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Running head: INTERPERSONAL RIGIDITY

A Test of the Influence of Interpersonal Rigidity on the Behaviour and Experiences of Others

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M.A. Thesis

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Abstract

Interpersonal rigidity is defined as the extremeness of an individual's behaviour and the narrowness of the behavioural repertoire measured according to the Interpersonal Circumplex (Kiesler, 1983). While acknowledged as an important influence on interpersonal behaviour, rigidity has been examined in very few studies to date. The influence of interpersonal rigidity was therefore explored using sequential analytic techniques designed to assess the impact of specific behaviours on the course of ongoing interactions. Pairs of undergraduate students completed the Revised Interpersonal Adjective Scales (IAS-R; Wiggins et al., 1988), from which their rigidity scores were calculated. They then played a modified, sequential version of the Prisoner's Dilemma Game, set up so that the two dimensions of the Interpersonal Circumplex (Dominance and Love) were reflected respectively in the choice of which player went first on each turn, and whether to cooperate or compete (defect). In general, vector length (rigidity) scores were either negatively or not related to indices of sequential dominance, suggesting that rigid individuals are not those who control interactions, but rather are those whose behaviour becomes more predictable from that of more flexible individuals. In addition, the sequentially dominant participants had more positive views of their own and their partners' behaviour, suggesting that making others' behaviour more predictable is somehow interpersonally satisfying. Some alternative statistical techniques are suggested for future research to clarify these somewhat counterintuitive relationships.

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A Test of the Influence of Interpersonal Rigidity on the Behaviour and Experiences of Others

Interpersonal theory is a system of propositions that attempts to describe and predict human behaviour during social interactions. In this theory, individuals' motivations are presumed to influence their interpersonal behaviour. Individuals initially form impressions of themselves and others from early interactions, and develop characteristic styles of interacting based on these early interpersonal experiences. These early impressions and associated behavioural styles later contribute to their self-concepts. Early interpersonal theorists proposed that unstable self-concepts engender anxiety. Thus, having a stable sense of self is considered a motivating factor that is expressed through an individual's interpersonal behaviour. Individuals attempt to validate their self-concepts through their interpersonal interactions in an effort to ward off this anxiety (Carson, 1982). Hence, interpersonal theorists believe that an understanding of human behaviour can only arise from viewing individuals within their interactional systems (Kiesler, 1988).

One of the main tenets of interpersonal theory is that individuals' behaviour in any given interpersonal interaction is influenced, and often constrained, by others with whom they are interacting. One of the ways in which individuals' behaviour can be influenced by the behaviour of others is by

a pull for *complementary* responses. These are responses that are believed to satisfy individuals' need for confirmation of their self-concepts. A great deal of research has focused on demonstrating the principle of complementarity, but the results have often been inconclusive. This suggests that other factors may also influence individuals' interpersonal behaviour. A second factor that may modify the course of interpersonal interactions is an individual's *rigidity*, which is defined as the extremeness of the individual's behaviour and the narrowness of the behavioural repertoire (Kiesler, 1983).

There has been considerable research on the existence and importance of complementarity in interpersonal interactions, but very little research to date has examined interpersonal rigidity. The present study will explore the effects of interpersonal rigidity on the course of interactions.

Interpersonal Theory

The Interpersonal Circumplex

Interpersonal theory describes interpersonal behaviour in terms of two dimensions: the Dominance dimension (power, status, or control) and the Love dimension (affiliation or warmth). These dimensions are represented in space by two orthogonal axes. The space circumscribed by these axes is known as an interpersonal circumplex (see Figure 1). The Dominance dimension is

represented by the vertical axis, generally labelled Dominant-Submissive. The Love dimension is represented by the horizontal axis, generally labelled Friendly-Hostile. During an interaction, interactants are negotiating both how friendly or hostile they will be with others, and the degree of control they will exert over the interaction (Kiesler, 1983; 1988).

Numerous interpersonal circumplexes have been described (e.g., Kiesler, 1983; Strong et al., 1988; Wiggins, Phillips, & Trapnell, 1989). These circumplexes provide what Kiesler (1983) calls a "taxonomy of two-dimensional behaviors" (p. 186). Each segment of behaviours is made up of weighted contributions from each of the two axes. That is, interpersonal behaviours represent the mutual expression of the Control and Affiliation dimensions (Kiesler, 1983). By extension, each angular segment of an interpersonal circumplex is associated with a prototypical profile; all those individuals falling within a particular segment will share some features of the prototype (Wiggins, Phillips, & Trapnell, 1989).

Interpersonal Acts and Transaction Cycles

The basic unit of behaviour, according to interpersonal theorists, is the interpersonal act. Interpersonal acts serve to present certain aspects of individuals' self-concepts and, by the response they elicit, to structure others' behaviour to meet individuals' needs for self-confirmation. Validation of their

self-concepts can then encourage the individuals to repeat their original behaviours (Kiesler, 1988). Interpersonal acts and the responses they elicit from other interactants have both overt (behavioural) and covert (or nonverbal) components. Both of these components of interactants' behaviour are designed to give rise to an interaction that is congruent with and confirmatory of their self-concepts. Kiesler (1983) describes the stages of an interpersonal response: "(a) a covert response, labeled the 'impact message,' and (b) the subsequent overt action, labeled the 'complementary response'" (p. 205). The impact message is an internal experience, but will affect individuals' overt actions. Interactions and relationships result from the cumulative exchange of messages, both overt and covert, between the interactants (Kiesler, 1988).

The basic unit of an interpersonal interaction is the Interpersonal Transaction Cycle (Wagner et al., 1995). Individuals' covert experiences can cause them to behave in a certain way. That behaviour, in turn, causes covert reactions in other interactants, leading them to respond in certain ways. These actions and reactions form a loop that continues throughout the interaction; that is, the Interpersonal Transaction Cycle. Based on their experiences of early interactions with significant others, individuals will come to adopt certain characteristic transaction patterns, which can lead to the formation and maintenance of stable individual differences. The interpersonal circumplex

defines the universe of transaction styles that may be exhibited by different individuals. These transaction styles then feed into the interpersonal transaction cycle, and become stable interactional styles (Wagner et al., 1995).

Factors Influencing Interpersonal Behaviour

Numerous factors influence individuals' interpersonal behaviour, including both individual differences and environmental contingencies. The individual differences inherent in interpersonal behaviour can be graphically represented by the interpersonal circumplex, which specifies the universe of possible interpersonal styles (Kiesler, 1990). There are diverse environmental contingencies that may affect interpersonal behaviour. In interpersonal theory the major environmental factor to be specified so far is the behaviour of other interactants.

Complementarity

By far the most widely studied influence on interpersonal behaviour is the complementary response (Kiesler, 1990). Interpersonal theory posits that individuals use complementary interactions to confirm their self-concepts, as illustrated by the interpersonal circle (see Figure 1). Individuals' interpersonal acts serve as cues to appropriate responses for others involved in an interaction; that is, individuals act in such a way as to prompt responses that confirm and

reinforce their self-concepts. Interpersonal acts, by virtue of their placement on the circle, serve to constrain the responses of others to small, specific areas of the circle termed *complementary* segments. However, the constraining power of interpersonal behaviour is probabilistic rather than deterministic. In other words, individuals' actions will not compel others to respond in a complementary fashion, but will encourage, or increase the likelihood, of the complementary response (Carson, 1982; Kiesler, 1983; 1988; Tracey, 1994). If a complementary response is provided, the originator will find the interaction rewarding; if the complementary response is not provided, the originator will find the interaction aversive. The interactants are not consciously aware of the impact of their actions on others, but inadvertently respond to the impact that others' actions have on them (Kiesler, 1988).

Kiesler (1983) defines complementarity as occurring on the basis of reciprocity on the Dominance dimension or axis (dominance complements submission, submission complements dominance) and correspondence/ similarity on the Love dimension or axis (hostility complements hostility, friendliness complements friendliness). In terms of circle locations, complementary responses occur vertically within the left or right halves of the circle. Complementary and noncomplementary responses also tend to occur at the same level of intensity as the original act. That is, mild-moderate acts

evoke mild-moderate responses, while extreme acts pull similarly extreme responses. Therefore, rigidity on the part of one interactant may eventually cause other interactants to escalate the rigidity of their own behaviour (Kiesler, 1983).

While Kiesler (1983; 1988) stated that a growing body of literature supported the principle of complementarity, Orford (1986) suggested that the overall picture of interpersonal complementarity was much less conclusive than previously thought. In general, Orford did not find strong support for the notion of complementarity in interpersonal behaviour, especially with respect to hostile complementarity. He noted that the relationships found between antecedent and consequent pairs of behaviours over different studies showed a significant lack of consistency, thus indicating that factors other than complementarity may influence interpersonal interactions and should be considered in future research on interpersonal interactions.

In a different approach to investigating interpersonal complementarity, Strong et al. (1988) suggested that interpersonal theorists (e.g., Carson, 1982; Kiesler, 1983) had framed their propositions of complementarity in more probabilistic, less deterministic, terms than Orford (1986) asserted in his critique. Strong et al. pointed out that any given interpersonal act, while not necessarily determining a particular response, will at least affect the likelihood

of occurrence of the response in question. That is, an action will not *cause* the complementary reaction to occur, but may increase the chance of its occurrence. The authors also suggest that there are multiple influences and determinants acting to shape interpersonal behaviour in any particular situation, only one of which is the principle of complementarity. In their study, Strong et al. (1988) used vector analysis to assess the contribution made by complementarity in governing the course of an interpersonal interaction. This type of analysis allowed the authors to compare the effect of a particular antecedent behaviour on the likelihood of its complementary response to the effects of the same antecedent behaviour on the likelihood of all the other responses from the interpersonal circumplex. Summing over all these effects gives a resultant vector which indicates the magnitude and direction of the overall net response to the antecedent behaviour.

Most antecedent behaviours influenced the proportion of several of the possible responses. However, when the resultant vectors were plotted, the directions of their effects (i.e., the impacts of the antecedent on the response behaviours) were more in keeping with the predictions of complementarity. The impact of interactants' behaviour was visible in the overall pattern of responses, rather than in each individual response. That is, one individual's behavioural style may encourage a general pattern of responding from others,

but does not necessarily dictate each and every response others make. However, Strong et al. (1988) cautioned again that there are many other possible influences on interpersonal behaviour which should be incorporated into further research on interpersonal theory.

Tracey (1994) made an even more compelling case for the principles of complementarity. Previous research has not explored the possibility that different behaviours may have different tendencies to elicit complementary responses from others. In other words, behaviours from different segments of the interpersonal circumplex may have different degrees of constraining power. In addition, because different types of behaviours have different base rates (e.g., friendly behaviour would be more common than hostile behaviour), they would also likely elicit different reactions (e.g., it would be more socially acceptable to respond in a complementary fashion to friendly behaviour than to hostile behaviour). Thus, the base rates of different behaviours can also have an effect on complementarity.

For this analysis, Tracey (1994) used the data set from the Strong et al. (1988) study mentioned above. The data consisted of the proportion of responses from each octant of the interpersonal circumplex given each type of antecedent behaviour. Rather than using the traditional exploratory approach common to previous research on complementarity, he used a confirmatory

approach that involved testing hypothesized order relations against randomized orders. Predictions of the likelihood of each pair of sequential behaviours (antecedent-consequent) were made based on the degree of complementarity. A correspondence index (CI) was then calculated to describe the relative fit of the predictions to the data. Randomization tests were performed on both the original data matrix and a base-rate-corrected data matrix. Tracey (1994) found that the majority of predictions were met, and the CI was positive and significant, for both the original and base-rate-corrected data sets. The complementarity model had a closer fit to the base-rate corrected data set than to the original data set. He concluded that the base rates of different behaviours do influence the likelihood of complementarity.

Orford (1986) concluded that while there was evidence supporting friendly complementarity, hostile complementarity was uncommon in interpersonal interactions. Tracey (1994) disputed this conclusion, claiming that none of the studies reviewed by Orford had taken into account the fact that hostile behaviour itself was rare, and had made the assumption that all behaviours were equally likely. When Tracey analyzed the base-rates of behaviours from the friendly and hostile sides of the circle, he found that hostile behaviours made up less than 1/3 of the consequent behaviours emitted - significantly less than friendly behaviours. Thus, the frequency of the two

types of behaviours cannot be compared directly. The base rate of emission of the particular behaviour of interest must be taken into account in order to establish whether complementarity is being demonstrated.

Tracey (1994) also concluded that friendly behaviour had a stronger impact on the responses made during an interaction. Interpersonal theorists have typically assumed that, within the same level of intensity, each type of behaviour will have the same effect in eliciting consequent behaviours from a complementary segment of the circumplex. However Tracey points out that social expectations will make friendly behaviours more common and more likely to occur, even given a hostile antecedent. Thus, he concluded that the presence of complementarity was mediated by the different base rates of behaviors.

In summary, while Orford (1986) strongly disputed the existence of complementarity in interpersonal interactions, others (Strong et al., 1988; Tracey, 1994) showed that the phenomenon can be detected if the base rates of different behaviours are taken into account, and it is considered to be a more probabilistic than deterministic influence on behaviour. However, even in those studies that adhere to these recommendations, the results still do not uphold perfect complementarity. There are still unexplained sources of variability in individuals' interpersonal behaviour which need to be elucidated.

One important point to note is that none of the above-mentioned research took into account the intensity of the behaviour. There was no distinction made between the more socially acceptable, moderate behaviours and the less adaptive, rigid behaviours within each category. Wiggins et al. (1989) and Kiesler (1983) have both indicated that rigidity or flexibility in interpersonal interactions is an important influence on interactants' behaviour. Therefore, rigidity may be one of the factors that moderates complementarity, and may have an influence on the course of an interaction.

Flexibility and Rigidity

Although individuals' characteristic styles of relating to others may be described by their location at a particular segment of the interpersonal circle, no single person's behaviour will come from only one segment of the circle. Rather, an individual's characteristic interpersonal style will be comprised of several segments from the circumplex. In some cases, a style may be a simple blend of two neighbouring segments, while in others it may be a triad with a peak in one segment and fewer instances of behaviours from the adjacent segments on each side. The degree to which individuals engage in different interpersonal behaviours is referred to as profile variance (Wiggins et al., 1989). By definition, the narrower the band of interpersonal circle segments making up the behavioural style, the more inflexible or maladaptive the behaviour.

Therefore it follows that "normal", flexible individuals will enact behaviours from a number of circle segments, whereas "abnormal" individuals will have more restricted behavioural repertoires (Kiesler, 1983). Paulhus and Martin (1988) coined the term *functional flexibility* to describe "the ability to adjust one's behavior to the interpersonal demands of a wide range of situations" (p. 91). This concept encompasses two components of flexible, adaptive behaviour: having a wide range of behavioural options from which to choose, and possessing the ability to choose behaviour appropriate to the situation.

In addition to profile variance, interpersonal behaviour can also be described according to its level of intensity. Kiesler (1983) stated that for each segment of the interpersonal circumplex, the vector length from centre of circle to placement of behaviour represents the extremeness, or intensity, of the behaviour. Individuals who consistently enact extreme behaviour are considered interpersonally rigid. To capture this dimension, Kiesler suggested that instruments based on the interpersonal circle should have the capacity to distinguish at least two levels of intensity - mild/moderate and extreme. This distinction is necessary in order to assess the degree of rigidity or abnormality of behaviour using a circular measure.

Vector length in the interpersonal circle is an index of the extremeness of behaviour (Kiesler, 1983). Although the vector length of an interpersonal

profile is an indication of the deviation within a profile, it is not associated with angular orientation within the circle (Wiggins et al., 1989). Therefore, vector length does not correlate with location on the interpersonal circle, nor with interpersonal style. For this reason, vector length should not show any systematic associations or relations with scores on measures of general psychopathology, unless the extent of the psychopathology was assessed within certain diagnostic categories of the interpersonal circumplex. However, because the angular direction of the vector indicates the characteristic interpersonal style, and the vector length indicates the degree of intensity of that style, within a particular segment of the circle (or diagnostic category) the vector length could be correlated with measures of interpersonal problems. That is, vector length is unrelated to general psychopathology, but within categories it may be related to specific interpersonal problems, inflexible interactional styles, and maladaptive transaction cycles (Wiggins et al., 1989).

Kiesler (1988) defined maladjusted behaviour as "disordered, inappropriate, inadequate, and self-defeating interpersonal actions, maladjusted behavior results originally and cumulatively from an individual's failure to attend to and correct the self-defeating, interpersonally unsuccessful aspects of his or her interpersonal acts" (p. 17). Individuals with maladjusted behaviour not only restrict their behaviour to a narrow band of the interpersonal circle and

engage in extreme behaviour, they fail to realize the aversive impact that they have on others. More well-adjusted individuals can gauge the impact of their actions on others and modify the interaction accordingly. Disturbed people's behaviour is not contingent upon the situation or on the behaviour of others in the interaction, but is both consistent and rigid during and across interactions.

Rigidity, complementarity, and interpersonal relationships. Adaptive interpersonal functioning has two components: intensity of expression (indexed by vector length) and flexibility of expression (indexed by profile variance; Wiggins et al., 1989). Rigid individuals have narrower bands of behaviours from which to choose and do not modify their behaviour according to the situation. Therefore, they are less likely to provide the complementary responses predicted by interpersonal theory. That is, rigid individuals' behaviour is not necessarily predicated on that of others - rigid people will continue to enact their customary interpersonal styles regardless of what behaviours others demonstrate or try to elicit. They will also resist any "pull" from others to enact behaviours from different segments of the circle (Kiesler, 1983).

Although individuals will try to elicit complementary responses from others with whom they interact, whether to confirm their self-concepts or to reduce anxiety, they typically will not always find complementary interaction

partners. While engaging in everyday interactions, individuals are likely to encounter others with many different interpersonal styles, to which they must adapt (Carson, 1982; Kiesler, 1983). It is at this point that the notion of interpersonal flexibility or rigidity becomes relevant. It is interpersonal flexibility that allows individuals to engage in behaviours from many segments of the interpersonal circle, enabling them to interact with and complement others, as well as being complemented by others. Flexibility also allows them to create mutually satisfying relationships, and is considered adaptive in an interpersonal sense. However, those who are interpersonally rigid typically engage in behaviours from only a narrow portion of the circle, consistently pulling for complementary reactions from others, while not necessarily providing in turn responses that will satisfy others. The desired complementary reactions to rigid persons' behaviour may be forthcoming initially, but as other interactants begin to feel that they are being manipulated, they may end the interaction, start to show nonverbal indications of hostility, or give unsatisfactory responses (Kiesler, 1988).

O'Connor and Dyce (1997) suggested that complementarity would be more crucial in a relationship involving rigid individuals than in one in which the participants can flexibly negotiate a mutually satisfying interaction. Rigid people have cross-situational consistency in their behaviour regardless of the

environmental context. Thus, their interactions with others whose interpersonal styles are naturally complementary would be less problematic than their interactions with others who had different needs and different styles of interacting. Previous research on the existence and the importance of complementarity in interpersonal interactions produced mixed findings. One possible reason for the inconsistencies in other studies of complementarity is that researchers have not taken into account the potentially confounding effect of rigidity. O'Connor and Dyce (1997) investigated the moderating effects of rigidity on the complementarity of small groups (musical bands).

Musicians rated themselves and each other band member on a modified version of the Revised Interpersonal Adjectives Scales (IAS-R; Wiggins, Trapnell, & Phillips, 1988). The band members also rated their degree of positive regard for the other group members and the degree of integration among all of the members as a unit. The authors hypothesized that there would be an inverse relationship between the magnitude of the deviation from theoretical perfect complementarity and the level of both positive regard and group integration. However, they also suggested that this relationship would be moderated by the group members' rigidity scores. That is, positive regard and group integration in bands with high overall rigidity scores would be expected to be greater if the band members' interpersonal styles were already

complementary than in bands with non-complementary members. In the latter case, the degree of rigidity would have more of an effect on the band members' relationships because non-complementary relationships do not provide the same degree of confirmation of the interactants' self-perceptions. Both interactants may pull for complementary responses, but in interactions between rigid and non-complementary individuals, none of them may be satisfied.

O'Connor and Dyce (1997) did indeed find that vector length moderated the relationship between complementarity and both positive regard and group integration. In groups with high mean rigidity scores, complementarity was more strongly associated with positive regard and group integration than in bands with low mean rigidity scores. Thus, rigid individuals may have a stronger need to seek self-confirmation from complementary interpersonal interactions, whereas individuals that are more flexible can adapt better to the different interpersonal environments in which they find themselves. However in this study, the groups were pre-existing and the measures were static indices of group integration and positive regard. The present study will attempt to elucidate the role of rigidity on course of an interaction between two individuals who do not already know each other. The purpose of having strangers interact is to avoid the accumulation of prior experiences and impressions that are inevitable between individuals who already have some

type of relationship. In other words, interactants in the present study will start their interaction with a "blank slate". This will provide a more clear indication of how the overt behaviour of individuals, and the covert impact of the behaviour on others, can influence an interpersonal interaction.

Rigidity and the Interpersonal Transaction Cycle

As Kiesler (1983) noted, "the interpersonal definition of maladjusted behavior (extreme and rigid acts on the interpersonal circle) indicates clearly that the actions of abnormal individuals tend to override differences in situational parameters, including different styles of interactants" (p. 209). Kiesler (1988) described the Maladaptive Transaction Cycle, a self-defeating pattern of interactions that can result from rigid and maladaptive behaviour. Individuals interact with one another in such a way as to confirm their self-perceptions. Rigid people's initial actions will elicit complementary responses from the other interactants. This first stage will be somewhat mutually confirming for rigid individuals, as their self-concepts have so far been validated. However, rigid individuals do not perceive or satisfy others' similar needs for self-confirmation, and continue to enact the same narrow band of behaviours that make up their characteristic style. Others, feeling "pulled" and constricted in their own behaviour, may continue to provide the complementary response, but will eventually feel somewhat manipulated and send covert, non-

verbal messages of hostility or resentment. The effect of these covert messages is to threaten the self-concept of the rigid individuals, who then escalate their original behaviours, creating an aversive interaction. At this point, others may choose to terminate the interaction or may increase their covert messages of hostility. Either way, rigid individuals eventually set up a Maladaptive Transaction Cycle, which is maintained by their own behaviour, although they may be unaware of this (Kiesler, 1988).

However, a similar, albeit transient, process can occur with more normal individuals who are experiencing stress or anxiety. Van Denburg and Kiesler (1993) called this process *transactional escalation* and described it as an increasing reliance on familiar or preferred interpersonal behaviours in the face of stress or anxiety. This exerts pressure on others with whom the individual interacts to adapt to the escalation, and to continuously provide complementary and confirmatory responses.

As Tracey (1994) and Van Denburg and Kiesler (1993) noted, previous research on complementarity has neglected to take into account both the base rates of various interpersonal behaviours and the interactants' baseline interpersonal styles before the experimental interaction. For this reason, researchers cannot be sure that non-complementary responses are not merely part of the interactant's usual interpersonal style, or the result of an escalation of

a particular behaviour in response to stress. Van Denburg and Kiesler suggested that this might be one reason for some of the previous inconsistent empirical results regarding the principle of complementarity in interpersonal transactions. Therefore, they selected undergraduate students whose baseline interpersonal styles were known, and had them interact in potentially stressful situations to investigate the effect of stress on the extremeness and rigidity of interpersonal behaviour.

Undergraduate students whose typical interpersonal style was friendly-submissive were selected to interact with confederates. Observers coded subjects' interpersonal behaviours first in a low-stress interview condition in order to establish the baseline behaviour, and then in a subsequent interview which consisted either of a continued low-stress (control) or a high-stress condition. During the high-stress condition interviewers began to enact behaviours that were not complementary to the participants' baseline pattern (i.e., they began to enact hostile-submissive behaviours), while in the low stress condition, interviewers continued providing the complementary, friendly-dominant response to the participants' friendly-submissive behaviour (Van Denburg & Kiesler, 1993). The authors hypothesized that the participants' typical interpersonal style would become more extreme during the high-stress condition, and that the participants would rely on narrower bands of behaviour

from the interpersonal circle, consisting mainly of their preferred interpersonal behaviours. That is, they proposed that the participants would become more rigid.

The authors found that, as predicted, subjects in the high-stress condition demonstrated a significant increase in their friendly-submissive scale scores during the second (high stress) half of the interview, while the low-stress subjects did not. To test the hypothesis that subjects would become more rigid and narrow in their behaviour requires scrutiny of the other three quadrants of the circle as well the friendly-submissive quadrant. Individuals whose behaviour is becoming more rigid should employ behaviours from fewer segments of the circle, and intensify those behaviours that come from their preferred segments of the circle (Van Denburg & Kiesler, 1993). The authors found that during the second half of the interview high-stress subjects showed a decrease in friendly dominant behaviours but an increase in hostile dominant behaviours. Thus, there was a decrease in behaviours from one region of the circle which was outside the participant's preferred behavioural repertoire, as predicted. However, behaviours from the other two regions did not decrease, contrary to the predictions of the transactional escalation hypothesis.

Overall, the study showed that friendly-submissive participants who were subjected to a stressful interpersonal situation tended to escalate their

friendly-submissive behaviours (thus exhibiting more *extreme* behaviour) and de-escalated their friendly-dominant behaviours, consistent with the predictions. However, they did not reduce their hostile-submissive or dominant behaviours as expected. It is possible that because the initial proportion of hostile-dominant behaviours was so low, any lack of de-escalation seen in these behaviours could simply be regression to the mean. The authors suggest that the de-escalation of particular interpersonal behaviours may be more evident if researchers concentrate on the interpersonal segments next to the individual's characteristic segment.

Van Denburg and Kiesler (1993) pointed out the need to integrate the concept of transactional rigidity with previous versions of interpersonal theory. These earlier formulations generally view rigidity as a trait, whereas the authors suggested that, in some situations, it can be more of a state (e.g., in stressful situations). That is, individuals can exhibit varying levels of rigidity, all within the same interpersonal profile, depending on the circumstances. Given that the interactants' baseline interpersonal style was not measured in most previous research, it is possible that some non-complementary responses are merely a reflection of the individual's normal style, or a stylistic intensification in response to stress or anxiety. Van Denburg and Kiesler (1993) took a more dynamic approach to the study of interpersonal rigidity than has been the case

in previous research. However, they looked at the elicitation of rigidity in response to interpersonal stress rather than looking at the impact of rigidity on interactions. In addition, the subjects whose behaviour became more rigid were interacting with confederates; thus, it is not known how their rigid behaviour would affect another participant in a more naturalistic interaction. The present study will examine the impact of rigidity by assessing the course of an interaction between two participants of known rigidity scores.

Analyzing Interpersonal Interactions

Theoretically, any interaction between two or more individuals is an interpersonal interaction, and should conform to some extent to the predictions of interpersonal theory. Kiesler (1983) suggested that these predictions should be met most often in situations which are naturally occurring, unstructured, and somewhat ambiguous. However, to discern the effects of factors such as rigidity on the course of an interaction, some structure must be in place, and there must be some way of coding the interactants' behaviour that will map onto a circular structure and will also lend itself to analysis. The Prisoner's Dilemma Game (PDG) can be set up to satisfy these criteria and provide an easy means of collecting and simplifying data from interpersonal interactions. The PDG is an experimental procedure in which two or more individuals interact via a series of choices, the end result being a payoff of some sort (e.g.,

points or money). Each choice allows the players to specify both how much they will receive, and how much their partners will receive. The game is set up so that those choices that maximize individual gain actually minimize joint gain. In other words, as Oskamp (1971) explained in his review of games, "achieving individual goals is incompatible with achieving mutual or group goals" (p. 225). Therefore, researchers can use this procedure to analyze the different motives that guide the choices of different individuals (Wiggins, 1980). Oskamp also explained that the prototypical PDG evaluated the play of one participant against some sort of pre-programmed strategy, but pointed out that free-play games have also been used to study interactions in which there are two (or more) participants playing together, and there are no pre-defined strategies. This free-play procedure thus more closely resembles real social interactions. Finally, the original PDG procedures had the players making their choices simultaneously, and without knowledge of their partners' choices. However, the game can also be played in a sequential fashion in which the players alternate their choices, and are informed of their partners' previous choice before making their own. In this scenario, as in real social interactions, each action is a response to a previous action, as well as a stimulus for later reactions.

The Prisoner's Dilemma Game and The Interpersonal Circumplex

Wiggins (1980) stated that descriptors of interpersonal behaviour naturally fall into a two-factor, circumplex structure, as do descriptors of other constructs, such as affect, personality (Wiggins et al., 1989), or behaviour (Gifford & O'Connor, 1987). Therefore, the behaviour of participants engaging in experimental games, like the PDG, should also be able to be represented in a circular pattern. He also suggested that the PDG is a good model of social interactions because it involves the exchange of resources. In social interactions, the resources are love and dominance/status (that is, the same resources that are represented by the axes of the Interpersonal Circumplex). In the PDG, the resources are often points or money. In spite of this difference, Wiggins proposed that the motivations inherent in social exchanges and experimental games are analogous, and thus the latter can serve as a model of the former.

Maki, Thorngate, and McClintock (1979) developed a graphical model of social motivations, in which each motivation is associated with a vector in circular space, in order to study interpersonal motivations in interactions. The choices players make in the PDG are considered to be associated with general motives (i.e., individualism, cooperation, altruism, martyrdom, masochism, sadomasochism, aggression, and competition) which are placed in a circular

model analogous to the Interpersonal Circumplex. The orthogonal axes in this case are Own Outcome (vertical) and Other's Outcome (horizontal). That is, players' motivations are a combination of the impact of their choices on their own payoff outcome and their partner's payoff outcome. Therefore, players' motivations can be inferred from the series of choices they make over the course of a PD game. Sometimes these motivations will be stable strategies to which players may adhere throughout the game, and sometimes players will change their motivations, and choice patterns, in response to the other player's moves. Therefore, a sequential, free-play PD game can be considered analogous to an interpersonal interaction, to which individuals will bring more or less flexible interactional styles.

Oskamp (1971) lays out the typical payoff matrix for a Prisoner's Dilemma game as follows:

	Player B	
Player A	Cooperate	Defect
Cooperate	3 , 3	0 , 5
Defect	5 , 0	1 , 1

If the game outcome is the sum of both players' scores, the most beneficial outcome occurs when both players cooperate, and the least beneficial outcome occurs when both players defect. Individual gain is maximized for one player if that player defects and the other cooperates. This will also result in a maximal difference between the players' scores (Oskamp, 1971). Thus, it is clear that the choice to cooperate or defect in the PDG can be considered analogous to the choice of whether to be friendly or hostile in a social interaction. That is, players' choices with respect to cooperation or defection can indicate where their interpersonal behaviour would be located on the Lov dimension of the interpersonal circumplex.

In a simultaneous PDG, in which both players choose at once in ignorance of the other's choice, there are four possible outcomes for each turn (i.e., cooperate-cooperate, cooperate-defect, defect-cooperate, or defect-defect; Oskamp, 1971). However, in the sequential game, the first player's choice both halves the number of possible outcomes on that turn and gives information about the first player's interpersonal behaviour. That is, in the sequential game, the first player exercises some control over the outcome. Therefore, in a sequential game, if the players' serial positions on each turn are left for them to determine, their actions can reflect their positions on the Dominance dimension of the interpersonal circumplex. In other words, a player who consistently

chooses to go first is demonstrating dominance, while a player who consistently waits to see what the opponent has chosen is exhibiting submissiveness.

In summary, the Prisoner's Dilemma Game can be used to simulate interpersonal interactions in the laboratory. In the sequential version, as in social situations, the interaction proceeds in a two-way fashion, with interactants responding to and eliciting each others' behaviours. The interactants' interpersonal styles can be inferred from their styles of play. The Love dimension is reflected in the choice to cooperate (friendly) or defect (hostile), while the Dominance dimension is reflected in whether the players choose to go first (dominant) or to await their partner's choice (submissive).

Analysis of Sequential Data

Interpersonal interactions consist of a series of behaviours that unfold over time. Given that interactions have a goal-directed nature (i.e., they serve to confirm the self-concept of an individual), both interactants will try to direct the interaction to some extent. This direction requires an interactant's skillful manipulation of the behaviour of the other interactant. According to the propositions of interpersonal theory, this manipulation takes place in systematic and predictable ways (Kiesler, 1983). Thus, in analyzing interpersonal interactions, both the sequence of events and the impact of various events are important, rather than merely base rates and frequencies (Bakeman & Gottman,

1986). Analyses that capture both types of information are needed to study the course of an interaction. The proper analytic technique can be instrumental in revealing the complex patterns that arise when several individuals interact, each contributing their own goals, motivations, and manipulation skills.

Sequential analysis is a generic term used to refer to a collection of statistical techniques that are designed to assess the sequence and impact of particular behaviours during interactions. This type of analysis is contrasted with those techniques which assess merely frequency or base rates (Wampold & Kim, 1989) or those static measures that assess an individual's score on some variable at only one point in time (Bakeman & Gottman, 1986). Sequential analytic techniques can be used to determine whether particular sequences of behaviour occur by chance, or whether they are systematic (Wampold & Kim, 1989). That is, they test whether behaviours are *independent* of each other. If they are not independent, the probability of one behaviour following another will be significantly greater or less than that expected by chance.

Both unidirectional and bidirectional independence can be assessed using sequential analysis techniques. A test of unidirectional independence assesses the influence of the antecedent behaviour on the probability of the subsequent behaviour. A test of bidirectional independence does the same, but in addition, simultaneously assesses the influence of the subsequent behaviour

on the probability of the repetition of the antecedent behaviour. That is, it tests the independence of the circular pattern of antecedent-subsequent-antecedent behaviours (Wampold & Kim, 1989). Truly complementary interactions lack bidirectional independence. That is, behaviours are both responses to previous actions, and catalysts for later actions. For example, according to the Interpersonal Circumplex, hostile dominant behaviour from one interactant will elicit hostile submissive behaviour from another; this will in turn, elicit hostile dominant behaviour from the first interactant. This is a repeating loop of behaviours that are dependent each on the other. Alternatively, as Kiesler (1988) defines it, this constitutes a complementary Transaction Cycle.

Sequential analysis can also be used to assess *sequential dominance*[1] in an interaction, that is, whether one interactant influences the direction of the interaction more than another does. Gottman and Ringland (1981) defined dominance as "asymmetry in predictability" (p. 395). Thus, if one interactant's behaviour is more predictable from the behaviour of another than the reverse, the latter interactant is considered dominant. For example, if one person's friendly submissive behaviour was more predictable from another's friendly dominant behaviour than the reverse, the friendly dominant person would be

[1] Note that the concept of dominance in the sequential analyses of an interaction is not the same type of dominance encountered in the Interpersonal Circumplex. The former refers to the control exerted by an individual over an interaction, while the latter is an interactional style.

considered sequentially dominant. The dominance concept is especially useful in investigating how interactants manipulate an interaction, a central theoretical issue in interpersonal theory. Parallel dominance tests the symmetric influence between two behaviours or interactants. For example, the likelihood of transition between hostile dominance (HD) and hostile submissiveness (HS) could be compared to the likelihood of transition between HS and HD. Nonparallel dominance tests the difference in predictability between two different sets of behaviours. For example, the likelihood of the transition from HD to HS could be compared to the likelihood of the transition between friendly dominance (FD) and friendly submissiveness (FS). In this example, non-parallel dominance can be assessed in terms of the likelihood of submissive behaviours following dominant ones. Given the wealth of specific predictions which can be derived from the principles of complementarity and rigidity, it is clear that sequential analytic techniques are uniquely suited for evaluating the validity of the basic propositions of interpersonal theory.

The Present Study

Interpersonal rigidity is an important, but often neglected, influence on interpersonal behaviour (O'Connor & Dyce, 1997; Van Denburg & Kiesler, 1993). Although rigidity has been acknowledged as a factor in interpersonal interactions in previous research (Kiesler, 1983; 1988), it has seldom been

systematically studied. The present study assessed the impact of rigid behaviour on individuals' interpersonal interactions.

Van Denburg and Kiesler (1993) observed rigidity during ongoing interpersonal interactions. However, they did not look at the correlation between the participants' baseline rigidity scores and outcomes of the interaction. Rather, they assessed the ability of a confederate's stress-inducing behaviour to elicit rigid behaviour from study participants. The present study used interactions that were somewhat more naturalistic. That is, both interactants were participants, rather than using a confederate trained to direct the interaction in a certain fashion, and participants' rigidity was not be manipulated. Instead, the relationship between the vector length score (an index of rigidity) and sequential dominance (an index of the extent to which participants influenced the course of the interaction) was examined. The goal of this research, then, was to analyze the course of an interaction, and whether individuals' rigidity score affected the role they played in influencing that course.

O'Connor and Dyce (1997) studied the effect that vector length had on the relationship between complementarity and measures of positive regard and cohesiveness among members of small groups (musical bands). The group members were known to each other and relationships between them were

already established. The dependent variables that were assessed (measures of positive regard for other group members and degree of group integration) were chosen based on predictions from interpersonal theory. Inasmuch as complementary interactions are presumed to validate and confirm individuals' self-concepts, these would be more satisfactory for the interactants, and should have resulted in higher positive regard between those individuals who complemented each other. Complementarity should be especially important for rigid individuals, who exert a stronger pull for self-confirmation from their interpersonal interactions. Group cohesiveness was assessed because groups with complementary members should experience less conflicted and more productive relationships, leading to better overall group integration (O'Connor & Dyce, 1997). The present study extended the research regarding the impact of rigidity on interpersonal relationships, but focused instead on how participants perceived themselves and others after an interaction, and whether rigidity influenced these perceptions. Thus, the second goal of the present study is to investigate whether vector length is correlated with outcome measures assessing individuals' perceptions of their own and others' behaviour after interacting with others.

Method

Participants

Participants were students recruited from Introductory Psychology classes at Lakehead University. Students were offered the chance to gain a bonus point added on to their final grade and to be entered into a draw for one of four $25 prizes; however, participation was strictly voluntary.

Materials

The Revised Interpersonal Adjectives Scales (IAS-R; Wiggins et al., 1988) are a commonly used self-report method of measuring individuals' characteristic interpersonal styles. There are 64 items (selected from the original 128) which are distributed evenly across the eight scales of an interpersonal circumplex. Cronbach's alphas for the eight scales range from .75 to .86. A principal components analysis revealed the expected two factors representing Dominance and Love, and the scales have a clear circumplex structure (Wiggins et al., 1988).

Procedure

Students were recruited from Introductory Psychology classes. A brief description of the study was presented at the end of class, and the possibility of earning a bonus point was offered. Students were given a sheet on which to

sign up if they were interested. They were told that participation was strictly voluntary, and confidentiality was assured.

Students were matched into pairs based on availability and were asked to come into the laboratory. They were met by the experimenter, and upon entering the laboratory were seated on either side of a partition that prevented them from communicating with each other during the experiment. They were given a package containing, among other things, an informed consent form (see Appendix A). The experimenter went through the consent form with students, and they indicated consent to participate in the experiment by signing the form.

Students next filled out the full (64 item) form of the IAS-R (see Appendix B) based on *how they think they behave in general.* The game procedure was then explained (See Appendix C), and students had the opportunity to ask questions if they did not understand. The payoff matrix used in the game was explained and a copy was given to each student to look at during the game if they so desired. They were told that on each turn, the choice of which student went first would be left up to them, and that whenever they were ready, the person who wanted to go first in that turn could indicate so by holding up one of two cards (cooperate and compete, which replaced the more traditional defect choice in order to minimize negative connotations) to indicate her/his choice. The experimenter would write that choice on an overhead

projector placed where both students could see it. A practice game of five turns was played to make sure they understood. After the practice game, the point totals for the two individuals and for the pair were added so that the students could see the effect of their choices on the individual and group totals. The students were asked not to try to communicate with each other during the game, but to indicate their choices only to the experimenter. They were again given the opportunity to ask any questions if they did not understand the game procedure.

The participants then began playing the game. On each turn, the participant who wished to go first indicated so by holding up one of two cards, indicating her/his choice to the experimenter. The experimenter wrote the choice on the overhead projector so that both students could see it. The second participant then made her/his choice, and indicated this by holding up the appropriate card for the experimenter. The experimenter recorded all of the choices, as well as the participant sequence on each turn, on the overhead projector, and both participants could see the series and sequence of choices throughout the game.

At the end of 100 turns, the experimenter terminated the game. The students then filled out two copies of a short form (32 items) of the IAS-R (see Appendix D), which has been shown to adequately converge with the full form

(O'Connor & Dyce, 1997). One was completed based on *how they thought they behaved during the interaction* (designated IAS-self), and the other based on *how they thought their partner behaved* (designated IAS-other).

When they were finished completing these forms, students were given a debriefing form describing the entire experiment (see Appendix E). They were given the opportunity to ask questions of the experimenter, and were offered the opportunity to obtain results of the study. They then received a receipt for the bonus point, and were thanked for participating.

Results

Data Reduction

The data were set up in order to assess the theorized relationships between personality measures and behaviours, and to see whether individuals' behaviour reflected their personality descriptions. The data from the IAS-R items were divided into eight scales (see Wiggins et al., 1988). The standardized scores from each of the eight scales were then used to calculate individuals' Dominance (Dom) and Love (or Affiliation; Lov) scores, the two dimensions of the Interpersonal Circle. This was done according to the following formulas provided by Wiggins et al. (1989):

$$Lov = (.3) \sum_{i=1}^{8} Z_i \cos \theta_i$$

$$\text{Dom} = (.3) \sum_{i=1}^{8} Z_i \sin \theta_i,$$

where θ = the ideal angle of each scale's placement in the interpersonal circumplex. The vector length for each individual was then calculated from the above scores according to the following formula provided by Wiggins et al.:

$$\text{Vector length} = [(\text{Dom})^2 + (\text{Lov})^2]^{1/2}$$

Using circle geometry, the angular location for each individual was calculated from the Dom and Lov scores. Usually the angular location from IAS-R data is used to derive individuals' octant placements (see Wiggins et al., 1988; 1989), however because the data from the Prisoner's Dilemma Game (PDG) could only be transformed into quadrant locations, the IAS-R angular locations were used to derive quadrant locations instead. Thus, individuals with angular locations between 0° and 90° were considered friendly-dominant (FD); those with locations between 90° and 180° were considered hostile-dominant (HD); those with locations between 180° and 270° were considered hostile submissive (HS); and those with locations between 270° and 360° were considered friendly-submissive (FS).

The proportions of each of the four types of behaviours (FD, HD, HS, and FS) were calculated for each player from the Prisoner's Dilemma Game (PDG) data. Then each player's proportion of Dom (dominant) behaviours was

calculated by summing the proportions of FD and HD behaviours. Similarly, the proportion of Lov (friendly) behaviours was calculated by summing the proportions of FD and FS behaviours. The proportions of Dom and Lov behaviours were then translated into quadrant assignments as well in order to compare the participants' behaviour with their personality ratings. The proportions of Dom and Lov behaviours were converted into standardized z scores, and individuals' behavioural quadrant assignments were obtained using these standardized scores. That is, individuals with positive standardized Dom and Lov scores were considered behaviourally friendly-dominant; individuals with positive standardized Dom scores and negative standardized Lov scores were considered behaviourally hostile-dominant; individuals with negative standardized Dom and Lov scores were considered behaviourally hostile-submissive; and individuals with negative standardized Dom scores and positive standardized Lov scores were considered behaviourally friendly-submissive.

Preliminary Analyses

Before conducting any analyses, the data were screened for non-normality using techniques recommended by Tabachnick and Fidell (1996). That is, if the ratio of the skewness to the standard error of the skewness exceeded ± 3.29 the data was considered significantly skewed. For the IAS-R

data, the Dom and Lov scores and the vector lengths were assessed using these criteria, and for the PDG data, the proportions of the four different behaviour types as well as the overall proportions of Dom and Lov behaviours were assessed using these criteria. The vector length scores from the IAS-R administered after the game procedure (IAS-self and IAS-other) showed slight skewness (3.6 for IAS-self and 3.7 for IAS-other). However, this was considered a borderline value, so for ease of interpretability, and because inter-individual variability was of conceptual interest, the data were not transformed. None of the proportions calculated from the PDG data showed any significant skewness. Again, because inter-individual variability was conceptually desirable, no outliers (standardized scores exceeding ± 3.29) were transformed or removed.

Reliability analyses were conducted on the eight scales of the IAS-R completed before the game, and the four scales of the IAS-R completed after the game. These ranged from .68 to .92. The results of these analyses are shown in Table 1.

Personality and Behavioural Data

The percentages of individuals falling into the four different possible quadrant assignments from the personality and behavioural measures are shown in Table 2. There were approximately equal percentages of individuals in each

of the four different quadrants (i.e., FD, FS, HS, and HD); however, it is important to note that the quadrant assignments were not necessarily the same for individuals across the three assessments. For example, participants could have behaved in a manner during the game that differed from the way that they described themselves before having played the game.

Due to the fact that participants were randomly assigned to pairs, there were several dyadic outcomes that could result: complementary pairs (i.e., the two members were similar on the Lov and opposite on the Dom dimension), similar pairs (i.e., the two members were the same on both dimensions), anticomplementary pairs (i.e., the two members were similar on the Dom but opposite on the Lov dimension) and acomplementary pairs (i.e., the two members were opposite on both dimensions). Similar, anticomplementary, and acomplementary pairs are all grouped under the more general term noncomplementary. According to interpersonal theory, individuals try to elicit behaviours from others that complement their own personality styles, and more rigid individuals should "pull" more strongly for these complementary behaviours. The data from the IAS-R self-report of personality traits completed before the game showed that there were 14 (26%) complementary pairs and 39 (64%) noncomplementary pairs (25% similar pairs, 17% anticomplementary pairs, and 32% acomplementary pairs). However, the data from the PDG game

showed that in their behaviour, 42 (79%) of the pairs were complementary, while the remaining 11 (21%) were noncomplementary. (As the game was set up in such a way that on each turn, if one player was dominant the other must be submissive, there was no way for similar or anticomplementary pairs to exist, as they both involve correspondence on the Dom dimension.)

Personality-Behaviour Correlations

Pearson product-moment correlations were calculated to evaluate the relationship between the personality variables (i.e., Dom and Lov scores) and behaviour (i.e., the proportions of Dom and Lov behaviours). Note that, because a positive relationship was predicted, both the one-tailed and the two-tailed significance levels were calculated; the one-tailed significance levels are presented, with the two-tailed levels in parentheses. The pre-game Lov scores were significantly correlated with the proportion of Lov behaviours, $r = .29$, $p = .001$ (two-tailed $p = .003$). The pre-game Dom scores were also significantly, although more weakly, correlated with the proportion of Dom behaviours, $r = .17$, $p = .04$ (two-tailed $p = .08$). The post-game Lov scores were significantly correlated with the proportion of Lov behaviours, $r = .45$, $p < .001$ (two-tailed $p < .001$). Finally, the correlation between the post-game Dom scores and the proportion of Dom behaviours approached significance, $r = .14$, $p = .08$ (two-tailed $p = .16$). In addition, because the two dimensions are proposed to be

orthogonal, the correlation between the Dom and Lov scores was calculated, and the two were independent, $r = .026$, n.s.

However, when analyzing dyadic data, simple Pearson correlations do not take into account the interdependence of the two members of the interacting dyad. Social psychologists have long acknowledged that interacting individuals' behaviour is interdependent (Griffin & Gonzalez, 1995; Kenny & LaVoie, 1985), and this fact is a basic tenet in interpersonal theory (Kiesler, 1983; 1988). For example, in a dyad in which one member consistently behaves in a friendly manner, the other member may feel compelled to also behave in a friendly manner. Their behaviour would thus be correlated, and might also seem to confirm the principle of complementarity, but the statistical relationship is confounded by the similarity induced by the interaction itself. The correlation needs to be corrected for the interdependence of dyad members' scores on the variables under analysis. Griffin and Gonzalez provided formulas for calculating correlations that are corrected for interdependence.

The pattern of results from these correlational analyses was similar to that of the Pearson product-moment correlations. That is, the pre-game Lov scores were significantly correlated with the proportion of Lov behaviours, $r = .26$, $p = .03$ (two-tailed $p = .06$). The pre-game Dom scores were also significantly correlated with the proportion of Dom behaviours, $r = .23$, $p = .05$

(two-tailed p = .09). The post-game Lov scores were significantly correlated with the proportion of Lov behaviours, r = .41, p = .001 (two-tailed p = .002). However, the correlation between the post-game Dom scores and the proportion of Dom behaviours only approached significance, r = .20, p = .08 (two-tailed p = .15).

For the PDG data, the correlation between the proportion of Dom behaviours and the proportion of Lov behaviours was .05, n.s. The Dom and Lov codes were thus orthogonal in the PDG data as well as in the IAS-R data. Using the standardized proportions of Dom and Lov behaviours, vector length scores based on the PDG data were computed (using the same Pythagorean formula, described previously, as for the IAS-R data). The correlation between vector length scores derived from the IAS-R and the vector length scores derived from the PDG data was .07, n.s. Rigidity based on IAS-R profiles was thus clearly not reflected in rigidity scores based on PDG behaviour.

Another set of preliminary analyses was then conducted in a further attempt to find support for the validity of the vector length computations. Specifically, distance scores were computed to operationalize the degree of difference between general personality and behaviour during the game. Interpersonal theory suggests that individuals with higher vector length scores should show smaller differences between their general personality and their

behaviour in the PDG game. That is, rigidity should have been manifested in greater personality-behaviour consistency. The personality-behaviour deviation scores were computed for the Dom dimension, for the Lov dimension, and for both dimensions combined (i.e., by calculating the Euclidean distances between IAS-R and PDG locations on the interpersonal circle). The correlations between IAS-R vector length scores and the deviation scores were .30 for Dom, .29 for Lov, and .40 for the combined index. Similar findings emerged when PDG vector length scores were used instead of IAS-R vector length scores: .37 for Dom, .34 for Lov, and .49 for the combined index. These correlations were all positive and significant at the $p = .01$ level, indicating that vector length (or rigidity) was associated with greater deviations between general personality and PDG behaviour, in direct contrast to expectations. The validity of the vector length scores as indices of behavioural rigidity thus seems questionable, at least with regards to PDG behaviour.

The proportions of PDG Dom behaviours were relatively weakly correlated with the IAS-R Dom scores, suggesting that the act of going first during the game was not necessarily a manifestation of interpersonal dominance. A further problem emerged when sequential analytic techniques (which are described in more detail below) were applied to the Dom data. Specifically, the PDG Dom coding system caused there to be numerous

structural zeros in the transitional frequency matrices. A structural zero occurs when the coding system is such that one code cannot follow another. An example from the present study is the fact that a Person A Dom code could not be immediately followed by a Person B Dom code. Whenever one person played first and thereby received a dominant code, the other person necessarily played second and therefore received a submissive code. Regular, simple sequential statistics can be modified to handle the existence of these structural zeros. However, the sequential dominance statistics described by Wampold (1984; 1989), which are required for the present analyses, have not yet been adapted for this purpose. Application of Wampold's formulas to data involving structural zeros produces inaccurate results with respect to the expected frequencies, and therefore also the kappas. Given both this problem and the weak correlations with the IAS-R Dom scores, the decision was made to exclude the Dom codes from the remaining analyses. The sequential analyses that follow were thus based solely on the Lov (or cooperate-compete) data, for which there were no similar problems. (The sequential analyses using the Dom data were nevertheless conducted, and few significant findings emerged.)

Sequential Analyses

Basic sequential patterns. O'Connor (in press) wrote a series of programs for SPSS that will calculate the sequential statistics described by Wampold (1984; 1989; Wampold & Kim, 1989; Wampold & Margolin, 1982). These programs were used in all of the following analyses.

In categorical sequential analyses, data is read from a single stream of events (in this case, participants' behaviours) and is turned into a matrix of transitional frequencies (that is, a matrix showing the number of transitions between each behaviour and all other behaviours). In addition, the program calculates the transitional frequencies that would be expected from the base rates of the different behaviours and produces this matrix for comparison with the observed transitional frequencies. Based on the difference between the observed and expected transitional frequencies, a transformed kappa statistic is then calculated for each transition. The transformed kappa statistic reflects the extent to which the observed transitional frequencies deviate from the expected transitional frequencies. It ranges from −1.00 (i.e., one behaviour follows another to the minimum extent possible) to +1.00 (i.e., one behaviour follows another to the maximum extent possible). The zero value represents a chance relationship between two behaviours (i.e., the probability that one behaviour follows another is equal to the probability of that behaviour occurring at any

other point in the sequence of behaviours). Finally, a matrix of z scores for the transformed kappas is produced to evaluate the significance level of different transitional frequencies (Wampold, 1984; 1989).

Wampold (1989; Wampold & Kim, 1989) discussed the advantages of the transformed kappa statistic. One important advantage is that, unlike the z score, transformed kappa is not dependent on the base rates of the behaviours or on the number of behaviours (i.e., the length of the interaction). In the present study, all interactions comprised the same number of behaviours (two behaviours per turn for 100 turns). However, there could be, and were, different base rates of the four different types of behaviours in each dyad. A standardized z score calculated merely on the difference between the observed and expected transitional frequencies could be affected by these differential base rates, but the kappa statistic avoids this problem. A second advantage is that, being independent of the factors mentioned above, the kappa statistic can become a variable in its own right for further analyses. For example, it could be used in between-groups comparisons, or could be correlated with other variables of interest. In the present study, the kappas for the transitions of interest were correlated with personality data from the IAS-R to evaluate personality-behaviour correspondences.

The kappas calculated using the general sequential statistics were as follows: for the Friendly-Friendly transition $\kappa = .49$; for the Friendly-Hostile transition, $\kappa = .06$; for the Hostile-Friendly transition, $\kappa = .07$; and for the Hostile-Hostile transition $\kappa = .39$. However, these transitions are all unidirectional. Complementary interactions, on the other hand, are presumed to be bidirectional circuits, each behaviour reinforcing the chance of the other's occurring. Thus, it is necessary to simultaneously test both directions of a circuit between two behaviours.

Tests of bidirectional independence. The sequential test of bidirectional independence tests the strength of a symmetrical circuit between two behaviours (Wampold & Kim, 1989; Wampold & Margolin, 1982). For example, one behaviour may be hypothesized to increase the chance of a second behaviour occurring immediately after it, and the second behaviour may in turn reinforce the re-occurrence of the first behaviour. This, therefore, can be used to assess whether, and to what degree, complementarity exists between two behaviours. For example, if one person behaves in a friendly-dominant manner, does this encourage another person to behave in a friendly-submissive manner in return, and if so, does this then reinforce the original friendly-dominant behaviour from the first individual? Although complementarity was not of primary interest in the present study, the sequential analytic test of

bidirectional independence can easily and effectively test the existence of this phenomena, and so this test was included for informative purposes.

The mean kappas for the four possible transitions were as follows: Friendly-Friendly (F-F; $\kappa = .49$); Friendly-Hostile (F-H; $\kappa = .07$); Hostile-Friendly (H-F; $\kappa = .10$); Hostile-Hostile (H-H; $\kappa = .40$). The F-F and the H-H transitions are complementary, while the F-H and H-F transitions are noncomplementary. The kappas from those cells representing complementary circuits were averaged over dyads, and 2 one-sample t-tests were performed to test whether these mean kappas (i.e., levels of complementarity) were significantly different from zero. Both of the complementarity t-tests were significant. That is, the strength of the friendly-friendly circuit was significantly greater than zero, $\kappa = .49$, $t_{(105)} = 32.05$, $p < .001$, as was the strength of the hostile-hostile circuit, $\kappa = .40$, $t_{(101)} = 27.08$, $p < .001$ (see Table 3 for full results). However, when similar one-sample t-tests were performed on the non-complementary columns, these were also significant, although much weaker in size (see Table 3). Finally, to compare the magnitude of the kappas for the complementary and non-complementary transitions, a paired-sample t-test was conducted on the mean of the two complementary kappa columns and the mean of the two non-complementary kappa columns. The complementary

kappas were significantly greater than the non-complementary kappas, $t_{(101)} = 10.397$, $p < .001$.

Tests of sequential dominance. Sequential dominance refers to a difference in predictability between individuals. That is, all of the individuals in an interaction are likely to influence its course, but some may have more influence than others. Those individuals who influence an interaction more (i.e., from whose behaviours the course of an interaction is more predictable) are considered sequentially dominant. Note that being sequentially dominant is not necessarily the same as being interpersonally dominant. Interpersonal dominance is a style of interacting in which an individual tends to take the initiative in an interaction, while sequential dominance involves influencing the course of an interaction (Kiesler, 1983; Wampold, 1984; Wampold & Kim, 1989). Thus, individuals who are interpersonally submissive can still be sequentially dominant, if they constrain others' behaviour more than the reverse.

There are two types of sequential dominance tests – parallel dominance and non-parallel dominance. Parallel dominance tests the symmetric difference in predictability between two behaviours (e.g., is one person's friendly-submissive behaviour more predictable from the other's friendly-dominant behaviour than the reverse?) Wampold (1984) designated this as "the

difference in predictability of i to j and j to i" (p. 425). Non-parallel dominance tests the difference in predictability between two different unidirectional transitions (e.g., does one person's friendly behaviour elicit friendly behaviour from a second individual to a greater extent than the second person's hostile behaviour elicits hostile behaviour from the first person?) Wampold designated this "the difference in predictability of i to j and k to l" (p. 428). In the present study, parallel dominance analyses were conducted using the kappas for the four possible transitions to generate global indices of sequential dominance in each dyad. The non-parallel dominance analyses were used to assess patterns of sequential dominance for transitions between specific behaviours. In both cases, predictions of complementarity were used to establish the transitions of interest. For example, the predictability of Person A's friendly behaviour from Person B's friendly behaviour could be compared to the reverse to determine who in the interaction made friendly behaviour more predictable, and was therefore sequentially dominant. The indices of dominance were then used in correlational analyses with personality variables from the IAS-R, most notably the rigidity scores (vector lengths). Individuals who are more rigid (i.e., have greater vector lengths) are presumed to exert more interpersonal "pull" to elicit self-confirming behaviours from others, and so these individuals were expected to be those who were also more often sequentially dominant.

The sequential dominance indices from the PDG behaviours were compared with the complementarity predictions made from the personality-based quadrant assignments from the IAS-R. For example, if a friendly (personality) person were interacting with a hostile (personality) person, the principle of complementarity would suggest that the friendly person would pull for friendly behaviour from the hostile interactant. On the other hand, the hostile person would pull for hostile behaviour from the friendly interactant. This prediction could then be tested in the PDG behavioural data to assess the strength of both of these "pulls". The transformed kappa statistic would give the magnitude and direction of the designated transitions. For example, assume the friendly person's codes were entered first and the hostile person's codes were entered second into the non-parallel dominance test. If the kappa came out positive, that would mean that the friendly person pulled more strongly for friendly behaviour from the hostile interactant than the hostile person pulled for hostile behaviour from the friendly interactant. If the kappa came out negative, it would mean that the hostile person's pull was stronger.

Tests of parallel dominance. Parallel dominance tests were run on each of the four possible transitions. In summary, the mean kappas for the four transitions were: Friendly-Friendly -κ = -.04; Friendly-Hostile κ = -.01; Hostile-Friendly κ = .02; and Hostile-Hostile κ = -.09. Then the corrected

dyadic correlations (Griffin & Gonzalez, 1995) were calculated between each of the kappas and both the pre-game and post-game vector length and Lov scores. These correlations are found in Table 4.

The Friendly-Friendly kappas were significantly correlated with only the Lov scores that participants assigned to their partners in describing their behaviour after the game, $r = .33$, $p = .01$. The Friendly-Hostile kappas were significantly associated with the vector length scores derived from participants' descriptions of their own behaviour after the game (post-game vector lengths), but in the opposite direction to that predicted, $r = -.29$, $p = .04$. The Hostile-Friendly kappas also came close to being correlated significantly with the post-game vector length scores, but also in the opposite direction to that predicted, $r = -.25$, $p = .07$. Finally, the Hostile-Hostile kappas were significantly correlated with the vector length scores participants gave their partners when describing their behaviour after the game, $r = .38$, $p = .005$.

Not surprisingly, there were several significant correlations among the kappas. The Friendly-Friendly kappas were significantly negatively correlated with the Hostile-Friendly kappas, $r = -.35$, $p = .009$, and positively correlated with the Hostile-Hostile kappas, $r = .73$, $p < .001$. The Friendly-Hostile kappas were positively correlated with the Hostile-Friendly kappas, $r = .60$, $p < .001$.

Finally, the Hostile-Friendly kappas were slightly negatively correlated with the Hostile-Hostile kappas, $r = -.23$, $p = .09$.

Tests of nonparallel dominance. The nonparallel dominance kappas deriving from the complementary predictions were calculated for all of the dyads and were then correlated with the IAS-R personality variables (the raw Lov scores and the vector lengths). These correlations are found in Table 5. First, the quadrant assignments from the participants' descriptions of themselves before the game were used to assess whether the pull toward transitions that would be complementary to their baseline interpersonal styles would correlate with their vector length or Lov scores. It was predicted that the person with the greatest vector length in an interaction should also exert the greatest pull for complementary behaviour (i.e., have the greater kappa). In fact, the corrected dyadic correlation (Griffin & Gonzalez, 1995) between the kappas and the original (pre-game) vector length scores approached significance but in the opposite direction to that predicted, $\underline{r} = -.23$, $p = .09$. The corrected correlation between the kappas and the vector length score calculated from participants' post-game descriptions of their behaviour was not significant, $\underline{r} = -.095$, n.s. In addition, because the data had been set up in such a way as to isolate only the Lov dimension, the corrected correlations between the kappas and the raw Lov scores were calculated. The corrected correlation

between the kappas and the original (pre-game) Lov scores was not significant, $r = -.12$, n.s., however the corrected correlation between the kappas and the Lov score derived from the post-game descriptions was significant, $r = .27$, $p = .05$. Finally, the corrected dyadic correlation between the kappas and the Lov scores that participants gave their partners when describing their behaviour after the game approached significance, $r = .25$, $p = .07$.

Next, the quadrant assignments from the participants' post-game descriptions of their behaviour (as opposed to the baseline personality locations) were used to assess whether their game behaviour elicited complementary behaviour from their partners, and whether the strength of these complementary transitions would correlate with the vector length or Lov scores. In fact, the corrected dyadic correlation between the kappas and the original (pre-game) vector length scores was not significant, $r = -.079$, n.s. Neither of the corrected correlations between the kappas and the post-game vector length scores were significant, (for vector length-self, $r = -.046$, n.s. and for vector length-other, $r = .11$, n.s.) The corrected correlation between the kappas and the original (pre-game) Lov scores was not significant, $r = -.11$, n.s., nor was the corrected correlation between the kappas and the Lov score derived from the post-game descriptions, $r = .16$, n.s. The only scores with which the kappas

correlated significantly were the Lov scores that participants gave their partners in describing their game behaviour, $r = .37$, $p = .006$.

Supplementary Analyses

Due to the fact that the expected correlations between the vector length scores and the nonparallel dominance indices did not emerge, supplementary analyses were conducted in an effort to clarify the results from the nonparallel tests. Two possible hypotheses for the lack of a relationship between the vector length and the sequential dominance kappas were examined. First, it could be that participants did not fully understand the game initially, or were behaving in a way they thought the experimenter wanted them to. Thus, after they grasped the consequences for the different choices, or alternatively had several rounds of interaction with the other player on which to base their further play, their behaviour might have changed to become more determined by the ongoing interaction rather than external factors. Therefore, the nonparallel analyses were run again on turns 31 through 100, leaving out the first 30, to see if eliminating the early rounds clarified existing or revealed any new relationships. However, the results paralleled those originally obtained from the nonparallel analyses.

The second possibility comes from Kiesler's (1983) proposition that rigid behaviour from one interactant may eventually pull the same from others.

It is possible that after interacting for some period of time with an individual who lacked behavioural flexibility, interactants escalated their own rigid behaviour. Over the course of an interaction, then, the control (i.e., sequential dominance) may have alternated between the participants, equalizing in the end. To this end, the nonparallel dominance analyses were re-run using only the first 15 and 25 turns of the game to see if one person was more clearly controlling and directing the early stages of the interaction, and if so, whether that was also the person with the greater vector length in the pair. However, during the first 15 and the first 25 turns, no significant relationships emerged at all. It was not until the results were run on the first 50 turns that significant correlations emerged, and these were the same as those that were found in the analyses of the full game. That is, after 50 turns the nonparallel dominance kappas were significantly correlated with the participants' post-game lov scores (r = .28, p = .04) and the lov scores they assigned their partners (r = .29, p = .03). Thus, the relationships that were found in the original analyses were clearly stable throughout the game.

The correlations between the IAS-R data and the sequential dominance kappas were generally not consistent with predictions, and so the data were analyzed separately for individuals from different octant locations on the interpersonal circle. Specifically, the correlations between the IAS-R scores

and the nonparallel dominance kappas were computed for the set of individuals from each IAS-R octant. The expectation was that more supportive findings may exist for some octant locations than for others. The sample sizes for these analyses were sometimes small, but the results might nevertheless help explain the perplexing findings. The results are reported in Table 6, which displays the correlations between the kappas and the vector length, Dom, and Lov scores for individuals from the various octants. The most striking finding is the relatively strong negative correlations for individuals in the Friendly-Dominant and Friendly-Submissive octants. Individuals with higher vector length and IAS-R Lov scores tended to display less sequential dominance in the PDG behavior than individuals with lower scores. The only notable positive correlations to emerge were for vector length and the kappas within the Hostile-Submissive and Submissive octants. That is, only in the Hostile-Submissive and Submissive octants was the hypothesis supported (i.e. that those individuals who were sequentially dominant were also those who had longer vector length scores).

Discussion

Interpersonal theory suggests that individuals interact with others in ways that will confirm their own self-concepts. For this reason, it is postulated that individuals influence the course of their interactions in certain systematic

ways. For example, according to interpersonal theory, complementary interactions serve to confirm individuals' self-concepts and therefore individuals will elicit behaviours from others that are complementary. Although all individuals are presumed to pull self-confirming behaviours from others with whom they interact, interpersonal theorists also recognize that there are individual differences in the need for self-confirmation. The construct of interpersonal rigidity highlights these differences – individuals who are rigid or inflexible have greater need for self-confirmation from their interactions with others, and therefore are believed to exert more influence or control over the interactions. The purpose of the present study was to investigate the impact of rigidity using statistics specifically designed to evaluate the impact of particular behaviours on the course of an interaction.

Personality-Behaviour Correlations

The relationship between personality and behaviour was investigated using the corrected dyadic correlations (Griffin & Gonzalez, 1995) between the data from the IAS-R and the PDG. It was predicted that individuals' pre-game scores on the IAS-R would correlate with their behaviour in the PDG, as individuals are presumed to act in ways that confirm their own conceptions of their personalities. The correlations between the personality measures and the participants' behaviour during the game suggest that, consistent with

interpersonal theory, people do have characteristic interpersonal styles related to their personality. The correlations between the Lov scores (both pre-game and post-game) and the friendly behaviours during the game were significant. The correlations between the Dom scores and the dominant behaviours during the game were significant, albeit somewhat weaker, for the pre-game scores, and approached significance for the post-game scores. However, none of the correlations exceeded a moderate effect size and none of these relationships explained more than 17% of the variance in behaviour. There are two possible explanations for this.

First, the small effect sizes could be an indication that the behavioural coding system used was not a good index of people's typical behavioural orientations. For example, the act of going second in the game was considered behaviourally submissive, but it could instead reflect the desire to act from the position of power, in that those who go second already know what their partners have chosen, and can therefore definitively determine their own payoff. However, there is evidence from previous research using the PDG that, at least the cooperate/compete (or cooperate/defect) choice does represent interpersonal motivations and behaviours well (e.g., Bennett & Carbonari, 1976; Kelley & Stahelski, 1970). That is, there do seem to be different types of individuals who choose to consistently cooperate or to consistently compete in their game

behaviour, and their game behaviour correlates with such other measures as authoritarianism (Bennett & Carbonari, 1976; Kelley & Stahelski, 1970), beliefs about human nature (Wrightsman, 1966), and moral development (Bennett & Carbonari, 1976).

Alternatively, the small correlations between the personality indices and the game behaviour could be evidence for interpersonal flexibility. The players were randomly matched, and only ¼ of them were paired with a player who was initially complementary to their personality. Thus, most of them would have been induced to show some flexibility in their behaviour. The percentages of complementary and noncomplementary pairs before and during the game provide some support for the principle of complementarity and its putative influence on behaviour; however, it is clear that there are other factors which can also affect individuals' behaviour. For example, although more of the pairs behaved in complementary fashion than would have been expected from the IAS-R data, not all of the pairs did so, and some pairs actually changed their behaviour to become noncomplementary. Clearly, there are other determinants of interpersonal behaviour. The main purpose of this study was to evaluate the influence of one of these, interpersonal rigidity, on dyadic behaviour.

It was somewhat surprising that the vector length scores calculated from the IAS-R personality data (which are an index of rigidity; Wiggins et al., 1989)

and those derived from the game behaviour were not correlated. In previous research on interpersonal behaviour, the lack of consistent support for complementarity has sometimes been explained by recourse to the possibly moderating effect of interpersonal rigidity (e.g., O'Connor & Dyce, 1997). That is, individuals who are more rigid are believed to have a greater need for complementary interactions, and to exert a greater pull for complementary behaviours from their interaction partners. Those who are more flexible are believed to be more able to modify their behaviour to suit the situation in which they find themselves (Kiesler, 1983; 1988). Thus, the weak correlations between personality and behaviour could potentially have been attributed to the differential effects of the rigidity scores of the players in different dyads. However, the fact that the rigidity indices from the personality measures and game behaviour do not match suggests that one or both of the rigidity indices lack construct validity.

In an effort to elucidate the problematic aspects of this relationship, correlations were calculated between the rigidity scores and the distance between individuals' personality and behavioural locations in the interpersonal circle. That is, individuals whose behaviour during the game was located some distance from where their personality profiles had placed them in the circumplex would be considered more flexible (i.e., should have shorter vector

lengths; Wiggins et al., 1989). However, this was not the case. In fact, the rigidity scores and distance scores were significantly related, but in the opposite direction than that expected from the predictions of interpersonal theory. That is, those individuals who evinced greater discrepancies between their personality scores and their behaviour were also those who had *greater* rigidity scores. It is also interesting to note that this relationship was of greater magnitude than the original personality-behaviour correlations. The validity of the vector length scores as indices of behavioural rigidity thus seems questionable, at least with regards to PDG behaviour. Kiesler (1983) and Wiggins et al. (1989) both considered vector length an index of interpersonal rigidity, however, it is possible that behavioural rigidity is not necessarily an operationalization of interpersonal rigidity. The measures with which Wiggins et al. correlated vector length were measures of psychopathology and of interpersonal problems, and they found that within octants, vector length was significantly correlated with psychopathology and interpersonal problems.

The correspondence between the personality indices and behaviour was somewhat stronger for the Lov dimension (the cooperate-compete choice in the game) than for the Dom dimension. In addition, as discussed previously, the way the Dom dimension was set up (go first-go second choice) did not lend itself well to the sequential analytic techniques used to analyze the game

behaviour. For these reasons, and because of the validity concerns discussed above, the sequential analyses were conducted only on the Lov dimension, for which there was more support in the data.

Sequential Analyses

Basic sequential patterns. The basic sequential statistics calculate the strength of all possible unidirectional transitions. The kappas from the main transitions (i.e., Friendly-Friendly, Friendly-Hostile, Hostile-Friendly, and Hostile-Hostile) clearly support the notion that interactions often evolve to become complementary. The kappas for the two types of complementary transitions (F-F and H-H) are moderate to large in size and positive, while those for the noncomplementary transitions are near zero. That is, friendly behaviour from one participant encouraged the same from the other participant, and a similar encouragement occurred for hostile behaviour between the partners. On the other hand, the chances of a hostile response to a friendly initiative, or a friendly response to a hostile initiative, were significantly lower.

However, social interactions are not made up of a series of unidirectional transitions. When individuals interact, each of their behaviours serves both as a response to previous behaviours, and a stimulus for future ones. This creates a series of overlapping circuits. Therefore, the bidirectional circuits in the data were also examined for evidence of complementarity.

Tests of bidirectional independence. The tests of bidirectional independence were used to evaluate the strength of bidirectional behavioural circuits, and to compare the strength of those that were complementary to that of the noncomplementary circuits. It was predicted that the kappa values would be stronger for those circuits that were complementary, and this was indeed the case.

However, while much smaller than those for the complementary circuits, the kappas for the noncomplementary circuits were also significantly different from zero. These results support complementarity to some degree, but also clearly leave room for other influences. One factor that may explain the somewhat equivocal results of tests of complementarity is interpersonal rigidity. Individuals who are interpersonally rigid are proposed to be more likely to try to elicit complementary behaviour from others, and less likely to provide complementary responses to others if these are not their normal interpersonal style. Thus, while more flexible individuals may adapt their behaviour to suit the interpersonal situation in which they find themselves, rigid individuals will display consistent and unchanging behaviour. O'Connor and Dyce (1997) found such a moderating effect of rigidity when they studied complementarity and rigidity in musical bands. In those bands that had high overall rigidity scores, group cohesiveness and mutual regard were higher if

members complemented each other. However, in bands with low rigidity scores, complementarity did not have as great an influence on cohesiveness or regard for other band members. The results of sequential analyses addressing the possible impact of rigidity in the present study are addressed below.

Tests of sequential dominance. Sequential dominance assesses a difference in predictability between individuals or behaviours. Individuals who are sequentially dominant exert more influence over an interaction, and make others' actions more predictable. This concept seemingly fits in well with the concept of interpersonal rigidity, as rigid people presumably work to make the interaction more predictable (and therefore self-confirming) from their own behaviour. It was hypothesized that in the present study, those individuals who had higher rigidity scores would also be the same individuals who were sequentially dominant in their dyadic interactions. This hypothesis was evaluated generally in the parallel dominance tests, and specifically with respect to the pull for behaviours complementary to each individual's original personality locations in the nonparallel dominance tests.

Parallel dominance tests. It was hypothesized that the vector lengths would correlate with the kappas, because as previously mentioned, the concepts of rigidity and sequential dominance are very similar. In addition, because the analyses were conducted specifically on the Lov behaviours, it was predicted

that the kappas would also correlate with the Lov scores. The results were not entirely in line with these predictions. The kappas for the Friendly-Friendly (F-F) transition were positively correlated with the Lov scores that participants gave their game partners (Lov-other), suggesting that those who behaved in a more friendly manner also perceived their partners as being more friendly. The positive relationship also means, however, that the partners were induced to behave in a friendly manner by the participants' original friendly behaviour, from which the partners' friendly responses became more predictable. On the other hand, these kappas were not significantly associated with the Lov scores participants gave themselves before or after the game, nor were they significantly associated with the vector length scores. One possible explanation for the positive relationship between these kappas and the Lov-other scores and the lack of any relationship between those same kappas and the Lov and Lov-self scores was that it was not necessarily the reciprocation of friendliness that resulted in the Lov-other scores, but the fact that the responses were complementary. However, the hostile results do not bear out this interpretation.

The H-H kappas were significantly correlated with the vector length scores participants assigned to their partners (vector length-other), but not with participants' own vector length scores (vector length or vector length-self), contrary to expectations. One reason for this could be that consistently

competitive people (i.e., those that made the hostile choice in the game) may seem uncooperative, and this could be perceived as rigid behaviour to their partners. In fact, in some instances uncooperative behaviour may be considered by participants to be almost synonymous with rigidity. However, participants may not interpret their own competitive choices as uncooperative or rigid, but merely assertive, or possible retaliatory to their partners' competition.

Eisenberger, Cotterell , and Marvel (1987) described a group of individuals that they called creditors who believe in the "norm of reciprocity". This is considered a social motivation according to which giving help to a partner in the present could result in greater rewards in the future, and may be an alternative explanation for the strength of the transitions found between complementary behaviours on the Lov dimension (which are also similar behaviours). It may also explain why F-F transitions (which are akin to trading favours) result in participants' positive regard for their partners, while H-H (which are more suspicious, wary interactions, even though they are also complementary) do not.

The Friendly-Hostile (F-H) kappas and the Hostile-Friendly (H-F) kappas (the two noncomplementary transitions) were both negatively correlated, although not significantly in the case of the H-F kappas, with the vector lengths derived from participants' post-game descriptions of their own

behaviour. That is, individuals whose behaviour was less predictable in noncomplementary transitions described themselves as less rigid.

Although the inter-kappa correlations were of less theoretical interest than the kappa-personality correlations in the present study, they do provide some information about general sequential dominance within dyads. There was a positive relationship between the F-F and the H-H kappas, which suggests that the individuals who were sequentially dominant with respect to the friendly behaviours were also the sequentially dominant individuals with respect to the hostile behaviours. That is, there was probably one individual in each dyad who was more sequentially dominant in the complementary transitions, regardless of whether the transitions in question were between friendly or hostile behaviours. There was also a positive relationship between the F-H and the H-F kappas. This would indicate that those individuals who were more likely to answer a friendly initiative with a hostile response were also those who were more likely to answer a hostile initiative with a friendly response. The fact that these two kappa values were also negatively correlated with the post-game vector length-self scores suggests that individuals may have had an instinctive understanding of who was sequentially dominant and who was cast in the role of simply responding to the more dominant person, but tended to confuse rigidity with predictability. That is, the individuals whose behaviour

was less predictable (i.e., less predicated on that of the other interactant) were those who tended to describe themselves as less rigid. There were negative relationships between the F-F and the H-F kappas, and also between the H-H and the H-F kappas. That is, as the kappas for the complementary transitions increased, the kappas for the noncomplementary transitions tended to decrease. However, because a transition that was not complementary must, by definition, be noncomplementary, these correlations were likely a by-product of the ipsative nature of the coding scheme.

Nonparallel dominance tests. The predicted positive correlation between the vector length scores and the nonparallel kappas did not emerge, and in fact there was a negative relationship which approached significance. That is, in the nonparallel analyses, those individuals who were more sequentially dominant during the interaction (i.e., made the interaction more predictable) actually had the *shorter* vector lengths, in direct contrast to predictions from interpersonal theory. However, the effect size was somewhat small ($r = -.23$), and only approached significance ($p = .09$), so it is possible that there is no true relationship between vector length scores and sequential nonparallel dominance.

This would seem to stand in direct contradiction to the propositions of interpersonal theory, however Kiesler (1983) did suggest that rigid behaviour

from one interactant may eventually pull the same from others. Thus, it is possible that during an interaction with a rigid individual, interactants escalated their own rigid behaviour, as was found in Van Denburg and Kiesler (1993). However, this possibility was not borne out in the supplementary nonparallel dominance analyses that were run on the first 15, 25, or 50 turns, and starting with the 50-turn analyses, the same results were found as were obtained from the analyses of the full game. The vector length scores calculated from participants' own descriptions of their game behaviour showed no relationship with the nonparallel dominance kappas, nor did the vector length scores participants assigned their partners after the game. Again, this could potentially support the notion of rigidity evoking rigid responses over the course of an interaction, because participants did not systematically describe either themselves or their partners as being more rigid during the interaction.

As the data analyzed were from only the Lov dimension (the cooperate-compete choice), the correlations between the kappas and the Lov scores were also tested, to see if clearer relationships emerged when only the variability in the Lov behaviours was included. The same predictions applied to the Lov scores as were made for the vector length scores. The kappas were not significantly associated with the pre-game Lov scores, however, they were significantly positively correlated with the post-game Lov-self scores. This

suggests that when individuals behaved in such a way that their own cooperative/competitive choices determined the tone of the interaction they tended to describe themselves as more friendly. In addition, the relationship between the kappas and the Lov scores participants assigned their partners after the game (Lov-other) was positive and approached significance. This suggests that when individuals' pull for complementary behaviour (i.e., similarity on the Lov dimension) is strong and their partners behave in a complementary fashion, individuals also describe their partners as more friendly. Thus, when individuals are able to elicit complementary behaviours from their partners, they perceive them to be more friendly, regardless of actual behaviour. However, the lack of a relationship with the vector length-self or vector length-other scores suggests that participants cannot necessarily determine who had the greater impact on what Lov choices were made.

When the data were separated and analyzed by octant location (from the pre-game IAS-R scores) some interesting and surprising patterns emerged. The data from some octants showed the expected positive correlations between the nonparallel kappas and vector length, however these were the hostile submissive and submissive octants. It is seemingly counterintuitive that those individuals who show relationships between their behavioural rigidity (i.e., sequential dominance) and personality-based rigidity (i.e., IAS-R vector length

scores) indices should be those who are considered to have personalities in the submissive portion of the interpersonal circumplex. However, Coyne, Burchill, and Stiles (1991) described an interactional perspective on depression which suggests that the interpersonal demands that depressed individuals make of others can eventually make others feel responsible in some way for the depressed person. This perceived responsibility eventually becomes burdensome, and covert messages of frustration and hostility may leak back to the depressed person, who then escalate their demanding behaviour out of need for reassurance. In this way, a person who is submissive (the depressed person) can still exert considerable control over an interaction. For those individuals who were located in the dominant portion of the circumplex, however, there was either no relationship between personality-based and behavioural rigidity (Dominant and Hostile-Dominant) or a negative relationship (Friendly-Dominant).

When analyzing only the Lov scores, the nonparallel kappas from the game behaviour showed moderate negative correlations for those individuals in the Friendly part of the circumplex (Friendly-Submissive and Friendly-Dominant). That is, those individuals who rated themselves as higher on the Love dimension before the game (e.g., described themselves as sympathetic, kind, accommodating) tended to be less sequentially dominant. This suggests

that individuals scoring high on this dimension may confound sequential dominance (i.e., exerting control over an interaction) with being mean or antisocial; being the sequentially dominant person in an interaction may seem socially unacceptable to these participants.

Rigidity and Interpersonal Behaviour

In general, the present study provided mixed support for the predictions of interpersonal theory regarding rigid individuals. Although complementarity was not a main focus of the study, it was used to guide predictions of dyadic behaviour, and there was support for the principle of complementarity in the sequential analyses. The parallel dominance analyses suggest that when individuals consistently respond to friendly initiatives with friendly behaviour in return (i.e., complementary responses), they are perceived as being more friendly and social themselves. However, if they consistently respond to hostile (or competitive) initiatives with hostile behaviour in return (also a complementary response) they are viewed as being more rigid. Thus, although hostile-hostile interactions are considered complementary and thus self-confirming, and were more common than noncomplementary transitions in the data from the present study, they are not necessarily given the same positive evaluation as friendly and complementary interactions. In addition, the parallel dominance results suggest that individuals have some idea of the existence of

rigidity, but may confuse it with predictability. That is, those individuals who were *not* sequentially dominant (whose behaviour was more predictable in the interaction) and who gave noncomplementary responses were considered *more* rigid, contrary to expectations. Note that, while interpersonal theory suggests that sequentially dominant individuals should *be* more rigid, it does not necessarily follow that these individuals will *perceive* themselves as such. However, there were no significant relationships between the parallel dominance kappas and the vector lengths from the personality measures administered before the game.

The results of the nonparallel analyses also suggest that those who were sequentially dominant were the individuals who had lower rigidity scores. In addition, the sequentially dominant individuals seemed to have a more positive experience of the interaction – they described both their own and their partners' behaviour as more friendly, kind, and sympathetic.

Taken together, these suggest that the original conception of how rigid people will behave in an interaction may need some modification. It seems from the sequential dominance analyses that rigid individuals are not those who make the interaction more predictable, but those whose behaviour is more predictable. This seems counterintuitive, given that interpersonal theory suggests that rigid individuals constrain interactions more. However, a slightly

different perspective on sequential analyses, discussed in Warner's (1995) work below, proposes that there are both external (social) and internal determinants for behaviour. Another person's behaviour is considered an external determinant, and the results of the present study suggest that the sequentially dominant person in an interaction is the external determinant that makes the other person's behaviour more predictable. However, it is possible that the predictability of a rigid person's behaviour comes, in fact, from a more internal determinant (e.g., their pre-formed ideas of how they and others behave.) This modified view is somewhat more consistent with the propositions of interpersonal theory than the results obtained from the lag-sequential analyses used in the present study.

Strengths, Limitations, and Suggestions for Future Research

There were several strengths in the present study. First, the use of sequential analytic techniques has grown in the past two decades (Wampold, 1992; 1995), and these techniques are well-suited to the study of interpersonal behaviour. The test of bidirectional independence provides a good operationalization of complementarity, and the concept of sequential dominance is very similar to the interpersonal concept of rigidity. In addition, interpersonal theory is fundamentally concerned with the interdependence of

individuals' behaviour, and sequential analytic techniques are designed to assess precisely this aspect of dyadic (or group) interactions.

Second, the use of the Prisoner's Dilemma Game provided a concise and efficient method of studying interpersonal theory. The choice between cooperation and competition (or defection) maps well onto the Love (or Affiliation, friendly-hostile) dimension of interpersonal theory (e.g., Kelley & Stahelski, 1970). The choice between going first and going second was used to reflect the interpersonal styles Dominant and Submissive, however, the validity of this coding scheme was more equivocally supported by the data. Although the actual setup of the Dominance choices in the present study resulted in some problems with respect to the requirements that sequential analyses make of the data, these are not insurmountable. One possible way of overcoming the difficulties with the Dominance codes is to ask participants on each turn what they *would do* (rather than having them directly do it.) The participants could then be informed on each turn what their partner said they would do. In this way, both participants could theoretically say they would choose to go first (or second) on a turn, and thus the structural zeroes in the transitional frequency matrices would be eliminated. However, there are other, statistical, methods of dealing with structural zeroes which are discussed below.

Finally, although the use of the PDG lent some structure and provided ease of coding behaviour, the present study involved essentially naturalistic interactions, in the sense that participants were told to just behave as they thought they normally would in a social interaction, within the constraints of the game. Previous research, both on interpersonal theory (e.g., Van Denburg & Kiesler, 1993) and PDG behaviour (e.g., Cotterell, Eisenberger, & Speicher, 1992; Eisenberger et al., 1987) have used either confederates or programmed "partners" as the second person in an interaction. While this is a useful strategy to control or elucidate certain parameters of interactions, it would somewhat defeat the purpose of sequential analytic techniques, which are designed to assess the impact individuals have on each other's behaviour over the course of an interaction. By not instructing participants to behave in certain ways or according to certain motivations, the behavioural sequences were kept truer to the way they would unfold in real social interactions.

There were also several limitations to the present study, which could suggest possible areas of modification in future research. First, for each dimension in the game, there were only two choices available to the participants. Although it has been suggested by researchers in the past (e.g., Gifford & O'Connor, 1987; Wiggins et al., 1989; Kelley & Stahelski, 1970) that these two dimensions are fundamental in interpersonal behaviour, there are

often many more choices available to interactants in real social situations. For example, Bennett and Carbonari (1976) suggested three personality types based on the cooperative/competitive distinction – the familiar maximize-own-gain, maximize-joint-gain, and an additional one, maximize-relative-gain. This last type defects not only to obtain more points than a partner, but to try to maximally separate the points of her/himself and the partner. Maki et al. (1979) propose that an interaction can be set up in such a way that all eight of the orientations they specify can be reflected in participants' choices. Thus, the fact that there were only two choices may represent an oversimplification of interpersonal situations.

Second, the structural zeroes that resulted from consecutive Dominant codes (go first-go second choice in the game) being unable to repeat meant that the intended analyses would produce incorrect values in the statistics calculated from this data, and so the Dom dimension was removed from the analyses. Bakeman and Quera (1995) described an alternative method of analyzing sequential data using log-linear techniques (as opposed to the binomial distribution and quadratic assignment theories upon which lag-sequential analyses are based; Wampold & Margolin, 1982). The log-linear techniques they discuss have several advantages, including the ability to handle data matrices that have structural zeroes, as well as the ability to handle non-

overlapping data (which was not an issue in the present study), and to explore data at lags greater than one in order to determine whether there were influences more distal than the immediately preceding behaviour affecting current behaviour in the interaction.

The problem encountered with structural zeroes when using the present lag-sequential analyses is that the expected frequencies are calculated for each cell based on the base rates of all of the possible codes. So, for example looking only at the dominance data, a stream of codes in the current study would take the form Dominant-Submissive-Dominant-Submissive, etc. Therefore, Dominant-Dominant and Submissive-Submissive transitions are logically impossible; however, the sequential analysis programs calculate expected frequencies for these cells anyway. This, then, would render the kappa values, which are based on the difference between observed and expected frequencies, incorrect. It is possible for lag-sequential techniques to take structural zeroes into account and correct for them when calculating the kappa values, however, the formulas provided by Wampold (1984; 1989; Wampold & Margolin, 1982) have not yet been adapted to do this. The log-linear techniques described by Bakeman and Quera, on the other hand, set the appropriate cells to zero, and calculate the expected frequencies of the remaining cells in consideration of the structural zeroes.

In addition, these techniques include a type of omnibus test of significance that evaluates an entire transitional frequency matrix against the expected frequency matrix to see if there is an overall difference between the two. Further, more specific tests are then undertaken on a post hoc basis only if this omnibus test is significant, in order to control Type I error rates. The present study was used to explore several specific hypotheses, however each of the statistical tests were run on, and transitional frequency matrices were generated from, the same data, which Wampold and Kim (1989) noted could inflate the studywise Type I error rate. Therefore, future researchers interested in the interdependent nature of dyadic (or group) interpersonal behaviour could benefit from the techniques described by Bakeman and Quera to allow more flexibility in their data, and to avoid the problem of inflated error rates with repeated statistical tests.

Third, the present analyses were used to detect the influence that participants have on each other, and in the case of the sequential dominance analyses, whether one person's behaviour becomes more predictable from that of another. However, this limits the exploration of the source of variation in one person's behaviour to the variation in the behaviour of the other. Warner (1992) called this a social (or external) determinant of behaviour. She noted, though, that there is also an important internal determinant of behaviour – the

individual's own past behaviour. Warner presented statistical techniques that can evaluate and compare the contribution of both individuals' own past behaviour and fellow interactants' behaviour in determining sources of variation in behaviour during an interaction. In the context of the present study, rigid individuals would be presumed to have stronger internal determinants for their behaviour, across all situations. However, more flexible individuals would presumably vary the relative contributions of internal and external determinants depending on the situation (e.g., getting to know a stranger vs. interacting with an intimate other). The techniques Warner described could be used to compare between groups (rigid vs. flexible individuals) and situations (intimate vs. non-intimate; low anxiety vs. high anxiety, etc.) to establish the parameters along which rigid individuals' behaviour differs from that of their more flexible counterparts.

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Table 1

Reliability of the Revised Interpersonal Adjectives Scales (IAS-R)

Scale	Cronbach's Alpha
Self-Report Personality Description (long form completed prior to the game)	
Friendly	.91
Friendly-Dominant	.84
Dominant	.77
Hostile-Dominant	.84
Hostile	.79
Hostile-Submissive	.85
Submissive	.72
Friendly-Submissive	.68
Self-Report Behaviour Description (short form completed after the game)	
Friendly (Self)	.88
Friendly-Dominant (Self)	.82
Dominant (Self)	.81
Hostile-Dominant (Self)	.90
Description of Partner's Behaviour (short form, completed after the game)	
Friendly (Other)	.92
Friendly-Dominant (Other)	.85
Dominant (Other)	.85
Hostile-Dominant (Other)	.88

Table 2

Percentages of the Quadrant Assignments Assessed Before, During, and After the Prisoner's Dilemma Game

Assessment	Friendly-Dominant	Hostile-Dominant	Hostile-Submissive	Friendly-Submissive
Participants' self-report descriptions of their personality before the game	26	22	27	25
Participants' self-report descriptions of their behaviour during the game	27	27	21	25
Participants' actual behaviour during the game	25	25	24	26

Table 3

One-Sample T-Tests Assessing Strength of Bidirectional Circuits (Test of Complementarity)

Transition	Mean Kappa	T value	Degrees of Freedom	95% Confidence Interval for the Mean	
				Lower	Upper
Complementary Tests					
Friendly A-Friendly B	.49**	32.05	105	.46	.52
Hostile A-Hostile B	.40**	27.08	101	.37	.43
Noncomplementary Tests					
Friendly A-Hostile B	.07*	2.46	103	.01	.12
Hostile A-Friendly B	.10**	3.80	101	.05	.15

* $p < .05$ ** $p < .001$

Table 4

Corrected Dyadic Correlations for Parallel Dominance Analyses

	κ (AF-BF)	κ (AF-BH)	κ (AH-BF)	κ (AH-BH)	VL	VL (S)	VL (O)	Lov	Lov (S)	Lov (O)
κ (AF-BF)	--									
κ (AF-BH)	-.19	--								
κ (AH-BF)	-.35**	.60**	--							
κ (AH-BH)	.73**	-.10	-.23	--						
Vector length	-.03	-.09	.07	-.18	--					
Vector Length (self)	-.09	-.29*	-.25	-.03	.46**	--				
Vector Length (other)	.16	-.06	-.17	.19	.23	.44**	--			
Lov	-.17	.02	.00	-.06	-.10	-.05	.17	--		
Lov (self)	.18	-.11	-.16	.21	-.27	-.22	.04	.59**	--	
Lov (other)	.33*	-.04	.08	.38**	-.11	-.05	-.05	.11	.23	--

* $p < .05$
** $p < .01$

Table 5

Corrected Dyadic Correlations for Non-Parallel Dominance Analyses (Pre-Game Quadrant Assignments)

	κ	VL	VL (S)	VL (O)	Lov	Lov (S)	Lov (O)
κ	--						
Vector length	-.23	--					
Vector Length (self)	-.10	.46**	--				
Vector Length (other)	-.06	.22	.44**	--			
Lov	-.11	-.10	-.06	.16	--		
Lov (self)	.27*	-.26	-.22	.04	.59**	--	
Lov (other)	.25	-.11	-.05	-.05	.11	.23	--

* $p < .05$
** $p < .01$

Table 6

Correlations Between Nonparallel Dominance Kappas and Personality Indices by Octant Location

Octant	N	Vector Length	Dom Scores	Lov Scores
Dominant	8	-.08	-.09	.35
Hostile Dominant	15	.05	.11	-.01
Hostile	13	-.12	.22	.13
Hostile Submissive	16	.35	-.55*	-.14
Submissive	11	.23	-.24	.06
Friendly Submissive	11	-.42	.25	-.54
Friendly	13	-.14	.08	-.13
Friendly Dominant	17	-.59*	.50	-.60*

* $p < .05$, one-tailed

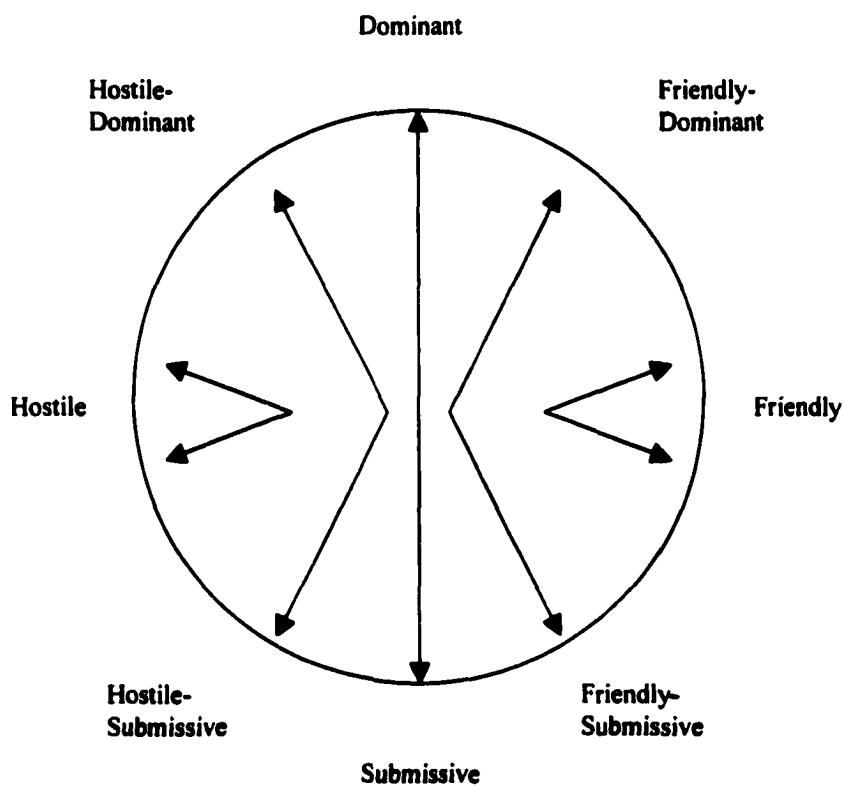

Figure 1. The 1983 Interpersonal Circle, with complementary segments indicated by arrows.

Appendix A: Consent Form

Interpersonal Flexibility Study
Consent Form

This is a study assessing how people behave in an interaction, and how they each interpret the other's actions to form impressions of the other person's personality. This study will comprise several questionnaires, as well as a game that will be played between two participants. Your signature on this form indicates your consent to participate in this study being conducted in the Department of Psychology at Lakehead University by Kirsten Barr, M.A. candidate in Experimental Psychology, under the supervision of Dr. Brian O'Connor. Your signature also indicates that you understand the following:

1. I, _____, am aware that I am participating in a research study being conducted by Kirsten Barr under the supervision of Dr. Brian O'Connor, Department of Psychology, Lakehead University.
2. I am aware that my participation is strictly voluntary, and that I may withdraw from the study at any time without penalty to myself.
3. I am aware that I will receive one (1) bonus point in my Introductory Psychology course for participating in this study.
4. I am aware that other than the bonus point (see #3), there are no known risks or benefits associated with my participation in this study.
5. I am aware that all information I give in the course of this study will remain anonymous and confidential and that it will not be made available to anyone other than those individuals mentioned above.
6. I am aware that all of the data from this study will be kept in a secure location for seven (7) years by Dr. Brian O'Connor.
7. I am aware that I can obtain a copy of the results after the study is completed by contacting Dr. Brian O'Connor, Department of Psychology, Lakehead University.

_____

Signature of Participant

_____ _____

Date Signature of Researcher

Appendix B: Revised Interpersonal Adjectives Scales – Long Form

On this page are a list of adjectives that can be used to describe personality characteristics. Please rate how accurately the words describe your personality on the following scale:

1 extremely inaccurate	2 very inaccurate	3 quite inaccurate	4 slightly inaccurate	5 slightly accurate	6 quite accurate	7 very accurate	8 extremely accurate

____	forceful	____	calculating	____	uncrafty	____	tender
____	self-assured	____	wily	____	introverted	____	meek
____	hardhearted	____	assertive	____	extraverted	____	crafty
____	softhearted	____	tenderhearted	____	domineering	____	cruel
____	persistent	____	unsympathetic	____	neighbourly	____	unaggressive
____	cocky	____	unsly	____	shy	____	unargumentativ
____	dominant	____	tricky	____	cunning	____	forceless
____	boastless	____	uncheery	____	timid	____	cheerful
____	boastful	____	unsociable	____	kind	____	uncharitable
____	friendly	____	charitable	____	sly	____	perky
____	bashful	____	unauthoritative	____	unbold	____	warmthless
____	undemanding	____	ruthless	____	ironhearted	____	unsparkling
____	coldhearted	____	outgoing	____	accommodating	____	gentlehearted
____	enthusiastic	____	uncalculating	____	firm	____	unwily
____	uncunning	____	sympathetic	____	self-confident	____	unneighbourly
____	distant	____	dissocial	____	jovial	____	antisocial

Thanks for your help!

Appendix C: Instructions to Participants

Instructions to Participants

We are interested in conducting a study of how people interact together and how they interpret others' actions. In this study you will be interacting with another individual through a game in which you will make a series of choices. We would prefer you not talk to your game partner, because we want your impressions and interpretations to be based solely on their actions.

Playing The Game

During this game a matrix of payoff points will be presented to you and you will have two choices, to cooperate or to compete. You will notice that some of the choices allow you both to gain points, and some allow only one player to gain points. In making your choice, you can compete, acting to your own benefit at the other person's expense. This may sometimes maximize one person's individual scores, however this depends on what the other person does. Alternatively, you can cooperate, which will maximize your pair's total score. The choice between cooperation and competition in this particular game has some direct analogies to how people treat each other in daily life. For some people, competition and winning is important and cooperation is unrealistic and risky because other people are generally not warm and cannot be trusted. For other people, competition seems too cold hostile and cooperation seems to be the proper way of interacting with others, even if means sometimes being taken advantage of by the other person. In this game, there is no good or bad way of responding. What is most important is that you simply be yourself and respond the way you normally do in daily life. Also, in the game you will be making choices about whether to be the first person or the last person to respond or play on each trial, and there is again a direct analogy with every day behavior. Going first on a specific trial is a way of taking the initiative in a social interaction, whereas the person who waits and goes second is essentially letting the other person take the initiative in their interaction. And again, there is no good or bad way of behaving on this issue. What is most important is that you simply be yourself and respond the way you normally do in daily life. The purpose is for us to see how much information you can pick up about your partner based on his or her actions in this task. Again, for this reason, it is important for you to just act in your normal way.

Whenever you are ready, you can begin.

1. If you are ready to begin the turn, hold up your hand with the card of your choice. Whoever raises a card first will go first on that turn. I will inform the other player of the choice that was made.
2. The player going second on that turn will indicate his/her choice to me by holding up the appropriate card. I will then inform the first player of the response.
3. A turn will consist of each player making a choice once, and you will go through many turns. There is no set rule regarding who goes first on each turn. The person that starts one turn will not necessarily start every turn; again, this will be up to you. There is no predetermined number of turns; I will decide when to stop the game.

The Matrix

Look at the matrix now to make sure you understand it. Here is an example: if the first player to go in the first turn chose to cooperate, and the second player also chose to cooperate, the group would receive 6 points (that is, both players would receive 3 points). If on the next turn, the first player chose to cooperate and the second player chose to compete, the group would receive five points (that is, the first player would receive nothing while the second player would receive 5 points). Below the matrix are some examples of point totals that would be accumulated over 10 trials in different choice conditions. We will start with two practice games of 5 turns each to make sure you understand the game and to answer any questions that you may have before the experiment starts. I will tell you the totals after each of these, but after that I will no longer tell you the totals. Once the game is finished, there will be some questionnaires for you to fill out about your partner and the interaction. These will ask you to describe your own and your partner's behaviour during the game. Again, because we want to know how well your partner can describe you based on knowing your actions, it is important to act in the way you think you would in normal social interactions. These questionnaires will complete your participation in the experiment. Do you have any questions?

Appendix D: Revised Interpersonal Adjectives Scales – Short Form

Please rate how accurately the words describe your behaviour *during the game* on the following scale:

1 extremely inaccurate	2 very inaccurate	3 quite inaccurate	4 slightly inaccurate	5 slightly accurate	6 quite accurate	7 very accurate	8 extremely accurate

____	forceful	____	calculating	____	domineering	____	tender
____	self-assured	____	wily	____	neighbourly	____	crafty
____	softhearted	____	assertive	____	cunning	____	cheerful
____	persistent	____	tenderhearted	____	kind	____	perky
____	cocky	____	tricky	____	sly	____	gentlehearted
____	dominant	____	charitable	____	accommodating	____	enthusiastic
____	boastful	____	outgoing	____	firm	____	jovial
____	friendly	____	sympathetic	____	self-confident	____	extraverted

Thanks for your help!

Appendix E: Participant Debriefing Form

The purpose of this study is to examine people's interpersonal behaviour, that is, how they interact with others. Interpersonal theory suggests that people interact with each other in certain systematic and predictable ways. We are interested in assessing whether personality styles, measured by the questionnaires you filled out before and after the game, influence how people behave in interpersonal situations.

Interpersonal theory suggests also that some people will have more flexible behavioural repertoires. That is, the way they behave will depend more on the context or situation they are in. On the other hand, some people will behave according to their normal personality style regardless of the situation. Therefore, one goal of the study is to see how closely the assessments of your personality (made by you and your partner) matched the way you behaved during the game.

In addition, some people will structure or steer an interaction more than others. We can use a statistical analysis to find out which person in an interaction structured it more. Therefore, another goal of this study was to find out if people who do this show some corresponding feature in the personality style questionnaires you filled out.

If you are interested in finding out more about interpersonal theory, some references available in the Lakehead University library are:

Kiesler, D. J. (1983). Therapeutic Metacommunication: Therapist Impact Disclosure as Feedback in Psychotherapy. Palo Alto, CA: Consulting Psychology Press.

Kiesler, D. J. (1988). The 1982 Interpersonal Circle: A taxonomy for complemetarity in human transactions. Psychological Review, 90(3), 185-214.

If you want to find out the results of the study, you can contact:

Kirsten Barr or Dr. O'Connor
Department of Psychology
Lakehead University
955 Oliver Road
Thunder Bay ON P7B 5E1
807-343-8441.

We anticipate the results being ready by the end of the summer. We appreciate your participation in this study. Do you have any further questions?