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Running Head: HOSTILITY IN RELATIONSHIPS

**Satisfaction and Stability within Long-Term Relationships
Involving Trait Hostility**

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M.A. Thesis

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Abstract

This study examined correlates of trait hostility within long-term relationships. In accordance with the rules of complementarity put forth by interpersonal theorists, it was predicted that hostile individuals would more often be paired with similarly hostile individuals, and that, counter-intuitively, such relationships would involve high levels of satisfaction and stability. The participants were 70 couples involved in long-term romantic relationships. Both partners of each couple completed an anonymous, 20-minute questionnaire that included measures of personality, relationship satisfaction, and relationship commitment. The results indicate that the existence of complementarity and its association with relationship satisfaction and stability are different for friendliness and hostility, and depend upon whose ratings of personality are compared. When participants' Friendliness-Hostility self-ratings were compared to their ratings of their partners' Friendliness-Hostility, complementarity was only evident among friendly participants, but not hostile participants. Further, both friendly and hostile participants reported greater relationship satisfaction and commitment when they rated their partners as friendly, rather than hostile. When partners' Friendliness-Hostility self-ratings were compared, the results were inconsistent and varied by gender. The patterns of results are discussed in relation to interpersonal theory, base-rate hypotheses, and theories of social influence.

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Satisfaction and Stability within Long-Term Relationships Involving Trait Hostility

Expressions of hostility are generally considered negative and aversive.

Yet, hostility is a facet of some individuals' personalities when present as a recurring and enduring pattern of behaviour. Despite the negative connotations of hostility, it should not be assumed that the presence of trait hostility, in and of itself, negates the possibility of satisfying and stable long-term relationships. Rather, questions of relationship compatibility involve attention to both partners and the interplay between them. While the possibility cannot be dismissed that individuals possessing trait hostility may be unable to form successful relationships, it is likely that particular relationship contexts accommodate trait hostility and allow for relationship satisfaction and stability. This study seeks to determine which personality pairings, if any, promote happiness and commitment within relationships when trait hostility is evident in one or both partners.

The focus of interpersonal theory on relationships and social interaction provides a useful framework for investigating the influence of personality characteristics on relationship compatibility. Specifically, the interpersonal circle provides a taxonomy of interpersonal traits and precise rules of personality complementarity that allow for clear predictions to be made about the satisfaction and stability of long-term relationships. The present study will apply an interpersonal perspective to an examination of trait hostility within long-term

relationships. The existence of complementarity between partners, in terms of friendliness and hostility, will be measured according to the interpersonal circle. Further, compatibility will be assessed by investigating the association of couples' complementarity with both relationship satisfaction as defined by participants' reports of their happiness within their relationships, and relationship stability as defined by participants reports of their commitment to their relationships.

The Interpersonal Circle

The interpersonal circle is a representation of all interpersonal traits and behaviours. The circumplex arrangement was first designed by Leary and colleagues (Freedman, Leary, Ossario, & Coffey, 1951; Laforge, Leary, Naboisek, Coffey, & Freedman, 1954; Leary, 1957; Leary & Coffey, 1954; Leary & Harvey, 1956) to provide the full range of interpersonal descriptors and to illustrate the relationships among different traits and behaviours. Subsequent research supports the validity of viewing interpersonal behaviour and personality in a two-dimensional circumplex arrangement (Conte & Plutchik, 1981; Wiggins, 1979, 1982; Wiggins, Phillips, & Trapnell, 1989; Wiggins, Trapnell, & Phillips, 1988). Several versions of the interpersonal circle have appeared in the literature since Leary's original construction (Carson, 1969; Kiesler, 1983; Lorr & McNair, 1965; Wiggins, 1979). However, differences among the variants are minimal and there is general agreement regarding the overall organization of interpersonal traits and behaviours.

Specifically, the interpersonal circle is structured around a set of axes defined by two orthogonal dimensions considered fundamental to descriptions of interpersonal traits. The horizontal axis has been labelled affiliation and is anchored by friendliness or love on its positive end and hostility or hate on its negative end. The vertical axis has been referred to as that of status, control, or power, and is anchored by dominance on its positive end and submission on its negative end. Interpersonal traits are considered to be composed of varying degrees of these two fundamental dimensions. Thus, all interpersonal traits can be located within a circle centred at the intersection of the Friendliness-Hostility and dominance-submission axes.

Proximity along the circumference of the interpersonal circle depicts similarity between traits. Descriptors located directly across from one another in the circle indicate opposing traits. With this arrangement, the interpersonal circle offers both a continuous and a linear depiction of personality traits.

Continuity around the circumference of the circle allows for traits to be grouped according to the specificity of description that is required. It is common for the interpersonal circle to be divided along the two dimensions or into four, eight, or sixteen categories. At a quadrant level, the hostile-dominant segment includes such descriptors as competitive, egotistical, cold, vindictive, critical, strict, and punitive. Within the hostile-submissive quadrant, traits are variously described as detached, aloof, unresponsive, rebellious, complaining, unassured,

self-doubting, helpless, and dependent. Examples from the friendly-dominant quadrant include confident, assured, helpful, respected, sociable, outgoing, and spontaneous. Finally, the friendly-submissive quadrant incorporates the descriptors of cooperative, deferent, trusting, grateful, gullible, forgiving, content, and appreciative.

The breadth and specificity of interpersonal traits represented by the interpersonal circle make it a useful tool in personality assessment. Further, as previously stated, research lends support to the depiction of personality offered by the interpersonal circle. Thus, the present study relies on the interpersonal circle to define and identify participants' personalities.

Personality

Beginning with Sullivan (1953), interpersonal theorists have proposed that a desire to reduce anxiety is a primary motive underlying interpersonal behaviour (Carson, 1969; Kiesler, 1983, 1996; Leary, 1957). Related to the importance of social interdependence, perceived threats to interpersonal relationships often engender anxiety. Individuals seek to minimize this anxiety by establishing and maintaining approval and security within their relationships.

Through experience, people learn that certain interpersonal behaviours are associated with disapproval, rejection, and a subsequent increase of anxiety, whereas other behaviours are associated with approval, security, and anxiety reduction (Carson, 1969; Kiesler, 1983, 1996; Leary, 1957). Within their unique

interpersonal contexts of learning and development, people acquire patterns or tendencies of interpersonal behaviour that are designed to minimize anxiety. According to interpersonal theorists, these unique patterns of interpersonal behaviour define an individual's personality.

Appraisals by others, or, more accurately, an individual's perceptions of others' appraisals of him or her, are critical determinants of a person's actions and personality. Most influential are the primary and significant relationships a person experiences. It is through these relationships with significant others that a person's self-concept and worldview emerge in early development and are sustained throughout adulthood (Carson, 1969; Kiesler, 1983, 1996; Leary, 1957; Sullivan, 1953).

Interpersonal Interactions

Interpersonal theory involves explicit propositions regarding the interpersonal contexts that promote continued and satisfying interactions. Ultimately, interpersonal relations will either be conjunctive, leading to inclusion and further interaction, or disjunctive, leading to exclusion and avoidance of future interaction (Sullivan, 1953). It is the degree to which each interactant's needs are accommodated that determines the nature and duration of interpersonal interactions.

Leary (1957) defined the principle of reciprocal interpersonal relations: "Interpersonal reflexes tend (with a probability significantly greater than chance)

to initiate or invite reciprocal interpersonal responses from the 'other' person in the interaction that lead to a repetition of the original reflex" (p. 64). Individuals' interpersonal behaviours are designed to provoke or elicit particular responses from other interactants that affirm their original behaviours. Thus, social interactions involve a reinforcing quality.

Carson (1969) further explained that interpersonal acts "convey implicit messages that give or deny love or status to the self or to the other person" (p. 85). Thus, every interpersonal behaviour can be defined not only in terms of its own situation on the interpersonal circle, but also according to the location on the circle of the response it is intended to elicit. Carson described the relationship between an interpersonal behaviour and the response it is designed to provoke as complementarity.

Complementarity

Carson (1969) reiterated earlier proposals that complementary interactions are mutually rewarding in their ability to meet each participant's need for security. Complementary responses confirm individuals' beliefs about themselves and their interpersonal environments, thus minimizing insecurity and anxiety. When present, complementarity of interpersonal traits and related behaviours promotes satisfying and continued relationships.

Drawing on Leary's (1957) work, Carson (1969) relied on the interpersonal circle to operationalize the complementarity of interpersonal traits

and behaviours. Specifically, he stated that complementarity on the status or control dimension is defined according to reciprocity, with dominant behaviours eliciting equally intense submissive responses and submissive behaviours eliciting equally intense dominant responses. In contrast, complementarity occurs on the affiliation axis according to correspondence, where behaviours of love or friendliness provoke similar responses of love or friendliness and behaviours of hate or hostility provoke similar responses of hate or hostility. It is the latter aspect of complementarity that is the focus of the present study's investigation of trait hostility within long-term relationships. Thus, it is expected that individuals displaying patterns of hostile behaviors will frequently be involved with other similarly hostile individuals.

Notably, interpersonal behaviours do not always receive the responses they were intended to elicit. Carson (1969) believed that such interactions are stressful to the degree that a participant's need for security is not met. Two kinds of non-complementary interactions have been described by Carson and subsequent theorists within the framework of the interpersonal circle.

Anticomplementarity occurs when an interpersonal response does not meet criteria of complementarity on both the Dominance-Submission and Friendliness-Hostility dimensions. These interactions are thought to involve great relationship stress and are not likely to result in the continuation of the relationship. As an

example, anticomplementarity exists when friendly-dominant acts are followed by hostile-dominant responses.

Acomplementarity refers to situations in which interpersonal responses are consistent with the preceding behaviours on one of the dimensions but not the other. These interactions result in moderate relationship stress and will lead either to discontinuation of the relationship or further attempts to negotiate complementarity. Acomplementarity occurs, for example, when a friendly-submissive behaviour is responded to with a similarly friendly-submissive behaviour and when a hostile-dominant behaviour is responded to with a friendly-submissive behaviour.

Interpersonal Complementarity Research.

Kiesler (1983) cited eighteen studies from which he interpreted substantial support for the rules of interpersonal complementarity, but noted three others with equivocal results. Orford's (1986) review of the literature, which included ten of the studies referenced by Kiesler and an additional four studies, came to a much different conclusion. He determined that while there was evidence for complementary behaviours occurring most frequently and anticomplementary behaviours least frequently, certain acomplementary behaviours were found to occur more often than interpersonal theorists would predict. Specifically, hostile-dominance was more often responded to with further hostile-dominance than its complement, and hostile-submission received friendly-dominant responses as

often as complementary hostile-dominant responses. Orford concluded only marginal support for interpersonal complementarity and stated that although complementarity was apparent, it was not as prominent for hostile behaviours as it was for friendly behaviours.

The difference between friendly and hostile complementarity was corroborated in subsequent statistical analyses using a randomization test of hypothesized relations and correspondence analysis (Tracey, 1994). The data included previously collected behavioural observations of 80 individuals who had participated in a task-oriented dyadic interaction with a research confederate (Strong et al., 1988). It was found that interpersonal models of complementarity fit well with actual data for friendly behaviours but not for hostile behaviours. Rather, hostile behaviours only evidenced complementarity when the base-rate of antecedent behaviours was controlled for.

Notably, it is difficult to make overall conclusions from the literature considering the methodological differences in the available studies. For example, different studies rely on different versions of the interpersonal circle, and while variation among circles is minimal, the slight differences that do exist may hinder generalizable conclusions between studies. Relatedly, it may be difficult to compare findings drawn from different levels of classification (i.e., quadrants, octants, two dimensions).

Another area of difficulty in making overall conclusions from a review of the literature involves the focus of measurement. Specifically, some researchers have used global personality measures to investigate interpersonal traits, whereas others have used behavioural coding schemes to study brief interpersonal interactions. Of the latter studies, some have applied a unit-by-unit analysis to investigate the sequencing of behaviours, while others have summated the behaviours of each interactant into an overall aggregate score for that person's interpersonal tendencies within the interaction. Thus, overall interpretation of research in this area is hindered by the focus of some studies on personality, others on interpersonal behaviours, and others on context-dependent behavioural tendencies. In general, trait studies have provided more consistent results than behavioural studies regarding the existence and importance of interpersonal complementarity. However, because samples have not been differentiated according to levels of Friendliness-Hostility, the support offered by trait studies is often ambiguous in terms of the complementarity of trait hostility.

Relationship Compatibility

Complementarity can be understood as compatibility. That is, when personalities, behaviours, or needs of interactants are complementary, interpersonal theory predicts satisfying and stable relationships. Notably, complementarity defines compatibility much differently than either opposites-attract or similarity-attraction hypotheses. When traits or behaviours from a given

segment of the interpersonal circle are met with traits or behaviours from either the same segment or the segment directly opposite, the interaction is considered complementary. Interpersonal theory thus predicts a moderate degree of stress associated with relationships involving people who have highly similar or opposing personality traits when considering the full range of the interpersonal circle. Instead, interpersonal theorists believe that traits and behaviours that are complementary to one another provide the mutual reinforcement that is fundamental to relationship satisfaction and stability. With respect to the exclusive focus on the friendliness-hostility dimension in the current investigation, interpersonal theory proposes that the most happy and committed relationships will either involve two equally friendly partners or two equally hostile partners.

Hostility in Long-Term Relationships

The occurrence of hostile complementarity and its impact on relationship satisfaction and continuance have been the subject of some controversy within the literature. In contrast to friendly complementarity, the ability of hostile complementarity to promote harmonious relationships may appear counterintuitive. Challenges have been put forth regarding both the presence of hostile complementarity as well as its association with relationship satisfaction. However, interpersonal theorists explain that hostile complementarity is necessary

and beneficial to hostile individuals and provides them with more self-confirmation, reinforcement, and security than friendly responses would.

Challenges to the occurrence of hostile complementarity. It has been suggested that not all behaviours of the interpersonal circle have the same base rate nor eliciting power, and as a result, non-complementary behaviours are sometimes the most probable. In particular, Tracey (1993, 1994) argues that when taking into account the larger social context of interpersonal interactions, friendly behaviours are more socially acceptable than hostile behaviours, and thus occur at a more frequent base rate. Further, he explains that society's press against hostile behaviours diminishes the likelihood of their being reciprocated. Rather, while hostile behaviours are likely to elicit a decreased degree of friendliness, Tracey suggests that, due to social convention, responses will nevertheless fall in the range of friendly, and not hostile, behaviour. Tracey states that while non-complementarity of hostile behaviours is likely, a direction of complementarity may be evident in responses if the base rate of friendly and hostile behaviours are first taken into account.

Tracey (1993) notes that the constraining power of social norms and roles may only be a factor in less intimate forms of relationship. Over time, interacting partners become less reliant on social convention as they develop a more personal foundation to base their relationship negotiations upon. Tracey suggests that it is not until this point that individual needs for self-validation become prominent.

Thus, the complementarity of hostile behaviours may only be evident in close or long-term relationships.

Challenges to hostile complementarity promoting relationship stability and satisfaction. Drawing upon the proposal by Kelly and Thibault (1978) that stability and satisfaction of relationships are two independent constructs, Tracey (1993, 1994) cautions against inferring satisfaction on the basis of complementarity. Tracey explains that complementarity between interactants relates to agreement on the underlying basis of a relationship. He agrees with proponents of the interpersonal circle that complementarity, including that of hostile behaviours, may be important to relationship stability since relationships cannot be expected to endure without a fundamental agreement between participants about the nature and meaning of their interactions. In contrast, he suggests that relationship satisfaction is indicated by the relative presence of hostile and friendly behaviours. He proposes that whereas relationship stability may be predicated upon the presence of complementary behaviour, relationship satisfaction can be inferred from the degree of friendly behaviour. Thus, while hostile complementarity may be necessary for the continuance of some relationships, it is also likely to be associated with relationship dissatisfaction.

An alternate challenge is offered by Strong (1986, 1991; Strong et al., 1988) with the theory of social influence. He states that interpersonal behaviours exert influence by the messages they convey not only about an individual's needs

but also about the resources that a person has to offer. Friendly behaviours are thought to demonstrate resources such as cooperation and support, and are expressions of satisfaction with the relationship, whereas hostile behaviours threaten the withdrawal of those resources and demonstrate dissatisfaction. Further, while hostile behaviours may elicit hostile responses, Strong and colleagues suggest that these relationships are far from harmonious and cannot be considered stable. Interpersonal theory explains that a hostile response to a hostile behaviour reinforces the original behaviour, leading to its repetition, and thus stability is created in the form of a predictable pattern. In contrast, social influence theory states that the dissatisfaction and withdrawal of resources that are implied by hostile behaviours express and exert pressure for change in the relationship. If such change is not forthcoming, then friendly behaviours will not reappear, and the relationship will be terminated. Thus, according to social influence theory, hostility is the antithesis of both satisfaction and stability, regardless of whether or not it is responded to in a complementary manner.

In sum, both the occurrence and the consequences of hostile complementarity, as defined by the interpersonal circle, have been challenged. Interpersonal theory may not give sufficient weight to the constraining power of social convention on hostile complementarity, although this is perhaps less of a consideration for long-term relationships. More notably, interpersonal theory may fail to accurately recognize the meaning of hostile behaviours. Hostility

within relationships may denote dissatisfaction, which could possibly lead to relationship dissolution if not resolved.

Research on Hostile Complementarity

The therapeutic context. The perspectives of both Tracey (1993, 1994) and Strong (1986, 1991; Strong et al. 1988) were developed in the context of research regarding interpersonal aspects of psychotherapy relationships. Some of these studies have focused only on the occurrence of complementarity without regard for the effectiveness of therapy. Such studies, using client confederates or single-session video recordings of actual therapy, have supported both friendly and hostile complementarity with findings that friendly client behaviours are most often met with friendly therapist responses and hostile client behaviours are more often responded to with similarly hostile therapist behaviours (Beery, 1970; Gamsky & Fairwell, 1966; Heller, Myers, & Kline, 1963; Mueller & Dilling, 1968).

Additionally, research has explored the relationship between therapists' and clients' interpersonal behaviours and therapy outcomes. Interpersonal theorists suggest that effective therapy relies on the appropriate use of complementarity and non-complementarity by therapists to facilitate change in their clients. Specifically, once a therapeutic alliance has been established through the use of complementary interactions, therapists can bring about the most change by responding to clients in a non-complementary manner (Kiesler,

1983). This is thought to destabilize clients' negative and ineffectual self-concepts, and pressure them to adopt new, more productive interpersonal tendencies. Therapists can then return to complementary responses in order to reinforce their clients' healthier, more functional self-concepts. Thus, non-complementary interactions are expected to effect the most change in clients. In accordance with this, Talley, Strupp, and Morley (1990) found that patients improved more when they perceived their therapist's behaviours to be anticomplementary to their own self-concepts. Similarly, Dietzel and Abeles (1975) determined that successful therapists responded with less complementarity than unsuccessful therapists during the middle stages of therapy, when pressure to change is suggested to be most important. In contrast, Henry et al. (1986) found that successful therapist-client dyads demonstrated greater friendly complementarity, although less hostile complementarity, than unsuccessful dyads.

Other studies have demonstrated differences between friendly and hostile complementarity that appear better suited to a social influence interpretation than an interpersonal circle perspective. For example, Hays and Tracey (1990, as cited in Tracey, 1993) found that while successful and unsuccessful therapist-client dyads did not differ in their proportions of complementary responses to friendly antecedents, successful cases did show lower proportions of hostile complementarity in the early and late stages of therapy, when pressure to change is expected to be minimal and a reinforcing relationship is most important. Tasca

and McMullen (1992) found that decreased complementarity from the beginning to the middle stages of therapy was associated with positive outcome, but only with respect to friendly behaviours. Hoyt, Strong, Corcoran, and Robbins (1993) similarly found that friendly complementarity was least likely in the middle stages of successful therapy, whereas hostile complementarity was most likely. These studies indicate that high levels of hostile complementarity are detrimental to relationship building and are associated with greater pressures to change, as predicted by social influence theory. However, it has also been found that higher complementarity between therapists and clients on the hostility dimension is associated with perceptions of a stronger therapeutic alliance by both clients and therapists (Kiesler & Watkins, 1989).

Trait hostility in long-term relationships. There is a substantial body of research investigating personality variables in the context of committed relationships. However, most studies are difficult to interpret from an interpersonal perspective. First, the personality measures used in many studies include variable labels that are not in accordance with those of the interpersonal circle. Second, some studies report the overall degree of fit between partners' personalities without reference to particular personality variables. Third, these studies have investigated the personality compatibility between relationship partners as either similar or opposite, neither of which accurately reflect an interpersonal conception of complementarity.

Most relationship research comparing the similarity and opposites-attract hypotheses has supported the occurrence of the former, demonstrating predominantly positive correlations between partners' personality variables (Bentler & Newcomb, 1978; Burgess & Wallin, 1953; Katz, Glucksberg, & Krauss, 1960; Lewak, Wakefield, & Briggs, 1985; Murstein, 1961, 1967; Richard, Wakefield, & Lewak, 1990; Schellenberg & Bee, 1960). At least two of these studies included a variable labeled affiliation among the significant positive correlations (Katz et al., 1960; Murstein, 1961), which may indicate support for interpersonal complementarity on the Friendliness-Hostility dimension. At the same time, several studies have found mainly negative significant correlations between partners' personality variables, and concluded support for the opposites-attract hypotheses (Kerckhoff & Davis, 1962; Reiter, 1970; Saint, 1991; Winch, 1955, 1967; Winch, Ktsanes, & Ktsanes, 1954). Of note, one of these studies found a significant negative correlation between partners on a variable labeled affiliation (Reiter, 1970). Finally, a third set of findings do not favour either the similarity or opposites-attract hypotheses (Levinger, Senn, & Jorgensen, 1970).

Research exploring the association between relationship quality and partners' personalities from outside an interpersonal framework has almost unanimously supported personality similarity as important to satisfaction and stability. These studies have found that stable or happily married couples have several corresponding, and few opposing, personality traits (Bentler & Newcomb,

1978; Blazer, 1963; Cattell & Nesselroade, 1967; Dymond, 1954; Eysenck & Wakefield, 1981; Meyer & Pepper, 1977; McCall & Green, 1991; Murstein & Beck, 1972; Preston, Peltz, Mudd, & Frosher, 1952; Reiter, 1970; Tharp, 1963; Yom et al., 1975). In support of interpersonal complementarity on the Friendliness-Hostility dimension, one study noted significant positive correlations between partners' personalities on a variable labelled friendliness (Pickford, Signori, & Rempel, 1966), while another found that a dimension labelled warmth, representing a continuum from affiliation to aggression, was important to marital adjustment (Meyer & Pepper, 1977). In contrast, challenges to interpersonal complementarity were evident along the Friendliness-Hostility dimension in one study, which found spousal differences in aggression to be positively associated with wives' marital satisfaction (Katz, Glucksberg, & Krauss, 1960).

As stated, little research has examined personality variables in long-term relationships from an interpersonal perspective. Of the available studies, support has been demonstrated for interpersonal complementarity involving similarity on the friendly-hostile dimension (Buss, 1984; Fineberg & Lowman, 1975; Saitzyk, Floyd, & Kroll, 1997). The relationship between personality complementarity and marital quality appears to be different for friendly and hostile behaviours. Specifically, distressed couples were shown to reciprocate negative behaviours at a higher than chance rate, whereas nondistressed couples reciprocated negative behaviours at a rate less than chance, with no differences emerging for friendly

behaviours (Billings, 1979). Paradoxically, another study found a nonsignificant trend among maladjusted couples, compared to adjusted couples, for more sequences of complementary interactions involving friendly behaviours and fewer sequences of hostile complementarity (Fineberg & Lowman, 1975).

Overall, the existing research of relationship compatibility is difficult to interpret because of inconsistent personality measures across studies and equivocal results. The few studies that have applied an interpersonal framework substantiate the occurrence of complementarity within long-term relationships and demonstrate modest support for the interaction between complementarity and relationship quality. These studies also note a distinction between friendly and hostile complementarity, as suggested by research on interpersonal complementarity in general.

Hostile behaviours in long-term relationships. A relevant set of studies from outside personality research has investigated the effect of hostile behaviours, and not trait hostility, on long-term relationships. This research suggests that the presence of hostility is associated with low relationship quality, regardless of its complementarity. Whereas companionship has been found to positively correlate with marital satisfaction, hostility has demonstrated negative correlations (Hawkins, 1968). Several studies indicate that distressed and maladjusted couples exhibit more overall hostility and negative feeling and less friendliness and affection than nondistressed couples (Billings, 1979; Fincham & Bradbury, 1993;

Fineberg & Lowman, 1975; Floyd & Markman, 1983; Gottman, 1979; Margolin & Wampold, 1981; Robinson & Price, 1980; Smith, Sanders, & Alexander, 1990). One study, which also found hostility to increase when moving from the most to the least stable couples, noted that levels of warmth were still higher than levels of hostility in the least stable couples (Matthews, Wickrama, & Conger, 1996). Some studies have found that husbands' level of hostility is more of a factor than that of wives in terms of overall marital distress (Houston & Kelly, 1989; Smith, Pope, Sanders, Allred, & O'Keefe, 1988; Smith, Sanders, & Alexander, 1990). Research has suggested that partner's self-reported hostility is negatively associated with both their own and their spouses' reports of marital quality (Newton & Kiecolt-Glaser, 1995), although another study found that self-reported hostility was only negatively related to that partner's marital satisfaction and not that of their spouses' (Smith et al., 1990).

Challenges to hostile complementarity suggest that there is a different meaning associated with hostile complementarity than friendly complementarity that has different implications for long-term relationships. While research provides some support for the occurrence of hostile complementarity within more intimate relationships, there is reason to suspect that hostile complementarity or hostility in any form may be antithetical to stable and fulfilling relationship quality. In contrast, interpersonal theory posits that hostile individuals are able to

maintain relationships of good quality when paired with similarly hostile individuals.

The Present Study

The present study seeks to verify the rules of complementarity with respect to the friendly-hostile dimension of the interpersonal circle in a sample of long-term couples. Although interpersonal theorists presume complementarity to be most evident in significant relationships, few studies have actually investigated complementarity within long-term relationships. This population is particularly useful in examining hostile complementarity since it has been suggested that societal pressures against expressions of hostility are minimized in established relationships, which have developed unique rules of negotiation and agreement, and no longer rely on social convention for smooth interaction.

A focus on the friendly-hostile dimension is important because the occurrence and impact of hostile complementarity remains unclear, as implied by the debate and controversy within both the theoretical and research literature. Interpersonal theory contends that hostile complementarity occurs at a rate greater than chance and that such complementarity is necessary for satisfying and enduring relationships. However, theoretical challenges and some research evidence suggest that the rules of complementarity do not apply equally to hostility and friendliness, and that hostile and friendly complementarity have different meanings and implications for relationships. Thus, it is possible that

interpersonal complementarity may not apply to trait hostility, and if it does occur, it may not be related to relationship stability or satisfaction.

The present study will attempt to contribute to the literature regarding interpersonal complementarity along the friendly-hostile dimension by investigating long-term relationships. In accordance with interpersonal theory, the present study predicts that high levels of complementarity will be evident along the friendly-hostile dimension among long-term couples and that greater complementarity will be associated with higher levels of relationship quality. Acknowledging the challenges that have been put forth regarding hostile complementarity, the present study will specifically examine the proposal by interpersonal theorists that hostile individuals are more often coupled with similarly hostile individuals, and that such relationships are associated with higher levels of both relationship satisfaction and stability.

Method

Participants and Procedure

Participants were recruited in one of four ways. They were either approached in person, contacted by telephone from a list generated from the local telephone book, solicited through postings around the community or advertisements in local media, or contacted by e-mail or internet through newsgroups, directories, chat sites, and discussion boards.

All potential participants were informed that the researcher was conducting a study on long-term relationships and were asked if they would be interested in completing an anonymous, 20-minute questionnaire. They were also told that both partners in a couple were required to complete a questionnaire. This information was either presented in person, over the telephone, or through postings or advertisements in the community or on the internet.

Individuals who were contacted locally, but not those contacted through e-mail or internet postings, were informed of an opportunity for participants to enter a draw for \$50. The draw was only held for local participants due to ease of administration, ability to contact the winner, and ability to deliver the prize. In order to preserve anonymity, the names of participants who wished to enter the draw were not taken in conjunction with their completed questionnaires.

Local couples who agreed to participate were given a questionnaire package that contained two questionnaires, an information sheet, and return envelopes. The information sheet included a description of the project, contact information, a reminder to participants that they could withdraw at any time, and information regarding anonymity, confidentiality, and risks and benefits of participation (Appendix A). Couples who were approached in person had the option of completing the questionnaires at that time or taking them home. Couples who were recruited by telephone contact or through local advertisements

had questionnaire packages dropped off in their mailboxes to be completed in their own time and mailed back to the researcher.

Internet participants were recruited from several online sources (Appendix B). Couples who agreed to participate over the internet were directed toward a web-site which began at <http://flash.lakeheadu.ca/~jjharris/homepage.html>. A brief description of the project, instructions, and contact information were provided on the homepage (Appendix C) and at the beginning of the questionnaire (Appendix D). The content of the web-based version of the questionnaire was identical to that of the paper-based version.

Information was gathered from both partners of 70 adult heterosexual couples. Participants ($n = 140$) ranged in age from 18 to 68 years ($M = 37.01$ years, $SD = 11.93$). The highest level of education was reported as elementary school by 2.2% of participants, high school by 34.5% of participants, college by 34.5% of participants, and university by 28.8% of participants. Most participants reported being employed at the time of the study (85.5% of men and 74.2% of women).

Participants reported that they had been involved in their current relationships from between three months and 47 years ($M = 11.85$ years, $SD = 11.40$). Most participants reported that they were married (69.6%), although some couples reported being engaged (7.2%) and some reported that they were just going out (23.2%). Most couples stated that they were living together

(78.3%). Length of cohabitation ranged from two months to 43 years ($M = 12.09$, $SD = 11.25$).

Slight differences in demographic information were noted between participants who completed the questionnaire in paper format ($n = 48$) and participants who completed the internet version of the questionnaire ($n = 92$). The former group was older, on average, than the latter, $t(137) = 1.94$, $p = .05$. Participants who completed the questionnaire on paper ranged in age from 25 to 68 years, with a mean age of 39.72 years ($SD = 10.57$), whereas the internet participants ranged from 18 to 65 years with a mean age of 35.62 years ($SD = 10.39$). The highest level of education attained was reported to be elementary school by 2.1% of paper-format participants and 2.2% of internet participants, high school by 42.6% of paper-format participants and 30.4% of internet participants, college by 36.2% of paper-format participants and 33.7% of internet participants, and university by 19.1% of paper-format participants and 33.7% of internet participants. Of the participants who completed the questionnaire on paper, 82.6% of men and 70.8% of women reported being employed, compared to 87.0% of men and 76.1% of women who filled out the questionnaire over the internet.

Differences in relationship length and type were also noted between participants who completed the questionnaire on paper and those who participated online. Participants who responded to the paper-format of the questionnaire

reported longer relationships, on average, than internet participants, $t(138) = 4.72$, $p < .01$. Length of relationship for participants who responded on paper ranged from 3.5 to 40 years, with a mean of 17.72 years ($SD = 11.03$), whereas length of relationship for internet participants ranged from 3 months to 47 years, with a mean of 8.79 years ($SD = 10.39$). More participants who completed the questionnaire on paper were married (91.7%), compared to internet participants (57.8%). None of the paper-format participants reported being engaged at the time of the study and 8.3% of these participants reported that they were just going out. In contrast, 11.1% of the internet participants were engaged at the time of the study and 31.1% reported that they were just going out. More paper-format participants were living with their partners (95.7%) than were internet participants (69.6%). The average length of cohabitation was longer for paper-format participants than internet participants, $t(104) = 3.28$, $p < .01$. Of the participants who responded to the questionnaire on paper, those who were living together had been doing so for between 2 and 39 years ($M = 16.24$ years, $SD = 11.49$), whereas the internet participants who were living together had been doing so for between 2 months and 43 years ($M = 9.26$ years, $SD = 10.24$).

Measures

The questionnaire included items regarding demographic information, measures of relationship satisfaction and commitment, and interpersonal

personality variables (Appendix E). A delineation of scale and subscale items is provided in Appendix F.

Relationship satisfaction. Participants' happiness with their relationships was assessed with the Quality of Marriage Index (QMI; Norbert, 1983). This measure has demonstrated good discriminant validity (Heyman, Sayers, & Bellack, 1994; Norbert, 1983) and good convergent validity with other measures of relationship satisfaction and adjustment (Callahan, 1997, 1996; Heyman et al., 1994; Norbert, 1983). The QMI asks participants to respond to six statements using an 8-point Likert scale ranging from extremely inaccurate to extremely accurate. A relationship satisfaction score was computed for each participant as the mean of his or her responses to QMI items. Higher scores reflect higher relationship satisfaction.

Relationship commitment. The degree of stability and commitment within a relationship was measured using a scale developed by Lund (1985). Psychometric information for this scale is not available. Participants were asked to respond to five statements using an 8-point scale ranging from extremely inaccurate to extremely accurate. A commitment score was computed for each participant as the mean of his or her responses to commitment items. Higher scores represent higher relationship commitment.

Friendliness-Hostility scores. The Revised Interpersonal Adjective Scales (IAS-R) were developed by Wiggins and colleagues (1988), and are considered to

be the most psychometrically and geometrically sound empirical markers of circumplex traits (O'Connor & Dyce, 1997). They display a clear circumplex structure, high internal consistency within subscales, and substantial correlations with other self-report measures of personality and with non-verbal social behaviour (Wiggins et al., 1988). They are composed of eight adjectives for each of the eight poles of the interpersonal circle, for a total of 64 adjectives. Participants were asked to indicate how accurately the adjectives described themselves and their partners on 8-point Likert scales.

Because of time considerations, adjectives from only the following four subscales were used: Warm-Agreeable (friendly), Gregarious-Extraverted (friendly-dominant), Assured-Dominant (dominant), and Arrogant-Calculating (hostile-dominant). These four subscales were chosen to provide an adequate representation of the full interpersonal circle. Notably, the four subscales used in this study are non-opposite poles, and since each pole of the circumplex is thought to have a strong negative correlation with its opposite pole, this strategy was designed to provide a sampling of the full spectrum of the interpersonal circle. Further, many of the IAS-R items that were not included in the present study are redundant with items from the poles that were sampled. Wiggins and colleagues (1988) merely added the prefix "un-" to several adjectives to create items for their opposite poles. Participants' responses to these instances generally reflect their responses to the original words, and thus provide little additional information.

Finally, factor analysis of a prior study that relied on the same four subscales depicted a solution highly similar to that reported by Wiggins et al. (1988) for all eight IAS-R subscales (O'Connor & Dyce, 1997).

For each participant, scores for the friendly (ff), friendly-dominant (fd), hostile-dominant (hd), and dominant (dd) octants of the interpersonal circle were computed as the mean of corresponding subscale items. Octant scores were standardized using the means and standard deviations of a large sample ($n = 1161$) reported by Wiggins et al. (1988). These standardized octant scores were then used to compute one composite Friendliness-Hostility score for each participant according to the following formula provided by Wiggins and colleagues (1988, 1989): $.3*(ffz-hhz + .707*(fdz-hdz-hsz+fsz))$. Because the Friendliness-Hostility scores were based on standardization, the range of obtained values was generally between -3.0 and $+3.0$, with higher scores reflecting more friendliness and lower scores reflecting more hostility. Friendliness-Hostility scores were calculated for participants' self-ratings, their ratings of their partners, their partners' self-ratings, and their partners' ratings of them.

The present study aimed to elucidate patterns of complementarity along the Friendliness-Hostility dimension, with a particular focus on hostile complementarity. Thus, several of the subsequent analyses were performed separately for friendly and hostile participants, allowing for possible differences between the two groups to emerge. Identification of participants as either friendly

or hostile was based upon their standardized Friendliness-Hostility self-ratings. Participants with self-rating scores above zero were classified as Friendly and participants with self-rating scores below zero were classified as Hostile.

Correspondence indices. Two kinds of correspondence indices, labelled non-complementarity and disengagement, were computed to assess the relationship between participants' Friendliness-Hostility and the Friendliness-Hostility of their partners. The non-complementarity index was based upon interpersonal theory and focused on the relative similarity between partners' Friendliness-Hostility. The disengagement index was based upon Hoyt et al. (1993) and assessed the degree to which partners were engaging, warm, and friendly. Additionally, within both correspondence indices, two sets of comparisons were made: one set of calculations was based upon participants' self-ratings and their ratings of their partners, and a second set of calculations was made between the self-ratings of participants and the self-ratings of their partners. This resulted in four correspondence calculations for each couple. Non-complementarity was calculated for the Friendliness-Hostility self-ratings of participants' in comparison to their ratings of their partner and in comparison to their partners' self-ratings. Disengagement was also calculated for the Friendliness-Hostility self-ratings of participants in comparison to their ratings of their partner and in comparison to their partners' self-ratings.

The non-complementarity index was derived from the proposal within interpersonal theory that behaviours or personalities plotted along the Friendliness-Hostility dimension are most complemented by similar behaviours or personalities. In this formulation, the complement of friendliness is an equivalent degree of friendliness and the complement of hostility is an equivalent degree of hostility. Scores for the non-complementarity index were derived by calculating the absolute value of the difference between participants' Friendliness-Hostility self-ratings and their partners' Friendliness-Hostility. Because Friendliness-Hostility ratings were standardized scores, ranging from approximately -3.0 to $+3.0$, calculations for non-complementary could result in values ranging from 0.0 to 6.0 . Non-complementarity scores close to zero indicate that participants' levels of Friendliness-Hostility were equivalent to their partners' levels of Friendliness-Hostility. Higher non-complementarity scores represent less similar levels of friendliness or hostility within couples.

The disengagement index was based upon the proposal by Hoyt et al. (1993) that an engaging response is one that is positive and accepting, regardless of the content of an antecedent communication. Thus, friendliness is thought to always be engaging, whether in response to similar friendliness or hostility. Maximum engagement occurs when the degree of friendliness in a response matches the degree of friendliness or hostility in the antecedent expression. In terms of couples' personalities, high engagement would be evident whenever an

individual's partner is relatively friendly, whether or not the individual's own Friendliness-Hostility score is in the hostile or friendly range. Disengagement, then, refers to the extent to which the personality of an individual's partner is generally not positive and accepting, but is instead hostile.

Computations for the disengagement index are outlined in Hoyt et al. (1993) and involve different procedures depending on participants' own Friendliness-Hostility scores. For Friendly participants, engagement is defined identically to interpersonal complementarity, since the ideal pairing of a friendly individual is with another equally friendly individual. Thus, the disengagement index is computed in the same way as the non-complementarity index when participants' self-ratings of Friendliness-Hostility are above zero. Concepts of engagement and interpersonal complementarity diverge when addressing individuals who are relatively hostile. The maximally engaging pairing for a hostile individual would be with a friendly partner, and not an equivalently hostile partner, as predicted by interpersonal theory. The disengagement index for participants scoring below zero on Friendliness-Hostility was computed as the absolute value of a participant's Friendliness-Hostility self-rating added to their partner's level of Friendliness-Hostility. For both Friendly and Hostile participants, low disengagement scores reflect that the Friendliness-Hostility score of a participant's partner is in the friendly range and of similar magnitude as the participant's Friendliness-Hostility score.

Results

Overview of Analyses

Several methods of statistical analyses were applied to assess patterns of association between Friendliness-Hostility and reports of relationship satisfaction and commitment. Analyses were conducted across the total sample, and for the sample divided into Friendly and Hostile participants based on Friendliness-Hostility self-ratings. Unless otherwise noted, participants were classified as Friendly if their Friendliness-Hostility self-ratings were above zero ($n = 90$) and were classified as Hostile if their Friendliness-Hostility self-ratings were below zero ($n = 50$).

First, Pearson product-moment correlations were computed to examine the relationships between various reports of the Friendliness-Hostility of participants and their partners, between reports of relationship satisfaction and commitment by participants and their partners, and between the various ratings of Friendliness-Hostility and participants' relationship satisfaction and commitment. Second, because of the dyadic design of this research, the degree of non-independence between partners' reports was assessed and analyses were conducted at both the individual and dyad levels. Third, the correspondence between the Friendliness-Hostility of both partners in a couple, measured by an index of non-complementarity and an index of disengagement, was examined in association with relationship satisfaction and commitment. Fourth, moderated regressions

were performed to assess the interaction between the Friendliness-Hostility of both partners in a couple in the prediction of participants' relationship satisfaction and commitment. Graphs of the moderated regressions depict patterns of association between relationship satisfaction and commitment and the interaction of the Friendliness-Hostility of participants and their partners. And fifth, distance scores analyses provided a more refined examination of the pattern of associations between participants' relationship satisfaction and commitment and their partners' Friendliness-Hostility, both self-rated and as rated by participants. This involved distance scores calculated between partners' Friendliness-Hostility and a range of values selected from along the Friendliness-Hostility continuum. Partners' distance scores were then examined in association with participants' relationship satisfaction and commitment. Further detail was facilitated by examining these associations separately for participants with varying degrees of self-rated Friendliness-Hostility.

Preliminary Analyses

Despite differences in demographic and relationship information, participants who responded to the questionnaire on paper ($n = 48$) were similar to participants who responded over the internet ($n = 92$) for variables relating to personality, relationship satisfaction, and relationship commitment. No significant differences were observed between participants responding on paper and over the internet for Friendliness-Hostility self-ratings, ratings of partners'

Friendliness-Hostility, relationship satisfaction, or commitment. Because of the similarity between participants responding on paper and those responding online in terms of the variables of interest to this study, data were pooled across the two groups for subsequent analyses involving Friendliness-Hostility, relationship satisfaction, and relationship commitment.

Men and women reported similar levels of relationship satisfaction and commitment. There were also no differences between men and women in their ratings of their partners' Friendliness-Hostility. Of note, the mean Friendliness-Hostility self-rating of women was higher than that of men, $t(138) = 3.67$, $p < .01$, indicating higher levels of friendliness among women. This was also apparent in the numbers of men and women classified as either Friendly or Hostile according to self-ratings. Relatively similar numbers of men were categorized as Friendly ($n = 38$) and Hostile ($n = 32$), whereas substantially more women were categorized as Friendly ($n = 52$) than Hostile ($n = 18$).

Pearson Correlations

Pearson product-moment correlations were computed to examine associations among participants' Friendliness-Hostility and relationship satisfaction and commitment. Friendliness-Hostility was assessed with both self-ratings and ratings of partners. Statistical significance was determined by an alpha level of .05 or less.

Friendliness-Hostility. Analyses were conducted to examine the relationships between the Friendliness-Hostility of participants and their partners. Positive correlations were expected based upon the proposal of interpersonal theory that complementarity involves similarity between partners along the Friendliness-Hostility dimension of personality. Two comparisons were made: participants' self-ratings were compared to their ratings of their partners, and participants' self-ratings were compared to their partners' self-ratings.

Participants' self-ratings of Friendliness-Hostility were significantly positively correlated with their ratings of their partners' Friendliness-Hostility ($r = .33$) across the total sample. However, this relationship was only apparent among Friendly participants ($r = .35$), and not Hostile participants ($r = -.13$). Correlations were positive, but not significant, for both Friendly men ($r = .22$) and Friendly women ($r = .49$). In contrast, correlations were negative, but not significant, for both Hostile men ($r = -.07$) and Hostile women ($r = -.23$).

There was no significant correlation between participants' Friendliness-Hostility self-ratings and their partners' Friendliness-Hostility self-ratings across the total sample ($r = -.05$). This was evident for both Friendly participants ($r = .01$) and Hostile participants ($r = .03$). Correlations for Friendly men ($r = .02$) and Friendly women ($r = .08$) were similarly negligible. Among Hostile participants, correlations between partners' self-ratings were positive for men ($r = .28$), but negative for women ($r = -.26$), although neither was significant.

Relationship satisfaction and commitment. Correlations were computed to assess the association between participants' reports of relationship satisfaction and commitment, and to compare reports of relationship satisfaction and commitment within couples. Across the total sample, a significant positive correlation was observed between participants' reports of relationship satisfaction and commitment ($r = .74$). Participants' reports of relationship satisfaction were positively correlated with their partners' reports of relationship satisfaction ($r = .66$). Participants' reports of commitment were also positively correlated with their partners' reports of commitment ($r = .48$). These associations were apparent when the sample was divided into Friendly and Hostile participants and when the sample was divided by gender.

Relationship quality and self-ratings of Friendliness-Hostility. Pearson product-moment correlations were used to examine the associations between participants' reports of relationship satisfaction and commitment and the Friendliness-Hostility self-ratings of participants and their partners (see Tables 1 and 2). Across the total sample, participants' Friendliness-Hostility self-ratings were significantly positively correlated with their reports of relationship satisfaction ($r = .25$) and commitment ($r = .18$), indicating that friendlier self-ratings were associated with higher relationship satisfaction and commitment. However, correlations between participants' self-ratings and their reports of relationship satisfaction and commitment were not significant for either Friendly

or Hostile participants. When the sample was analyzed by gender, women demonstrated significant positive correlations between their Friendliness-Hostility self-ratings and their reports of relationship satisfaction ($r = .28$) and commitment ($r = .25$). A nonsignificant positive trend was noted between men's Friendliness-Hostility self-ratings and their relationship satisfaction ($r = .22$).

Participants' reports of relationship satisfaction and commitment were not significantly correlated with their partners' Friendliness-Hostility self-ratings across the total sample. This was also evident among both Friendly and Hostile participants, and for both men and women.

Relationship quality and ratings of partners' Friendliness-Hostility.

Pearson product-moment correlations were computed to assess the association of participants' reports of relationship satisfaction and commitment with both their ratings of their partners' Friendliness-Hostility and their partners' Friendliness-Hostility ratings of them (see Tables 1 and 2).

Participants' reports of relationship satisfaction and commitment were consistently associated with their ratings of their partners' Friendliness-Hostility. Specifically, participants' reports of relationship satisfaction were significantly positively correlated with their ratings of their partners' Friendliness-Hostility across the total sample ($r = .38$), for both Friendly ($r = .28$) and Hostile ($r = .46$) participants, and for both men ($r = .31$) and women ($r = .45$). Participants' reports of commitment were also significantly positively associated with their ratings of

their partners' Friendliness-Hostility across the total sample ($r = .32$), for Friendly ($r = .27$) and Hostile ($r = .29$) participants, and for men ($r = .33$) and women ($r = .32$). These correlations indicated that participants with friendlier ratings of their partners reported higher relationship satisfaction and commitment.

Participants' reports of relationship satisfaction and commitment showed some significant associations with their partners' Friendliness-Hostility ratings of them. Participants' relationship satisfaction was significantly correlated with their partners' Friendliness-Hostility ratings of them for the total sample ($r = .28$), for Friendly participants ($r = .24$), and for both men ($r = .27$) and women ($r = .28$), with a nonsignificant positive trend emerging among Hostile participants ($r = .22$). Participants' reports of overall commitment were only significantly correlated with their partners' Friendliness-Hostility ratings of them across the total sample ($r = .19$), although a nonsignificant positive trend was apparent among women ($r = .20$).

Dyad-Level and Individual-Level Analyses

The sample of participants consisted of relationship couples and thus involved the potential for non-independence of observations between partners' reports. It was therefore important to assess the degree of relatedness between the responses of participants and their partners when testing correlations. The pairwise approach outlined by Gonzalez and Griffin (1999) was used to determine the legitimacy of pooling data across all individuals in the sample, to estimate

overall correlations controlling for mean differences, and to evaluate associations at both the dyad and individual levels.

Equality of variances and covariances. Because the sample was composed of heterosexual couples, the partners of each dyad were distinguishable in terms of gender and it was necessary for assumptions of equal variance and covariance to be met before data could be pooled across men and women. Tests for equality of variances indicated that there were no significant differences between men and women in their population variances on Friendliness-Hostility self-ratings ($t = 1.61, p = .11$), ratings of partners' Friendliness-Hostility ($t = .75, p = .46$) relationship satisfaction ($t = .51, p = .62$), and commitment ($t = .92, p = .36$). Population covariances between Friendliness-Hostility self-ratings and relationship satisfaction ($z = .09, p = .61$), and between Friendliness-Hostility self-ratings and commitment ($z = .44, p = .66$), were not significantly different for men and women. Men and women also did not demonstrate different population covariances between relationship satisfaction and ratings of partners' Friendliness-Hostility ($z = 1.12, p = .26$), nor between commitment and ratings of partners' Friendliness-Hostility ($z = .02, p = .99$).

Finally, cross-partner population covariances were assessed to examine whether differences existed between men and women in the association within couples between one partner's reports of relationship satisfaction and commitment and the other partner's Friendliness-Hostility ratings. Specifically,

population covariances between women's Friendliness-Hostility and their partners' relationship satisfaction were not significantly different from population covariances between men's Friendliness-Hostility and their partners' relationship satisfaction ($z = .51, p = .61$). Similarly, population covariances between women's Friendliness-Hostility and their partners' commitment were not significantly different from population covariances between men's Friendliness-Hostility and their partners' commitment ($z = .49, p = .63$). Population covariances between women's ratings of their partners' Friendliness-Hostility and their partners' reported relationship satisfaction were not significantly different from men's ratings of their partners' Friendliness-Hostility and their partners' reported relationship satisfaction ($z = -.23, p = .82$). There were also no significant differences between covariances of women's ratings of their partners' Friendliness-Hostility and their partners' reported commitment and covariances of men's ratings of their partners' Friendliness-Hostility and their partners' reported commitment ($z = .40, p = .69$).

The non-significant results of these tests of equalities of variances and covariances suggested that pooling of data across men and women was appropriate.

Overall within-partner correlations. Overall within-partner correlations were computed to assess the strength of the linear relationship between two variables across all participants, both men and women. They essentially represent

a weighted average of men's and women's correlations between the specified variables.

The overall within-partner correlation between participants' relationship satisfaction and their Friendliness-Hostility self-ratings was .25 ($p < .01$), when pooling both sexes and correcting for possible mean differences between men and women. The overall within-partner correlation between participants' reports of relationship satisfaction and their ratings of their partners' Friendliness-Hostility was .40 ($p < .01$), when pooling both sexes and controlling for mean differences. Thus, higher Friendliness-Hostility self-ratings and higher ratings of partners' Friendliness-Hostility were both associated with higher relationship satisfaction.

The overall within-partner correlation between participants' reports of commitment and their Friendliness-Hostility self-ratings was .18 ($p = .04$), across all participants and controlling for mean differences between men and women. The overall within-partner correlation between participants' commitment and their ratings of their partners' Friendliness-Hostility was .33 ($p < .01$), pooling across men and women and controlling for mean differences. These correlations indicated that higher Friendliness-Hostility self-ratings and higher ratings of partners' Friendliness-Hostility were both associated with higher reports of commitment.

Overall cross-partner correlations. Overall cross-partner correlations were computed to assess the linear relationship between participants' scores on a

variable and their partners' score on another variable, across all participants. These correlations are essentially weighted averages of men's and women's correlations between the specified variables.

The overall cross-partner correlation between participants' relationship satisfaction and their partners' Friendliness-Hostility self-ratings was not significant ($r = .14$, $p = .10$), when pooled across men and women and correcting for mean differences. The overall cross-partner correlation between participants' ratings of their partners' Friendliness-Hostility and their partners' relationship satisfaction was $.29$ ($p < .01$). Thus, higher relationship satisfaction was reported by participants whose partners viewed them as having higher degrees of friendliness.

The overall cross-partner correlation between participants' commitment and their partners' Friendliness-Hostility self-ratings was not significant ($r = .07$, $p = .42$). The overall cross-partner correlation between participants' ratings of their partners' Friendliness-Hostility and their partners' commitment was $.22$ ($p = .01$). This indicated that higher commitment was reported by participants whose partners viewed them as having higher degrees of friendliness.

Dyad-level and individual-level effects. Dyad-level effects refer to whether the similarity between individuals within couples on one variable is associated with their similarity on another variable. For a dyad-level effect to be present, it is necessary that participants and partners are similar on each of the

variables being compared. However, in the present study, while the intraclass correlations were significant for both relationship satisfaction ($r = .67, p < .01$) and commitment ($r = .48, p < .01$), neither Friendliness-Hostility self-ratings ($r = .04, p = .73$) nor participants' ratings of partners' Friendliness-Hostility ($r = .13, p = .29$) demonstrated significant within-dyad similarity. Thus, dyad-level effects could not be computed or meaningfully interpreted for Friendliness-Hostility, either participants' self-ratings or their ratings of their partners.

Individual-level correlations between relationship satisfaction and Friendliness-Hostility self-ratings ($r = .18, p = .13$) and between relationship satisfaction and participants' ratings of partners' Friendliness-Hostility ($r = .20, p = .10$) were also not significant. Thus, variation of relationship satisfaction unique to individuals within dyads was not significantly associated with either the unique variation of participants' Friendliness-Hostility self-ratings or the unique variation of participants' ratings of their partners' Friendliness-Hostility. Individual-level correlations between commitment and participants' Friendliness-Hostility self-ratings ($r = .15, p = .21$) and between commitment and participants' ratings of their partners' Friendliness-Hostility ($r = .17, p = .17$) were also not significant.

Correspondence Indices

Correspondence indices were computed to compare participants' Friendliness-Hostility self-ratings with their partners' Friendliness-Hostility, both

self-rated and as rated by participants, in association with reports of relationship satisfaction and commitment (see Tables 3-6). Two types of correspondence were assessed. The non-complementarity index referred to the degree of similarity between partners' Friendliness-Hostility. The disengagement index reflected the degree to which partners were engaging, warm, and friendly.

Participants' self-ratings and their ratings of their partners. Across the total sample, participants' relationship satisfaction was significantly negatively correlated with the disengagement index calculated between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility ($r = -.27$; see Table 3). Thus, higher relationship satisfaction was associated with lower disengagement, indicating that participants reported more relationship satisfaction when their ratings of their partners were friendlier. Participants' relationship satisfaction was not significantly associated with the non-complementarity index calculated between participant's Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility.

For Friendly participants, the non-complementarity index was calculated in the same way as the disengagement index. Thus, participants' relationship satisfaction was significantly negatively correlated with both non-complementarity and disengagement for Friendly participants ($r = -.23$). Among Hostile participants, relationship satisfaction was significantly negatively correlated with disengagement ($r = -.31$), and demonstrated a nonsignificant trend

toward a positive correlation with non-complementarity ($r = .23$). Relationship satisfaction was significantly negatively correlated with disengagement for both men ($r = -.27$) and women ($r = -.29$), but was not associated with non-complementarity for either men or women. Thus, all participants reported higher relationship satisfaction when their ratings of their partners were friendlier. This was true for men and women, and for both Friendly and Hostile participants.

Across the total sample, participants' reports of commitment were significantly negatively correlated with disengagement ($r = -.21$), but were not associated with non-complementarity, when indices were calculated between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility (see Table 4). This suggested that higher relationship commitment was associated with lower disengagement, indicating that participants reported more commitment when their ratings of their partners were friendlier.

Friendly participants evidenced a significant negative correlation between their reports of commitment and disengagement ($r = -.22$), as well as their identical index of non-complementarity. No significant correlations were apparent between commitment and both the disengagement and non-complementarity indices for Hostile participants. For men, commitment was significantly negatively correlated with disengagement ($r = -.29$), but no association was evident for non-complementarity. Correlations between

commitment and the disengagement and non-complementarity indices were not significant among women. Thus, Friendly participants and men reported more commitment when their ratings of their partners were friendlier. The correspondence between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility did not appear to be associated with commitment for Hostile participants or for women.

Participants' self-ratings and their partners' self-ratings. Participants' relationship satisfaction was not significantly correlated with the disengagement index calculated between participants' Friendliness-Hostility self-ratings and their partners' Friendliness-Hostility self-ratings (see Table 5). The non-complementarity index calculated between participants' self-ratings and their partners' self-ratings was significantly associated with men's relationship satisfaction ($r = -.26$), but demonstrated no significant correlations with relationship satisfaction across the total sample, for women, or among Friendly or Hostile participants. Thus, men reported higher relationship satisfaction when there was less non-complementarity, or more complementarity, between their Friendliness-Hostility self-ratings and their partners' Friendliness-Hostility self-ratings.

Correlations between participants' commitment and the disengagement index calculated between participants' Friendliness-Hostility self-ratings and the self-ratings of their partners were only significant among men ($r = -.25$; see Table

6). Significant negative correlations were evident between participants' commitment and the non-complementarity index calculated between participants' self-ratings and their partner's self-ratings across the total sample ($r = -.19$) and among men ($r = -.28$). Thus, for the total sample, there was some indication that higher relationship commitment was associated with more complementarity within couples. However, the correspondence between the Friendliness-Hostility self-ratings of participants and their partners was generally only associated with commitment for men. No significant correlations were evident between either of the correspondence indices and commitment for women, or for Friendly and Hostile participants.

Moderated Regressions

Moderated regressions assessed whether the interaction between participants' Friendliness-Hostility self-ratings and the Friendliness-Hostility of their partners, both self-rated and as rated by participants, could significantly predict participants' reports of relationship satisfaction and commitment. The interaction between the Friendliness-Hostility of participants and their partners was entered into moderated regressions as a product term and tested to determine if prediction of the dependent variable, either relationship satisfaction or commitment, was significantly improved beyond that accounted for by either participants' or partner's Friendliness-Hostility alone. Discussion of moderated regression is available in Cohen and Cohen (1983) and Aiken and West (1991).

Based on interpersonal theory, it was expected that participants with higher levels of trait hostility would report more relationship satisfaction and commitment when their partners also possessed higher, rather than lower, levels of trait hostility. Similarly, it was expected that participants with higher levels of friendliness would report more relationship satisfaction and commitment when their partners possessed higher, rather than lower, levels of friendliness.

The results of moderated regressions indicated that there was no significant interaction between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility in the prediction of participants' reports of relationship satisfaction and commitment. Of note, the interaction between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility demonstrated a nearly significant prediction of relationship satisfaction for the total sample (R^2 -change = .02, p = .06) and of commitment for women (R^2 -change = .04, p = .08).

Moderated regressions were also used to examine the interaction between participants' Friendliness-Hostility self-ratings and their partners' Friendliness-Hostility self-ratings in association with relationship satisfaction and commitment variables. No significant associations were found, although the prediction of commitment by the interaction of men's Friendliness-Hostility self-ratings with those of their partners approached significance (R^2 -change = .05, p = .06).

The weak interaction effects observed in the present study may be related to the conservativeness of the moderated regression procedure (McClelland & Judd, 1993). Thus, despite low significance, the information provided by moderated regressions is useful in depicting the patterns between participants' Friendliness-Hostility self-ratings, their partners' Friendliness-Hostility levels, and variables of relationship satisfaction and commitment. The interaction between the Friendliness-Hostility of participants and their partners was plotted against mean levels of relationship satisfaction and commitment using a program designed by O'Connor (1999). Separate graphs depict partners' Friendliness-Hostility as participants' ratings of their partners and as partners' self-ratings. In both cases, partners' Friendliness-Hostility levels were represented by three groups: high (1 SD above mean), moderate (mean), and low (1 SD below mean). Graphs were plotted for men and women separately.

Participants' self-ratings and their ratings of their partners. The interaction between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility is plotted against relationship satisfaction in Figure 1 and commitment in Figure 2. The graphs for relationship satisfaction demonstrate that among participants with low self-rated Friendliness-Hostility, those who rated their partners as also having low Friendliness-Hostility reported less mean relationship satisfaction than those who rated their partners as having high Friendliness-Hostility. When participants' ratings of their partners'

Friendliness-Hostility were low, participants' mean relationship satisfaction increased as their Friendliness-Hostility self-ratings increased. However, when participants' ratings of their partners' Friendliness-Hostility were high, participants' mean relationship satisfaction remained uniformly high regardless of their Friendliness-Hostility self-ratings. Among participants with higher self-rated Friendliness-Hostility there was little difference in mean relationship satisfaction between the different levels of partners' friendliness.

The graphs for commitment reflect different patterns for men and women. The mean commitment reported by men who rated their partners as having high levels of Friendliness-Hostility was higher than that reported by men who rated their partners as having low levels of Friendliness-Hostility. Mean commitment remained relatively constant across the range of men's Friendliness-Hostility self-ratings for all levels of partner ratings. Among women with lower Friendliness-Hostility self-ratings, mean commitment was less for those who rated their partners in the low level of Friendliness-Hostility than for those who rated their partners in the high level of Friendliness-Hostility. When partners were rated as having low Friendliness-Hostility, mean commitment increased as women's Friendliness-Hostility self-ratings increased, whereas the mean commitment for women who rated their partners in the high level of Friendliness-Hostility was relatively constant, regardless of their self-rated Friendliness-Hostility.

Participants' self-ratings and their partners' self-ratings. Interactions between the self-ratings of participants and their partners demonstrated different patterns of association with the relationship satisfaction reported by men and women (see Figure 3). When partners' Friendliness-Hostility self-ratings were high, men's mean relationship satisfaction increased significantly as their own Friendliness-Hostility self-ratings increased. Among men whose partners' Friendliness-Hostility self-ratings were low, no significant changes in mean relationship satisfaction were observed as men's Friendliness-Hostility self-ratings increased. For men with lower Friendliness-Hostility self-ratings, mean relationship satisfaction was higher when partners' self-ratings were also low, rather than high. In contrast, among men with higher Friendliness-Hostility self-ratings, mean relationship satisfaction was higher when partners rated themselves as also having high, rather than low, Friendliness-Hostility. For women, mean relationship satisfaction increased as their Friendliness-Hostility self-ratings increased for all levels of partners' self-rated Friendliness-Hostility, although the increase was more substantial for women whose partners' Friendliness-Hostility self-ratings were low.

The graphs for commitment demonstrate a similar distinction between men and women (see Figure 4). For men with partners whose Friendliness-Hostility self-ratings were high, mean relationship satisfaction increased as men's own self-ratings increased. For men with partners whose Friendliness-Hostility

self-ratings were low, mean relationship satisfaction decreased slightly as men's Friendliness-Hostility self-ratings increased. Among men with low Friendliness-Hostility self-ratings, mean commitment scores were higher for those whose partners' self-ratings also indicated low Friendliness-Hostility than for those whose partners' self-ratings indicated high Friendliness-Hostility. For men with high Friendliness-Hostility, mean commitment scores were higher for those whose partners' Friendliness-Hostility self-ratings were also high level than for those whose partners' Friendliness-Hostility self-ratings were low. Among women, increases in mean commitment were apparent as women's Friendliness-Hostility self-ratings increased, for all levels of partners' self-rated Friendliness-Hostility.

Distance Scores Analyses

Distance scores analyses were designed to provide a more detailed and precise assessment of the pattern of correlations between participants' reports of relationship satisfaction and commitment, participants' Friendliness-Hostility self-ratings, and the Friendliness-Hostility of partners, both self-rated and as rated by participants. This was facilitated by allowing for more subtle distinctions between the Friendliness-Hostility self-ratings of participants and by exploring patterns in relation to the entire range of the Friendliness-Hostility continuum, as described below.

Previous analyses focused on potential differences between friendly and hostile complementarity by dividing participants into two groups, Friendly and Hostile, based on Friendliness-Hostility self-ratings above and below zero, respectively. To examine more precise distinctions of Friendliness-Hostility, analyses of distance scores were performed for four groups of participants based on Friendliness-Hostility self-ratings. This categorization was made according to approximate quartile divisions; participants with self-ratings below the 25th percentile were classified as Very Hostile, participants with self-ratings between the 25th and 50th percentiles were classified as Moderately Hostile, participants with self-ratings between the 50th and 75th percentiles were classified as Moderately Friendly, and participants with self-ratings above the 75th percentile were classified as Very Friendly. Categorization was done separately for men and women.

Distance scores were calculated as the absolute value between the Friendliness-Hostility scores of participants' partners, both self-ratings and as rated by participants, and a range of possible locations along the Friendliness-Hostility continuum. The specific standardized Friendliness-Hostility values that were selected to calculate distance scores began with -3.0 at the most hostile extreme and increased in increments of 0.5 up to $+3.0$ at the most friendly extreme. Thus, thirteen distance scores were calculated for each partner. Correlations were then computed between partners' distance scores from each of

these locations and participants' reports of relationship satisfaction and commitment. These correlations were computed for each of the four Friendliness-Hostility groups separately.

When partners' distance scores were positively correlated with relationship satisfaction and commitment variables, this indicated that participants reported higher levels of those variables when their partners' Friendliness-Hostility scores were located further away from the Friendliness-Hostility value they were measured against. Negative correlations suggested that participants reported higher levels of relationship satisfaction and commitment when their partners' Friendliness-Hostility scores were located closer to the Friendliness-Hostility value they were measured against.

From the perspective of interpersonal theory, it was expected that among participants with more hostile self-ratings, correlations between relationship satisfaction and commitment and their partners' Friendliness-Hostility distance scores would be negative when measured against hostile values and positive when measured against friendly values of the Friendliness-Hostility continuum. This would suggest that hostile participants reported higher relationship quality when their partners' Friendliness-Hostility were closer to the hostile range and further from the friendly range of the Friendliness-Hostility dimension. The reverse pattern was expected for participants with more friendly self-ratings, indicating that friendly participants reported higher relationship quality when their partners'

Friendliness-Hostility were further from hostile values and closer to friendly values of the Friendliness-Hostility continuum.

Ratings of partners' Friendliness-Hostility. A general trend in the correlations emerged, for both relationship satisfaction and commitment, for distance scores calculated using participants' ratings of their partners' Friendliness-Hostility (see Figures 5 and 6). When participants' ratings of their partners' Friendliness-Hostility were measured against values on the hostile side of the Friendliness-Hostility dimension, distance scores were positively correlated with relationship satisfaction and commitment. This suggested that participants' relationship satisfaction and commitment were higher when there were larger distances between their ratings of their partners' Friendliness-Hostility and hostile values of the Friendliness-Hostility continuum. The reverse pattern occurred when participants' ratings of their partners' Friendliness-Hostility were measured against values on the friendly side of the Friendliness-Hostility dimension. Distance scores were negatively correlated with relationship satisfaction and commitment for friendly values of the Friendliness-Hostility dimension, suggesting that higher degrees of participants' satisfaction and commitment were associated with smaller distances between their ratings of their partners' Friendliness-Hostility and values on the friendly side of the Friendliness-Hostility dimension.

This pattern was most consistent among the Very Hostile and Moderately Hostile participant groups. For example, when distance scores were calculated between participants ratings of their partners' Friendliness-Hostility and values on the hostile side of the Friendliness-Hostility continuum, correlations with participants' relationship satisfaction and commitment ranged from .19 to .38 for Very Hostile men, and from .24 to .54 for Very Hostile women. When distance scores were calculated between participants' ratings of their partners and values on the friendly side of the Friendliness-Hostility continuum, correlations with participants' relationship satisfaction and commitment ranged from -.30 to .09 for Very Hostile men, and from -.55 to -.23 for Very Hostile women.

Participants in the Moderately Friendly and Very Friendly groups demonstrated some deviations from the general pattern that varied by gender. For men in the Moderately Friendly group, reports of relationship satisfaction and commitment were negatively correlated with partners' distance scores measured against values in the somewhat friendly range of the Friendliness-Hostility continuum ($r = -.54$ to $-.35$), but were unrelated to partners' distance scores measured from hostile or extreme friendly values. This suggests that Moderately Friendly men reported higher relationship satisfaction and commitment when their ratings of their partners' Friendliness-Hostility were close to the somewhat friendly range of the Friendliness-Hostility dimension. For women in the Very Friendly group, reports of relationship satisfaction and commitment were

primarily positively correlated with partners' distance scores measured against somewhat friendly values of the Friendliness-Hostility dimension ($r = -.05$ to $.40$), and were not associated with partners' distance scores calculated with hostile or extreme friendly values. This indicated that Very Friendly women reported higher relationship satisfaction and commitment when their ratings of their partners' Friendliness-Hostility were further away from the somewhat friendly range of the Friendliness-Hostility dimension.

Partners' self-ratings of Friendliness-Hostility. Across the four friendliness groups, no overall trend in correlations with relationship satisfaction and commitment emerged when partners' distance scores were calculated using partners' self-ratings of Friendliness-Hostility (see Figures 7 and 8).

For the Very Hostile group, partners' distance scores showed different correlations with relationship satisfaction and commitment for men and women. For Very Hostile men, partners' distance scores were positively correlated with relationship satisfaction and commitment when measured against somewhat friendly values of the Friendliness-Hostility dimension ($r = .10$ to $.40$), but did not demonstrate significant correlations when measured against hostile values or extreme friendly values of the Friendliness-Hostility dimension. For Very Hostile women, partners' distance scores were negatively correlated with relationship satisfaction and commitment when calculated against somewhat hostile scores of the Friendliness-Hostility dimension ($r = -.45$ to $-.11$), but not when measured

against friendly or extreme hostile values of the Friendliness-Hostility continuum. This suggested that Very Hostile men reported higher relationship satisfaction and commitment when their partners' Friendliness-Hostility self-ratings were further from the somewhat friendly range of the Friendliness-Hostility dimension. Very Hostile women reported higher relationship satisfaction and commitment when their partners' Friendliness-Hostility self-ratings were closer to somewhat hostile values of the Friendliness-Hostility dimension.

Partners' distance scores for the Very Friendly group also displayed different patterns of correlations with relationship satisfaction and commitment for men and women. Very Friendly men demonstrated significant positive correlations with relationship satisfaction and commitment when partners' distance scores were measured against values on the hostile side of the Friendliness-Hostility dimension ($r = .27$ to $.45$) and significant negative correlations with relationship satisfaction and commitment when distance scores were measured against values on the friendly side of the Friendliness-Hostility dimension ($r = -.55$ to $-.31$). Very Friendly women displayed negative correlations with relationship satisfaction and commitment when partners' distance scores were calculated from the hostile side of the Friendliness-Hostility dimension ($r = -.33$ to $.09$) and primarily positive correlations with relationship satisfaction and commitment when distance scores were calculated from the friendly side of the Friendliness-Hostility dimension ($r = -.12$ to $.36$). This

indicated that when partners' Friendliness-Hostility scores were located close to hostile values of the Friendliness-Hostility dimension, Very Friendly men reported lower relationship satisfaction and commitment while Very Friendly women reported higher relationship satisfaction and commitment. Conversely, when partners' Friendliness-Hostility scores were located close to friendly values of the Friendliness-Hostility continuum, Very Friendly men reported higher relationship satisfaction and commitment and Very Friendly women reported lower relationship satisfaction and commitment.

Discussion

Aspects of interpersonal theory were examined in an investigation of personality and relationship quality in a sample of long-term relationship couples. Despite the proposition within interpersonal theory that rules of complementarity are most apparent in significant relationships, little research has actually examined complementarity within long-term relationships. The present study attempted to fill this gap by relying on information gathered from 70 couples who had been together from between three months and 47 years, with a mean length of relationship of 11.85 years.

A specific focus on the Friendliness-Hostility dimension of the interpersonal circle was designed to address current debate within the theoretical and research literature. Interpersonal theorists maintain a similarity hypothesis of

complementarity in relation to Friendliness-Hostility. Thus, it was predicted that people with high levels of friendliness would more often be paired with partners similarly high in friendliness and that people with high levels of hostility would more often be paired with partners who were also high in hostility. It was further predicted, in accordance with interpersonal theory, that these complementary pairings would demonstrate higher relationship satisfaction and commitment than couples with non-complementary personalities along the Friendliness-Hostility dimension.

Existence of Complementarity

Participants were asked to rate both themselves and their partners according to a list of adjectives measuring personality. This allowed for multiple comparisons of personality along the Friendliness-Hostility dimension. First, participants' self-ratings were compared to their ratings of their partners' personalities. Second, participants' self-ratings were compared to their partners' self-ratings. Notable differences were evident depending on which Friendliness-Hostility ratings were considered.

Comparisons between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility demonstrated different correlations when participants were divided into two groups according to their self-ratings along the Friendliness-Hostility dimension. Among Friendly participants, those with higher self-ratings perceived their partners to be similarly

high in friendliness. Among Hostile participants, the correlations were not significant, but demonstrated a trend toward more hostile self-ratings being associated with higher ratings of partners' friendliness. Thus, interpersonal complementarity, measured between participants' self-ratings and their ratings of their partners, was found to occur when participants' self-ratings were friendly, but not when they were hostile.

Comparisons between participants Friendliness-Hostility self-ratings and their partners' Friendliness-Hostility self-ratings were not significant. Different patterns of association were evident when participants were divided into two groups based on their self-ratings along the Friendliness-Hostility dimension. Among Friendly participants, the relationship between participants' Friendliness-Hostility self-ratings and their partners' Friendliness-Hostility self-ratings was negligible. Correlations among Hostile participants, while not significant, depicted a trend for men toward more hostile participant self-ratings being associated with lower Friendliness-Hostility self-ratings by their partners, and an opposite trend for women toward more hostile participant self-ratings being associated with higher Friendliness-Hostility self-ratings by their partners. Thus, complementarity between partners' self-ratings may occur when men are hostile, but was not supported for hostile women nor for friendly men or women.

Conclusions regarding the existence of Friendliness-Hostility complementarity within long-term relationships depend upon which ratings of

personality are compared. The present study found support for the presence of complementarity between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility among Friendly, but not Hostile, participants. However, previous research has not compared people's Friendliness-Hostility self-ratings with their perceptions of their partners' personalities. Rather, most research comparing personality within long-term relationships has relied primarily on self-report assessments of personality and has yielded equivocal results (Buss, 1984; Murstein, 1961; Reiter, 1970; Katz, Glucksberg & Krauss, 1960). The low correlations that were found in the present study between partners' Friendliness-Hostility self-reports are reflective of the equivocal findings in previous research.

Differences between hostile and friendly complementarity are highlighted by the results of the present study. The occurrence of complementarity was only found among Friendly participants, supporting the contention that rules of complementarity apply differently to friendliness and hostility. Tracey (1993, 1994) has explained differences in friendly and hostile complementarity as the result of societal norms and conventions. He suggests that because hostile behaviours are less socially acceptable than friendly behaviours, they occur at a less frequent base-rate and are less likely to be reciprocated. He explains that hostile behaviours may evidence a direction of complementarity in that they elicit

less friendly responses than friendly behaviours, but because of social conventions, these responses will nevertheless fall in the friendly range.

Tracey's explanation focuses on a behavioural level of analysis of interpersonal interaction and he notes that societal norms are probably less of an influence on behaviours in more intimate relationships. However, from an interpersonal perspective of personality, it is reasonable to infer from Tracey's argument that the constraining power of societal norms on hostile behaviours may influence personality development, resulting in a lower base-rate of individuals with personalities in the hostile range of the Friendliness-Hostility dimension. Thus, if the base-rate of trait hostility is low, there may be reduced opportunities for hostile individuals to be paired with other hostile individuals, and consequently, a decreased likelihood of hostile personality complementarity among relationship couples. In the present study, trait hostility was less frequent than trait friendliness; more participants had friendliness self-ratings above zero than below zero when standardized on the basis of data from a large normative sample collected by Wiggins et al. (1988). At the same time, the base-rate hypothesis would still allow for a direction of complementarity among hostile individuals, indicated by individuals with higher levels of hostility being paired with less friendly partners than individuals with lower levels of hostility. The negative correlations that were found between partners' friendliness among Hostile participants, although not significant, run counter to this prediction,

suggesting that differences in hostile and friendly complementarity are due to more than just differences in base-rate frequencies.

Friendliness-Hostility and Relationship Quality

The association between relationship quality and the Friendliness-Hostility dimension of personality also varied according to which ratings of personality were assessed. In general, the relationship satisfaction and commitment of both partners in a couple were more consistently correlated with ratings of partners' Friendliness-Hostility than either partners' Friendliness-Hostility self-ratings. Significant correlations were in the positive direction, indicating that higher relationship quality was associated with friendlier ratings of partners.

Complementarity and Relationship Quality

Several methods were used to examine the association between relationship satisfaction and commitment and comparisons of partners' personalities along the Friendliness-Hostility dimension. Because results varied according to which ratings of Friendliness-Hostility were compared, the different comparisons will be discussed separately.

Participants' self-ratings and their ratings of their partners. Among Friendly participants, higher relationship satisfaction and commitment were generally associated with higher ratings of partners' friendliness. This was apparent in significant correlations between measures of relationship quality and indices of couples' Friendliness-Hostility correspondence. This was also evident

in distance scores analyses, which suggested that higher relationship quality was reported by participants when their ratings of their partners' Friendliness-Hostility were further from hostile values and closer to friendly values of the Friendliness-Hostility continuum, although some discrepancies were observed that varied by gender. Most notably, reports of relationship quality by Very Friendly women were higher when their ratings of their partners' Friendliness-Hostility were further away from the somewhat friendly range of the Friendliness-Hostility continuum. Graphs of moderated regressions also suggested some deviation from predictions of interpersonal complementarity, depicting mean levels of relationship quality as consistently high for Friendly participants, regardless of their ratings of their partners. Despite these exceptions, the overall pattern of results suggested that Friendly participants reported higher relationship satisfaction and commitment when they perceived their partners to be similarly friendly, and thus provides some support for interpersonal theory's tenet that complementarity is associated with high relationship quality.

Among Hostile participants, higher relationship satisfaction and commitment was also generally associated with higher ratings of partners' friendliness. This was noted in associations between reports of relationship quality and indices of couples' Friendliness-Hostility correspondence. Distance scores analyses and graphs of moderated regressions also indicated that Hostile participants' relationship quality was higher when they reported friendlier ratings

of their partners. Thus, the assertion within interpersonal theory that complementarity is associated with high relationship quality was not supported among Hostile participants.

When comparisons were made between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility, the association between similarity along the Friendliness-Hostility dimension and relationship quality was only supported among Friendly participants. Hostile participants demonstrated higher relationship quality when they rated their partners' as friendly rather than similarly hostile. These results are incompatible with interpersonal theory, which maintains that similarity between couples along the Friendliness-Hostility dimension meets individuals' needs for security and self-confirmation, and is thus associated with satisfaction and stability. Instead, the findings of the present study are better explained by the theory of social influence put forth by Strong and colleagues (Strong, 1991; Strong et al., 1988), who propose that interpersonal behaviours convey messages not only about the needs of an individual, but also about the resources that an individual has to offer. Friendly and hostile behaviours are thought to have different meanings in terms of the provision of resources they represent. Specifically, friendly behaviours express satisfaction with the relationship and offer resources such as cooperation and support, whereas hostile behaviours are messages of dissatisfaction that threaten the withdrawal of those resources and exert pressure to change. Thus,

from the perspective of social influence theory, relationships in which one or both partners are predominantly hostile will be characterized by low relationship satisfaction and stability. Results of the present study support the formulation of social influence theory when comparisons between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility are examined in association with relationship quality.

Participants' self-ratings and their partners' self-ratings. Among Friendly participants, comparisons between their Friendliness-Hostility self-ratings and the self-ratings of their partners demonstrated inconsistent associations with relationship quality across the different methods of analysis. Gender differences were also apparent in these associations. Correlations between relationship quality and indices of couples' Friendliness-Hostility complementarity were not significant among Friendly participants. For Friendly men, distance scores analyses and graphs of moderated regressions suggested that higher relationship quality was reported by participants whose partners' self-ratings were friendlier. Results for Friendly women were not consistent. Distance scores analyses suggested that Friendly women reported higher relationship quality when their partners' self-ratings were more hostile, whereas graphs of moderated regressions indicated that Friendly women reported high mean levels of relationship quality regardless of partners' Friendliness-Hostility self-ratings. Thus, when comparing the Friendliness-Hostility self-ratings of participants and their partners, an

association between complementarity and high relationship quality was suggested among Friendly men, but was not evident for Friendly women.

Results were similarly inconsistent among Hostile participants when comparing the Friendliness-Hostility self-ratings of participants and their partners. Correlations between relationship quality and indices of couples' Friendliness-Hostility correspondence were not significant for Hostile participants. For Hostile men, distance scores analyses and graphs of moderated regressions suggested that Hostile men reported higher relationship quality when their partners reported more hostile self-ratings. For Hostile women, distance scores analyses indicated that higher relationship quality was reported when partners' self-ratings were somewhat hostile, while graphs of moderated regressions suggested that higher relationship quality was reported when their partners' Friendliness-Hostility self-ratings were friendlier. Thus, the results for Hostile men provide some support for the association between higher relationship quality and Hostile complementarity, when the self-ratings of participants were compared to the self-ratings of their partners, but the associations are unclear for Hostile women.

These results suggested that when partners' Friendliness-Hostility self-ratings were compared, similarity along the Friendliness-Hostility dimension was generally associated with high relationship quality for both Friendly and Hostile men. This provides some support for the claim of interpersonal theory that Friendliness-Hostility complementarity is associated with high relationship

satisfaction and commitment. However, results among women in the present study are unclear, and do not support interpersonal theory.

Gender Differences

Previous research has evidenced gender asymmetry when examining relationship quality and self-reports of trait hostility, although the nature and direction of gender differences vary across studies (Gaelick, Bodenhausen, & Wyer, 1985; Houston & Kelly, 1989; Huston & Vangelisti, 1991; Smith et al., 1988; Smith, Sanders & Alexander, 1990). The gender differences that were observed in the present study are similarly ambiguous. When the Friendliness-Hostility self-ratings of participants and their partners were compared, patterns of association with relationship quality were more coherent among men than women, and suggested that hostile complementarity may be associated with reports of higher relationship quality among men, but not women. Although this finding was not significant, it raises the possibility that men and women interpret hostility differently. In addition, graphs of moderated regressions suggested that women's Friendliness-Hostility self-ratings may be more important to their reports of relationship quality than complementarity with their partners' self-ratings, at least among relatively friendly women. This is supported by the finding that women tended to report more of an association between relationship quality and their Friendliness-Hostility self-ratings than men did.

It should also be noted that inconsistencies related to gender might be attributable to differences in the relative hostility and friendliness between men and women in the present study. Although there were no gender differences in the variances and covariances of Friendliness-Hostility ratings and relationship quality variables, a higher mean Friendliness-Hostility self-rating was noted for women. Substantially more women had Friendliness-Hostility self-ratings above zero than below zero, whereas men's Friendliness-Hostility self-ratings were more evenly distributed. The higher proportion of Friendly women may have contributed to the gender discrepancies and inconsistencies observed in the present study.

Strengths, Limitations, and Recommendations for Future Research

The design of the present study allowed for several contributions to research on interpersonal theory and long-term relationships. In contrast to stranger or acquaintance paradigms conducted in laboratory settings, the present study provided information drawn from naturally occurring dyads and examined interpersonal patterns within long-standing and established relationships. Additionally, the present study made use of both self-ratings and ratings of partners in assessments of Friendliness-Hostility, facilitating multiple comparisons of partners' personalities. Finally, relationship satisfaction and commitment were analyzed separately in the present study, taking into account

the possibility of different mechanisms underlying these variables of relationship quality.

Some cautions may be made in regard to the sample characteristics of the present study. First, substantially more couples responded to the questionnaire over the internet than on paper. Differences between these two groups were noted in age, education, relationship length, and relationship type. However, the two groups were similar for variables of interest to the present study, including Friendliness-Hostility ratings, relationship satisfaction, and commitment. Thus, the generalizability of results is supported across participants responding to the questionnaire on paper and online.

More notably, the prevalence of trait hostility among women was relatively low. It is possible that the low prevalence of hostility among women may be unique to the present sample. However, it may also be the result of different implications and consequences of hostility between men and women in the general population (Gaelick et al., 1985; Huston & Vangelisti, 1991; MacGregor & Davidson, 2000; Newton & Kiecolt-Glaser, 1995). Further research is required to elucidate potentially different meanings and associations of trait hostility between men and women in long-term relationships.

A potential weakness is also noted regarding the assessment of personality in the present study. Specifically, only half the traits of the IAS-R were included in the questionnaire due to time considerations. The traits that were assessed,

however, were non-orthogonal, and since each pole of the interpersonal circumplex is thought to have a strong negative correlation with its opposite pole, this strategy was expected to provide an adequate sampling of the full range of circumplex personality traits. Factor analysis has confirmed the utility of this strategy in previous research relying on the same abbreviated set of personality traits (O'Connor & Dyce, 1997).

The present study applied a global assessment of personality to investigate interpersonal theory in the context of long-term relationships. This research would be complemented by examination of behavioural patterns among long-term couples. Additionally, a more comprehensive understanding of the association between relationship quality and Friendliness-Hostility complementarity among couples would be provided by longitudinal research.

Conclusions

Two primary conclusions are drawn from this study. First, interpretations of interpersonal complementarity vary according to which ratings of personality are compared. Second, rules of complementarity do not appear to apply equally to friendliness and hostility.

In the present study, marked differences were noted when analyses of Friendliness-Hostility complementarity involved comparisons of participants' self-ratings with their ratings of their partners in contrast to comparisons of participants' self-ratings with the self-ratings of their partners. Most research has

relied on the latter method, focusing on comparisons between the self-reports of partners within a relationship, and has yielded equivocal results pertaining to hostile complementarity and relationship quality. This was reflected in the present study by weak effects and conflicting patterns when comparing participants' self-ratings with their partners' self-ratings. In contrast, while no other study from an interpersonal perspective has compared participants' personality self-ratings with their ratings of their partners' personalities, the present investigation found a striking consistency in the pattern of results when this method was used.

The two personality comparisons that were made in the present study reflect fundamentally different research questions. Self-reports of personality are often used as measures to approximate actual personality. Consequently, comparing the personality self-reports of partners within a long-term relationship may be interpreted as comparing the actual personalities of those partners. However, validity coefficients for self-report personality scales are often low (Buss, 1984) and may not translate into observable behavioural tendencies. Thus, if comparisons of the actual personalities of partners within a relationship are sought, self-ratings may not be the most appropriate method.

Comparisons between participants' personality self-ratings and their ratings of their partners' personalities can be viewed as reflecting individuals' appraisals or perceptions of themselves and their partners. Notably, these appraisals may not consistently coincide with observable phenomenon. Yet, they

may nevertheless be closely linked to individuals' feelings and reports of relationship satisfaction and commitment. This method would appear well-suited to an examination of interpersonal theory, which involves the assertion that an individual's behavioural tendencies are guided by a dynamic interaction between their self-appraisals and their perceptions of the behaviours of people they interact with.

The results of the present study suggest that friendly and hostile complementarity have different implications within long-term relationships. Complementarity between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility was found to occur among relatively friendly participants, but not among relatively hostile participants. Further, when participants' Friendliness-Hostility self-ratings were compared to their ratings of their partners' Friendliness-Hostility, similarity between participants and their partners was only associated with relationship quality for relatively friendly participants. Relatively hostile participants demonstrated higher relationship quality when they reported higher ratings of their partners' friendliness. Thus, when perceptions of partners' Friendliness-Hostility are considered, the degree to which partners are perceived to be friendly appears to be more important to relationship satisfaction and stability than the degree to which they are perceived to be similar.

References

- Aiken, L. S., & West, S. G. (1991). Multiple regression: Testing and interpreting interactions. Newbury Park, CA: Sage.
- Beery, J.W. (1970). Therapists' responses as a function of level of therapist experience and attitude of the patient. Journal of Consulting and Clinical Psychology, 34, 239-243.
- Bentler, P.M., & Newcomb, M.D. (1978). Longitudinal study of marital success and failure. Journal of Consulting and Clinical Psychology, 46, 1053-1070.
- Billings, A. (1979). Conflict resolution in distressed and nondistressed married couples. Journal of Consulting and Clinical Psychology, 47, 368-376.
- Blazer, J.A. (1963). Complementary needs and marital happiness. Marriage and Family Living, 25, 89-95.
- Burgess, E.W., & Wallin, P. (1953). Engagement and marriage. Philadelphia: Lippincott.
- Buss, D. M. (1984). Marital assortment for personality dispositions: Assessment with three different data sources. Behavior Genetics, 14, 111-123.
- Callahan, C.A. (1997). Internal consistency, reliability, and concurrent validity of the Kansas Marital Satisfaction Scale and the Quality Marriage Index. Psychological Reports, 80, 49-50.

- Callahan, C.A. (1996). Correlations of scores on the Kansas Marital Satisfaction Scale and the Quality Marriage Index. Psychological Reports, 78, 530.
- Carson, R.C. (1969). Interaction concepts of personality. Chicago: Aldine.
- Cattell, R.B., & Nesselroade, J.B. (1967). Likeness and completeness theories examined by sixteen personality factor measures on stably and unstably married couples. Journal of Personality and Social Psychology, 7, 351-361.
- Cohen, J., & Cohen, P. (1983). Applied multiple regression/correlation analysis for the behavioral sciences. Hillsdale, NJ: Erlbaum.
- Conte, H.R., & Plutchik, R. (1981). A circumplex model for interpersonal personality traits. Journal of Personality and Social Psychology, 40, 701-711.
- Dietzel, C.S., & Abeles, N. (1975). Client-therapist complementarity and therapeutic outcome. Journal of Counseling psychology, 22(4), 264-272.
- Dymond, R. (1954). Interpersonal perception and marital happiness. Canadian Journal of Psychology, 8, 164-171.
- Eysenck, H.J., & Wakefield, J.S. (1981). Psychological factors as predictors of marital satisfaction. Advances in Research and Therapy, 3, 151-192.
- Fincham, F.D., & Bradbury, T.N. (1993). Marital quality, depression, and attributions: A longitudinal analysis. Journal of Personality and Social Psychology, 64, 442-452.

Fineberg, B.L., & Lowman, J. (1975). Affect and status dimensions of marital adjustment. Journal of Marriage and the Family, 37, 155-159.

Floyd, F.J., & Markman, H.J. (1983). Observational biases in spouse observation: Toward a cognitive/behavioral model of marriage. Journal of Consulting and Clinical Psychology, 50, 783-784.

Freedman, M.B., Leary, T., Ossario, A. G., & Coffey, H.S. (1951). The interpersonal dimension of personality. Journal of Personality, 20, 143-161.

Gaelick, L., Bodenhausen, G.V., & Wyer, R.S. (1985). Emotional communication in close relationships. Journal of Personality and Social Psychology, 49, 1246-1265.

Gamsky, N.R., & Fairwell, G.F. (1966). Counselor verbal behaviour as a function of client hostility. Journal of Counseling Psychology, 13(2), 184-190.

Gonzalez, R. & Griffin, D. (1999). The correlation analysis of dyad-level data in the distinguishable case. Personal Relationships, 6, 449-469.

Gottman, J.M. (1979). Marital interaction: Experimental investigations. New York: Academic Press.

Hawkins, J. L. (1968). Associations between companionship, hostility, and marital satisfaction. Journal of Marriage and the Family, 30, 647-650.

Heller, K., Myers, R.A., & Kline, L.V. (1963). Interviewer behaviour as a function of standardized client roles. Journal of Counseling Psychology, 27(2), 117-122.

Henry, W.P., Schacht, T.E., & Strupp, H.H. (1986). Structural analysis of social behavior: Application to a study of interpersonal process in differential psychotherapeutic outcome. Journal of Consulting and Clinical Psychology, 54, 27-31.

Heyman, R.E., Sayers, S.L., & Bellack, A.S. (1994). Global marital satisfaction versus marital adjustment: An empirical comparison of three measures. Journal of Family Psychology, 8, 432-446.

Houston, B.K., & Kelly, K.E. (1989). Hostility in employed women: Relation to work and marital experience, social support, stress, and anger expression. Personality and Social Psychology Bulletin, 15, 175-182.

Hoyt, W.T., Strong, S.R., Corcoran, J.L., & Robbins, S.B. (1993). Interpersonal influence in a single case of brief counseling: An analytic strategy and a comparison of two indexes of influence. Journal of Counseling Psychology, 40(2), 166-181.

Huston, T.L. & Vangelisti, A.L. (1991). Socio-emotional behavior and satisfaction in marital relationships: A longitudinal study. Journal of Personality and Social Psychology, 61, 721-733.

Katz, I. Glucksberg, S., & Krauss, R. (1960). Need satisfaction and Edwards PPS scores in married couples. Journal of Consulting Psychology, 24, 205-208.

Kerckhoff, A.C. & Davis, K.E. (1962). Value consensus and need complementarity in mate selection. American Sociological Review, 27, 295-303.

Kelly, H.H., & Thibault, J.W. (1978). Interpersonal relations: A theory of interdependence. New York: Wiley.

Kiesler, D.J. (1983). The 1982 Interpersonal circle: A taxonomy for complementarity in human transactions. Psychological Review, 90, 185-214.

Kiesler, D.J. (1996). Contemporary interpersonal theory and research: Personality, psychopathology, and psychotherapy. New York: John Wiley & Sons.

Kiesler, D.J., & Watkins, L.M. (1989). Interpersonal complementarity and the therapeutic alliance: A study of the relationship in psychotherapy. Psychotherapy, 26, 183-194.

Laforge, R., Leary, T., Naboisek, H., Coffey, H.S., & Freedman, M.P. (1954). The interpersonal dimension of personality: 2. An objective study of repression. Journal of Personality, 23, 129-153.

Leary, T. (1957). The interpersonal diagnosis of personality. New York: Ronald.

Leary, T., & Coffey, H.S. (1954). The prediction of interpersonal behavior in group psychotherapy. Group Psychotherapy, 7, 7-51.

Leary, T., & Harvey, J.S. (1956). A methodology for measuring personality changes in psychotherapy. Journal of Clinical Psychology, 12, 123-132.

Levinger, G., Senn, D.J., & Jorgensen, B.W. (1970). Progress toward permanence in courtship: A test of the Kerkhoff-Davis hypothesis. Sociometry, 33, 427-433.

Lewak, R.W., Wakefield, J.A. Jr., & Briggs, P.F. (1985). Intelligence and personality in mate choice and marital satisfaction. Personality and Individual Differences, 6, 471-477.

Lorr, M., & McNair, D.M. (1965). Expansion of the interpersonal behavior circle. Journal of Personality and Social Psychology, 2, 823-830.

Lund, M. (1985). The development of investment and commitment scales for predicting continuity of personal relationships. Journal of Social and Personal Relationships, 2, 3-23.

MacGregor, M.W., & Davidson, K. (2000). Men's and women's hostility is perceived differently. Journal of Research in Personality, 34, 252-261.

Margolin, G., & Wampold, B.E. (1981). Sequential analysis of conflict and accord in distressed and nondistressed marital partners. Journal of Consulting and Clinical Psychology, 49, 554-567.

Matthews, L.S., Wickrama, A.S., & Conger, R.D. (1996). Predicting marital instability from spouse and observer reports of marital interaction. Journal of Marriage and the Family, *58*, 641-655.

McCall, D.L., & Green, R.G. (1991). Symmetricality and complementarity and their relationship to marital stability. Journal of Divorce and Remarriage, *15*, 23-32.

McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. Psychological Bulletin, *114*, 376-390.

Meyer, J.P., & Pepper, S. (1977). Need compatibility and marital adjustment in young married couples. Journal of Personality and Social Psychology, *35(5)*, 331-342.

Mueller, W.J., & Dilling, C. (1968). Therapist-client interview behaviour and personality characteristics of therapists. Journal of Projective Techniques and Personality Assessment, *32*, 281-288.

Murstein, B.I. (1961) The complementary need hypothesis in newlyweds and middle-aged married couples. Journal of Abnormal and Social Psychology, *63*, 194-197.

Murstein, B.I. (1967). Empirical tests of role, complementary needs, and homogamy theories of marital choice. Journal of Marriage and the Family, *29*, 689-696.

Murstein, B.I., & Beck, G.D. (1972). Person perception, marriage adjustment, and social desirability. Journal of Consulting and Clinical Psychology, 39, 396-403.

Newton, T.L., & Kiecolt-Glaser, J.K. (1995). Hostility and erosion of marital quality during early marriage. Journal of Behavioral Medicine, 18, 601-619.

Norbert, R. (1983). Measuring marital quality: A critical look at the dependent variable. Journal of Marriage and the Family, 45, 141-151.

O'Connor, B. P. (1999). Simple and flexible SAS and SPSS programs for analyzing lag-sequential categorical data. Behavior Research Methods, Instrumentation, and Computers, 31, 718-726.

O'Connor, B.P., & Dyce, J. (1997). Interpersonal rigidity, hostility, and complementarity in musical bands. Journal of Personality and Social Psychology, 72, 362-372.

Orford, J. (1986). The rules of interpersonal complementarity: Does hostility beget hostility and dominance, submission? Psychological Review, 93, 365-377.

Pickford, J.H., Signori, E.I., & Rempel, H. (1966). Similar or related personality traits as a factor in marital happiness. Journal of Marriage and the Family, 28, 190-192.

Preston, M.G., Peltz, W.L., Mudd, E.T., & Frosher, H.B. (1952).

Impressions of personality as a function of marital conflict. Journal of abnormal Sociological Psychology, 47, 326-336.

Reiter, H.H. (1970). Similarities and differences in scores on certain personality scales among engaged couples. *Psychological Reports*, 26, 465-466.

Richard, L.S., Wakefield, J.A. Jr., & Lewak, R. (1990). Similarity of personality variables as predictors of marital satisfaction: A Minnesota Multiphasic Personality Inventory (MMPI) item analysis. *Personality and Individual Differences*, 11, 39-43.

Robinson, E., & Price, M.G. (1980). Pleasurable behaviour in marital interaction: An observational study. *Journal of Consulting and Clinical Psychology*, 48, 117-118.

Saint, D.J. (1991). Complementarity in marital relationships. *The Journal of Social Psychology*, 134, 701-703.

Saitzyk, A.R., Floyd, F.J., & Kroll, A.B. (1997). Sequential analysis of autonomy-interdependence and affiliation-disaffiliation in couples' social support interactions. *Personal Relationships*, 4, 341-360.

Schellenberg, J.A. & Bee, L.S. (1960). A re-examination of the theory of complementary needs in mate selection. *Marriage and Family Living*, 22, 227-331.

Smith, T.W., Pope, M.K., Sanders, J.D., Allred, K.D., and O'Keefe, J.L. (1988). Cynical hostility at home and work: Psychosocial vulnerability across domains. Journal of Research on Personality, 22, 525-548.

Smith, T.W., Sanders, J.D., & Alexander, J.F. (1990). What does the Cook and Medley Hostility Scale measure? Affect, behavior and attributions in the marital context. Journal of Personality and Social Psychology, 58, 699-708.

Strong, S.R. (1986). Interpersonal influence theory and therapeutic interactions. In F.J. Dorn (Ed.), Social influence processes in counseling and psychotherapy (pp. 17-30). Springfield, IL: Thomas.

Strong, S.R. (1991). Social influence and change in therapeutic relationships. In C.R. Snyder & D.R. Forsyth (Eds.), Handbook of social and clinical psychology: The health perspective (pp.540-562). New York: Pergamon Press.

Strong, S.R., Hills, H.I., Kilmartin, C.T., DeVries, H., Lanier, K., Neslon, B.N., Strickland, D., & Meyer, C.W. (1988). The dynamic relations among interpersonal behaviors: A test of complementarity and anticomplementarity. Journal of Personality and Social Psychology, 54, 798-810.

Sullivan, H.S. (1953) The interpersonal theory of psychiatry. New York: Norton.

Tasca, G.A., & McMullen, L.M. (1992). Interpersonal complementarity and antithesis within a stage model of psychotherapy. Psychotherapy, 29, 515-523.

Talley, P.F., Strupp, H.H., & Morey, L.C. (1990). Matchmaking in Psychotherapy: Patient-therapist dimensions and their impact on outcome. Journal of Consulting and Clinical Psychology, 58(2), 182-188.

Tharp, R.G. (1963). Psychological patterning in marriage. Psychological Bulletin, 60, 97-117.

Tracey, T.J. (1994). An examination of the complementarity of interpersonal behavior. Journal of Personality and Social Psychology, 67, 864-878.

Tracey, T.J. (1993). An interpersonal stage model of the therapeutic process. Journal of Counseling Psychology, 40, 396-409.

Wiggins, J.S. (1979). A psychological taxonomy of trait-descriptive terms: The interpersonal domain. Journal of Personality and Social Psychology, 37, 395-412.

Wiggins, J.S. (1982). Circumplex models of interpersonal behavior in clinical psychology. In P.C. Kendall & J.N. Butcher (Eds.), Handbook of research methods in clinical psychology (pp. 183-221). New York: Wiley.

Wiggins, J.S., Phillips, N., & Trapnell, P. (1989). Circular reasoning about interpersonal behavior: Evidence concerning some untested assumptions

underlying diagnostic classification. Journal of Personality and Social Psychology, 56, 296-305.

Wiggins, J.S., Trapnell, P., & Phillips, N. (1988). Psychometric and geometric characteristics of the Revised Interpersonal Adjective Scales (IAS-R). Multivariate Behavioral Research, 23, 517-530.

Winch, R.F. (1955). The theory of complementary needs in mate-selection: Final results on the test of the general hypothesis. American Sociological Review, 20, 552-555.

Winch, R.F. (1967). Another look at the theory of complementary needs in mate-selection. Journal of Marriage and the Family, 29, 756-767.

Winch, R.F., Ktsanes, T., & Ktsanes, V. (1954) The theory of complementary needs in mate-selection: An analytic and descriptive study. American Sociological Review, 19, 241-249.

Yom, B.L., Bradley, P.E., Wakefield, J.A., Kraft, I.A., Doughtie, E.B., & Cox, J.A. (1975). A common factor in the MMPI scales of married couples. Journal of Personality Assessment, 39, 64-69.

Appendix A

Information Sheet Included in Questionnaire Packages

Dear Participant:

I am a Master's student in the psychology department of Lakehead University and I'm looking for people to participate in a study I'm conducting. The purpose of the study is to examine recollections of family life in relation to features of adult relationships and to identify characteristics that contribute to relationship satisfaction. The study involves you and your partner separately and privately filling out a brief questionnaire, which should require about 20 minutes of your time.

Your responses will remain completely anonymous and confidential. There are no good or bad answers to the questions. There is no deception involved, and there are no risks to you for participating in the study. Please remember that your participation in the study is completely voluntary and you may withdraw at any time.

The data from all participants will be pooled and analyzed as a group, as the responses of any single individual are meaningful only in relation to the responses of others. This means that no conclusions can be drawn about the responses of individual participants. You may obtain a copy of the final results of the study by contacting me.

If you are personally concerned with your parent-child or current adult relationships, feel free to contact myself or Dr. Brian O'Connor at the address below for referral information, or you may directly contact any of the following people or organizations: (1) the Lakehead Regional Family Centre: 343-5000; (2) Psychologists, Psychiatrists, or other Counselors: see the yellow pages of the phone book; or (3) the Minister of your Church.

Feel free to contact me if you have any questions. I very much appreciate your participation.

Thank you,

Joy Harrison

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Lakehead University
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Appendix B

Sources Used to Recruit Internet Participants

Online Messaging

ICQ (web.icq.com)

Yahoo Messenger (pager.yahoo.com)

Excite PAL (www.excite.com/communities/pal/home)

E-mail Search Engines

Lycos WhoWhere? People Finder (www.whowhere.lycos.com)

Whitepages (www.whitepages.com)

Infospace (www.infospace.com)

Newsgroups

soc.couples

alt.support.marriage

Discussion Boards

Remarq Discussions (www.remarq.com)

Relationships

Marriage

Parents

Lycos Communities Message Boards (clubs.lycos.com)

Being Married

Marriage and Commitment

Queendom Community Discussion Boards (www.queendom.com)

Relationships

WebPsych Club

General Discussion

Appendix C

Homepage for the Web-based Version of the Questionnaire

Relationship Questionnaire

If you are currently in a long-term relationship
and
if both you and your partner
are each able to fill out this 20-minute, anonymous questionnaire
your assistance in this project would be greatly appreciated.

~ ~ ~

**Proceed to
questionnaire
by selecting the
appropriate link:**

Male

Female

This questionnaire is part of a project being conducted through the Psychology Department of Lakehead University. The purpose of the study is to examine recollections of family life in relation to features of adult relationships and to identify characteristics that contribute to relationship satisfaction.

There are two sections, each of which takes approximately 10 minutes to complete. For your input to be included in the study, both you and your partner are asked to each fill out a questionnaire. You are encouraged to do this separately and privately. Bookmarking this page (Adding to Favorites) might be useful so your partner can do it at a later time.

Data from all participants will be pooled and analyzed as a group. This means that no conclusions can be drawn about the responses of individual participants. If you would like a copy of the final results, please provide your e-mail or mailing address in the space at the end of the questionnaire or through my e-mail.

Feel free to contact me if you have any questions. I can be reached at jiharris@flash.lakeheadu.ca or you can include your comments or questions in the space provided at the end of the questionnaire.

~ ~ ~

Thank you for your participation.

Appendix D

Instructions at the Beginning of the Web-based Version of the Questionnaire

Relationship Questionnaire

—Please allow page to load completely before proceeding—

There are two pages to this questionnaire. Both pages must be submitted for the information to be useful.

If you find any of the questions too personal, you do not have to respond, although it would be most helpful to us if you answered every question.

it is important that your partner also participate. However, you should each fill out a questionnaire separately and privately.

There are no good or bad answers to any of the questions below. Please just give the most accurate, truthful response. Your responses will remain anonymous and confidential.

Appendix E

Research Questionnaire

QUESTIONNAIRE

This questionnaire is concerned with you and your relationships. There are no good or bad answers to any of the questions below. Please just give the most accurate, truthful response. Your responses will remain anonymous and confidential. If you find any of the questions too personal, you do not have to respond, although it would be most helpful to us if you answered every question.

Gender: Male Female

How old are you? _____

What is your highest educational degree?

____ elementary school ____ high school ____ college ____ university

Do you have a job? yes no If "yes," what do you do? _____

Are both your parents alive? yes no

If "no," indicate which parent died & your age when they died. _____

Are your parents divorced? yes no

If "yes," how old were you when they divorced? ____ years

The next questions are concerned with your current romantic relationship.

How long did (or has) your relationship with this person lasted? _____

What is the nature of your relationship with your partner? married engaged just going out

Do you live with your partner? yes no If yes, for how long have you been living together? ____ years

The following questions are concerned with your current relationship. Using the 1-8 scale below, please rate the accuracy of each statement by placing the appropriate number on the dash beside each statement.

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

____ We have a good relationship.

____ My relationship with my partner is very stable.

____ Our relationship is strong.

____ My relationship with my partner makes me happy.

____ I really feel like part of a team with my partner.

- ___ Everything considered, the degree of happiness in my relationship is very high.
- ___ It is likely that our relationship will last a long time.
- ___ A potential partner would have to be very attractive for me to pursue a new relationship.
- ___ I am committed to our relationship.
- ___ My partner is committed to our relationship.
- ___ I am likely to continue our relationship.
- ___ My partner is likely to continue our relationship.

Please rate the accuracy of the following statements about yourself.

1	2	3	4	5	6	7	8
extremely inaccurate	very inaccurate	quite inaccurate	slightly inaccurate	slightly accurate	quite accurate	very accurate	extremely accurate
___ I am cheerful				___ I am assertive			___ I am dominant
___ I am childlike				___ I am forceful			___ I am shy
___ I am sympathetic				___ I am tender			___ I act as a leader
___ I am affectionate				___ I am aggressive			___ I am ambitious
___ I am analytical				___ I am compassionate			___ I use harsh language
___ I am athletic				___ I am competitive			___ I am willing to take risks
___ I am feminine				___ I am flatterable			___ I defend my own beliefs
___ I am independent				___ I love children			___ I have leadership qualities
___ I am loyal				___ I am individualistic			___ I am sensitive to others
___ I am masculine				___ I am soft-spoken			___ I make decisions easily
___ I am self-reliant				___ I am understanding			___ I am warm
___ I am self-sufficient				___ I am yielding			___ I am gentlehearted
___ I am domineering				___ I am firm			___ I am self-confident
___ I am self-assured				___ I am persistent			___ I am cocky
___ I am crafty				___ I am cunning			___ I am boastful
___ I am wily				___ I am calculating			___ I am tricky
___ I am sly				___ I am softhearted			___ I am accommodating
___ I am tenderhearted				___ I am charitable			___ I am kind
___ I am friendly				___ I am neighborly			___ I am jovial
___ I am perky				___ I am enthusiastic			___ I am a strong personality
___ I am outgoing				___ I am extraverted			___ I am gullible
___ I am willing to take a stand				___ I am eager to soothe hurt feelings			

Finally, please rate the accuracy of the following statements about your current relationship partner.

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

My partner is:

<input type="checkbox"/> cheerful	<input type="checkbox"/> assertive	<input type="checkbox"/> dominant
<input type="checkbox"/> childlike	<input type="checkbox"/> forceful	<input type="checkbox"/> shy
<input type="checkbox"/> sympathetic	<input type="checkbox"/> tender	<input type="checkbox"/> acts as a leader
<input type="checkbox"/> affectionate	<input type="checkbox"/> aggressive	<input type="checkbox"/> ambitious
<input type="checkbox"/> analytical	<input type="checkbox"/> compassionate	<input type="checkbox"/> uses harsh language
<input type="checkbox"/> athletic	<input type="checkbox"/> competitive	<input type="checkbox"/> is willing to take risks
<input type="checkbox"/> feminine	<input type="checkbox"/> flatterable	<input type="checkbox"/> defends his/her own beliefs
<input type="checkbox"/> independent	<input type="checkbox"/> loves children	<input type="checkbox"/> has leadership qualities
<input type="checkbox"/> loyal	<input type="checkbox"/> individualistic	<input type="checkbox"/> is sensitive to others
<input type="checkbox"/> masculine	<input type="checkbox"/> soft-spoken	<input type="checkbox"/> makes decisions easily
<input type="checkbox"/> self-reliant	<input type="checkbox"/> understanding	<input type="checkbox"/> warm
<input type="checkbox"/> self-sufficient	<input type="checkbox"/> yielding	<input type="checkbox"/> gentlehearted
<input type="checkbox"/> domineering	<input type="checkbox"/> firm	<input type="checkbox"/> self-confident
<input type="checkbox"/> self-assured	<input type="checkbox"/> persistent	<input type="checkbox"/> cocky
<input type="checkbox"/> crafty	<input type="checkbox"/> cunning	<input type="checkbox"/> boastful
<input type="checkbox"/> wily	<input type="checkbox"/> calculating	<input type="checkbox"/> tricky
<input type="checkbox"/> sly	<input type="checkbox"/> softhearted	<input type="checkbox"/> accommodating
<input type="checkbox"/> tenderhearted	<input type="checkbox"/> charitable	<input type="checkbox"/> kind
<input type="checkbox"/> friendly	<input type="checkbox"/> neighborly	<input type="checkbox"/> jovial
<input type="checkbox"/> perky	<input type="checkbox"/> enthusiastic	<input type="checkbox"/> a strong personality
<input type="checkbox"/> outgoing	<input type="checkbox"/> extraverted	<input type="checkbox"/> gullible
<input type="checkbox"/> willing to take a stand	<input type="checkbox"/> eager to soothe hurt feelings	

Thank You Very Much For Your Help

Appendix F

Questionnaire Scales and Subscales

Relationship Satisfaction

- ___ We have a good relationship.
- ___ My relationship with my partner is very stable.
- ___ Our relationship is strong.
- ___ My relationship with my partner makes me happy.
- ___ I really feel like part of a team with my partner.
- ___ Everything considered, the degree of happiness in my relationship is very high.

Relationship Commitment

- ___ It is likely that our relationship will last a long time.
- ___ I am committed to our relationship.
- ___ My partner is committed to our relationship.
- ___ I am likely to continue our relationship.
- ___ My partner is likely to continue our relationship.

Personality

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

Table 1

Correlations between Friendliness-Hostility and Relationship Satisfaction

Group	<u>n</u>	Participants' Self-Ratings	Participants' Ratings of their Partners	Partners' Self-Ratings	Partners' Ratings of Participants
Total Sample	140	.25**	.38**	.13	.28**
Friendly People	90	.15	.28*	.21	.24*
Hostile People	50	.06	.46**	.06	.22
Men	70	.22	.31**	.12	.27*
Women	70	.28*	.45**	.17	.28*

Note. Participants in the Friendly Group had standardized Friendliness-Hostility scores above zero. Participants in the Hostile Group had standardized Friendliness-Hostility ratings below zero.

* $p \leq .05$

** $p \leq .01$

Table 2

Correlations between Friendliness-Hostility and Relationship Commitment

Group	<u>n</u>	Participants' Self-Ratings	Participants' Ratings of their Partners	Partners' Self-Ratings	Partners' Ratings of Participants
Total Sample	140	.18*	.32**	.05	.19*
Friendly People	90	.07	.27**	.13	.09
Hostile People	50	-.08	.29*	-.01	-.18
Men	70	.12	.33**	.12	.18
Women	70	.25*	.32**	.03	.20

Note. Participants in the Friendly Group had standardized Friendliness-Hostility scores above zero. Participants in the Hostile Group had standardized Friendliness-Hostility ratings below zero.

* $p \leq .05$

** $p \leq .01$

Table 3

Correlations between Relationship Satisfaction and Correspondence Indices for Participants' Friendliness-Hostility Self-Ratings and their Ratings of their Partners' Friendliness-Hostility

Group	n	Correspondence between Self-Ratings and Ratings of Partner	
		Non-complementarity	Disengagement
Total Sample	140	-.08	-.27**
Friendly People	90	-.22*	-.22*
Hostile People	50	.23	-.31*
Men	70	-.16	-.27*
Women	70	.03	-.29*

Note. Participants in the Friendly Group had standardized Friendliness-Hostility scores above zero. Participants in the Hostile Group had standardized Friendliness-Hostility ratings below zero.

* $p \leq .05$

** $p \leq .01$

Table 4

Correlations between Relationship Commitment and Correspondence Indices for Participants' Friendliness-Hostility Self-Ratings and their Ratings of their Partners' Friendliness-Hostility

Group	n	Correspondence between Self-Ratings and Ratings of Partner	
		Non-complementarity	Disengagement
Total Sample	140	-.08	-.21*
Friendly People	90	-.22*	-.22*
Hostile People	50	.19	-.17
Men	70	-.19	-.29*
Women	70	.10	-.10

Note. Participants in the Friendly Group had standardized Friendliness-Hostility scores above zero. Participants in the Hostile Group had standardized Friendliness-Hostility ratings below zero.

* $p \leq .05$

** $p \leq .01$

Table 5

Correlations between Relationship Satisfaction and Correspondence Indices for the Friendliness-Hostility Self-Ratings of Participants and their Partners

Group	n	Correspondence between Partners' Self-Ratings	
		Non-complementarity	Disengagement
Total Sample	140	-.16	-.10
Friendly People	90	-.16	-.16
Hostile People	50	-.02	-.02
Men	70	-.26*	-.19
Women	70	-.07	-.04

Note. Participants in the Friendly Group had standardized Friendliness-Hostility scores above zero. Participants in the Hostile Group had standardized Friendliness-Hostility ratings below zero.

* $p \leq .05$

** $p \leq .01$

Table 6

Correlations between Relationship Commitment and Correspondence Indices for the Friendliness-Hostility Self-Ratings of Participants and their Partners

Group	n	Correspondence between Partners' Self-Ratings	
		Non-complementarity	Disengagement
Total Sample	140	-.19*	-.11
Friendly People	90	-.16	-.16
Hostile People	50	-.13	-.08
Men	70	-.28*	-.25*
Women	70	-.10	-.02

Note. Participants in the Friendly Group had standardized Friendliness-Hostility scores above zero. Participants in the Hostile Group had standardized Friendliness-Hostility ratings below zero.

* $p \leq .05$

** $p \leq .01$

Figure Captions

Figure 1. Moderated regressions of the interaction between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility, in the prediction of relationship satisfaction.

Figure 2. Moderated regressions of the interaction between participants' Friendliness-Hostility self-ratings and their ratings of their partners' Friendliness-Hostility, in the prediction of relationship commitment.

Figure 3. Moderated regressions of the interaction between the Friendliness-Hostility self-ratings of participants and their partners, in the prediction of relationship satisfaction.

Figure 4. Moderated regressions of the interaction between the Friendliness-Hostility self-ratings of participants and their partners, in the prediction of relationship commitment.

Figure 5. Correlations between participants' relationship satisfaction and the distance of their ratings of their partners' Friendliness-Hostility from selected values along the Friendliness-Hostility continuum.

Figure 6. Correlations between participants' relationship commitment and the distance of their ratings of their partners' Friendliness-Hostility from selected values along the Friendliness-Hostility continuum.

Figure 7. Correlations between participants' relationship satisfaction and the distance of their partners' Friendliness-Hostility self-ratings from selected values along the Friendliness-Hostility continuum.

Figure 8. Correlations between participants' relationship commitment and the distance of their partners' Friendliness-Hostility self-ratings from selected values along the Friendliness-Hostility continuum.

Figure 1

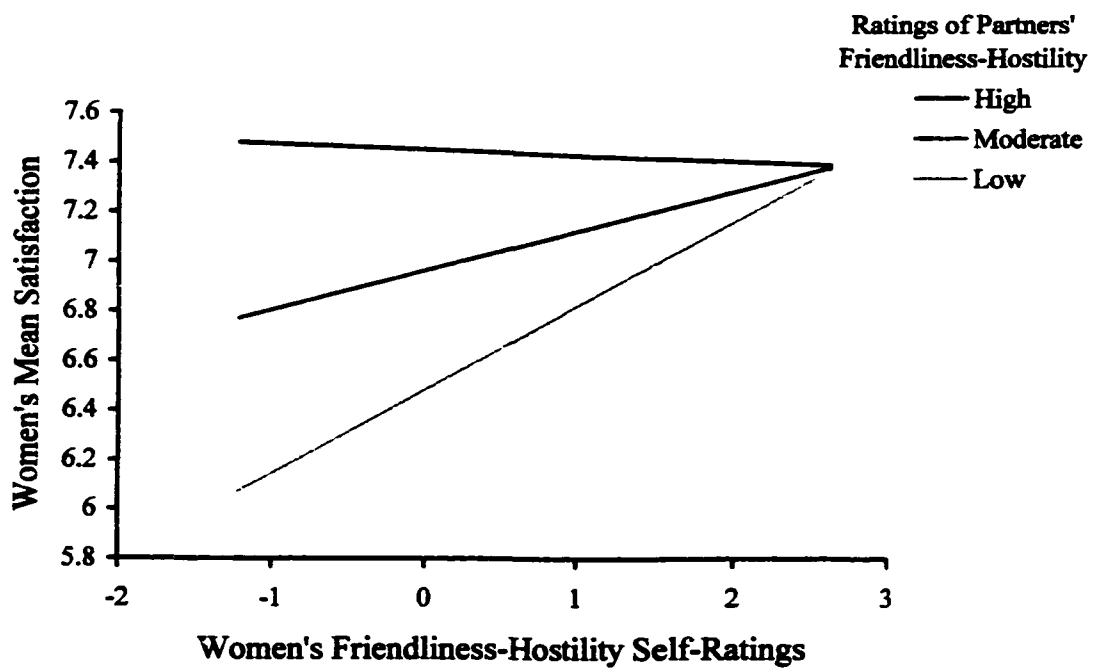
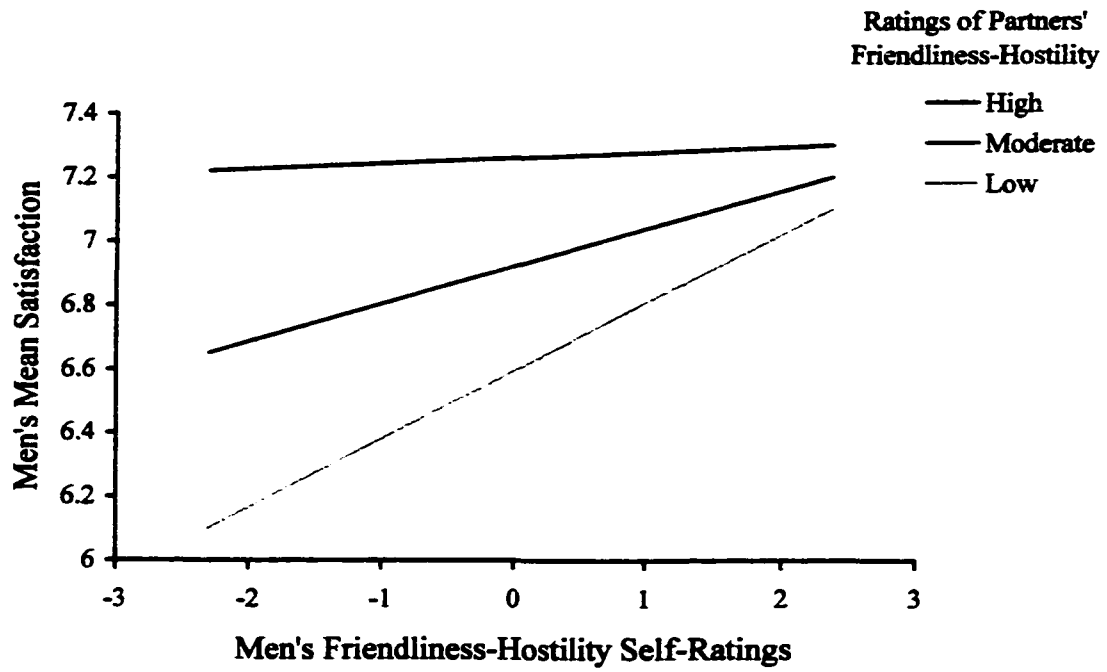


Figure 2

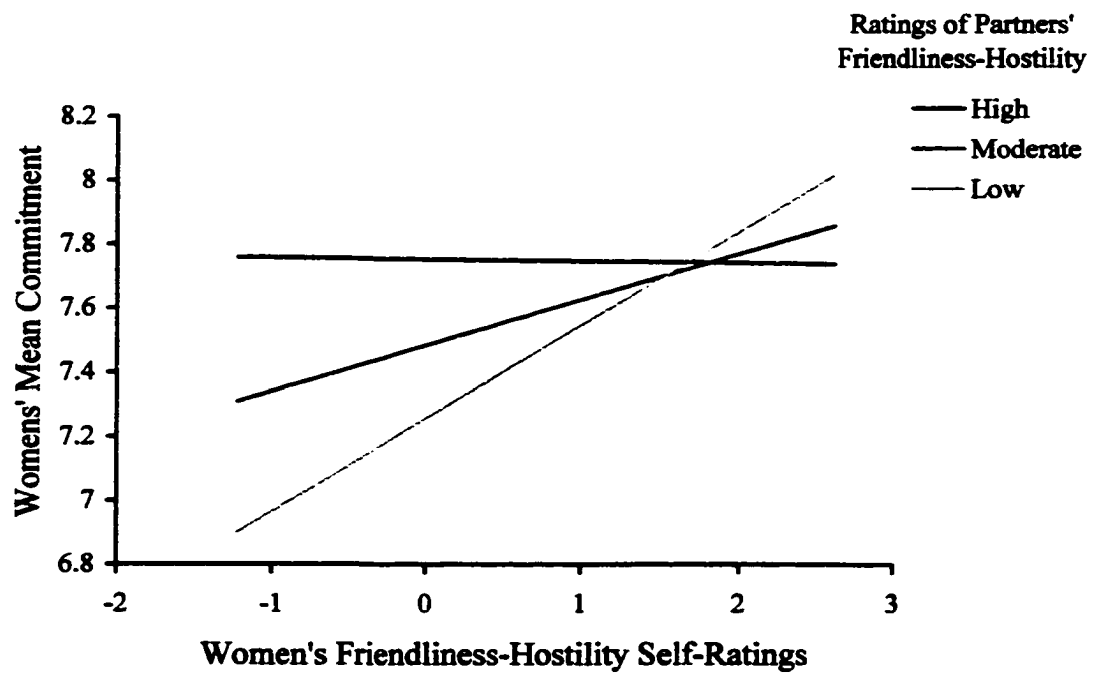
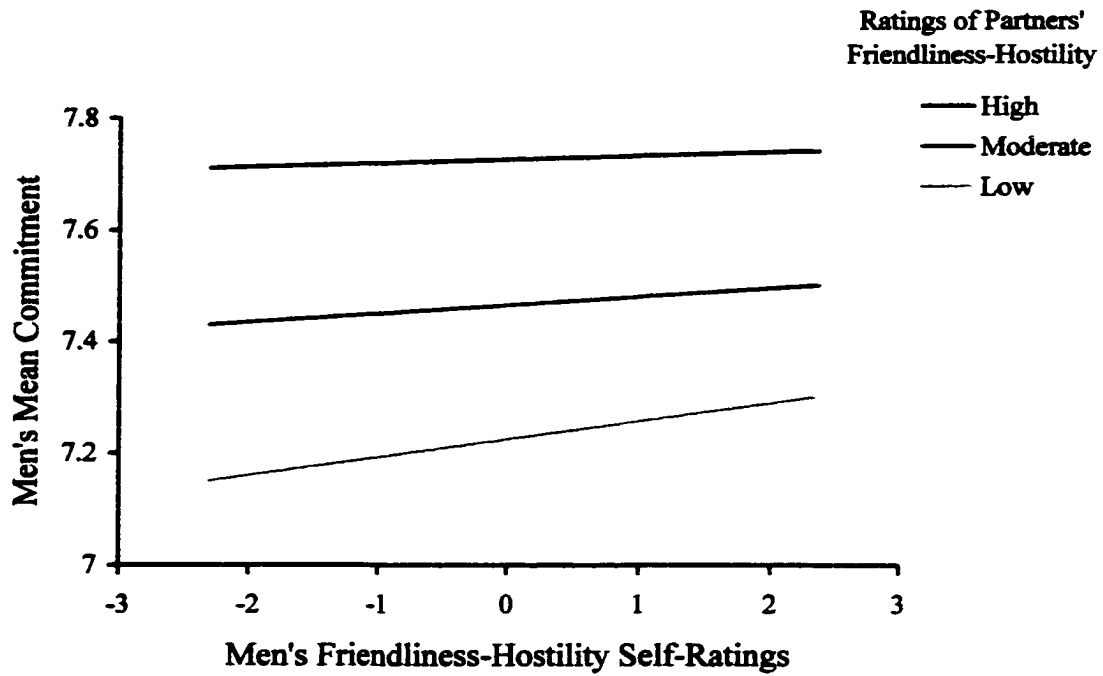


Figure 3

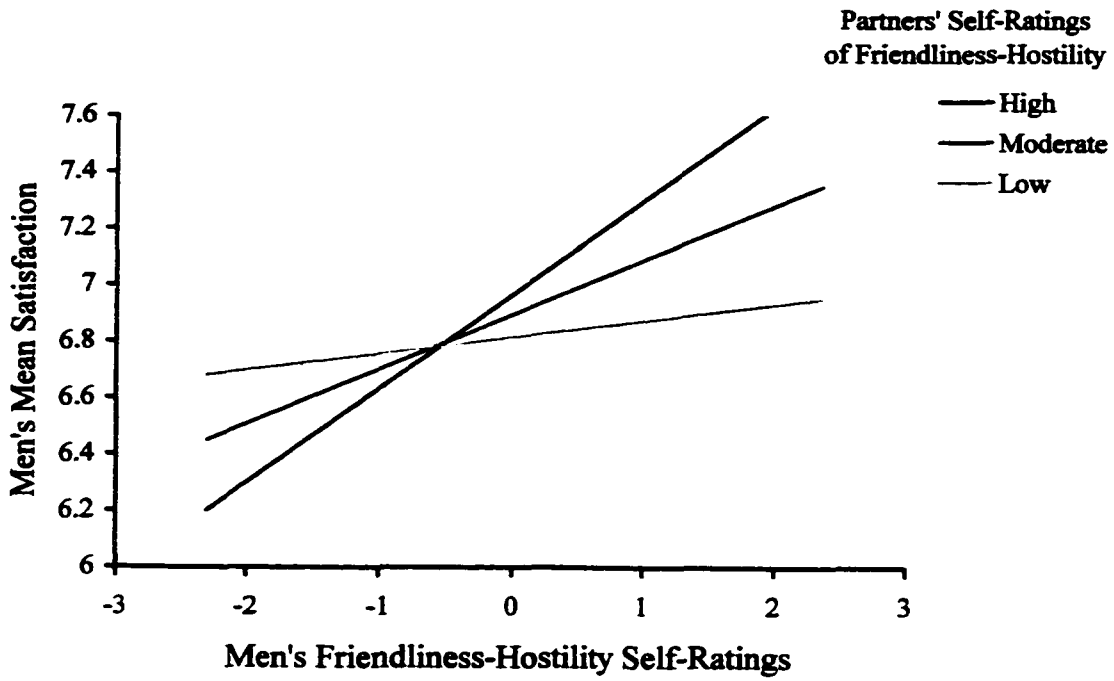


Figure 4



Figure 5

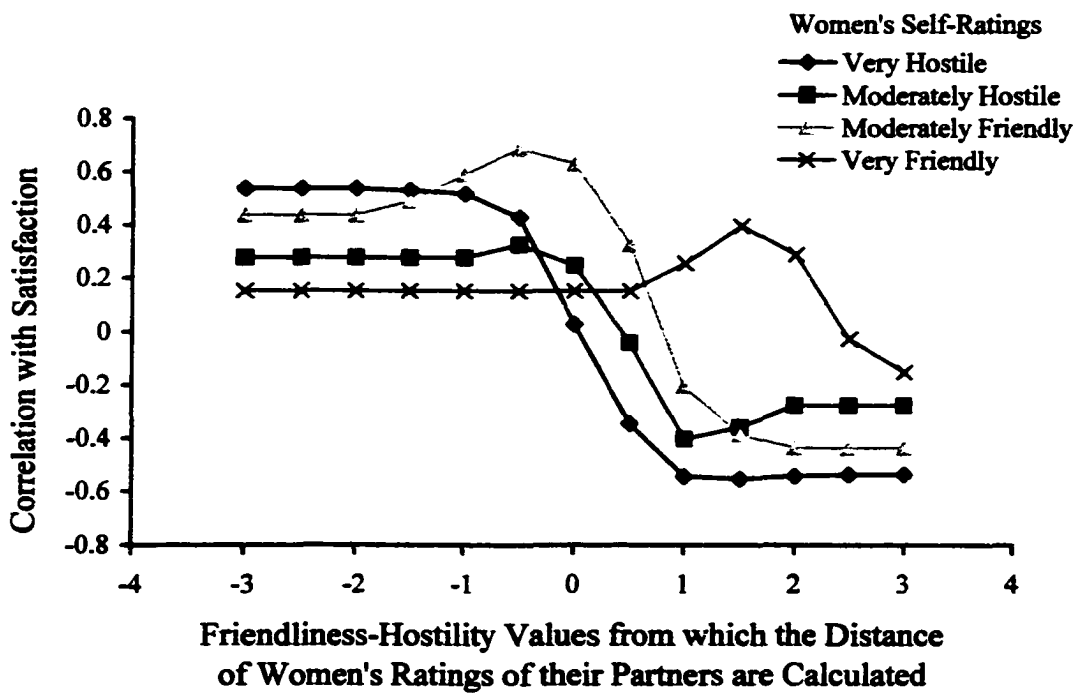
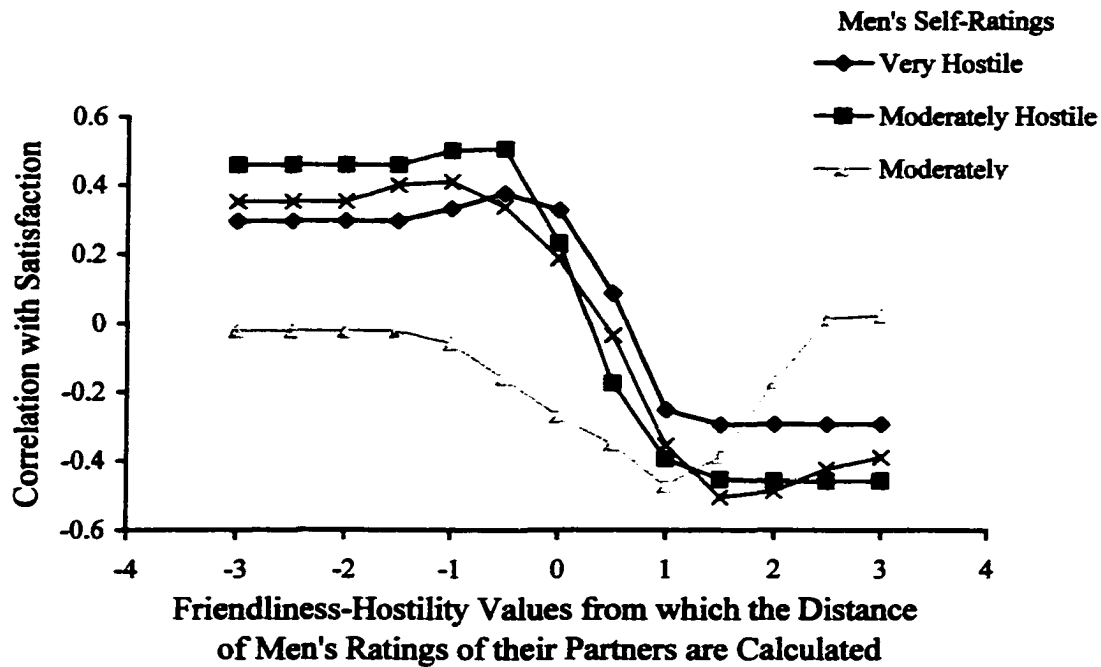


Figure 6

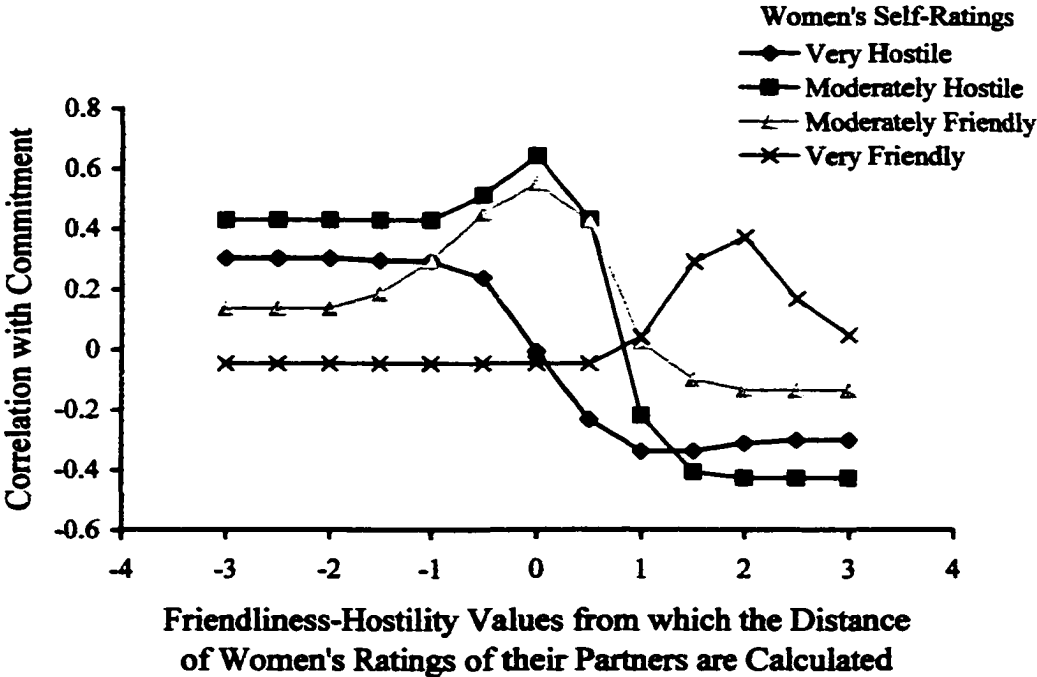
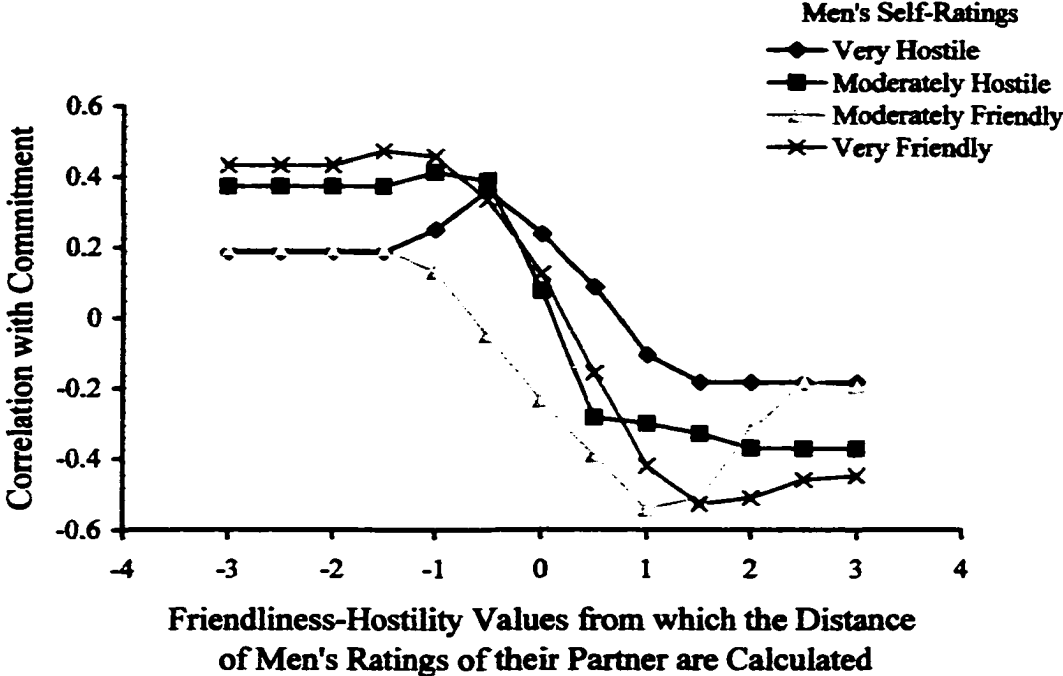


Figure 7

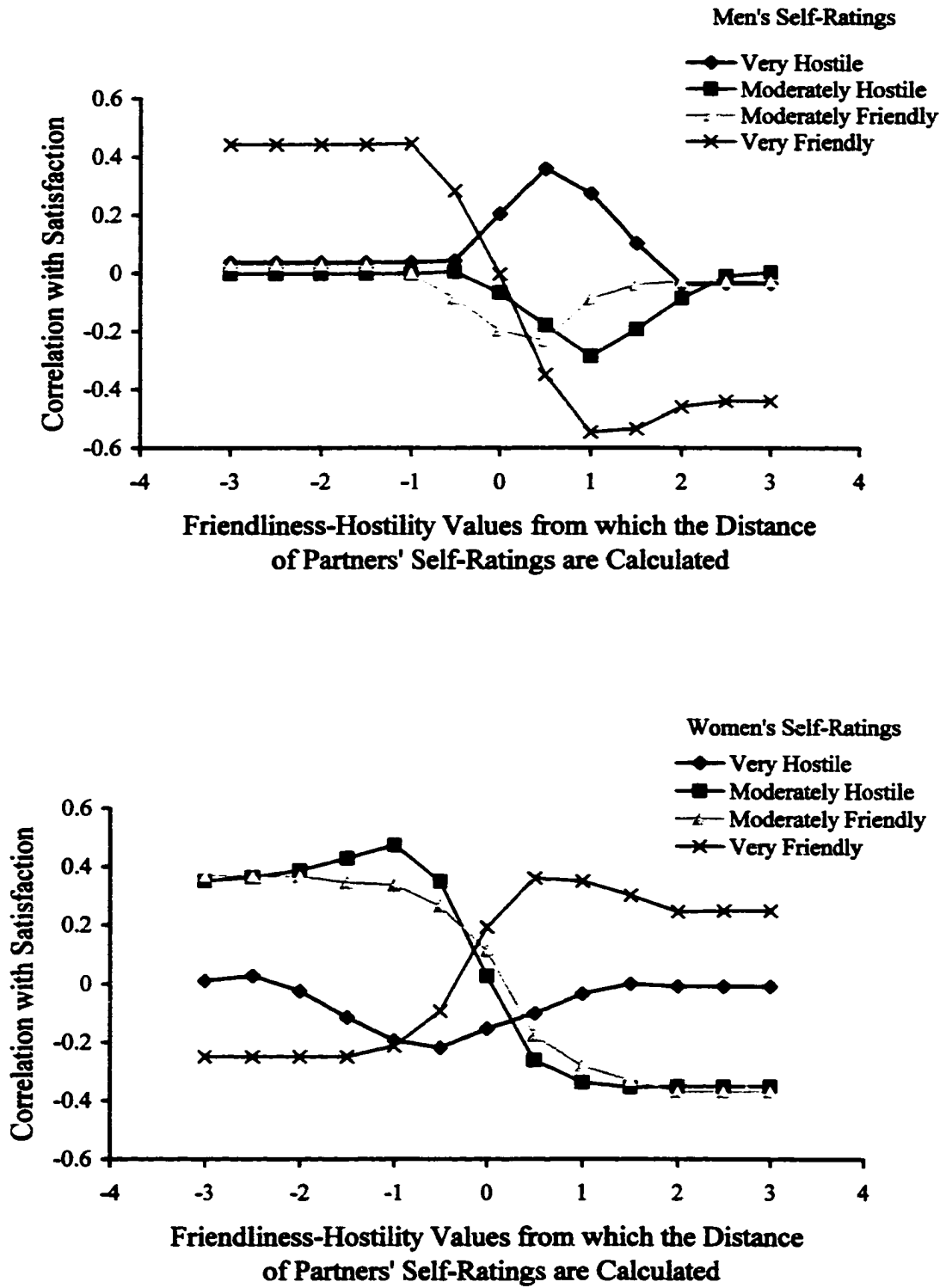


Figure 8

