15:15:54.94	15:17:08.05			1%
Story 1	N7	Closed	0.57	0.57	0.803611	1	73.10	15:15:54.94	15:17:08.05			1%
Story 2	N7	Eye contact	1.94	29.14	8.40328	15	105.51	15:16:23.08	15:18:08.58	Left	Left	28%
Story 2	N7	1:30	0.83	3.34	2.24088	4	105.51	15:16:23.08	15:18:08.58	5.04198	11.77	3%
Story 2	N7	3:00	1.67	5.00	1.68066	3	105.51	15:16:23.08	15:18:08.58			5%
Story 2	N7	4:30	1.72	3.43	1.12044	2	105.51	15:16:23.08	15:18:08.58	Right	Right	3%
Story 2	N7	6:00	3.02	21.17	3.92153	7	105.51	15:16:23.08	15:18:08.58	14.56569	43.15	20%
Story 2	N7	7:30	3.46	24.20	3.92153	7	105.51	15:16:23.08	15:18:08.58			23%
Story 2	N7	9:00	1.15	14.95	7.28285	13	105.51	15:16:23.08	15:18:08.58			14%
Story 2	N7	10:30	0.67	4.00	3.36131	6	105.51	15:16:23.08	15:18:08.58			4%
Story 2	N7	Closed	0.27	0.27	0.560219	1	105.51	15:16:23.08	15:18:08.58			0%
Story 3	N7	Eye contact	1.20	13.20	6.64874	11	99.27	15:16:52.60	15:18:31.87	Left	Left	13%
Story 3	N7	12:00	0.50	4.51	5.43987	9	99.27	15:16:52.60	15:18:31.87	5.43987	6.12	5%
Story 3	N7	1:30	0.70	4.92	4.23101	7	99.27	15:16:52.60	15:18:31.87			5%
Story 3	N7	3:00	0.37	0.37	0.60443	1	99.27	15:16:52.60	15:18:31.87	Right	Right	0%
Story 3	N7	4:30	0.83	0.83	0.60443	1	99.27	15:16:52.60	15:18:31.87	18.13291	65.32	1%
Story 3	N7	6:00	3.10	9.30	1.81329	3	99.27	15:16:52.60	15:18:31.87			9%
Story 3	N7	7:30	5.75	45.97	4.83544	8	99.27	15:16:52.60	15:18:31.87			46%
Story 3	N7	9:00	1.05	13.65	7.8576	13	99.27	15:16:52.60	15:18:31.87			14%
Story 3	N7	10:30	0.63	5.70	5.43987	9	99.27	15:16:52.60	15:18:31.87			6%
Story 3	N7	Closed	0.80	0.80	0.60443	1	99.27	15:16:52.60	15:18:31.87			1%
Story 4	N7	Eye contact	1.56	21.88	15.85	14	52.87	15:17:11.95	15:18:04.82	Left	Left	41%
Story 4	N7	12:00	0.81	0.81	1.13214	1	52.87	15:17:11.95	15:18:04.82	2.26428	1.55	2%
Story 4	N7	1:30	0.87	0.87	1.13214	1	52.87	15:17:11.95	15:18:04.82			2%
Story 4	N7	3:00	0.68	0.68	1.13214	1	52.87	15:17:11.95	15:18:04.82	Right	Right	1%
Story 4	N7	6:00	1.92	5.77	3.39642	3	52.87	15:17:11.95	15:18:04.82	19.24638	22.85	11%
Story 4	N7	7:30	3.56	10.67	3.39642	3	52.87	15:17:11.95	15:18:04.82			20%
Story 4	N7	9:00	0.98	9.85	11.3214	10	52.87	15:17:11.95	15:18:04.82			19%
Story 4	N7	10:30	0.58	2.33	4.52856	4	52.87	15:17:11.95	15:18:04.82			4%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Control/Baseline	N8	Eye contact	3.07	144.31	11.7993	47	238.24	17:36:41.22	17:40:39.46	Left	Left	61%
Control/Baseline	N8	12:00	0.62	5.00	2.00839	8	238.24	17:36:41.22	17:40:39.46	8.78673	32.91	2%
Control/Baseline	N8	1:30	1.19	13.04	2.76154	11	238.24	17:36:41.22	17:40:39.46			5%
Control/Baseline	N8	3:00	0.90	5.40	1.5063	6	238.24	17:36:41.22	17:40:39.46	Right	Right	2%
Control/Baseline	N8	4:30	0.80	14.47	4.51889	18	238.24	17:36:41.22	17:40:39.46	14.3098	46.56	6%
Control/Baseline	N8	6:00	0.76	9.09	3.01259	12	238.24	17:36:41.22	17:40:39.46			4%
Control/Baseline	N8	7:30	0.88	25.49	7.28043	29	238.24	17:36:41.22	17:40:39.46			11%
Control/Baseline	N8	9:00	0.79	15.08	4.76993	19	238.24	17:36:41.22	17:40:39.46			6%
Control/Baseline	N8	10:30	0.67	5.99	2.25944	9	238.24	17:36:41.22	17:40:39.46			3%
Control/Baseline	N8	Closed	0.37	0.37	0.251049	1	238.24	17:36:41.22	17:40:39.46			0%
Somoan 1	N8	Eye contact	2.53	40.42	6.60911	16	144.86	17:39:15.53	17:41:40.39	Left	Left	28%
Somoan 1	N8	12:00	1.38	9.64	2.89149	7	144.86	17:39:15.53	17:41:40.39	7.84832	52.83	7%
Somoan 1	N8	1:30	3.24	48.60	6.19604	15	144.86	17:39:15.53	17:41:40.39			34%
Somoan 1	N8	3:00	0.93	0.93	0.41307	1	144.86	17:39:15.53	17:41:40.39	Right	Right	1%
Somoan 1	N8	4:30	1.10	3.30	1.23921	3	144.86	17:39:15.53	17:41:40.39	4.543768	17.80	2%
Somoan 1	N8	6:00	3.02	24.16	3.30456	8	144.86	17:39:15.53	17:41:40.39			17%
Somoan 1	N8	7:30	1.53	3.07	0.826139	2	144.86	17:39:15.53	17:41:40.39			2%
Somoan 1	N8	9:00	1.85	3.70	0.826139	2	144.86	17:39:15.53	17:41:40.39			3%
Somoan 1	N8	10:30	1.58	11.03	2.89149	7	144.86	17:39:15.53	17:41:40.39			8%
Somoan 2	N8	Eye contact	0.56	2.24	1.59841	4	149.22	17:40:27.88	17:42:57.10	Left	Left	1%
Somoan 2	N8	12:00	2.17	13.00	2.39762	6	149.22	17:40:27.88	17:42:57.10	1.998016	4.34	9%
Somoan 2	N8	1:30	0.79	2.37	1.19881	3	149.22	17:40:27.88	17:42:57.10			2%
Somoan 2	N8	4:30	0.98	1.97	0.799206	2	149.22	17:40:27.88	17:42:57.10	Right	Right	1%
Somoan 2	N8	6:00	2.26	13.57	2.39762	6	149.22	17:40:27.88	17:42:57.10	15.18492	116.07	9%
Somoan 2	N8	7:30	1.35	13.54	3.99603	10	149.22	17:40:27.88	17:42:57.10			9%
Somoan 2	N8	9:00	4.07	73.30	7.19286	18	149.22	17:40:27.88	17:42:57.10			49%
Somoan 2	N8	10:30	2.92	29.23	3.99603	10	149.22	17:40:27.88	17:42:57.10			20%
Somoan 3	N8	12:00	0.83	2.48	2.53696	3	70.12	17:40:57.33	17:42:07.46	Left	Left	4%
Somoan 3	N8	7:30	1.87	3.74	1.69131	2	70.12	17:40:57.33	17:42:07.46	0	0	5%
Somoan 3	N8	9:00	3.99	43.93	9.30219	11	70.12	17:40:57.33	17:42:07.46	Right	Right	63%
Somoan 3	N8	10:30	2.00	19.97	8.45654	10	70.12	17:40:57.33	17:42:07.46	19.45004	67.63	28%
Somoan 4	N8	Eye contact	0.67	0.67	0.397857	1	150.61	17:41:16.78	17:43:47.40	Left	Left	0%
Somoan 4	N8	12:00	4.43	8.87	0.795714	2	150.61	17:41:16.78	17:43:47.40	0	0	6%
Somoan 4	N8	6:00	4.37	13.10	1.19357	3	150.61	17:41:16.78	17:43:47.40			9%
Somoan 4	N8	7:30	2.46	41.85	6.76357	17	150.61	17:41:16.78	17:43:47.40	Right	Right	28%
Somoan 4	N8	9:00	3.35	63.66	7.55928	19	150.61	17:41:16.78	17:43:47.40	19.89285	127.97	42%
Somoan 4	N8	10:30	1.60	22.46	5.57	14	150.61	17:41:16.78	17:43:47.40			15%
Story 1	N8	Eye contact	2.82	59.26	11.8189	21	106.61	17:37:08.64	17:38:55.25	Left	Left	56%
Story 1	N8	12:00	0.71	6.43	5.06524	9	106.61	17:37:08.64	17:38:55.25	12.9445	31.07	6%
Story 1	N8	1:30	1.18	14.20	6.75365	12	106.61	17:37:08.64	17:38:55.25			13%
Story 1	N8	3:00	1.83	12.83	3.93963	7	106.61	17:37:08.64	17:38:55.25	Right	Right	12%
Story 1	N8	4:30	1.01	4.03	2.25122	4	106.61	17:37:08.64	17:38:55.25	5.065234	9.84	4%
Story 1	N8	7:30	1.07	3.21	1.68841	3	106.61	17:37:08.64	17:38:55.25			3%
Story 1	N8	9:00	0.20	0.20	0.562804	1	106.61	17:37:08.64	17:38:55.25			0%
Story 1	N8	10:30	1.29	6.43	2.81402	5	106.61	17:37:08.64	17:38:55.25			6%
Story 2	N8	Eye contact	3.15	78.63	9.42922	25	159.08	17:37:37.29	17:40:16.37	Left	Left	49%
Story 2	N8	12:00	0.65	3.27	1.88584	5	159.08	17:37:37.29	17:40:16.37	15.84108	73.77	2%
Story 2	N8	1:30	2.03	40.67	7.54337	20	159.08	17:37:37.29	17:40:16.37			26%
Story 2	N8	3:00	1.16	20.87	6.78904	18	159.08	17:37:37.29	17:40:16.37	Right	Right	13%
Story 2	N8	4:30	3.06	12.23	1.50867	4	159.08	17:37:37.29	17:40:16.37	0.754337	3.41	8%
Story 2	N8	7:30	1.70	3.41	0.754337	2	159.08	17:37:37.29	17:40:16.37			2%
Story 3	N8	Eye contact	2.81	16.83	5.35619	6	67.21	17:38:16.50	17:39:23.71	Left	Left	25%
Story 3	N8	1:30	10.01	40.03	3.57079	4	67.21	17:38:16.50	17:39:23.71	7.14159	48.53	60%
Story 3	N8	3:00	0.63	1.27	1.7854	2	67.21	17:38:16.50	17:39:23.71			2%
Story 3	N8	4:30	3.62	7.23	1.7854	2	67.21	17:38:16.50	17:39:23.71	Right	Right	11%
Story 3	N8	7:30	0.92	1.84	1.7854	2	67.21	17:38:16.50	17:39:23.71	1.7854	1.84	3%
Story 4	N8	Eye contact	2.40	43.16	8.08571	18	133.57	17:38:47.53	17:41:01.10	Left	Left	32%
Story 4	N8	12:00	0.98	7.83	3.59365	8	133.57	17:38:47.53	17:41:01.10	8.0857	51.90	6%
Story 4	N8	1:30	2.15	19.33	4.04285	9	133.57	17:38:47.53	17:41:01.10			14%
Story 4	N8	3:00	3.40	13.60	1.79682	4	133.57	17:38:47.53	17:41:01.10	Right	Right	10%
Story 4	N8	4:30	3.79	18.97	2.24603	5	133.57	17:38:47.53	17:41:01.10	9.88253	26.25	14%
Story 4	N8	6:00	0.89	4.43	2.24603	5	133.57	17:38:47.53	17:41:01.10			3%
Story 4	N8	7:30	0.77	3.87	2.24603	5	133.57	17:38:47.53	17:41:01.10			3%
Story 4	N8	9:00	2.06	18.54	4.04285	9	133.57	17:38:47.53	17:41:01.10			14%
Story 4	N8	10:30	0.48	3.83	3.59365	8	133.57	17:38:47.53	17:41:01.10			3%

Observations	Subjects	Behaviors	Mean	Total duration	Rate per minute (observation duration)	Total number	Duration	Start time	Stop time	L/R RPM	L/R Duration	% per minute
Control/Baseline	N9	Eye contact	4.84	193.62	9.28186	40	258.57	18:25:05.94	18:29:24.51	Left	Left	75%
Control/Baseline	N9	12:00	1.07	6.39	1.39228	6	258.57	18:25:05.94	18:29:24.51	5.569109	20.33	2%
Control/Baseline	N9	1:30	0.83	10.83	3.0166	13	258.57	18:25:05.94	18:29:24.51			4%
Control/Baseline	N9	3:00	0.92	7.33	1.85637	8	258.57	18:25:05.94	18:29:24.51	Right	Right	3%
Control/Baseline	N9	4:30	0.72	2.17	0.696139	3	258.57	18:25:05.94	18:29:24.51	5.569116	20.55	1%
Control/Baseline	N9	6:00	1.96	17.67	2.08842	9	258.57	18:25:05.94	18:29:24.51			7%
Control/Baseline	N9	7:30	0.92	8.27	2.08842	9	258.57	18:25:05.94	18:29:24.51			3%
Control/Baseline	N9	9:00	0.81	8.95	2.55251	11	258.57	18:25:05.94	18:29:24.51			3%
Control/Baseline	N9	10:30	0.83	3.33	0.928186	4	258.57	18:25:05.94	18:29:24.51			1%
Somoan 1	N9	Eye contact	1.78	31.97	15.4792	18	69.77	18:28:15.62	18:29:25.39	Left	Left	46%
Somoan 1	N9	12:00	1.93	1.93	0.859956	1	69.77	18:28:15.62	18:29:25.39	0.859956	0.47	3%
Somoan 1	N9	4:30	0.47	0.47	0.859956	1	69.77	18:28:15.62	18:29:25.39			1%
Somoan 1	N9	6:00	0.97	11.70	10.3195	12	69.77	18:28:15.62	18:29:25.39	Right	Right	17%
Somoan 1	N9	7:30	1.38	17.96	11.1794	13	69.77	18:28:15.62	18:29:25.39	16.33914	23.33	26%
Somoan 1	N9	9:00	0.89	5.37	5.15974	6	69.77	18:28:15.62	18:29:25.39			8%
Somoan 1	N9	Closed	0.37	0.37	0.859956	1	69.77	18:28:15.62	18:29:25.39			1%
Somoan 2	N9	Eye contact	0.81	18.72	16.0054	23	85.69	18:28:39.50	18:30:05.19	Left	Left	22%
Somoan 2	N9	12:00	0.70	2.10	2.08766	3	85.69	18:28:39.50	18:30:05.19	9.04652	12.20	2%
Somoan 2	N9	1:30	0.98	4.90	3.47943	5	85.69	18:28:39.50	18:30:05.19			6%
Somoan 2	N9	3:00	0.91	7.30	5.56709	8	85.69	18:28:39.50	18:30:05.19	Right	Right	9%
Somoan 2	N9	6:00	0.53	1.60	2.08766	3	85.69	18:28:39.50	18:30:05.19	30.61907	50.43	2%
Somoan 2	N9	7:30	1.43	25.66	12.526	18	85.69	18:28:39.50	18:30:05.19			30%
Somoan 2	N9	9:00	0.99	23.70	16.7013	24	85.69	18:28:39.50	18:30:05.19			28%
Somoan 2	N9	10:30	0.53	1.07	1.39177	2	85.69	18:28:39.50	18:30:05.19			1%
Somoan 2	N9	Closed	0.32	0.63	1.39177	2	85.69	18:28:39.50	18:30:05.19			1%
Somoan 3	N9	Eye contact	1.42	19.93	14.0706	14	59.70	18:30:36.35	18:31:36.05	Left	Left	33%
Somoan 3	N9	12:00	0.48	1.93	4.02017	4	59.70	18:30:36.35	18:31:36.05	7.03529	3.50	3%
Somoan 3	N9	1:30	0.39	1.93	5.02521	5	59.70	18:30:36.35	18:31:36.05			3%
Somoan 3	N9	3:00	1.10	1.10	1.00504	1	59.70	18:30:36.35	18:31:36.05	Right	Right	2%
Somoan 3	N9	4:30	0.47	0.47	1.00504	1	59.70	18:30:36.35	18:31:36.05	26.13108	30.82	1%
Somoan 3	N9	6:00	0.50	3.51	7.03529	7	59.70	18:30:36.35	18:31:36.05			6%
Somoan 3	N9	7:30	1.74	22.63	13.0655	13	59.70	18:30:36.35	18:31:36.05			38%
Somoan 3	N9	9:00	0.64	7.06	11.0555	11	59.70	18:30:36.35	18:31:36.05			12%
Somoan 3	N9	10:30	0.57	1.13	2.01008	2	59.70	18:30:36.35	18:31:36.05			2%
Somoan 4	N9	Eye contact	1.03	12.37	14.1573	12	50.86	18:31:09.75	18:32:00.60	Left	Left	24%
Somoan 4	N9	12:00	0.50	0.50	1.17978	1	50.86	18:31:09.75	18:32:00.60	10.61801	6.03	1%
Somoan 4	N9	1:30	1.03	2.07	2.35956	2	50.86	18:31:09.75	18:32:00.60			4%
Somoan 4	N9	3:00	0.60	3.00	5.89889	5	50.86	18:31:09.75	18:32:00.60	Right	Right	6%
Somoan 4	N9	4:30	0.48	0.97	2.35956	2	50.86	18:31:09.75	18:32:00.60	37.75298	30.51	2%
Somoan 4	N9	6:00	0.72	1.43	2.35956	2	50.86	18:31:09.75	18:32:00.60			3%
Somoan 4	N9	7:30	1.06	17.03	18.8765	16	50.86	18:31:09.75	18:32:00.60			33%
Somoan 4	N9	9:00	0.84	12.58	17.6967	15	50.86	18:31:09.75	18:32:00.60			25%
Somoan 4	N9	10:30	0.90	0.90	1.17978	1	50.86	18:31:09.75	18:32:00.60			2%
Story 1	N9	Eye contact	3.24	61.55	12.2546	19	91.10	18:25:41.95	18:27:13.05	Left	Left	68%
Story 1	N9	12:00	1.06	3.17	1.93494	3	91.10	18:25:41.95	18:27:13.05	2.57992	3.07	3%
Story 1	N9	1:30	0.77	3.07	2.57992	4	91.10	18:25:41.95	18:27:13.05			3%
Story 1	N9	6:00	1.17	7.04	3.86989	6	91.10	18:25:41.95	18:27:13.05	Right	Right	8%
Story 1	N9	7:30	1.48	8.90	3.86989	6	91.10	18:25:41.95	18:27:13.05	10.96468	15.60	10%
Story 1	N9	9:00	0.61	4.30	4.51487	7	91.10	18:25:41.95	18:27:13.05			5%
Story 1	N9	10:30	0.60	2.40	2.57992	4	91.10	18:25:41.95	18:27:13.05			3%
Story 1	N9	Closed	0.33	0.67	1.28996	2	91.10	18:25:41.95	18:27:13.05			1%
Story 2	N9	Eye contact	4.08	89.79	11.4028	22	115.76	18:26:26.33	18:28:22.09	Left	Left	78%
Story 2	N9	12:00	0.25	0.50	1.03662	2	115.76	18:26:26.33	18:28:22.09	5.701399	9.04	0%
Story 2	N9	1:30	0.86	6.01	3.62816	7	115.76	18:26:26.33	18:28:22.09			5%
Story 2	N9	3:00	0.86	2.57	1.55493	3	115.76	18:26:26.33	18:28:22.09	Right	Right	2%
Story 2	N9	4:30	0.47	0.47	0.518309	1	115.76	18:26:26.33	18:28:22.09	5.1831	10.69	0%
Story 2	N9	6:00	0.91	4.53	2.59155	5	115.76	18:26:26.33	18:28:22.09			4%
Story 2	N9	7:30	1.28	7.67	3.10986	6	115.76	18:26:26.33	18:28:22.09			7%
Story 2	N9	9:00	0.75	3.01	2.07324	4	115.76	18:26:26.33	18:28:22.09			3%
Story 2	N9	Closed	0.40	1.20	1.55493	3	115.76	18:26:26.33	18:28:22.09			1%
Story 3	N9	Eye contact	3.78	83.21	11.5783	22	114.01	18:26:48.02	18:28:42.03	Left	Left	73%
Story 3	N9	12:00	1.77	3.53	1.05258	2	114.01	18:26:48.02	18:28:42.03	3.157728	3.65	3%
Story 3	N9	1:30	0.73	2.20	1.57886	3	114.01	18:26:48.02	18:28:42.03			2%
Story 3	N9	3:00	0.41	0.82	1.05258	2	114.01	18:26:48.02	18:28:42.03	Right	Right	1%
Story 3	N9	4:30	0.63	0.63	0.526288	1	114.01	18:26:48.02	18:28:42.03	9.473188	18.63	1%
Story 3	N9	6:00	2.48	4.97	1.05258	2	114.01	18:26:48.02	18:28:42.03			4%
Story 3	N9	7:30	1.13	11.31	5.26288	10	114.01	18:26:48.02	18:28:42.03			10%
Story 3	N9	9:00	0.89	6.23	3.68402	7	114.01	18:26:48.02	18:28:42.03			5%
Story 3	N9	10:30	1.10	1.10	0.526288	1	114.01	18:26:48.02	18:28:42.03			1%
Story 4	N9	Eye contact	2.18	37.10	17.102	17	59.64	18:27:10.04	18:28:09.68	Left	Left	62%
Story 4	N9	12:00	2.23	2.23	1.006	1	59.64	18:27:10.04	18:28:09.68	3.018	1.47	4%
Story 4	N9	1:30	0.52	1.03	2.012	2	59.64	18:27:10.04	18:28:09.68			2%
Story 4	N9	3:00	0.43	0.43	1.006	1	59.64	18:27:10.04	18:28:09.68	Right	Right	1%
Story 4	N9	6:00	0.57	1.13	2.012	2	59.64	18:27:10.04	18:28:09.68	13.07803	17.30	2%
Story 4	N9	7:30	1.67	15.00	9.05402	9	59.64	18:27:10.04	18:28:09.68			25%
Story 4	N9	9:00	0.58	1.73	3.01801	3	59.64	18:27:10.04	18:28:09.68			3%
Story 4	N9	10:30	0.57	0.57	1.006	1	59.64	18:27:10.04	18:28:09.68			1%
Story 4	N9	Closed	0.40	0.40	1.006	1	59.64	18:27:10.04	18:28:09.68			1%

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