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A real-time assessment of interpersonal complementarity

PATRICK MARKEY,[a] SARA LOWMASTER,[b] AND WENDY EICHLER[c]
[a]*Villanova University;* [b]*Texas A&M University;* [c]*Pennsylvania State University*

Abstract
The principle of complementarity asserts that the interpersonal behaviors of interaction partners tend to complement each other by encouraging partners to act similarly in terms of warmth and opposite in terms of dominance. The current study applied Sadler's computer joystick tracking device (originally designed to assess personality perception) to examine complementarity. Sixty-six unacquainted females were videotaped during an unstructured dyadic interaction, and their warmth and dominance behaviors were coded using the joystick. Results indicated that both partners tended to alter their behaviors in a complementary manner. In addition, partners who complemented each other in terms of warmth tended to like each other more and performed tasks more accurately and quickly than dyads who were not as complementary on this dimension.

When two individuals interact with each other, it is often apparent that the behaviors expressed by one partner are intertwined with the behaviors expressed by the other interaction partner. When an individual extends her hand in greeting, the hand is typically met with a similar extended hand to be shaken. In a smooth interaction, turns are taken while speaking, and a laugh or a smile from a partner is reciprocated. In some ways, interpersonal interactions are like a dance wherein both partners implicitly know which behaviors to perform at a given moment. Of course, like dancing, a misstep or an inappropriate interpersonal behavior could lead to a less than optimal interaction. However, little is known about what specifically makes some interpersonal exchanges flow more smoothly than others. To this end, the current research examines the interpersonal behaviors of interaction partners in real time in order to investigate how interpersonal behaviors are intertwined. Moreover, the current research investigates whether dyads who alter their behaviors in a complementary manner like each other more and work better together compared with dyads whose behaviors do not complement each other.

The notion of interpersonal complementarity posits that during a dyadic interaction the interpersonal behavior of one person tends to elicit or constrain the interpersonal behavior of the other, and vice versa (Carson, 1969; Kiesler, 1983; Tracey, 1994). For example, Mary may act differently when her interaction partner behaves in a warm manner than she may act if her partner behaves in a hostile manner. This principle implies that interpersonal behaviors carry information regarding how partners should respond; thus, interpersonal behaviors can educe or restrain subsequent behavior from others.

In order to define the exact manner in which interpersonal behaviors complement each other, researchers have often employed the interpersonal circumplex (IPC). The IPC was originally created by researchers at the

Patrick Markey, Department of Psychology, Villanova University; Sara Lowmaster, Texas A&M University; Wendy Eichler, Pennsylvania State University.

Correspondence should be addressed to Patrick Markey, Department of Psychology, Villanova University, 800 Lancaster Ave., Villanova, PA 19085, e-mail: patrick.markey@villanova.edu.

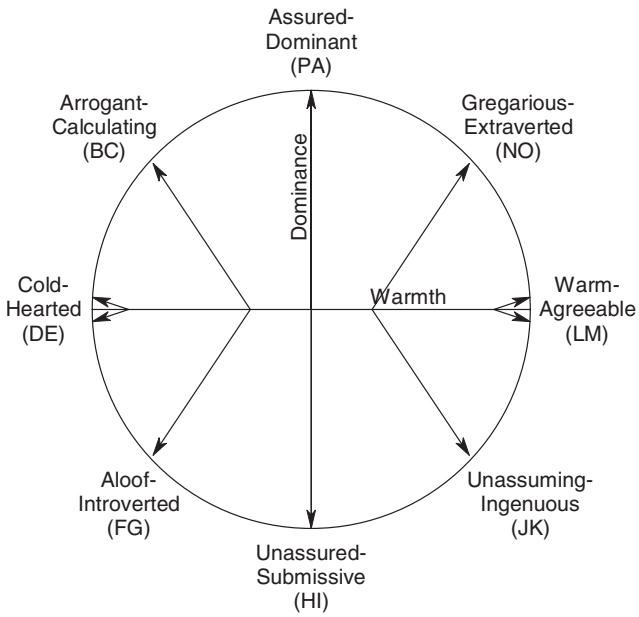

Figure 1. Carson's (1969) model of complementarity.

Kaiser Foundation (Freedman, Leary, Ossorio, & Coffey, 1951; Leary, 1957) by systematically observing the interpersonal behaviors of adults during social interactions. The IPC plots interpersonal behavior within a two-dimensional circular space using the primary dimensions of dominance and warmth. Using the two main dimensions of the IPC, interpersonal researchers have specified the particular manner in which complementarity occurs (Carson, 1969; Kiesler, 1983, 1996; Tracey, 1994). Specifically, complementarity occurs when individuals behave opposite in terms of the dominance dimension (i.e., dominance induces submission and submission induces dominance) and similar on warmth (i.e., warmth induces warmth and coldness induces coldness). Figure 1 uses arrows to display each interpersonal style's complement on the IPC. Similar concepts have been developed by researchers examining mutual adaptation in social interactions. However, these researchers often employ different terminology to describe complementarity. In this literature, "compensation" refers to responding to a behavior in the opposite direction (e.g., a submissive behavior would be the likely response to a dominant behavior), whereas "reciprocity" refers to behaviors in the similar direction (e.g., a warm behavior would be the likely response to a warm behavior; Burgoon, Stern, & Dillman, 1995; Street & Cappella, 1985).

Interpersonal theorists and researchers (e.g., Carson, 1969; Kiesler, 1983, 1996) further suggest that when individuals are able to interact with partners who complement their own behavior, they will likely experience a sense of self-validation and security. Leary (1957) suggests that this occurs because individuals essentially "train" others to respond to them in a manner that validates their own preferred interpersonal behavior. Hence, interpersonal researchers surmise that individuals will enjoy satisfying and lasting relationships when they interact with partners who tend to complement their own interpersonal behavior (Carson, 1969; Kiesler, 1983; Tracey, 1994).

Past research has suggested that, to varying degrees, interaction partners tend to complement each others' interpersonal behaviors (Markey & Kurtz, 2006; Strong et al., 1988; Tracey, 1994). For example, researchers have found that the behaviors of randomly paired strangers tend to occur in a manner predicted by Carson's model of complementarity

(Markey, Funder, & Ozer, 2003; Sadler & Woody, 2003). However, others (cf. Orford, 1986) have suggested that the support for complementarity has only been found along the warmth dimension (i.e., dominance does not induce submission, and vice versa). For example, Bluhm, Widiger, and Miele (1990) found that participants who interacted with a confederate coached to act in either a dominant or warm manner tended to act in a similar manner in regards to warmth, but the dominant behavior of the confederate failed to evoke submission in the participants.

Results of studies examining complementarity in established relationships have also been mixed. Females tend to describe their close, same-sex friends in a manner predicted by complementarity: similar to themselves on warmth and different on dominance (Yaughn & Nowicki, 1999). Romantic couples who are complements are likely to experience a more loving and harmonious relationship than other couples (Markey & Markey, 2007). However, other researchers have found less support for complementarity on both dimensions as a predictor of relationship outcomes. For example, O'Connor and Dyce (1997) found that members of music bands who complemented each other in terms of warmth, but not dominance, tended to be cohesive and have positive regard for one another. Research examining assortative mating strongly suggests that people tend to be romantically attracted to others who are similar to themselves in terms of the traits contained within the five-factor model of personality and the IPC, various demographic variables, and values (e.g., Botwin, Buss, & Shackelford, 1997; Buss, 1985; Markey & Markey, 2007; Vandenberg, 1972). Evidently, more research is needed to evaluate the underlying reasons for the divergent findings across these studies.

Relationship quality variables are not the only outcomes that have been studied in terms of complementarity. Interpersonal theorists also suggest that complementarity may be an important predictor of how well a dyad can work together. One of the only studies that has examined dyadic performance in the context of complementarity, Estroff and Nowicki (1992) found that same-sex dyads composed of individuals who complemented each other on both warmth and dominance achieved more success on various tasks (i.e., constructing puzzles and generating words) than dyads containing members who did not complement each other. Such a finding is consistent with Sullivan's (1953) notion that interpersonal anxiety (which would likely be felt by a person interacting with someone who does not complement his or her behavioral style) is an important factor in determining the performance of dyads. Perhaps individuals who do not complement each other experience interpersonal anxiety, which inhibits their success and productivity on collaborative tasks. It would, therefore, be interesting to extend Estroff and Nowicki's findings by examining different types of dyadic performance (e.g., accuracy of tasks, speed of tasks, etc.) in order to better understand the importance of complementarity.

Taken together, previous research suggests that attaining complementarity along the warmth dimension is related to satisfying and productive relationships. However, research seems mixed as to the complementarity of dominance behaviors and the effects of this complementarity on various relationship outcomes. It is possible that the inconsistencies of these findings may be because of various methodological issues. Specifically, past research examining complementarity has often utilized a less than natural interaction environment. This is particularly evident in experiments employing confederates or imagined partners (e.g., Bluhm et al., 1990; Tracey, 1994). For example, Strong and colleagues (1988) found that participants who interacted with a confederate coached to act in accordance with a particular interpersonal style (e.g., cold and submissive) tended to respond to this confederate in a complementary manner on both warmth and dominance dimensions (e.g., cold and dominant). Although such research suggests that complementarity tends to occur during an interaction, the generalizability of these findings to dyadic interactions where both individuals may freely vary their behavior is somewhat unclear (Markey & Kurtz, 2006). As noted by Sadler and Woody (2003), research

using confederates is less sensitive to the principle of complementarity, which states that *both* individuals will mutually influence each other's behavioral styles during a dyadic interaction. Because the roles of confederates are prescribed, they must adhere to a certain type of behavior despite the natural tendency to behave in a manner that may be normally warranted by the situation. Based on previous studies using this methodology, it is unclear if complementarity would occur in more realistic dyadic interactions in which both persons freely express their behaviors.

In addition to using prescribed interactions, researchers have also examined complementarity at a global trait level rather than at the behavioral level (e.g., Markey & Markey, 2007; O'Connor & Dyce, 1997; Tracey, Ryan, & Jaschik-Herman, 2001; Yaughn & Nowicki, 1999). Tracey (2004) recently noted that although it is interesting to examine complementarity at the trait level, complementarity was originally conceptualized as occurring at the behavioral exchange level. Consistent with this notion, Tracey argued and empirically demonstrated that when complementarity is studied at the trait level, important information is lost that is crucial for examining interpersonal complementarity. It is, therefore, postulated that some previous studies might have produced inconsistent results because they examined complementarity at a level that was not sensitive to the behavioral changes that occur during an interaction. In order to overcome these limitations, it is necessary to examine the behavioral exchanges between persons who are able to freely express any given behavior.

When examining complementarity at the behavioral level, researchers frequently code various "behavioral units" (e.g., an assessment of speaking turns) of participants. Data yielded from this method are typically analyzed by correlating each antecedent behavioral unit with each consequent behavioral unit. For example, dominant behavioral units might predict submissive behavioral units. Such a methodology has proven a very fruitful means of assessing complementarity (e.g., Hoyt, Strong, Corcoran, & Robbins, 1993; Lichtenberg & Tracey, 2003). However, because such a methodology typically uses speaking turns as its unit of assessment, it rarely examines nonverbal behavior and fails to examine the continuous "flow" of an interaction. This is an unfortunate omission because nonverbal behaviors may be just as important clues to the meaning of an individual's behavior than the actual words that are spoken. In addition, such an assessment treats an interaction as if the person who is not speaking is also not providing any information regarding his or her warmth or dominance. Given the importance of nonverbal behaviors, this is probably a false assumption. In fact, it seems very likely that during a dyadic interaction individuals are consistently providing each other with information regarding their dominance and warmth while not actually speaking. For example, a person might smile as her partner is telling a joke, or instead she might cross her arms and frown. Consequently, the joke teller may slightly change her behavior while she is telling the joke. Such behavioral alterations are often subtle, but they happen instantaneously. In this manner, the quick changes in how a person acts should be emphasized just as much as what a person says. It would, therefore, be useful to assess complementarity in "real time," or on par with the immediate changes observed in someone's behavior, using a methodology that assesses people's dominance and warmth when they are speaking as well as when they are not speaking.

To address the aforementioned issues, the current study investigated complementarity by examining the real-time behavioral exchanges of individuals in a dyadic interaction. Specifically, a computer joystick tracking device (originally created by Sadler to assess personality perception; Duong, Raja, & Sadler, 2005; Sadler & Woody, 2007) was used to assess participants' interpersonal exchanges of dominance and warmth during an interpersonal interaction. Unlike previous research that has examined complementarity using speaking turns and other verbal behavior, the current study utilized data gathered from a person's verbal and nonverbal behavior. It was hypothesized that through the course of

the interaction, members of dyads would alter their behaviors in a complementary manner. Specifically, interaction partners were predicted to respond in an opposite manner in terms of dominance (e.g., if participant A changed her behavior to be more dominating, participant B would likely react to this change by behaving in a more submissive manner) and in a similar manner in terms of warmth (e.g., if participant A changed her behavior to be more warm, participant B would likely mimic this change by behaving in a more warm manner).

In addition to examining the real-time behavioral exchanges of dyads, the current study also evaluated the validity of the complementarity model in predicting various relationship outcomes. Dyadic complementarity was predicted to be related to how much the members of a dyad liked each other, as well as the ability of a dyad to work together. Specifically, it was examined whether dyads that altered their behaviors in a complementary manner performed cooperative tasks more quickly and accurately than dyads that did not alter their behaviors in a complementary manner. Consistent with the principle of complementarity, it was predicted that dyads that altered their behaviors in a complementary manner would like each other more and would perform tasks more accurately and quickly than other dyads.

Method

Participants

Data were collected from 66 female undergraduates (M age $= 19.76$, $SD = 1.03$) who received course credit for their participation in the study. Of these participants, 12% were 1st-year students, 33% were sophomores, 44% were juniors, and 11% were seniors. Female dyads were utilized because prior research (Ansell, Kurtz, & Markey, 2008) suggests that complementarity tends to be stronger among female dyads than male dyads. These data were collected as part of a larger project examining predictors of interpersonal liking. The present analyses have not been previously reported.

Procedure

All participants performed the study in dyads. Each participant was randomly paired with another participant with whom she was unacquainted. Participants completed the study in three phases. In Phase 1, participants engaged in an unstructured behavioral interaction that was videotaped and coded for complementary behaviors. In Phase 2, participants reported their liking of each other; in Phase 3, participants worked together to complete two tasks.

Phase 1: Behavioral interaction

This interaction lasted 12 min and was videotaped with the participants' consent. During this interaction, participants sat facing each other at a small table. Participants were told that they would be left alone for 12 min and were free to discuss whatever they chose. The researcher then left the pair in the room to begin the timed interaction. At the end of the 12 min, the researcher returned to the room and asked the participants to complete the tasks described in Phases 2 and 3.

Phase 2: Liking

After completing the interaction task, participants were asked to respond to a single item assessing how much they liked the other participant. Participants indicated their liking of the other dyad member using a 10-point scale ranging from 0 (*disliked very much*) to 9 (*liked as much as a close friend*), with 4 indicating *neither liked nor disliked* ($M = 7.06$; $SD = 0.91$). Participants were provided privacy screens in order to ensure that they could not see each others' responses to this item.

Phase 3: Interaction tasks

Participants were next told that they would complete two tasks with their partner in order for the researcher to examine how well they could work together. Two specific tasks were chosen because they provided quantifiable measures of the constructs being assessed and because they required the participants to interact with one another. In addition, the tasks were relatively novel activities; it was expected that participants did not have past

experience with the tasks, making prior exposure an unlikely confound. The two tasks were presented to the participants in random order.

In the task assessing accuracy, participants were given an Etch-a-sketch covered with a laminated maze. An Etch-a-sketch is a toy that is flat and rectangular, and uses two knobs that move a stylus horizontally and vertically. Each participant utilized one of the control knobs so that one participant controlled horizontal movement and the other controlled vertical movement. Participants were told to work together to move the stylus through the maze without going outside of the maze walls. At the conclusion of the study, two research assistants independently counted the number of times that the tracing went outside the lines of the maze. In this coding scheme, a low score indicates relatively few errors, whereas a high score indicates many errors. The average agreement of the judges' accuracy ratings was $r = .92$ ($M = 2.65$, $SD = 2.14$).

To assess how quickly participants could work together, dyads were provided with a set of Lego bricks and a photograph taken of a structure built out of those Legos. The participants were instructed to work together as quickly as possible in order to replicate the structure in the photograph. The amount of time it took dyads to complete this task was then recorded ($M = 253.36$ s, $SD = 68.38$).

Joystick coding

Three judges separately utilized Sadler's joystick tracking device (Sadler, Ethier, Gunn, Duong, & Woody, 2008) in order to provide continuous codes of participants' warmth and dominance behaviors during the initial 12-min interaction. The joystick tracking device was designed to measure verbal and nonverbal behaviors that are broader than specific motor activities (e.g., "leg extension," "head orientation," "trunk recline," etc.; Gifford, 1991, 1994; Gifford & O'Connor, 1987) and focus on general behaviors that tend to have clear and meaningful interpersonal interpretations during an interaction (e.g., "warmth," "gregariousness," "arrogance," etc.; Funder, 1999)

Behaviors were coded during the preliminary 12-min interaction because theorists (e.g., Kiesler, 1983) have suggested that complementarity is most evident during unstructured interactions. A coding schedule was developed for each judge and organized in such a way that one randomly selected member from each dyad was coded for all dyads; upon completion of these ratings, the other dyad member was coded in a randomized order. This prevented members of the same dyad from being coded on the same day. On average, members of the same dyad were coded approximately 2 months apart. The joystick tracking device utilized by judges continuously assessed participants' behaviors every 0.20 s, yielding a total of 3,600 behavioral observations per person. While watching the video recording of the interaction, judges manipulated the joystick in order to represent a specific participant's ongoing behavior. Judges could move the joystick in any direction to represent how dominantly or warmly a participant was behaving at a given time. For example, if the participant was behaving very dominantly but only moderately warmly, the judge would move the joystick to the position located around 90°. If the participant then started acting more warmly but was also somewhat dominating, the judge would move the joystick close to 45°. The joystick was also sensitive to how strongly it was being pushed in a specific direction. For example, a judge could code a person as acting in a somewhat dominant manner by lightly pushing the joystick to 90°; if the participant started acting more dominantly, the judge could push the joystick even further in this direction. A miniature version of a Cartesian plane with the dominance and warmth axes labeled was also displayed on the lower right side of the video screen to provide judges with visual feedback about the current position of the joystick.

A computer program (also created by Sadler et al., 2008) numerically recorded the exact location of the joystick using the two dimensions of warmth and dominance as X and Y coordinates every 0.20 s for the entire 12-min interaction. Therefore, each judge provided 3,600 behavioral codes for dominance and 3,600 behavioral codes for warmth. These codes could range from −1000 (i.e., very low dominance or warmth) to +1000 (very

high dominance or warmth). Because the joystick was also sensitive to how strongly it was being pushed in a specific direction, participants could receive scores anywhere within this range (e.g., a score of 500 would indicate a moderate level of dominance or warmth). In this manner, the joystick tracking device defines a behavioral unit as the amount of dominance and warmth an individual is expressing at a given 0.20-s time period. In other words, a behavioral unit is measured in time, not single behaviors.

Before coding participants' behavioral interactions, each judge was trained by first familiarizing himself or herself with the IPC displayed in Figure 1. In addition, each judge was given several adjective descriptors (e.g., timid, assertive, outgoing, etc.) of each IPC octant in order to better understand the types of behaviors represented by each octant. Each judge then practiced using the joystick tracking device to code five videos of dyadic interactions, resulting in a total of 10 practice coding sets. The judges' performances were monitored by the researchers, and questions about the use of the joystick tracking device were discussed as they arose. In addition, all of the judges were blind to the hypotheses of the study and the notion of complementarity. As noted by Sadler (Sadler et al., 2008; Sadler & Woody, 2007), one issue that commonly arises during training is the question of how to rate short lulls (i.e., silences) in the conversation. Consistent with previous research using the joystick tracking device, judges were instructed to keep the joystick in approximately the same position during these lulls unless nonverbal behaviors were obviously indicating a different type of behavioral style. Finally, once judges' practice ratings were completed and acceptable, they proceeded with coding the experimental videos.

The reliability of the joystick tracking device was examined on two different levels. First, the reliability of the mean behavioral level was examined by using the mean dominance and warmth scores (i.e., the average of the 3,600 behavioral scores given to a specific participant) provided for each participant by the three judges. Results suggested modest agreement for both the dominance ratings (intraclass correlation = .61) and the warmth ratings (intraclass correlation = .58). The Spearman–Brown prediction formula was then used to compute the predicted three-judge reliability for each dimension (Shrout & Fleiss, 1979). Results indicated that the three-judge reliability was .70 for the dominance ratings and .67 for the warmth ratings. This suggested that judges tended to agree with each other as to which participants generally expressed dominant behaviors and which participants generally expressed warm behaviors. More central to the examination of complementarity, the judges' reliability of the dominance behavioral pattern was assessed (i.e., the changes in judges' dominance scores across the 3,600 behavioral codes) by correlating the 3,600 dominance scores given to a specific participant by a judge with a second judge's 3,600 dominance scores given to the same participant. The average two-judge agreement for the dominance behavioral pattern was modest (average two judge $r = .56$) with the three-judge reliability of the dominance behavioral pattern of .65. A similar analysis also found modest two-judge agreement for the warmth behavioral pattern (average two judge $r = .49$) with the three-judge reliability of .60. Such results suggest that *changes* in one judge's ratings of warmth and dominance were moderately correlated with *changes* in the other judges' ratings of these behaviors. Because of the moderate judge agreement, the 3,600 warmth and dominance scores given by each judge were aggregated by computing the average score at each time point for each participant.

Results

By continuously assessing the participants' behaviors, the joystick tracking device collected a total of 3,600 behavioral units of dominance and warmth per participant. The behavioral units were then chronologically organized in order to create dominance and warmth behavioral profiles. These profiles graphically display changes in participants' observed dominance and warmth behaviors that occurred during the course of the interaction. For example, Figures 2 and 3 present the

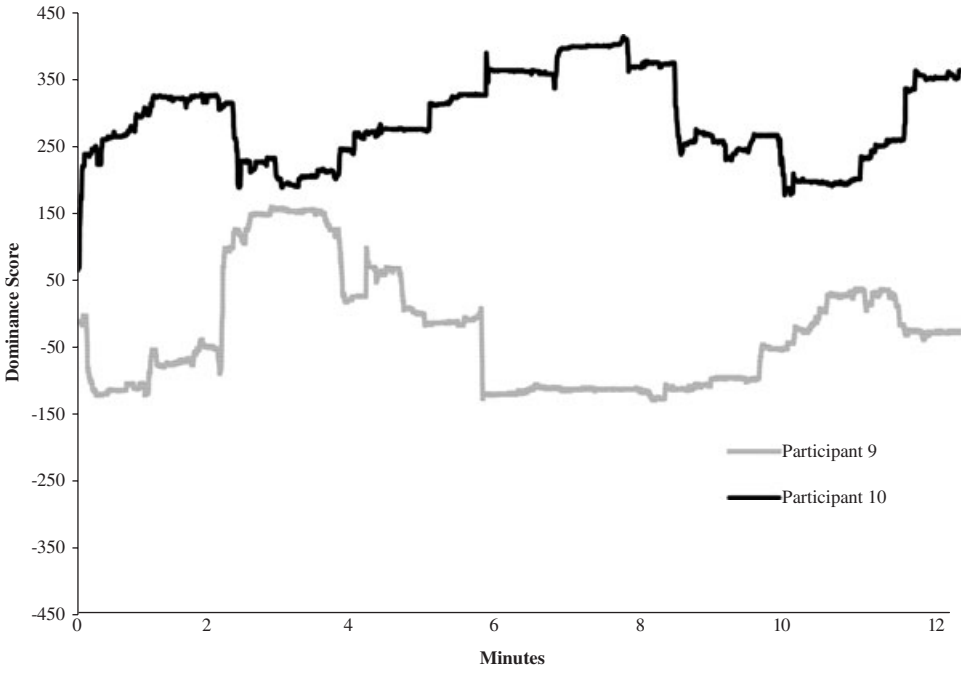

Figure 2. Dominance behavioral profile.

dominance and warmth behavioral profiles of a sample dyad, Participants 9 and 10. As can be seen in the figures, the participants in this dyad tended to alter their behaviors in a complementary manner. Both participants tended to alter their warmth behaviors to match each other (i.e., warmth encouraged warmth, and coldness encouraged coldness) while altering their dominance behaviors to occur in an opposite manner (i.e., dominance encouraged submission and submission encouraged dominance).

A simple means of quantifying the relationship between behavior profiles is to compute profile correlations across the members of a dyad. By correlating the behavioral patterns of dyad members, it is possible to determine whether *changes* in one member's behavioral profile were correlated with *changes* in the other member's behavioral profile. For example, Participant 9's warmth profile was positively related (profile $r = .72$) to Participant 10's warmth profile, whereas Participant 9's dominance profile was negatively related to Participant 10's dominance profile (profile $r = -.52$). Profile correlations were computed using Pearson r values because this statistic is unaffected by differences in profile elevation (Terracciano & McCrae, 2006) and only reflects the similarity (or dissimilarity) in profile shape. Intraclass correlations were not computed to examine profile similarity because these coefficients would be affected by elevation differences (McCrae, 2008), which likely reflect general behavioral tendencies rather than complementarity.

In order to examine the mean amount of complementarity expressed by all of the dyads, profile correlations were computed for each dyad's warmth and dominance codes. Significance tests associated with these mean profile correlations were also computed using one-sample t tests. Results indicated that complementarity occurred on both the warmth dimension (mean profile $r = .36$), $t(32) = 5.88$, $p < .01$, and the dominance dimension (mean profile $r = -.32$), $t(32) = -6.63$, $p < .01$. Such results suggest that complementarity tended to occur on both dimensions of the IPC. As noted by Sadler and colleagues (2008), when complementarity is examined in this manner, the correlations used to measure

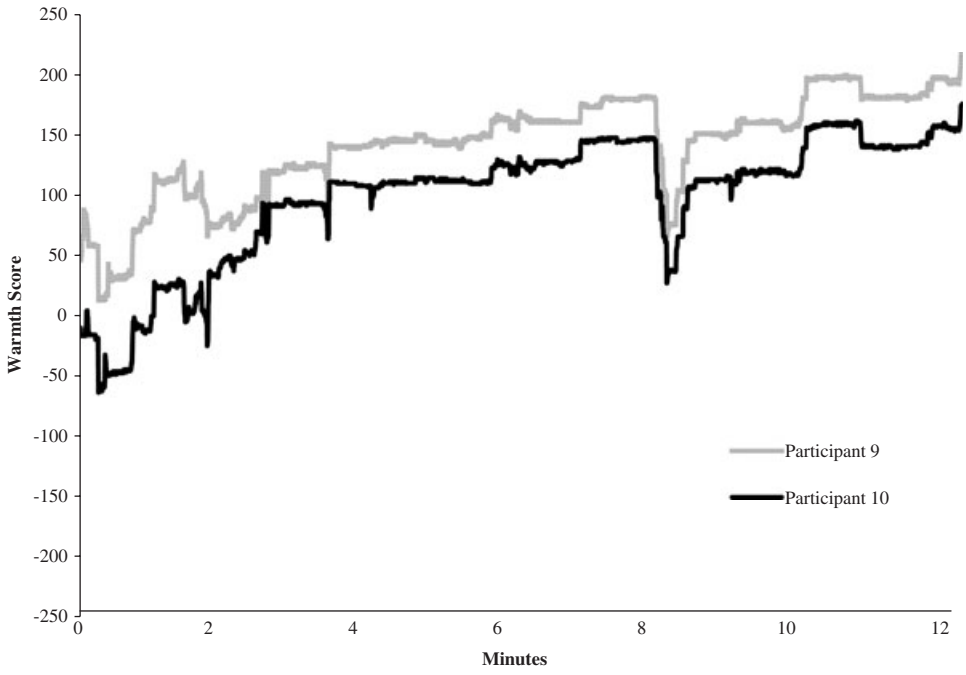

Figure 3. Warmth behavioral profile.

complementarity might be spurious, reflecting the autocorrelations within each time series. In order to examine this concern, pseudodyads (participants who did not interact with each other) were constructed by randomly pairing the behavioral profiles of participants in order to create 1,000 random dyads (Gurtman, 2001; Sadler et al., 2008). Profile correlations were then computed for each pseudodyad's warmth and dominance codes. The mean warmth profile correlation of these pseudodyads was $r = .04$ and the mean dominance profile correlation was $r = .03$. Because the same autocorrelations exist between the pseudodyads as the real dyads, the relatively low profile correlations from these pseudodyads suggests that the stronger warmth and dominance profile correlations from the real dyads ($r = .36$ and $r = -.32$) were not simply the result of autocorrelations within individual time series. In other words, the correlation between real dyadic members' warmth and dominance was not a result of a statistical artifact; rather, participants actually tended to alter their behaviors in a complementary manner.

It is important to note that quantifying complementarity in this manner assumes that communication between participants is almost instantaneous. Although this assumption is most likely incorrect (i.e., there is likely a slight lag between one person's behavior and his or her partner's response), varying time lags were examined in the current data using Tracey's (1994, 2004) method of transition matrices and did not produce different results. It appears that participants' responses to each others' behaviors are extremely rapid or occur at a rate faster than could be reliably coded using the joystick tracking device.

It was next examined whether the degree of complementarity expressed by a given dyad was related to the relationship of outcome liking. Because participants were nested within dyads, hierarchal linear modeling was used to predict liking from both the warmth and dominance profile correlations. Results indicated that liking was not related to complementarity in terms of dominance ($b = -.46$, $SE = 0.78$). $t(31) = -0.47$, $p = .44$, $r = -.02$, but was related to complementarity in terms of

Table 1. *Correlations between relationship outcome measures and degree of complementarity*

	Complementarity	
	Dominance	Warmth
Number of mistakes	−0.13	−0.37*
Speed of task	−0.17	−0.34*

Note. $N = 33$ dyads.
* $p < .05$.

warmth ($b = 1.05$, $SE = 0.47$), $t(31) = 2.21$, $p < .05$, $r = .36$.

To examine the relation between complementarity and the dyadic outcomes of task accuracy (i.e., the number of mistakes) and task speed (i.e., the time it took to complete the given task), the warmth and dominance profile correlations yielded for each dyad were correlated to each of these outcomes. As seen in Table 1, the number of mistakes made and speed of task completion were unrelated to dyadic complementarity in terms of dominance but were related in terms of warmth. Taken together, these analyses suggest that dyads whose members tended to alter their warm behaviors to match each other tended to report liking each other more and were more accurate and faster on subsequent tasks than dyads whose members failed to complement each other in terms of warmth.

Discussion

A central principle of interpersonal theory is that during an interaction the interpersonal behaviors of each member of a dyad tend to complement each other in particular ways (Carson, 1969; Kiesler, 1983). Specifically, the notion of complementarity predicts that individuals will tend to behave in a similar manner in terms of warmth and in an opposite manner in terms of dominance (Carson, 1969). To examine this issue, the current research coded the behaviors expressed during a dyadic interaction with a joystick coding technique. Such a methodology allowed for the assessment of warmth and dominance in real time.

Consistent with the predictions of complementarity, interaction partners tended to alter their behaviors in a manner so that they acted complementary to each other. Specifically, the changes observed in participants' warmth and dominance were significantly related to the changes observed in their interaction partners' warmth and dominance. These findings underlie the reciprocal nature of interpersonal interactions, in which an individual's verbal and nonverbal behavior both cause and are caused by that of his or her interaction partner.

In addition to predicting the exact manner in which behaviors tend to complement each other, interpersonal theory further suggests that when complementarity occurs, individuals will not only experience a satisfying interaction (Carson, 1969; Kiesler, 1983; Tracey, 1994) but will also be more productive (Estroff & Nowicki, 1992). However, the existent empirical research investigating this proposition has tended to show mixed results. In order to provide a more conclusive evaluation of this notion, the current study examined whether differences in dyadic complementarity predicted likeability and task performance. Members of dyads who altered their behaviors in a complementary manner in terms of warmth tended to like each other more and performed tasks more accurately and quickly than dyads that were not as complementary. These findings are consistent with prior research that has pointed to the importance of complementarity on the warmth dimension (e.g., O'Connor & Dyce, 1997; Orford, 1986).

Although warmth was an important predictor of dyadic liking and task performance, the complementarity of dyads in terms of dominance was unrelated to dyadic liking, task accuracy, or task speed. It is possible that the null result with regard to dyadic liking was because of the fact that dyadic members were only acquainted with one another for a short period of time, and thus warmth or friendly behaviors might have been the focus of their attention. In addition, it is possible that the null result with regard to task performance occurred because of the cooperative nature of the tasks utilized in the study. For example, a swift and accurate performance on the Etch-a-sketch or Lego task required a great deal

of cooperation between partners. Perhaps in more competitive situations, complementarity on the dominance dimension may play a greater role in predicting task success because these types of tasks often require one individual to be able to take control for successful completion. This notion is somewhat consistent with previous research (Nowicki, Fost, & Naik, 1997), which suggests that the type of interpersonal interaction a dyad is exposed to (cooperative or competitive) can moderate the importance of complementarity when predicting task performance. It would be interesting for future researchers to expand this research by utilizing the joystick tracking device in order to examine the importance of complementarity in both cooperative and competitive situations.

The results from this study provide several important contributions to the literature on complementarity. While existing research has used the notion of complementarity to predict outcomes related to relationship quality, fewer studies have used this notion to predict different aspects of dyadic task performance. The current study provided a unique investigation into task performance by identifying two specific qualities of performance: namely, accuracy and speed. The current study's methodology afforded increased generalizability and a more accurate assessment of complementarity than previous work. First, the use of unacquainted, nonconfederate partners in an unstructured situation provided a natural setting to observe interpersonal behaviors. In addition, the use of Sadler's unique joystick methodology captured a sensitive, "real-time" snapshot of interpersonal interactions at the behavioral exchange level. In addition to accruing a multitude of data, this method also allowed the experimenters to closely monitor and record the participants' interactions as an instantaneous flow of interpersonal verbal and nonverbal exchanges, closely paralleling real-life interactions. Building upon the findings presented in this study, future research utilizing Sadler joystick methodology could examine how much of complementarity is attributed to the verbal components of an interaction (i.e., speaking turns) and how much is attributed to various nonverbal behaviors.

The findings in this study provide an important stepping stone to further research on complementarity, but they must be understood within the context of their limitations. First, the participants in this study were limited to female undergraduates from a private university in the Northeastern United States. Thus, it is possible that the results of the current study may not generalize to more diverse dyads. The study of complementarity among dyads of varying sex, age, and educational level is recommended for further research. Kiesler (1996) contended that complementarity is strongest between same-sex peers, and past research suggests it is strongest among female dyads (Ansell et al., 2008). Therefore, it would be beneficial to replicate the current study's methodology with more diverse types of dyads in order to examine the potential influences of gender and acquaintanceship on complementarity, likability, and task performance. Because the joystick coding technique used in this study simultaneously coded verbal and nonverbal behaviors, it is unclear how much of the complementarity observed in the current study was attributed to each of these types of behaviors. In order to build upon the findings from the current study, future researchers might consider coding verbal and nonverbal behaviors separately to better understand how each of these behaviors uniquely affect complementarity. Also, because complementarity and task performance were assessed in two different situations, the current research assumed that there was some cross-situational consistency in terms of complementarity. Future researchers might consider assessing complementarity while participants are simultaneously engaging in various tasks. A final limitation in this study might be related to the cooperative tasks that the participants completed. These tasks were purposefully novel and fairly ambiguous so that the participants would have an equivalent level of experience and skill to complete them. However, these tasks are somewhat contrived and unnatural, and therefore may not have elicited the true

interpersonal dynamics that might be found in a naturally occurring interaction.

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