

**THE SELF-ORGANIZATION OF FRAMES: MEASURING STABLE  
COMMUNICATION PATTERNS IN DYADIC INTERACTIONS**

**by**

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**A thesis submitted in conformity with the requirements  
for the degree of Master of Arts  
Department of Human Development and Applied Psychology  
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The Self-Organization of Frames: Measuring Stable Communication Patterns In Dyadic Interactions

## **Abstract**

There is a substantial body of literature exploring dyadic communication process; however, many studies measure communication patterns as a linear ordering of behaviours and do not capture the recursive nature of human communication. Stable patterns of communication, called frames, emerge from the recursive interaction of verbal and non-verbal behaviours. The present study examined the impact that emotional intensity has on the emergence of frames. This thesis introduces a method of identifying and measuring frames by accounting for the recursive nature of human communication.

Six couples were observed having a conversation at three different levels of emotional tension. By applying dynamic systems principles and conducting a sequential analysis, it was possible to identify frames. The results show that as emotional tension increases frames emerge from the interaction of the couple's verbal and non-verbal behaviours. State space grids are used to depict the results as well as characterize styles of interaction. The discussion explores possible implications of this methodology for social-psychological and clinical research.

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## Table of Contents

<b>Abstract</b>	<b>i</b>
<b>Acknowledgements</b>	<b>ii</b>
<b>Table of Contents</b>	<b>iii</b>
<b>List of Tables</b>	<b>v</b>
<b>List of Figures</b>	<b>vi</b>
<b>Chapter 1</b>	<b>1</b>
<b>Introduction</b>	<b>1</b>
<b>Exploring Dyadic Communication</b>	<b>3</b>
<b>Understanding the Influence of Emotion on Interpersonal Communication</b>	<b>4</b>
<b>Measuring Dyadic Interactions</b>	<b>7</b>
<b>Operationalizing and Measuring Frames</b>	<b>8</b>
<b>Sequential Analysis of an Interaction: Studying Behaviours On-line</b>	<b>10</b>
<b>Dynamic Systems Approach: An Overview</b>	<b>10</b>
<b>Dynamic Systems and Dyadic Communication</b>	<b>12</b>
<b>Design of the Present Study</b>	<b>12</b>
<b>Research Questions</b>	<b>14</b>
<b>Research Hypotheses</b>	<b>14</b>
<b>Chapter 2</b>	<b>15</b>
<b>Method</b>	<b>15</b>
<b>Participants</b>	<b>15</b>
<b>Procedure</b>	<b>16</b>
<b>Verbal and Non-Verbal Coding Schemes</b>	<b>17</b>
<b>Coding Procedures</b>	<b>18</b>
<b>Data Analysis Procedures</b>	<b>20</b>
<b>Manipulation Check</b>	<b>20</b>
<b>Sequential Analysis: Identifying and Measuring the Strength of Frames</b>	<b>21</b>
<b>Measuring the Strength of the Frames across the Segments</b>	<b>21</b>
<b>Depicting the Strong Frames</b>	<b>22</b>

<b>Chapter 3</b>	<b>23</b>
<b>Results</b>	<b>23</b>
<b>Manipulation Check</b>	<b>23</b>
<b>Sequential Analysis</b>	<b>24</b>
<b>Hypothesis #1</b>	<b>24</b>
<b>Hypothesis #2</b>	<b>24</b>
<b>Hypothesis #3</b>	<b>25</b>
<b>Chapter 4</b>	<b>27</b>
<b>Discussion</b>	<b>27</b>
<b>Characterizing Styles of Interaction</b>	<b>29</b>
<b>Limitations of the Study</b>	<b>34</b>
<b>Implications of the Study</b>	<b>36</b>
<b>Conclusion</b>	<b>37</b>
<b>References</b>	<b>39</b>
<b>Appendix A: Letter to Potential Participant</b>	<b>55</b>
<b>Appendix B: Informed Consent Form</b>	<b>56</b>
<b>Appendix C: Demographic Questionnaire</b>	<b>57</b>
<b>Appendix D: Description of Emotional Events</b>	<b>58</b>
<b>Appendix E: Tardif Coding Scheme For Verbal Content</b>	<b>59</b>
<b>Appendix F: Tardif Coding Scheme for Affective (Nonverbal Behaviour) Cues</b>	<b>60</b>

## List of Tables

<b>Table 1: Demographic Information</b>	<b>46</b>
<b>Table 2: Coding Scheme For Affect: Verbal Content and Non-Verbal Behaviours</b>	<b>46</b>
<b>Table 3: Frequency Count of Aversive Codes</b>	<b>47</b>
<b>Table 4: Frequency of Autotransitions Across the Segments</b>	<b>48</b>
<b>Table 5: Autotransitions Within Each Segment for Each Dyad</b>	<b>49</b>
<b>Table 6: Number of Frames and Number of Strong Frames</b>	<b>51</b>

## List of Figures

<b>Figure 1: Manipulation Check: Increase of Dyadic Aversive Behaviours</b>	<b>47</b>
<b>Figure 2: Change in the Number of Strong Frames Across the Segments</b>	<b>52</b>



## **Chapter 1**

### **Introduction**

Over the past few decades, there has been substantial research on the topic of interpersonal communication, with a significant focus on the communication process within dyadic interactions. Research has included studies on information exchange processes (Argyle and Little, 1972; Bateson, 1972; Buck, 1984; Kellerman, 1987; Kendon, 1990; Thayer, 1972), marital satisfaction (Gottman, 1979; Gottman and Levenson, 1988; Nigel and Noller, 1998), and conflict resolution strategies (Canary and Stafford, 1994; Kelly, 1997; Samp & Solomon, 1998). The literature reveals two significant findings: first, stable patterns of communication are dependent on the quality of communication and the type of relationship (Duck, 1991; Millar and Rogers, 1987); and second, a person's level of affect will influence how she behaves and responds to particular actions (Buck, 1984; Rutter, 1985).

Understanding the dynamic nature of human communication can be achieved by identifying and measuring stable patterns of communication. However, few studies have measured the impact that emotional intensity has on stable patterns of communication (Duncan and Fiske, 1985; Kellerman, 1987). The purpose of this thesis is to introduce an innovative framework for analyzing the impact of increasing emotional tension on stable patterns of communication during a dyadic interaction.

The role of communication in an interaction is to organize and make sense of the information being exchanged between people (Kellerman, 1987). Fogel (1993) describes interpersonal communication as meaning-generating systems. Interpersonal communication is established through the exchange of verbal and non-verbal behaviours (Argyle, 1988; Buck, 1984; Heath and Bryant, 1992; Malandro and Barker, 1983; Rutter, 1985; Spencer, 1994). Verbal

and non-verbal behaviours are the means used to send a message, as well as to indicate an understanding of the meaning of the message (Argyle, 1988; Malandro and Barker, 1983; Rutter, 1985; Spencer, 1994).

Communication patterns are observable in the verbal and non-verbal messages expressed (Buck, 1991); however, the interaction of such behaviours occurring throughout the exchange is highly variable. The level of variability within an interaction creates a level of complexity that makes it appear as though there is nothing but disorganization. However, despite the seeming confusion, individuals can account for the variance and are able to make sense of the information in order to communicate effectively.

Recent research has focussed on measuring individuals' ability to organize information within interpersonal communication. Researchers have approached its intricate nature using notions developed from dynamic systems theory (e.g., Fogel, 1993; Heath and Bryant, 1992; Schapp, Buunk, and Kerkstra, 1988). According to this theory, the world is composed of patterns of interconnected relationships where each element of a system will influence, and will be influenced by the other (Capra, 1996). Dynamic systems theory offers a non-linear mathematical approach that enables one to study and understand the nature of interconnected relationships.

In the study of human communication, individuals exhibit patterns of behaviour containing information that is communicated to each other in a non-linear and multilevel manner (Nigel and Noller, 1998). Individuals often evaluate that information by assessing the affective meaning in the message. Theorists have stated that individuals evaluate the level of affect present in the information in order to respond to another person appropriately (Frijda, 1986; Lyons, 1980). From a research point of view, one needs to be able to measure emotion during the communication process before one can understand the impact of emotion on the process (Fogel,

1993). To further explore the influence of emotion on the communication process, a brief overview of the literature on dyadic communication and the influence of emotion on the dyadic interaction follows.

### **Exploring Dyadic Communication**

According to Buck (1984), communication originates as a linear process, beginning with a sender and ending with a receiver. Individuals receive and send information via facial expressions, speech, and gestures (Buck, 1984; Spencer, 1994). In a human communication system, each individual has the simultaneous role of sender and receiver of information, creating a recursive cycle of information transmission (Harries-Jones, 1995). Kellerman (1987) found that the ability to communicate is indicative of a recursive process inherent in dyadic communication.

Social cognition researchers have shown that individuals encode and decode messages in a variety of ways (Argyle, 1988; Rutter, 1985). Rutter (1985) refers to attribution theory when describing the process of decoding and encoding messages. Rutter (1985) states that individuals will make causal connections, or attributions, both to the source and to the content of the information when attempting to understand the meaning of a message. However, he does not explain how those attributions are developed or how they are transmitted during the interaction.

Researchers exploring the development of attributions within a dyadic interaction have found that individuals utilize previous experiences with the person as a means to make sense of that person's behaviour (Burgoon, 1993; Heath & Bryant, 1992; Roloff, 1981; Taylor and Altman, 1987). The finding is supported by Taylor and Altman (1987), who report that individuals draw on past experiences with the person in order to make appropriate attributions. Additionally, researchers have found that the message an individual exchanges is also

determined by the expectation of how the other person will respond (Kellerman, 1987; Roloff, 1987; Wolf and Etzel, 1982).

Burgoon (1993) states that an individual must be able to anticipate reactions from others in order to act accordingly. The ability to anticipate reactions suggests that individuals tend to prefer stability over chaos. Research has shown that the introduction of uncertainty into the communication process has the potential to produce expectancy violations, which may have negative consequences for the interaction, in the form of a conflict (Burgoon, 1993; Heath & Bryant, 1992). However, not all consequences need be negative. Planalp and Honeycutt (1985) found that while conflicts do arise, expectancy violations lead individuals to introduce a strategy in order to cope with various emotionally charged situations.

Strategies that may de-escalate a conflict have been observed by researchers (e.g. Rutter, 1985; Roloff, 1987). Rutter (1985) found that de-escalation of the conflict is more likely if one individual adjusts her behaviour, initiating a neutralizing element into the interaction. In fact, the introduction of uncertainty into the interaction may produce new, or creative, strategies for stabilizing communication (Fogel, 1993; Planalp & Honeycutt, 1985; Fogel, 1993), possibly leading the dyadic counterparts towards a better understanding and greater tolerance of each other.

### **Understanding the Influence of Emotion on Interpersonal Communication**

As suggested in the previous section, emotion plays an integral role in interpersonal communication. Berschield (1987) states that information transmission is always coupled with an affective component, alerting the receiver to the meaning of a message by illustrating and reinforcing what she is feeling (Berschield, 1987). Emotions can be seen as patterns of responses which prepare an individual to make suitable actions to whatever is occurring in her environment

(Dillard, 1987); in simpler terms, how an individual is feeling will impact on the interpretation of the verbal and non-verbal message, and on her subsequent response.

There is substantial debate in the literature over whether an emotion precedes an action or is a response to some action (Frijda, 1986; Dillard, 1987). One side of the debate states that an individual's emotion is the outcome of an appraisal of what is happening in her environment. For instance, a person's emotional response results from her interpretation of a message (Lazarus, 1991). Some argue, however, that an individual's reactions are mediated by the causal and evaluative aspects of an emotion (Lyons, 1980). According to this view, an emotion provides the basis for an action tendency (Frijda, 1986), causing one to behave in a way that reflects how she is feeling.

In fact, both sides of the debate are equally important in understanding the influence of emotion in a communication system. Specifically, what an individual is feeling at any point is the result of a process of situational evaluation, with the outcome of the evaluation determining the behavioural response (Lyons, 1980). Moreover, that feeling will influence how one regulates one's behaviour (Campos and Barrett, 1984).

An individual will regularly monitor and adjust her behaviour according to her emotional level (Campos and Barrett, 1984). Campos, Campos, and Barrett (1989) state that emotions themselves can be conceptualized as relational processes, with the ability of controlling or disrupting what is happening in an individual's environment. Wolf and Etzel (1982) found that individuals rely on their evaluations as a means of regulating the level of emotion in the interaction. However, Wolf and Etzel did not examine how regulation operates at the dyadic level. Specifically, what impact does the individual regulation process have on the dyadic

interaction? According to Fogel (1993), co-regulation is the key to understanding how individuals regulate the level of affect present in the interaction.

The process of co-regulation is an important component in any attempt to understand how stable patterns of communication develop in an interaction (Fogel, 1993). Co-regulation is the mutual co-ordination of actions during an interaction, and is achieved through the co-ordination of verbal and non-verbal actions (Rutter, 1985). Co-regulation can be observed throughout a conversation as an individual alters and adjusts her behaviour based on the other person's behaviour. Fogel (1993) states that this adjustment will impact on the topic of discussion. For example, if two people are feeling happy the topic of discussion will be positive (Roloff, 1981); on the other hand, if one person is angry and the other is indifferent, the topic being discussed can initially be positive but can quickly turn negative and start a conflict (Roloff, 1981). Co-regulation of the interaction is maintained by the individuals through the exchange of information embedded in their verbal and non-verbal behaviours. Furthermore, as illustrated in the above example, the topic of discussion may change as an individual's level of affect changes or stabilizes during the co-regulation process.

Social psychologists have tried to understand why, and how, the escalation and regulation of emotion persist in dyadic interactions (Buck, 1991; Burnett, 1987; Gottman, 1979; Gottman and Levenson, 1988). One line of thought is that once an emotion is expressed it serves a particular function (Frijda, 1986). Frijda (1986) suggests that these expressions are meant to modify another individual's behaviour during emotional situations. Thus, the expressions are a means of communicating emotion and intention through the verbal and non-verbal behaviours (Frijda, 1986). The next section provides an overview of the literature concerning the measurement of dyadic interactions.

## **Measuring Dyadic Interactions**

Research exploring dyadic interactions and interpersonal communication processes have been constrained by traditional methods of measurement and interpretations. Such methods have included: questionnaires (e.g., Noller and White, 1990); confederate influences (e.g., Argyle and Little, 1972); and summarizing frequency counts of behavioural events (e.g., Argyle, 1988; Rutter, Stephenson, Ayling, and White, 1978; Slugoski and Turnbull, 1988). While these approaches have provided a clear direction for research strategies, these methods cannot capture easily the recursive influence that behaviour sequences have on each other (Buck, 1984).

Researchers have argued that most research assumes that communication is best viewed as a linear ordering of events (e.g. Argyle, 1988). However, according to Buck (1984) the linear ordering is only one aspect to the examination of the sequence of individual actions. A thorough investigation of the dynamics of a dyadic interaction needs to investigate the non-linear patterns within the sequences of events in order to account for the recursive interaction of behaviour (Buck, 1984).

Research exploring group behaviour has contributed a number of insights into the study of dyadic interaction (Bateson, 1972; Fogel, 1993; Gottman, 1979). Several researchers have utilized the concept of frames in order to understand how information is communicated to each participant of an interaction (Bateson, 1972; Fogel, 1993; Fogel and Branco, 1997; Kendon, 1990). In social psychology, a frame is defined as a social situation containing a set of behaviours which control the situation and those individuals involved in the situation (Kendon, 1990). In this sense, behaviours can be conceived as consisting of discrete units within a stream of conversation. However, communication is continuous and the information contained in the

behaviours is constantly modified over time (Bateson, 1972; Fogel, 1993). Thus, while behaviour is seen as discrete units, the information processing process is far more complex.

Bateson (1972) states that individuals understand one another through the interpretation of a series of actions occurring within a certain period of time. Frames provide the means for understanding the context within which messages are transmitted (Bateson, 1972; Goffman, 1974). Frames stress the recursive process inherent in communication systems by highlighting the patterns that emerge within a certain period of time (Bateson, 1972; Bateson, 1991; Goffman, 1974; Kendon, 1990); however, frames have been used as a post hoc descriptor of individuals' behaviour (Fogel, 1993).

Kendon (1990) was the first to empirically test the occurrence of frames as a means of communication, by examining how frames develop during sequences of interactions. However, he did not offer a systematic way to measure frames throughout the interaction. More recently, Fogel (1993) has attempted to reinterpret and operationalize the concept of frames using the notions of co-regulation and continuous communication.

### **Operationalizing and Measuring Frames**

Fogel (1993) addresses the challenge of operationalizing frames within dyadic interactions by applying principles from dynamic systems theory as a means to explore the intrinsic influence that particular affective events has on human communication processes. Using the notion of continuous communication, Fogel (1993) identifies and examines the unique and recurrent characteristics of the behaviours occurring within a dyadic interaction.

He observed that information exchange occurring between two individuals is ordered, and that the actions of individuals during an interaction can be measured and understood by identifying frames. He combines the conventional definition of frames as a social situation with



the notion of continuous communication as the means to observe stable communication patterns (Fogel, 1993). Specifically, he states that frames, as stable patterns of interaction, are formed from a consensus between the participants regarding the topic and context within which a specific conversation occurs (Fogel, 1993). By observing and measuring the co-occurrence of any of the behaviours within an interaction one can identify a frame. Fogel (1993) suggests that the process of co-regulation is integral to a better understanding of the occurrence and recurrence of frames.

Frames emerge as stable patterns from the process of co-regulation, through the repetition of certain sets of behaviours. Since some combinations of behaviours become more prevalent than others, some frames will appear with greater frequency. By observing and measuring the co-occurrence of any of the behaviours within an interaction one can identify a frame, making it possible to develop an understanding of the strength and resiliency of some behaviours as they appear during dyadic exchanges.

Defining and operationalizing frames as a set of behaviours provides a framework for observing and measuring how the level of affect present in an interaction influences individuals' behaviours throughout the communication process. Recent developments in the measurement of dyadic interactions have adopted the notion of continuous communication in measuring stable patterns of interaction; methods of analysis have been developed as a means to capture the complexity of this notion (Argyle, 1988; Bakeman and Brownlee, 1980; Bakeman and Gottman, 1997; Buck, 1984; Duncan and Fiske, 1985; Gottman, 1979). Sequential analysis is currently used to examine different patterns of behaviours as they occur in real time (Argyle, 1988; Bakeman and Brownlee, 1980; Bakeman and Gottman, 1997; Duncan and Fiske, 1985; Gottman, 1979). The research reported here employed a sequential analysis within a dynamic

systems framework in order to uncover stable patterns of communication. The following section provides a brief overview of sequential analysis and dynamic systems.

### **Sequential Analysis of an Interaction: Studying Behaviours On-line**

The statistical analysis of sequences has been used as a research tool to examine interactional data (Argyle, 1988; Bakeman and Brownlee, 1980; Duncan and Fiske, 1985). The unit of analysis is an event, which can either be a single behaviour or a set of behaviours. The analysis is conducted on the transition from one event to another (Bakeman and Gottman, 1995). Since communication is recursive, sequential analysis is beneficial in that it takes previous events into account during the analysis; the real-time exchange of the behaviours is demonstrated by the frequency with which one event follows a preceding event compared across sequences or against a base rate of that event (Argyle, 1988; Bakeman and Gottman, 1995).

In the context of communication research, the real-time ordering of events can be measured as patterns of behaviours emerging within single events, and subsequently as transitions from one event to the next (Argyle, 1988; Gottman, 1990). A sequential analysis serves as the means by which we can analyze stable communication patterns of behaviour as frames. For example, research exploring mother-infant dyads has utilized sequential analysis as a means to understand whether there are particular behaviour sequences that are more likely to create healthy attachment patterns (Bakeman and Gottman, 1995). In this thesis, the frames are observed as sequences of behaviours in the stream of conversation between two individuals.

### **Dynamic Systems Approach: An Overview**

A Dynamic systems (DS) approach explores the complexity of the communication system by examining the recursive interaction of behaviours (Fogel and Thelen, 1987). DS principles and concepts have become popular in different areas of psychological research

(Abraham, 1995; van Geert, 1994; Port and van Gelder, 1995). Research utilizing a DS approach has been used in the areas of communication systems (Fogel, 1993), physical development (Fogel and Thelen, 1987), and socio-emotional development (Lewis, Lamey and Douglas, 1999). What follows is an overview of three key principles found in a DS approach. These principles -- attractors, control parameters, and self-organization -- provide a framework for reconceptualizing the nature of dyadic interactions.

Attractors represent long-term states in the communication system (Norton, 1995). Attractors emerge in the system as a result of the coupling of different elements (Lewis et al, 1999); that is, all behaviours converge into a single coherent action, or a stable state, at a specific point in time. For example, an individual may exhibit certain behaviours throughout a conversation despite changes to topic or situation. The consistent display of these behaviours under varying external conditions indicates that they are attractors.

Control parameters represent the constraints within which the system functions; they provide the set of conditions that affect the configuration of the system (Abraham, Abraham and Shaw, 1990). Altering a control parameter can cause a qualitative change in the system's stability (Port and van Gelder, 1997). This change can result in the emergence of new attractors or the recurrence of others (Abraham, Abraham and Shaw, 1990). For example, the temperature in a room can be seen as a control parameter (Harries-Jones, 1995). If the room becomes hotter, an individual may either leave the house or adjust the thermostat in order to cool the room. This example demonstrates that an individual will adjust her behaviour in relation to external conditions.

Self-organization is defined as the process by which new attractors emerge from the coordinated interaction of behaviours (Vallacher and Nowak, 1997). Using this definition, the

principle of self-organization is demonstrated by the emergence of highly coherent structures, through the interaction and co-ordination of lower level elements.

### **Dynamic Systems and Dyadic Communication**

Using a dynamic systems (DS) approach, a dyad is viewed as a behavioural system, with observable, stable patterns of communication in a synchronous dance of action and reaction. Fogel incorporates DS principles into his research by describing frames as self-organizing patterns or attractors (Fogel, 1993; Fogel and Branco, 1997). A change in the control parameter can cause a change in the configuration of the system, in such a way that certain patterns of interaction, or attractors, emerge more often than others. For instance, some frames can recur in different parts of a conversation, but new ones can emerge if the combination of behaviours changes.

As noted earlier, the three aforementioned DS principles (attractors, control parameters, and self-organization) provide a framework by which we can re-conceptualize the nature of dyadic interactions. The attractors are the frames that recur during the interaction. The control parameter is the level of negative affect present in the conversation. Self-organization is the process by which the co-ordination of those behaviours creates new frames or maintaining current ones. Using these principles as guides, the research forming the basis of this thesis was designed to measure and identify frames. It was hoped that the identification of frames would provide a sensitive tool for studying the impact of emotional intensity on conversation patterns.

### **Design of the Present Study**

This thesis utilizes a sequential analysis as a means of operationalizing frames as stable patterns of communication or, to use dynamic systems terms, attractors. Frames are embedded within the ordered sequences of verbal and non-verbal behaviours. In this study, a frame is

operationalized as the consecutive repetition of a behavioural event. Specifically, that same event must occur at least twice in a row; in other words, the second event must be the same as the first. The analysis is conducted on the transition of those events. For example, during a dyadic interaction a behavioural event described as facilitative may be followed by another facilitative event or an aversive event. The second person will also exhibit a particular behavioural event. Therefore, there are two behavioural events in a dyadic interaction at any one time. The two events are combined to produce a dyadic behavioural event. The observation of those consecutive dyadic behavioural events allows one to identify a frame. While there are many potential frames within any given interaction, those frames that recur demonstrate a stable patterning of behaviours in the communication process.

The number and type of frames present in the interaction can vary according to the level of affect present in the dyadic system. That is, the number of frames will vary according to the particular behaviours being displayed by each person. In order to assess the impact that emotional intensity has on the stable patterns of communication, the control parameter was altered by manipulating the level of negative affect in the interaction. Specifically, the control parameter was manipulated according to three levels of affect: neutral, moderately negative, and most negative.

It was hypothesized that the stability of the frames will vary according to the level of affect present in the interaction. In this thesis, frames are designated as strong or weak. Strong frames are those behavioural events that endure longer or recur at a level not exceeding a statistical chance level. Weak frames are those that either seldom recur, or recur in an inconsistent manner throughout the interaction.

Participants in this study were individuals in an established relationship. Rutter (1985) suggests that couples are appropriate subjects since they have developed established behavioural patterns over the course of their relationship. By videotaping six couples engaged in discussion of an issue that has some affective meaning for them, it was hypothesized that it would be possible to study the impact that emotion has on their behaviours emerging throughout the interaction. The goal of this study was to assess whether emotional tension has an impact on stable patterns of communication during an ongoing conversation through the identification and measurement of stable patterns of communication. In order to accomplish the stated goal, three research questions and three hypotheses guided the study.

### **Research Questions**

1. Can frames be identified in a stream of communication behaviour?
2. Is there a relationship between emotional intensity and the appearance of frames?
3. Do frames become stronger as emotional tension increases?

### **Research Hypotheses**

1. The first hypothesis is that frames will appear in the stream of communicative behaviour in one session of a videotaped dyadic interaction.
2. The second hypothesis is that when negative affect is increased (i.e., emotions are more intense), dyads will show increased organization as reflected in an increase in frames present across three segments.
3. The third hypothesis is that when the negative affect increases, the frames that are present will endure longer or recur more often.

## **Chapter 2**

### **Method**

#### **Participants**

The participants in this study were dyads composed of a man and a woman in an established relationship. A total of 9 dyads were recruited, of which 6 qualified for inclusion; the 3 that did not qualify did not complete a required questionnaire. Aside from 3 participants, two of whom were professional clinicians and one who was an animator, the participants were all university students, with a mean age of 28.58 years ( $SD=2.35$ ). The amount of time that a couple had been together ranged between 1 and 12 years, with an average of 5.33 years ( $SD= 3.73$ ). Eleven of the 12 participants had a university education, and the remaining participant had a college diploma in computer animation. Table 1 provides the demographic information for each participant.

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Insert Table 1 about here

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All participants were recruited through word of mouth. Participants were given a letter describing the study and stating that their participation would involve having a conversation with each other while being videotaped (see Appendix A). Each participant was then asked to complete an informed consent form, and was assured that all information would be kept confidential; each couple was assigned a code number so that their names would not be used. The participants were advised that they could withdraw from the study at any time (see Appendix B).

## **Procedure**

Once the couple agreed to participate, they were told that each individual would be receiving two questionnaires requesting personal information. The first questionnaire asked for individual demographic data, and the second required each participant to independently describe five emotional events that occurred between the couple within the past six months. The participants were asked to describe those events according to their emotional impact on a scale comprising the following emotional levels: most positive, positive, neutral, moderately negative, and most negative. The three couples not selected for the study did not report negative events (see Appendices C and D).

Since each participant submitted a questionnaire, a total of ten issues were submitted by each couple. The contents of the two negative events were later used as the topics of the videotaped conversations; the two positive events and one neutral event were requested from each participant in order to prevent speculation about the possible nature of the task.

Data collection was conducted in an observation room containing a one-way mirror, at a University clinic in a major city. Participation consisted of one session, which lasted approximately 40-minutes. The session was divided into three 6-minute videotaped segments, for a total of 18-minutes. A relaxation period of 5-minutes was provided before the start of each segment. Participants were told that each segment would commence and conclude when they heard a knock on the mirror. The segments were recorded using two video cameras placed behind the one-way mirror; in order to record each participant individually, the couple sat on chairs facing one another, at a distance of three feet apart. The participants were fully debriefed upon completion of the session.



At the beginning of the session, the couple was told that in two of the three segments they would be discussing an issue derived from their description of emotional events they provided on the second questionnaire. Since each participant completed a questionnaire, there were two 'moderately negative' issues and two 'most negative' issues for each couple. Each issue was selected by the researcher and was presented to the couple at the beginning of each segment. The researcher used the woman's 'moderately negative' issue for the second segment and the man's 'most negative' issue for the third segment.

The first segment consisted of the couple discussing a neutral issue, "what you will be doing this evening." All of the couples had the same neutral issue. In the second segment the investigator asked the participants to discuss a moderately negative issue, for example, "discuss why you dislike person X." In the final segment the couple was told to discuss something that was mostly negative, for example, "discuss the impact that person X has had on your plans." Since the investigator ensured anonymity and confidentiality, the exact wording is not given here. The next section describes the coding scheme and the coding procedures used for this study.

### **Verbal and Non-Verbal Coding Schemes**

Other observational researchers have employed coding schemes with codes that are meant to be sensitive enough to account for subtle behaviours (e.g., Gottman, 1979; Gottman and Levenson, 1988; Tardif, 1997). Hence, the finer the coding scheme, the greater the number of codes used. However, several methodological issues arise. First, those codes are distinguishable in terms of content, but not in terms of affect. Second, the finer the coding scheme is, the more difficult it is to achieve inter-rater reliability. In order to reliably study changes in affect,

researchers have combined several behaviours into a single behavioural grouping (e.g., Tardif, 1997).

An adapted form of Tardif's (1997) coding scheme for verbal and non-verbal affect was used (see appendices E and F). In this thesis, the coding scheme combined a series of verbal behaviours and a series of non-verbal behaviours into three different behavioural groupings, with a focus on the emotion being expressed. The first grouping provided a mechanism by which to examine the verbal emotional content of the segment. The second and third groupings measured the non-verbal affect by observing facial expressions and vocal levels, respectively.

Each of the behavioural groupings was observed and coded for three types of behaviours: facilitative, neutral, and aversive. Facilitative behaviours, defined as those behaviours which are helpful and which elicit a positive reaction, were given a code of 1. Neutral behaviours, those which are neither facilitative nor aversive, were given a code of 2. Aversive behaviours, those which express hostility or defiance, and do not invite cooperation or compromise, were given a code of 3. Table 2 describes the coding criteria.

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Insert Table 2 about here

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### **Coding Procedures**

Each segment was recorded on analogue video format and was subsequently digitized and copied onto CD-ROMs. Anecdotal evidence has shown that couples tend to find the notion of being filmed intimidating, and subsequently take a while to warm up. In order to account for the varying degrees of comfort, a 30-second delay was incorporated into the design. Since the couple was told to commence their conversation once they heard a knock on the mirror, the knock was used as a marker. Thus, coding for each segment commenced 30-seconds after the

knock on the mirror. Each participant's behaviour was coded sequentially and independently of the other person. Coding involved the following procedures.

In order to identify behaviours that may constitute frames, a three-step process in the coding procedure was conducted. In the first-step, each of the three behavioural groupings was observed and assigned a separate code. The same procedure was followed for the other two groupings. The investigator coded the three groupings for each participant separately. In other words, each segment was observed and coded at least three times, accounting for the observation of the verbal and non-verbal behaviours. For example, the first grouping, which focussed on the verbal content of the conversation, was given a code of facilitative. However, the other two groupings could have been assigned either an aversive or a neutral code. At the end of every 5-second interval, each participant had three separate codes assigned to his or her behaviour.

The second-step set out to describe the verbal and non-verbal behaviours as a single set of behaviours. Specifically, the three codes were combined as a single code, for each participant; the same code names were used for the combined codes. The determination of what behavioural groupings would go in which category was based on the following criteria: if at least two of the groupings were facilitative, then the code would be facilitative; if at least two groupings were aversive, then the code assigned was aversive; and if at least two groupings were neutral, then the code assigned was neutral. A neutral code was assigned as the default if all three groupings were observed within a five-second interval. Accordingly, at the end of each segment, one of three codes (neutral, aversive, or facilitative) was assigned to each participant for each 5-second interval. This resulted in two codes, corresponding to the behaviours of the man and the woman for each 5-second interval.

In the final step of the coding process, the man's and woman's codes within each 5-second interval were combined to form a joint, "dyadic," code for data analysis. For example, a given 5-second interval may have yielded a "facilitative" code for both the man and the woman, or a "neutral" code for the man and an "aversive" code for the woman. Since there are three possible codes for each participant, the combined man-woman codes result in nine potential "dyadic codes" within each 5-second interval. The three-step coding procedure was repeated for each participant.

Inter-rater reliability was achieved by employing a second individual to assign codes for each of the segments. Initially, the investigator and the second rater reviewed the video recordings in order to reach agreement as to which of the behaviours characterized the codes. Once 80% agreement was reached on code assignment, the investigator and the second rater independently coded the same portions of each segment; the 20% disagreement of code assignment was discarded.

The portion coded by each rater represents 20% of the total length of the segment. A kappa test was conducted for each of the behavioural groupings. The kappa score for each code is as follows: 0.85 for verbal content, 0.80 for tone of voice, and 0.75 for facial expressions. The average of the kappas is an acceptable level of 0.80.

### **Data Analysis Procedures**

#### **Manipulation Check**

In order to assess whether the level of negative affect increased over the three segments, as hypothesized, a manipulation check was conducted on the joint dyadic codes for each segment. This check measured whether the anticipated increase in negative affect across the three segments would be confirmed by an increase in aversive behaviours.

### **Sequential Analysis: Identifying and Measuring the Strength of Frames**

A frame was operationalized as the consecutive repetition of the same joint dyadic code, or an autotransition. In other words, the joint dyadic code had to recur at least twice in a row for it to constitute a frame.

The data were entered into a sequential analysis computer program, the Generalized Sequential Querier (GSEQ) (Bakeman and Quera, 1995). Analysis conducted on the GSEQ is based on a two-dimensional contingency table. The events defining the autotransitions were those in the rows and columns of the contingency table; rows were defined as the antecedent behaviours, and the columns were defined as the consequent behaviours.

The output of the GSEQ was based on the joint dyadic codes derived from the combination of behavioural groupings from each participant. In any stream of conversation there can be a number of possible transitions of events; however, not all transitions will necessarily be statistically significant. Those frames found to be statically significant are deemed “strong”, and those that recur at a level that does not exceed chance are deemed “weak.”

In order to assess the strength of the frames, a Chi-square significance test was conducted on the autotransition cell frequencies. An alpha value of 0.10 was used as the cut-off for statistical significance. A statistically significant value indicated that the probability was greater than chance that the repetition of an event would recur. In order to minimize the chances of a Type 1 error, only those autotransitions that repeated twice were deemed strong. Those frames found to be strong were subsequently interpreted using a statistical measure of association.

### **Measuring the Strength of the Frames across the Segments**

In order to measure the strength of frames across the segments, a Yule's Q odds ratio statistical test was conducted. This test measures the strength of the association between

sequential events (Bakeman and Gottman, 1997). The Yule's Q varies from -1 to 1, with 0 indicating no relationship among the events. The Yule's Q odds ratio serves two functions. First, it measures the strength of association by indicating the odds that one event is associated with itself at lag one (Bakeman and Gottman, 1997). The second function served by the Yule's Q is that it can be used as an index to make comparisons of individual event differences in various testing conditions, regardless of the frequency of the observed behaviours (Bakeman and Gottman, 1997). For the purposes of this research, comparisons can be made across the segments of each session by comparing the value of Yule's Q for each frame.

The Yule's Q was used as an index of the strength of the frames. A high positive value indicates that the two events are strongly associated, and a high negative value indicates that the sequence of codes is not likely to be found in a consecutive sequence. If the value increases as that emotional intensity increases then that frame is considered significant for that couple. A paired samples t-test was conducted on the Yule's Q values of the strong frames in order to assess whether that particular frame became stronger across the session.

### **Depicting the Strong Frames**

All possible states contained in a system can be depicted on a state space (Norton, 1995). Time and the frequency of behaviours form the axes that describe the state space. The state space displays the tendency for the convergence of different behaviours as a function of time (Eliasmith, 1996).

Lewis et al (1999) have utilized a modified state space as a means to depict and characterize behavioural change in real-time, known as a state space grid. According to Lewis et al (1999) the state space grid represents all possible coordinates as a matrix of cells. This technique allows for the depiction of changes to behavioural states in real time. Here, the focus is

not on the identification of behavioural change, but on the identification of stable behavioural patterns or frames. Therefore, the strong frames are depicted on a state space grid. The axes of the state space grid comprise the three codes of the man and the woman, respectively, and the shaded cells represent the strong frame. By creating a state space grid for each segment, it is possible to see the strong frames that endure across the session and to characterize the style of interaction.

## **Chapter 3**

### **Results**

#### **Manipulation Check**

The manipulation check revealed that there was an overall increase in the level of aversive behaviour from the first to the third segment for all the dyads. As can be seen in Table 3, there is a large range of values. In the first segment of Dyad 2, an aversive behaviour was observed only once while the other dyads exhibited a greater number of aversive behaviours. In order to avoid skewing the data towards the lower end of the distribution, the median was calculated for each of the segments. In the first segment the median is 13.00, for the second segment the median is 24.50, and for the third segment the median is 43.00. Table 3 lists the frequencies of the aversive behaviours across the three segments. Figure 1 depicts the same information graphically.

A closer look at the dyads reveals that four of the six dyads showed a consistent increase from the first to the third segment. Two of the six dyads showed a different pattern of aversive behaviours, as shown on Figure 1. In particular, dyads three and six showed a modest decrease from the first to the second segment, followed by an increase in the third segment.

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Insert Table 3 and Figure 1 about here

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## **Sequential Analysis**

### **Hypothesis #1**

The first hypothesis stated that frames will appear in the stream of communicative behaviour in one session of a videotaped dyadic interaction. The dyads maintained stable behavioural patterns throughout the communication process. The frequency of the frames in each segment ranged from 1 to 5. Overall, there were 7 to 11 frames in each of the three segments within each dyadic interaction. Table 4 presents the number of times frames were observed in each segment for each dyad. The presence of frames within each segment for each dyad confirms the hypothesis.

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Insert Table 4 about here

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### **Hypothesis #2**

The second hypothesis stated that when negative affect increases, dyads show increased organization as reflected by an increase in frames present across the session. Table 4 presents the frequency of observed frames during each of the three segments for each dyad.

As can be seen in Table 4, there was a gradual increase in the mean number of frames from segment one to segment three. In the first segment the mean number of frames was 1.83 (SD = 0.75). In the second segment, the mean number of frames was 3.50 (SD = 1.05). In the third segment, the mean number of frames was 3.67 (SD = 1.21). In order to assess whether the increase was statistically significant, a non-parametric One-Way ANOVA was conducted on the frequency of the frames across the three segments. The results reveal that there was a statistically



significant difference between the segments ( $X^2 (2, N = 6) = 7.64, p < .05$ ), demonstrating a genuine increase of frames from one segment to the other. The overall increase in the number of frames from segment one to segment three confirms the hypothesis.

### **Hypothesis #3**

The third hypothesis stated that when the negative affect increases, the strong frames that are present endure longer or recur more often. Table 5 shows the number of frames, as well as their associated Chi-Square values, appearing in each segment for each dyad. Table 6 provides a summary of the frequency of frames and strong frames present in each segment. In order to determine whether strong frames were present in each of the segments, a Chi-Square test of significance was conducted on the autotransition frequencies. The results indicate that in each segment strong frames were present. Three significance levels were used in the data analysis. Six frames were statistically significant at the 0.10 level, and the range of Chi-square values was 2.65 to 3.10 ( $df = 1$ ). Two frames were significant at the 0.05 level ( $X^2 (1) = 5.24, p < 0.05$ ). Fifteen frames were statistically significant at the 0.01 level, and the range of Chi-square values was 6.07 to 20.28 ( $df = 1$ ).

Examining each segment revealed the following results. In the first segment the mean number of strong frames present was 0.33 ( $SD = 0.52$ ). In the second segment the mean number of strong frames present was 1.33 ( $SD = 1.21$ ). In the third segment the mean number of strong frames 2.17 ( $SD = 1.17$ ). The steady increase in the number of strong frames from the first to the third segment confirms this hypothesis.

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Insert Table 5 and Table 6 about here

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In order to assess whether the increase in the number of strong frames from the first to the third segment was statistically significant, a non-parametric, One-Way ANOVA was conducted on the count of the strong frames across the session. The results reveal that the segments differed significantly from the other,  $X^2(2, N = 6) = 6.40, p < .05$ .

A Yule's Q test was conducted on all of the frames as a means to assess whether the strong frames that appeared across the three segments endured longer. Table 5 contains the Yule's Q values associated with the frames. The results show that the Yule's Q values ranged from  $-1.00$  to  $0.94$ . However, not all frames were strong. The range of Yule's Q values for the strong frames was  $0.41$  to  $0.94$ . This means that the observed behaviours that constitute a strong frames were closely associated with each other.

A two-tailed paired-samples t-test was conducted on the Yule's Q values of those frames that were strong in at least one segment in order to assess whether the strong frames endured longer as the negative affect increased. There was a total of 17 instances where a strong frame appeared in at least one segment. Specifically, the difference between the first and second segments was statistically significant ( $t(16) = -2.37, p < .05$ ). There was also a statistically significant difference between the first and third segments ( $t(16) = -2.99, p < .05$ ). However, the second and third segments were not significantly different from each other ( $t(16) = -.653, p > .05$ ). These results demonstrate that on the whole, as negative affect increased frames became stronger.

Figure 2 depicts the increase of strong frames across the three segments on state space grids. As shown in Figure 2, strong frames generally appear in the segments that contained an increase in emotional tension. An interesting observation is the overall absence of man-facilitative and the woman-aversive, or vice versa, strong frame. The most notable strong frame

is the man-neutral and woman-aversive. This strong frame appears for all of the dyads whenever the level of negative affect increased. This finding will be explored in the discussion.

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Insert Figure 2 about here

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## **Chapter 4**

### **Discussion**

The primary purpose of this thesis was to introduce a method by which to analyze the impact of increasing emotional tension on stable patterns of communication during a dyadic interaction. By manipulating the emotional intensity present in the interaction, this thesis has achieved its intended purpose of identifying and measuring stable patterns of communication at different levels of emotional tension. The methodology outlined in this thesis can provide a mechanism by which researchers may conduct a fine-grained analysis of stable patterns of communication during dyadic interactions.

Using frames as the unit of analysis made it possible to observe the complex aspects of an interaction. Frames were operationalized as stable behavioural patterns occurring within a stream of conversation. While frames have traditionally been used as a post hoc descriptor of interaction, we were able to measure and identify, in real time, the occurrence and recurrence of different frames. What is meaningful is that the frames are co-constructed, emerging from the mutual coordination of individual actions.

The first hypothesis investigated the notion that frames would appear in the stream of communicative behaviour in each segment of a videotaped dyadic interaction. Results supported this. Specifically, the results indicate that the methodology and procedure outlined in this thesis were able to capture frames within each segment. The observed patterns of the interaction illustrate that a couple's stable behavioural patterns during the communication process can be

measured. The results suggest that couples behave in a consistent or organized manner during emotionally tense situations. The consistency does not imply that a particular emotional state is more prevalent than others, since the frames can be comprised of behaviours that are aversive, neutral and/or facilitative. Rather, the consistency creates the conditions under which the couple can share meaning, for instance, when they try to resolve a conflict (Canary and Stafford, 1994).

The second hypothesis proposed that when negative affect is increased, dyads would show increased organization by an increase in the number of frames. Again, this hypothesis was confirmed. An overall increase in the number of frames across the segments is indicative of increased organization. The results show that the couples have established patterns of communication that enable them to cope with increased emotional tension. Tables 4 and 5 portray the increase in the number of frames as emotional intensity increases.

The third hypothesis stated that when the negative affect is increased the frames that are present endure longer or recur more often. As shown in Tables 5 and 6, and illustrated on Figure 2 this hypothesis was confirmed. Overall, there was a tendency towards increased organization for all of the dyads as the level of emotional tension increased. Specifically, all the dyads showed strong frames in their conversations as the emotional tension increased.

By manipulating the level of affect present in the dyadic system, it was possible to get a sense of how individuals react as emotional tension increases. For example, the level of tension in the second segment was moderately negative. In this segment stronger frames began to emerge for some of the dyads, thereby showing increased organization and stable communication patterns. By the third segment, characterized as the most negative, all of the dyads demonstrated an overall increase in the number of strong frames. This increase in strong

frames demonstrates that certain patterns of communicative behaviours become more stable when the level of negative affect increases.

An unanticipated finding which appeared in the results parallels findings in the literature on marital satisfaction. The results demonstrate that all of the dyads exhibited the man-neutral and woman-aversive strong frame. As shown in Figure 2, this strong frame appears whenever the level of negative affect has increased. This the finding may be due to measurement or researcher bias. A closer look at the literature reveals that this patterns is not unique, but in fact represents a very common manner in which men cope with increased negativity during periods of conflict.

Noller (1993) explored the ways in which men manage conflict in marital relationships. She found that husbands generally have difficulty coping with situations containing high levels of conflict; the husband tends to withdraw from the conflict while the wife will try to engage him in order to resolve the conflict. Noller (1993) suggests that withdrawing may be a method or strategy a man uses in order to minimize a conflict. In this study, an attempt to minimize the conflict can certainly be seen in the neutral behaviours the men exhibit when their partners behave in an “aversive” manner. However, Noller’s research focussed exclusively on verbal behaviours while this thesis assessed both verbal and non-verbal behaviours as part every interaction; interestingly, the findings in this thesis still paralleled her results.

### **Characterizing Styles of Interaction**

The current research sought to analyze frames as stable patterns of communication. The results provide insights into patterns of dyadic communication. Different types of exchanges can be observed in the verbal and non-verbal actions that each participant makes in relation to the other. Over time, a higher frequency of certain frames demonstrates the habitual nature of some behaviours.

Lewis et al (1999) have used the state space grids to characterize styles of interaction, such as avoidant or dependent, that are unique to individuals. The state space grids can also demonstrate style of interaction that may be similar across dyads. A close inspection of the state space grids in Figure 2 reveals an interesting pattern: there are similarities in the extent to which the couples behaved according to the varying emotional tension. The state space grid can be separated into two regions of communicative behaviours, flexible and rigid, respectively. The flexible region encompasses the facilitative behaviours exhibited by the dyad. The rigid region encompasses the aversive behaviours exhibited by the dyads. The neutral behaviours straddles the two regions. By separating the state space grid into two regions, it is possible to characterize the style of interaction exhibited by the dyads. What follows is a characterization of possible style of interaction for the dyads who participated in this study.

In the first segment, where the level of tension present was neutral, most dyads appeared to have communicated in a flexible manner and seemed more willing to communicate with each other. With the exception of one couple, there were no strong frames present. The one strong frame present was the neutral-neutral frame, which is not qualitatively different than no frames at all.

As the tension increased there were some changes to how the participants behaved. In the second segment, where the level of tension was negative, couples generally appeared to still be flexible in terms of conversation patterns. It was in this segment that individuals' communication patterns appeared to reflect more organization, such that strong frames began to emerge. All but one of the dyads had at least one strong frame, and the frames were predominantly in the flexible region of the state space. For example, couples primarily exchanged facilitative and neutral behaviours despite the increase in tension. However, two couples exhibited a different profile, in

which the woman behaved in an aversive manner while the man remained neutral. As suggested earlier, it may be that the man tends to soothe the interaction whenever the woman is becoming upset.

In the third segment, when emotional tension was at its highest, an interesting pattern emerged. There was clearly increased organization, as shown in the overall increase in strong frames for the dyads. However, as in the second segment, when the woman behaved aversively, the man remained neutral.

As outlined in the introduction, individuals will continually adjust their behaviour in response to their partner's actions. What can be inferred from the state space grids is that the couples studied here demonstrated sets of behaviours that portray how the couples behave when faced with potential conflict. Furthermore, the exhibited behaviours may be a reflection not only of the scenarios, but also of the nature of their relationship.

In summary, there is one significant pattern that generally appears during increased emotional negativity and is apparent on the state space grids. In particular, the man's behaviour is either facilitative or neutral when the woman is behaving aversively, while the reverse does not generally occur. This frame appears to signify that whenever the woman gets upset, the man's response is to calm down the interaction by behaving in a neutral manner; he appears to spend more time withdrawing from the conversation whenever the woman appears upset. The appearance of this frame suggests that the man's attempt to avoid conflict by behaving in a neutral manner, or exhibiting a withdrawal pattern, corresponds with Noller's findings discussed in the previous section.

In order to demonstrate the usefulness of the state space grid, what follows is an example of a 1-minute portion of a conversation that occurred in the third segment of Dyad 1. Some details have been changed in order to ensure anonymity and confidentiality of the participants.

In this example, the couple is discussing an issue that they have been grappling with for some time. This portion of the segment alternates between strong frames that are woman-aversive and man-neutral to woman-neutral and man-neutral. I have separated content into the strong frames in order to illustrate the shift in the strong frames. Each strong frame represents approximately 10-seconds of the conversation.

**1 to 10: Woman-aversive and Man-neutral**

*Woman: Do you think it is fine to have him living there...?*

*Man: If it were a bigger place, yeah.*

*Woman: Well, it isn't bigger place!*

*Man: (Says nothing).*

**11 to 20: Woman-aversive and Man-neutral**

*Woman: No, I don't want him there again. I'll tell him.*

*Man: No you won't.*

*Woman: I'll tell him that we don't want him there again.*

*Man: (stuttering) No, No,*

**21 to 30: Woman-aversive and Man-neutral**

*Woman: (sarcastically) Please!*

*Man: I spoke to a friend about it.*

*Woman: Did you? What did he say?*

*Man: He understood your point.*

In the first frame, the man and woman are exchanging information in order to get a sense of what the other person is feeling. The man is neutral, while the woman appears to be challenging his statements. With a neutral tone, the man maintains neutral behaviours by not responding to certain statements. In the second frame, the woman is still exhibiting aversive behaviours. The man begins to challenge the woman's statements, and a potential conflict emerges; however, his non-verbal behaviours remain neutral. His stuttering shows that he is beginning to feel uncomfortable with the situation, but does not want the conversation to escalate



into a conflict. By challenging him, the woman tries to engage the man. The man, however, makes various attempts to exchange information in order to convey the message that he is trying to understand her position. For example, by stating that his friend agrees with her, he tries to prove that he is trying to understand her feelings by making a clear effort to think about her feelings.

**31 to 40: Woman-neutral and Man-neutral**

*Woman: Why, what did you tell him?*

*Man: I said that, uh, you didn't like person X crashing there ...*

*Woman: Right...*

*Man: He said that he understands that.*

**41 to 50: Woman-neutral and Man-neutral**

*Woman: But didn't you tell him why? All he talks about ... about ... That's all he talks about. I don't like that!*

*Man: Well, you know, that's either his attention ... (she interrupts)*

**51 to 60: Woman-aversive and Man-neutral**

*Woman: No, before that. I ... I was listening to him and everything he says is about....*

*Man: (Silence)*

In the fourth frame there is a qualitative shift in the conversation, as reflected in the change in the strong frame. The couple exchange information, and appear to be discussing the issue amicably. The conversation remains in a neutral state for the fifth frame, but the final statement made by the man is interrupted. In the sixth frame, the conversation shifts back to the woman-aversive and man-neutral frame. In this frame there is the possibility that a full-blown conflict may emerge. The man is silent and appears to have withdrawn in order to avoid a conflict.

This example illustrates a typical exchange found in this study. The couple appears to be oscillating between the two frames. While the man appears to be involved in the conversation, he does not want to participate in a conversation that may turn into a conflict. However, the woman

appears to make various attempts to engage him throughout the conversation. A longer transcription of the content would reveal the same shifting of frames.

Additionally, the example also illustrates the strength of the coding scheme used in this study. By merely reading the content of the conversation it appears as though the man is engaged in the conversation and exchanging aversive behaviours. However, by including the non-verbal behaviours a different story is told. The man's voice and gestures remain neutral throughout the conversation. Therefore, by assessing the verbal and non-verbal behaviours simultaneously one is able to get a holistic understanding of the dynamics of the conversation.

### **Limitations of the Study**

While this thesis has been successful in measuring and identifying stable patterns of communication during increased emotion tension, several limitations are apparent. The first limitation is that the topics chosen for discussion by the participants did not elicit a high degree of negative affect across the segments. Perhaps by requesting the participants to discuss an issue which had occurred in the past, there was a greater likelihood that the issue had already been resolved. Future studies should devise a way to manipulate emotion with more consistency.

A second limitation is that it is certainly possible that the six couples in this study possess strong communication skills in their relationship, which may not be representative of the general population. It is noteworthy that all participants had some form of higher education, and five of the six couples have been in their relationship for at least four years. Furthermore, the socio-cultural history of the participants was not referred to in this study. Future studies should attempt to utilize this approach with diverse groups of individuals, and also account for the socio-cultural history of the individuals in order to determine whether couples who have identified problems within their relationship display similar patterns and frames.

A third limitation of this study lies in the interpretation of the results. It is very difficult to generalize the findings from a fine-grain analysis to the larger population. First of all, the size of the group under observation may not be representative of the larger population. Additionally, examining a dyad for eighteen minutes may not provide an accurate representation of the communication patterns in their relationship. Furthermore, it takes longer than a minute or two to resolve a conflict (Roloff and Cloven, 1994). Future studies should consider longer recording times, and with larger and diverse groups of individuals.

A fourth limitation is related to the state space grids. While the state space grids made it possible to characterize styles of interaction, we really do not know whether those frames have particular significance for the couple. Furthermore, we do not know how the interaction of verbal and non-verbal behaviours appears throughout the interaction. Accordingly, the analysis should be coupled with a relationship satisfaction questionnaire in order to determine whether specific patterns of behaviours have particular significance for the couple.

A final limitation is that this methodology cannot isolate when specific frames arose within the stream of conversation. For instance, some sequences may have appeared in sequences greater than two, and never occurred again. This thesis was concerned with demonstrating that stable patterns of behaviour do occur in a conversation, and that it is possible to capture the frames; this thesis was not concerned with where in the communication stream they occur. However, other researchers have been managed to do both. For example, Lewis et al (1999) have characterized mother-infant attachment patterns in real-time. Specifically, they have been able to assess the duration of particular behavioural sequences, such as when an infant averts her gaze, in order to ascertain whether the infant is displaying an avoidant or approaching attachment pattern. Future studies should attempt to refine the methodology outlined in this

thesis and to use it to locate and assess the duration of particular communication sequences in dyads in order to ascertain if certain frames arise at crucial periods of a conversation.

### **Implications of the Study**

The results of this study reveal that stable communication patterns can be observed and analyzed. The methodology and findings of this thesis can be used to augment current research practices. As revealed in the parallel findings of this thesis and Noller (1993), there is potential to apply this framework to different areas of social psychology, such as attribution theory. As stated in the introduction, assessing and measuring the impact of certain attributions on individuals' behaviours has been difficult. However, using the framework outlined in this thesis, attributions can be observed in the individual's verbal and non-verbal behaviours.

The present study has practical applications for research on relationship in dynamics and communication systems, specifically, the influence of emotion on communication patterns. I offer two examples of possible applications. As stated in an earlier section, previous research on communication has neglected to take into account the recursive nature of a stream of conversation (Buck, 1984; Argyle, 1988). The results of this thesis show that emotion can be both the information being communicated as well as an influence on the behaviour within the interaction. While emotion was systematically observed using a specific coding protocol, the content of the coding scheme does not need to be applied in other contexts; however, the procedures with which the coding scheme was used should be maintained.

Additionally, this thesis highlights some useful applications for sequential analysis. For instance, it is possible to predict the likelihood of certain behaviours occurring based on the previous behaviours; such predictions provide the basis with which to localize those states that help the relationship, as well as those that are problematic. The results of this thesis support

research findings by Planalp and Honeycutt (1985) that when uncertainty is introduced into a conversation, a couple can find themselves adopting new strategies in order to soothe a conflict. The methodology outlined in this thesis provides a way of identifying the behaviours and describing the strategies that a couple may utilize.

In a clinical context, many interventions are attempted at an individual level but the results of this study demonstrate the potential of exploring interventions at a dyadic level. Since the identification of dysfunctional patterns of communication between couples forms a basis for marital therapy, this thesis provides a method with which to localize those patterns and assist the couple to identify areas that they can work to improve upon. The methodology outlined in this thesis can supplement existing clinical research.

As one example, Luborsky and Crits-Christoph (1990) have developed a method, called the Core Conflictual Relationship Theme (CCRT), which examines central relationship patterns within a person's narrative. Using the CCRT method, Luborsky and Crits-Christoph are interested in measuring the central relationship pattern. Luborsky and Crits-Christoph examine the negative behavioural patterns that an individual writes about when she refers to other individuals. If that person was to be observed interacting with the person she is writing about, then we might be able to better understand whether and where an intervention is required. Using the methodology outlined in this thesis that would be possible.

### **Conclusion**

This thesis set out to examine stable communication patterns within a dyadic interaction. Individuals in a relationship tend to behave in a very predictable manner during conversations. Not surprisingly, the results reveal that couples do behave habitually, and at times these behaviours become rigid. By measuring the impact that different levels of emotional intensity

has on stable patterns of communication, the methodology outlined in this thesis provides a way to account for the complex nature with which behaviours are transmitted as information. Specifically, the methodology outlined in this thesis demonstrates that the language of frames is one way to measure and to analyze the predictability of behaviours emerging throughout a dyadic interaction.

The world is a complex web of relationships. Human relationships represent one part of the web. Humans rely on the ability to communicate and to be understood by others in order to maintain social order. Research has attempted macro and micro-level analyses into the nature of the human communication; however, the complex interaction between the two levels makes it very difficult to outline a definitive description of human communication processes. The methodology outlined in this thesis has provided a way in which we can begin to understand how humans communicate despite the complexity.

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**Table 1****Demographic Information**

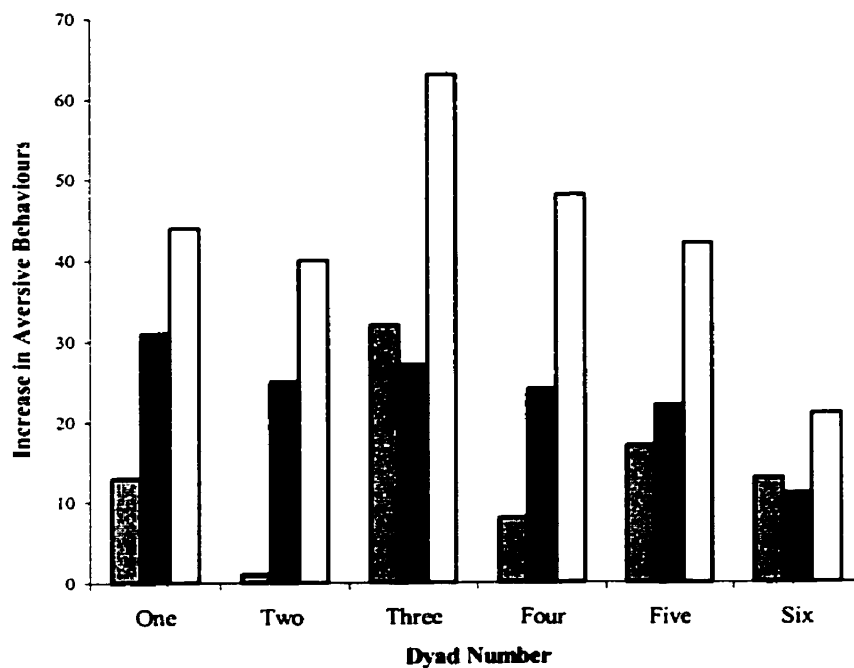
Dyad	Gender	Age	Education Level	Occupation	Years in Present Relationship	Living Together?
1	Woman	28	University	Student	5	Yes
	Man	31	College	Animator		
2	Woman	29	University	Student	2	Yes
	Man	26	University	Student		
3	Woman	27	University	Student	8	Yes
	Man	28	University	Student		
4	Woman	32	University	Clinician	12	Yes
	Man	33	University	Clinician		
5	Woman	29	University	Student	4	Yes
	Man	28	University	Student		
6	Woman	26	University	Student	1	Yes
	Man	26	University	Student		

**Table 2****Coding Scheme For Affect: Verbal Content and Non-Verbal Behaviours**

Code Name	Verbal Behaviours: Content	Non-Verbal Behaviours: Voice	Non-Verbal Behaviours: Face
Facilitative (1)	<ul style="list-style-type: none"> <li>▪ Approving or supportive comment</li> <li>▪ Direct agreement/Compliance</li> <li>▪ Problem Solving/Offering or eliciting an opinion or suggestion</li> <li>▪ Assent/Affirmative</li> </ul>	Caring; Satisfied; Warm; Tender; Cheerful; Empathetic; Happy; Concerned; Joyful; Affectionate; Laughing	Smile; Empathetic Expression; Head Nod
Neutral (2)	<ul style="list-style-type: none"> <li>▪ Exchange of information – Question/Clarification</li> <li>▪ Summarizing self or other/ Mind reading</li> <li>▪ Nothing is being said</li> </ul>	Neutral or No Voice	Neutral Expression
Aversive (3)	<ul style="list-style-type: none"> <li>▪ Disagreement with rationale supplied</li> <li>▪ “Yes but” agreement</li> <li>▪ Direct disagreement/ Noncompliance</li> <li>▪ Command/criticize/ complain/accuse/or obstinate-antagonistic</li> </ul>	Cold; Blaming; Sarcastic; Angry; Impatient; Furious; Blaring; Clipped; Mocking; Accusing; Whining; Defensive	Frown; Full or Partial Sneer; Smirk; Angry or Contemptuous Expression; Disgust; Glare; Tight Lips; Rolling of the Eyes

**Table 3****Frequency Count of Aversive Codes**

<b>Dyad</b>	<b>Segment 1: Neutral</b>	<b>Segment 2: Moderately Negative</b>	<b>Segment 3: Most Negative</b>
One	13.00	31.00	44.00
Two	1.00	25.00	40.00
Three	32.00	27.00	63.00
Four	8.00	24.00	48.00
Five	17.00	22.00	42.00
Six	13.00	11.00	21.00
Median	15.00	24.50	43.00

**Figure 1****Manipulation Check: Increase of Dyadic Aversive Behaviours**

- ▨ Segment 1: Neutral
- Segment 2: Moderately Negative
- Segment 3: Most Negative

**Table 4****Frequency of Autotransitions Across the Segments**

<b>Dyad</b>	<b>Segment 1: Neutral</b>	<b>Segment 2: Moderately Negative</b>	<b>Segment 3: Most Negative</b>	<b>Total</b>
One	2.00	4.00	5.00	11.00
Two	1.00	4.00	3.00	8.00
Three	3.00	3.00	4.00	10.00
Four	2.00	3.00	5.00	10.00
Five	2.00	2.00	3.00	7.00
Six	1.00	5.00	2.00	8.00
Mean	1.83	3.50	3.67	10.33
SD	0.75	1.05	1.21	1.64



**Table 5****Autotransitions Within Each Segment for Each Dyad**

Code	Segment 1: Neutral			Segment 2: Moderately Negative			Segment 3: Most Negative		
	Count	Yule's Q	X <sup>2</sup>	Count	Yule's Q	X <sup>2</sup>	Count	Yule's Q	X <sup>2</sup>
<b>Dyad 1</b>									
fac-fac	0	-1.00	0.06	0	-1.00	0.06	0	-1.00	----
fac-neu	0	-1.00	1.50	0	-1.00	0.01	6	0.91	20.28**
fac-ave	0	-1.00	0.01	0	-1.00	----	1	0.89	6.56
neu-fac	0	-1.00	1.50	2	0.59	2.33	0	-1.00	----
neu-neu	14	-0.10	0.17	16	0.33	1.98	18	0.85	20.81**
neu-ave	2	0.82	6.92**	4	0.80	9.40**	10	0.81	14.93**
ave-fac	0	-1.00	0.01	0	-1.00	0.14	0	-1.00	----
ave-neu	1	-0.08	0.02	8	0.63	6.56	4	0.87	13.53**
ave-ave	0	-1.00	0.60	0	-1.00	0.01	2	0.59	2.33
<b>Dyad 2</b>									
fac-fac	0	-1.00	0.01	4	0.80	9.40**	1	0.75	2.99
fac-neu	0	-1.00	0.41	1	0.83	4.52	2	0.77	5.24*
fac-ave	0	-1.00	----	1	0.59	1.38	0	-1.00	0.14
neu-fac	1	0.97	16.74	2	0.65	3.06†	0	-1.00	0.25
neu-neu	54	-0.08	0.02	15	0.41	3.10†	12	0.72	10.89**
neu-ave	0	-1.00	0.01	2	0.11	0.07	7	0.85	15.46**
ave-fac	0	-1.00	----	0	-1.00	----	0	-1.00	0.01
ave-neu	0	-1.00	----	0	-1.00	0.41	0	0.77	11.84
ave-ave	0	-1.00	----	0	-1.00	0.06	0	-1.00	0.14
<b>Dyad 3</b>									
fac-fac	0	-1.00	----	0	-1.00	0.25	0	-1.00	----
fac-neu	1	0.59	1.38	2	0.11	0.07	0	-1.00	0.06
fac-ave	0	-1.00	0.06	2	0.52	1.70	0	-1.00	0.01
neu-fac	1	0.97	16.76	0	-1.00	0.14	0	-1.00	----
neu-neu	28	0.66	9.94**	12	0.17	0.46	9	0.73	10.32**
neu-ave	2	0.25	0.34	0	-1.00	1.14	11	0.42	2.99†
ave-fac	0	-1.00	----	0	-1.00	----	0	-1.00	----
ave-neu	2	0.59	2.33	1	-0.01	0.00	5	0.14	0.19
ave-ave	1	0.51	0.93	0	-1.00	0.01	2	0.25	0.34

Code	Segment 1: Neutral			Segment 2: Moderately Negative			Segment 3: Most Negative		
	Count	Yule's Q	X <sup>2</sup>	Count	Yule's Q	X <sup>2</sup>	Count	Yule's Q	X <sup>2</sup>
<b>Dyad 4</b>									
fac-fac	1	0.41	0.57	0	-1.00	---	0	-1.00	0.01
fac-neu	2	-0.41	1.19	0	-1.00	0.25	0	-1.00	0.19
fac-ave	0	-1.00	0.01	0	-1.00	0.06	0	-1.00	---
neu-fac	0	-1.00	0.25	2	0.65	3.06†	2	0.45	1.24
neu-neu	16	-0.36	2.44	19	-0.15	0.41	4	-0.11	0.12
neu-ave	1	0.75	2.99	1	-0.22	0.16	5	0.50	2.82†
ave-fac	0	-1.00	0.01	0	-1.00	0.01	0	-1.00	0.06
ave-neu	0	-1.00	0.06	3	0.84	9.51**	6	0.46	2.65†
ave-ave	0	-1.00	---	0	-1.00	0.03	2	0.52	1.70
<b>Dyad 5</b>									
fac-fac	0	-1.00	0.14	0	-1.00	---	0	-1.00	---
fac-neu	1	-0.22	0.16	1	-0.43	0.75	0	-1.00	0.01
fac-ave	0	-1.00	0.01	0	-1.00	0.01	0	-1.00	---
neu-fac	0	-1.00	0.72	0	-1.00	0.06	0	-1.00	---
neu-neu	16	-0.30	1.72	22	0.30	1.67	16	0.33	1.98
neu-ave	2	0.38	0.85	3	0.30	0.67	16	0.55	6.07**
ave-fac	0	-1.00	---	0	-1.00	---	0	-1.00	---
ave-neu	0	-1.00	0.14	0	-1.00	0.14	3	0.54	2.44
ave-ave	0	-1.00	0.06	1	0.97	16.74	0	-1.00	0.03
<b>Dyad 6</b>									
fac-fac	0	-1.00	0.06	2	0.77	5.24*	0	-1.00	0.06
fac-neu	1	-0.52	1.20	1	0.15	0.07	0	-1.00	1.50
fac-ave	0	-1.00	0.01	0	-1.00	---	0	-1.00	0.01
neu-fac	1	0.07	0.01	4	-0.02	0.00	0	-1.00	1.50
neu-neu	17	-0.03	0.01	13	0.09	0.13	14	-0.10	0.17
neu-ave	0	-1.00	0.61	2	0.94	15.69**	2	0.82	6.92**
ave-fac	0	-1.00	0.06	0	-1.00	0.01	0	-1.00	0.01
ave-neu	0	-1.00	0.25	0	-1.00	0.25	1	-0.08	0.02
ave-ave	0	-1.00	---	0	-1.00	---	0	-1.00	0.06

**Note.** Each frame delineated in the left hand column reflects the joint dyadic codes for the participants, the man's behaviour code is listed first, followed by the woman's behavioural code; fac = facilitative, neu = neutral and ave = aversive. Significant Chi square values not noted because those autotransitions occurred at a frequency less than two. Dashes in the cells represent undefined Chi-square values due to expected value of zero.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; †  $p < 0.10$ .

**Table 6****Number of Frames and Number of Strong Frames**

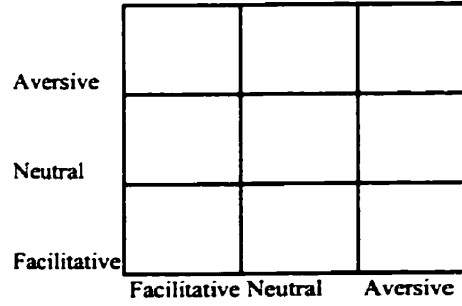
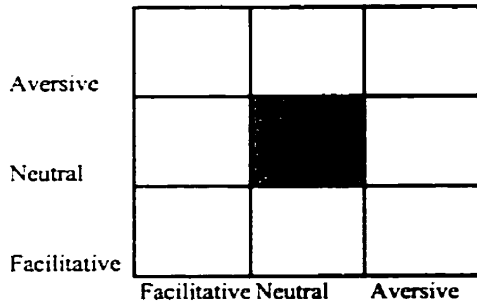
<b>Dyad</b>	<b>Segment 1: Neutral</b>		<b>Segment 2: Moderately Negative</b>		<b>Segment 3: Most Negative</b>	
	<b>Count of all Frames</b>	<b>Strong Frames</b>	<b>Count of all Frames</b>	<b>Strong Frames</b>	<b>Count of all Frames</b>	<b>Strong Frames</b>
One	2.00	1.00	4.00	1.00	5.00	4.00
Two	1.00	0.00	4.00	3.00	3.00	3.00
Three	3.00	1.00	3.00	0.00	4.00	2.00
Four	2.00	0.00	3.00	2.00	5.00	2.00
Five	2.00	0.00	2.00	0.00	3.00	1.00
Six	1.00	0.00	5.00	2.00	2.00	1.00
Mean	1.83	0.33	3.50	1.33	3.67	2.17
SD	0.75	0.52	1.05	1.21	1.21	1.17



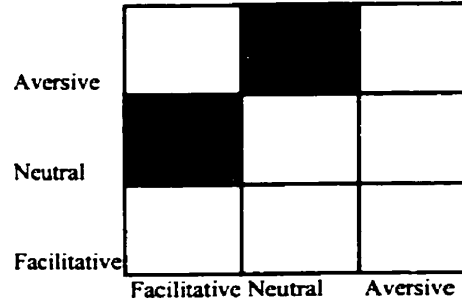
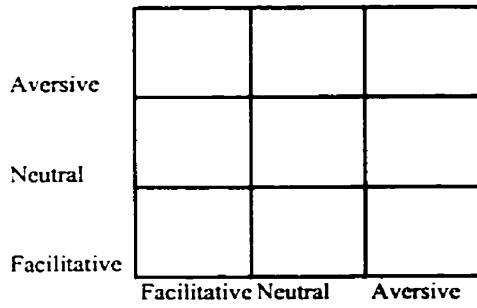
**Dyad 3**

**Dyad 4**

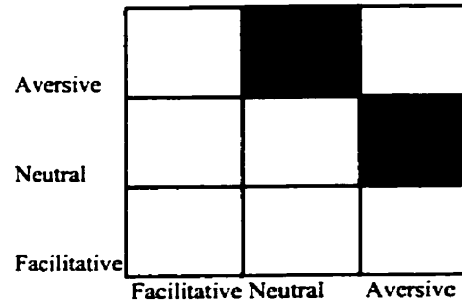
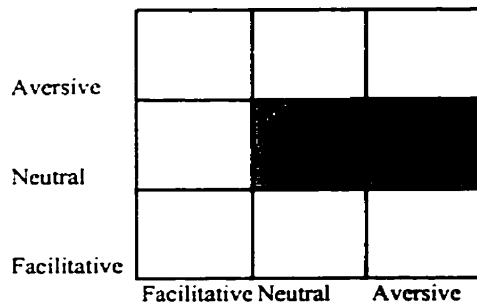
**Segment 1: Neutral**



**Segment 2: Moderately Negative**



**Segment 3: Most Negative**



**Man's Behavioural Codes**

**Woman's Behavioural Codes**

**Dyad 5**

**Dyad 6**

**Segment 1: Neutral**

Aversive			
Neutral			
Facilitative			
	Facilitative	Neutral	Aversive

Aversive			
Neutral			
Facilitative			
	Facilitative	Neutral	Aversive

**Segment 2: Moderately Negative**

Aversive			
Neutral			
Facilitative			
	Facilitative	Neutral	Aversive

Aversive			
Neutral			
Facilitative			
	Facilitative	Neutral	Aversive

**Segment 3: Most Negative**

Aversive			
Neutral			
Facilitative			
	Facilitative	Neutral	Aversive

Aversive			
Neutral			
Facilitative			
	Facilitative	Neutral	Aversive

**Man's Behavioural Codes**

**Woman's Behavioural Codes**

## **Appendix A**

### **Letter to Potential Participant**

Dear Madam/Sir:

I am requesting your participation in my study. My study is exploring communication in intimate relationships. This study is an exciting way to observe the complexities of being in an intimate relationship. Over the past couple of months I have either spoken to you or your partner regarding participating in my study. I have asked you to participate because you have been in a relationship for at least six months. Your participation involves three components. First, completing two questionnaires: one asking for basic demographic information, and a second asking you to describe five events which have occurred to you and your partner within the past six months. Second, coming to the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT), and having a conversation with your partner. Your conversation will be video taped. In total, your participation involves approximately thirty minutes of your time. Third, completing a Marital Adjustment questionnaire. At the end of the sessions I will explain to you the purpose of my study. Once my thesis is written I will provide a summary of the results to you and your partner.

All information collected in this study is confidential and at no time will your names be used in the report, nor will you be required to participate further. This study is designed to examine how individuals in a relationship communicate and not what is said. Your response to the questionnaires will not be considered as right or wrong. Access to the video data will be by myself and my thesis supervisor, Dr. Marc Lewis.

Please be aware that you may withdraw from the study at any time. The present research is in no way connected with the OISE/UT Psychoeducational Clinic. My research is supported by the Department of Human Development and Applied Psychology at OISE/UT. During the course of the interaction it is possible that emotional or physical discomfort may occur. Arrangements can be made for further consultation if any discomfort arises from your participation. If you have any questions regarding this study, please call me at 416-767-0284. I thank you in advance for your interest and participation.

Sincerely,  
Jorge Sousa

## **Appendix B**

### **Informed Consent Form**

My signature below certifies that this study has been explained to me and I am willing to participate. I understand that I will be asked to answer two questionnaires, as well as describe five events that have taken place between my partner and I within the past six months. Further, I agree to have a conversation with my partner/husband/wife videotaped.

I understand that our discussions will be kept confidential and that no one other than those working on this study will see our response to the questionnaire, or the videotape of my conversation.

- I am aware that I may withdraw from the study at any time, without penalty.
- I am aware that the present research is in no way connected with the OISE/UT Psychoeducational Clinic.
- I am aware that it is possible that emotional or physical discomfort may occur during the interaction.
- Any limitation to confidentiality has been discussed with me.

I hereby give my written consent to participate in this investigation.

Name (Please print): \_\_\_\_\_

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

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

Phone number: \_\_\_\_\_



**Appendix C****Demographic Questionnaire**

Thank you for agreeing to participate in my study. As I mentioned before, I am exploring the complex nature of intimate relationships. The participants in this study have been together for at least six months. You and your partner will be videotaped in three different sessions, each lasting about 10 minutes. Your participation will take approximately thirty minutes.

For the purposes of this study could you please answer the questions in Part A and complete Part B:

**Part A**

Name:

Gender:        Male            Female

Age:

Level of Education: Answer any of the following which apply

Completed High school

Some College (please state highest level completed)

College Diploma

Some University (please state highest level completed)

University Degree

Other (please elaborate)

Occupation (This includes student, self-employed, stay at home parent, unemployed):

Length of time you have been in your present relationship (in months):

Do you live with your partner? Yes            No

## **Appendix D**

### **Description of Emotional Events**

#### Part B

I am interested in hearing about five events which have taken place within the past six months between you and your partner. These events may or may not have resulted in a conflict between the two of you.

Below you will find the names of five emotional states. Please describe, in as much detail as you can, an event that occurred between you and your partner within the past six months in which the specified emotional state was exhibited by you or your partner. Please outline as much detail as you feel comfortable providing.

Below are examples of things that have occurred to me and my partner within the past six months.

1. Most Positive: My partner won \$100 and she took me out to dinner.
2. Moderately Positive: We went out to dinner and talked about our day.
3. Neutral: We were discussing which movie to watch.
4. Moderately Negative: My partner was late to meeting me for a movie.
5. Most Negative: We wanted to watch a concert. When we went to buy tickets we found out that it was sold out. I was quite angry with my partner, but she blamed it on me because apparently I could not decide whether I wanted to see the show or not. I was surprised she felt that way. We haven't spoken about it since.

There you have it. Very simple. Now it is your turn. Please fill out the areas below.

1. Most Positive
2. Moderately Positive
3. Neutral
4. Moderately Negative
5. Most Negative

No one will be reading this other than me and my M.A. thesis committee at OISE/UT. All I ask is that you DO NOT discuss this with your partner before your videotaped conversation. Once you have completed this sheet, we could then book a time at OISE/UT and complete the session. If you have any questions please do not hesitate to ask.

## **Appendix E**

### **Tardif Coding Scheme For Verbal Content** (Tardif, 1997)

#### **∞ Facilitative behaviours**

1. Approving, or supportive comment
2. Direct agreement/Compliance
3. Problem Solving/Offering or eliciting an opinion or suggestion
4. Assent/Affirmative

#### **■ Neutral behaviours**

5. Exchange of information – Question/Clarification
6. Summarizing self or other/Mind reading

#### **✓ Aversive behaviours**

7. Disagreement with rationale supplied
8. “Yes but” agreement
9. Direct disagreement/Noncompliance
10. Command/criticize/complain/accuse/or obstinate-antagonistic

## Appendix F

### Tardif Coding Scheme for Affective (Nonverbal Behaviour) Cues (Tardif, 1997)

#### Nonverbal Channel

	Positive	Negative
Face	smile empathetic expression head nod	frown sneer fearful expression cry smirk angry expression disgust glare
Voice	caring warm soft tender relieved empathetic concerned affectionate loving	satisfied buoyant bubbly cheerful chuckling happy joyful laughter
		cold tense scared impatient hard clipped hurt staccato whining mocking
		blaming sarcastic angry furious blaring depressed accusing laughter
Body	touching distance reduction open arms attention relaxation forward lean	arms akimbo neck or hand tension rude gestures hands thrown up in disgust pointing, jabbing, slicing