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# 8 INTERPERSONAL COMPLEMENTARITY

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The word *complementarity* is unusual and relatively unfamiliar. So to begin, let's consider some examples of the type of phenomena that this chapter addresses. Jill has a warm and friendly interpersonal style. Linda, who has a similarly warm style, finds that she interacts easily and enjoyably with Jill. However, Susan, who has a colder, more distant style, finds that interaction with Jill is somewhat awkward and unsatisfying. For example, she wishes that Jill would be less smarmy and more task-focused.

Dick tends to have a strongly dominant interpersonal style. Bill, who has a similarly dominant style, finds that he tends to clash with Dick and cannot work with him effectively. He wishes that Dick would "get off his high horse." However, Stuart, who has a more submissive style, enjoys Dick's sense of direction and self-confidence, and finds that they work together very well.

As these examples illustrate, any two people bring to an interaction their own consistent traits, called interpersonal styles. In addition, particular combinations of interpersonal styles may fit together in distinctive ways and yield different emotional and objective outcomes.

Now consider another type of example. Judy is a manager who is concerned about the work of her employee, David. She finds herself becoming increasingly blunt and directive toward him, but instead of improving, David seems only to become more sullen and lacking in initiative. Although she realizes the interaction patterns between them may be spiraling unproductively, she finds it difficult to interact with him in other ways, because he seems to "pull for" certain behaviors from her. For his part, David is bewildered that Judy, who once seemed like a reasonable person, has become so overbearing toward him.

As this example illustrates, when two people interact, they tend to modify their interactional behaviors in response to each other. These shifts can occur over a wide range of time scales—from a few minutes to several months or more. Although such shifts may make people happier with each other, this is not always the case, as the example also indicates.

*Interpersonal complementarity* is a general term referring to the ways in which the interactional behavior of pairs of people may fit together and influence each other. It

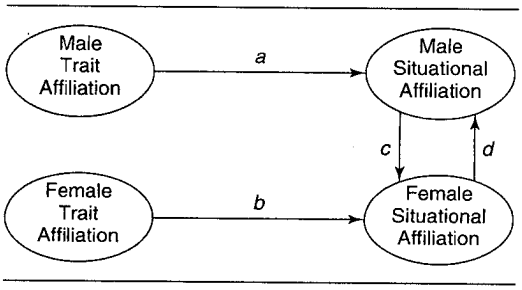


**FIGURE 8.1** Integrative Model of Complementarity
*Source:* Adapted with permission from Sadler and Woody, 2003.

consists of two related, but separable phenomena: the initial match versus mismatch of people's interaction styles, as in the first two examples, and the tendency of people to change their behavior in reaction to each other, as in the third example.

There is an important sense in which interpersonal styles and shifts in interpersonal behavior as a result of interaction are interlocking issues. Figure 8.1 shows an integrative model of complementarity (Sadler & Woody, 2003). In the ovals to the left are the interactants' interpersonal styles—in this case, their levels of trait affiliation. In the ovals to the right are the interactants' situational patterns of behavior—in this case, their levels of expressed affiliation during an interaction. The paths labeled *a* and *b* represent the consistent impact of the relevant underlying traits on situational behavior, whereas the paths labeled *c* and *d* represent the impact of each person's expressed behavior on the partner's situational behavior. The trait-to-situational-behavior relations (paths *a* and *b*) serve as the levers, so to speak, by which each person exerts an effect on the behavior of the other (paths *c* and *d*).

It is possible to predict outcomes of interactions either by using the pairing of interpersonal styles (that is, the underlying traits, at the left) or by using the pairing of behavior patterns evident during the interaction (the situational patterns, at the right, which incorporate the effects of the partners on each other). These two types of predictors are not the same—for example, although partners may be able to shift during an interaction toward behavior patterns that fit together better than their respective interpersonal styles, these shifts could be stressful or attention-demanding. Finally, patterns of mutual influence sustained over substantial periods of time may, in turn, eventually lead to changes in general interpersonal style as an outcome. To illustrate, interpersonal therapists attempt to promote lasting changes in the client's interpersonal style by altering situational patterns of behavior—for example, in interactions during therapy sessions.

### Fitting Interpersonal Complementarity Into a Broader Scientific Context

The predominant framework for studying complementarity has been the interpersonal circle or circumplex (Leary, 1957), defined by the orthogonal dimensions of affiliation and dominance, portrayed, respectively, as horizontal and vertical axes of a Cartesian plane (Kiesler, 1996). Using this framework, Carson (1969) posited that complementary behaviors are defined by sameness on the affiliation dimension (referred to as *correspondence*) and oppositeness on the dominance dimension (referred to as *reciprocity*). For example, friendly dominant behavior by one person invites friendly submissive behavior from an interaction partner. Kiesler (1983) elaborated on these dimensional principles by applying them to 16 stylistic prototypes around the interpersonal circle and specifying all hypothesized complementary pairings of interpersonal behavior. However, this finely grained conception is based on exactly the same two underlying, dimensional principles: greater affiliation pulls for greater affiliation, and greater dominance pulls for greater submissiveness (and vice versa). (For alternative, less widely adopted conceptions of interpersonal complementarity, see Wiggins, 1982, and Benjamin, 1974.)

Although the concept of complementarity arose within interpersonal theory, it has

much wider implications across the broad landscape of ideas in social, personality, and clinical psychology. For instance, complementarity is a paradigmatic case of dyadic interdependence, a major emerging theme in current psychological theory and research (e.g., Kenny, Kashy, & Cook, 2006). In addition, complementarity is highly consistent with the recent upsurge of interest in the role of synchronization and coregulation in social cognition and behavior (e.g., Semin, 2007; Semin & Cacioppo, 2008). Further, there is great potential for cross-fertilization of research in interpersonal complementarity with research in communication (e.g., Burgoon, Stern, & Dillman, 1995; Cappella, 1996) and systems theory (e.g., Boker & Wenger, 2007).

In view of all this potential, it is unfortunate that, by tradition, interpersonal theorists use key terms—*complementarity, reciprocity,* and *correspondence*—in ways that are surprisingly inconsistent with what most other researchers, outside the tradition of interpersonal theory, mean by the same words. In interpersonal theory, *complementarity* is a blanket term covering both similarity of behavior across partners (e.g., friendliness pulls for friendliness) and dissimilarity (e.g., dominance pulls for submissiveness). In contrast, in the communications literature (Burgoon et al., 1995) and in the romantic relationships literature (e.g., Beach, Whitaker, Jones, & Tesser, 2001; Pilkington, Tesser, & Stephens, 1991), the term *complementarity* refers only to instances of dissimilarity. In interpersonal theory, *reciprocity* refers to oppositeness on the dominance dimension and *correspondence* refers to sameness on the affiliation dimension. In contrast, in the communications literature and in social psychology more generally, the term *reciprocity* refers to sameness and the term *compensation* refers to oppositeness (Burgoon et al., 1995). Thus, what interpersonal researchers call *correspondence* (on the affiliation axis) would be called *reciprocity* by researchers outside of this tradition, and what interpersonal researchers call *reciprocity* (on the dominance axis) would be called *compensation* by most other researchers.

This situation brings to mind Humpty Dumpty's famous quip from Lewis Carroll's *Through the Looking Glass*: "When *I* use a word, it means just what I choose it to mean—neither more nor less." Our experience is that, at a social psychology convention, even the statement, "I do research on complementarity" will be misunderstood by most listeners. It is not only social psychologists who may be confused by this term. For example, Tracey (2007) described how an attendee of his poster presentation on complementarity in psychotherapy misunderstood this key term, and consequently engaged him in a long conversation about the importance of saying nice things to others (i.e., *complimenting* them). Clearly, researchers working within the tradition of interpersonal theory, with its rather parochial use of key terms, need to be careful to communicate effectively with other social scientists.

## EMPIRICAL EVIDENCE FOR COMPLEMENTARITY

Having discussed key concepts and terminology, we now turn to a brief review of the empirical evidence regarding complementarity. There are three broad types of relevant research, which we consider in the following order:

1. Studies comparing different combinations of partners' interpersonal styles: What pairings of interpersonal traits have what effects? Under what circumstances do these effects occur?
2. Studies addressing mutual influence and adaptation: What interpersonal characteristics pull for each other? Over what time frame do these effects occur, and under what circumstances? In addition, what outcomes do patterns of mutual adjustment have?
3. Studies addressing processes underlying complementarity: *Why* might

interactions and relationships tend to be complementary?

### Studies of Complementarity in Interpersonal Styles

A range of studies has evaluated how the complementarity of interaction partners' trait interpersonal style predicts various outcomes. Generally speaking, these studies tend to show that greater complementarity (i.e., sameness on the affiliation dimension and oppositeness on the dominance dimension) in trait interpersonal style tends to bring about positive outcomes, whereas anticomplementarity (i.e., oppositeness on the affiliation dimension and sameness on the dominance dimension) tends to yield detrimental outcomes. It is worthwhile to distinguish between two types of outcomes: *subjective* perceptions of how the partners feel about each other and their interaction, such as feelings of satisfaction; and *objective* measures of dyadic outcomes, such as quality of performance on a joint task.

Concerning subjective perceptions, one important outcome studied has been partners' satisfaction with a particular interaction, or more broadly, with their relationship. Indeed, one of the core tenets of interpersonal theory is that more complementary interpersonal styles should produce more satisfying, harmonious relationships (Kiesler, 1996). Several empirical studies support this principle. For example, Dryer and Horowitz (1997) showed that participants were more satisfied with their interaction when their interpersonal styles were opposite on dominance to an experimental confederate's scripted behavior. Participants were also more satisfied when their own dominance goals were opposite to the other person's dominance-related behavior. Likewise, Shechtman and Horowitz (2006) showed that when dominant participants perceived an interaction partner to be expressing similarly high levels of dominance, they were less satisfied (i.e., more angry toward the interaction partner) than when the interaction partner was not dominating. In a similar vein, Locke and Sadler (2007) studied how satisfaction is related to complementarity on trait interpersonal efficacy. In previously unacquainted, same-sex interactions, satisfaction with the interaction was positively associated with similarity in partners' levels of affiliative interpersonal efficacy. Thus, in these lab-based studies we see evidence that complementary matching of trait interpersonal styles tends to produce increased satisfaction in a dyadic interaction and noncomplementary matching results in decreased satisfaction.

Closely akin to the construct of satisfaction, liking and comfort between interaction partners are also higher when interaction partners have more complementary traits. Subjective perceptions of this nature have been studied with different types of relationships, such as interactions between strangers, friends, and colleagues. Two studies that looked at interactions between strangers both showed that increased complementarity led to increases in how much the interaction partners liked and were comfortable with each other. For instance, Tiedens and Fragale (2003; Study 2) had same-sex strangers (one being a confederate) interact in the lab, and the researchers manipulated the posture of each individual to be either expansive or constrictive. Their findings suggested that when individuals were matched such that one partner had expansive posture and the other partner had a more constricted posture (indicative of dominance reciprocity in nonverbal behavior), participants tended to experience more liking toward and comfort with the confederate, in comparison to when both had the same postures. Likewise, Nowicki and Manheim (1991) matched same-sex, female dyads based on trait interpersonal style and showed that complementary dyads (who were reciprocal on dominance and correspondent on friendliness) tended to show signs of greater liking and comfort, such as engaging in more conversation and sitting closer to each other, in comparison to anticomplementary dyads.

Several studies have also examined the impact of complementary interpersonal styles on perceptions of closeness in contexts outside the lab. In a study on relationships between friends, Yaughn and Nowicki (1999) collected information about the interpersonal styles of friends who varied in the closeness of the friendship. They found that in women, interpersonal complementarity was related to perceived relationship closeness. Likewise, both college roommates tend to feel more cohesive when there is a high degree of complementarity (Ansell, Kurtz, & Markey, 2008), and members of musical "bar bands" who show increased levels of complementarity perceive greater positive regard and group cohesion (Dyce & O'Connor, 1992; O'Connor & Dyce, 1997). Married couples also report greater relationship quality, characterized by greater love and harmony, when the trait interpersonal styles of each person complement each other (Markey & Markey, 2007). Thus, there is fairly broad support for the idea that higher levels of complementarity between interaction partners leads to more positive perceptions of each other and the relationship.

Although less research has focused on objective outcomes that may be related to complementary interpersonal styles, there is some support for these relations, too. Estroff and Nowicki (1992) found that complementarity is related to dyadic productivity. Specifically, when dyads were matched so that their interpersonal styles complemented each other, they were significantly more productive at putting together a jigsaw puzzle than partners who were anticomplementary. Smith and Ruiz (2007) examined objective indices of interpersonal distress in partners who were matched to be either correspondent or opposite on trait friendliness. They showed that when dyads were mismatched on trait friendliness, the participants tended to display increased blood pressure and heart rate.

Overall, this group of studies suggests that complementarity in trait interpersonal style plays a potentially important role in a variety of subjective and objective outcomes, both in controlled lab settings involving strangers and in real-life interactions between people in established relationships. Furthermore, these results generalize across same-sex and mixed-sex dyads. However, the number of studies that show evidence for these outcomes is relatively modest, suggesting that more research is needed. This is particularly the case for objective outcomes, for which there is limited, but promising, evidence. For instance, the few studies looking at more objective outcomes, such as task performance or distress level, have been conducted in the lab between two strangers. More research is needed to evaluate whether these findings generalize to other circumstances outside the lab, between individuals who are previously acquainted.

#### Studies of Mutual Influence and Adaptation

As mentioned earlier, a second major area of complementarity research concerns how partners influence each other's interpersonal behavior, either within a single interaction or over many interactions. In 1983, Kiesler reviewed the available evidence and concluded there was convincing evidence that responses to interpersonal behaviors tend to be complementary: Hostile dominant behavior tends to evoke hostile submissive behavior (and vice versa), whereas friendly dominant behavior tends to evoke friendly submissive behavior (and vice versa). However, in response, Orford (1986) argued that the evidence was actually more mixed. He agreed that there is fairly strong evidence for complementarity on the right side of the circumplex (i.e., friendly dominant behavior pulls for friendly submissive behavior and vice versa). However, his review of studies indicated that the evidence on the left side of the circumplex is less straightforward. In particular, some research suggested that hostile dominant behavior elicits similar levels of hostile dominance, rather than the expected complementary behavior of

hostile submissiveness. Furthermore, hostile submissive behavior may often be met with friendly dominant behavior, rather than the expected complementary behavior of hostile dominance.

Subsequently, further studies and review (e.g., see Kiesler, 1996) have shed more light on the question of whether mutual influence follows the principles of complementarity. There are three main types of studies, representing various time scales as follows:

1. Act-by-act behavioral complementarity. At the most micro level of assessment, some work has evaluated complementarity in specific moment-to-moment behavioral acts. What is the probability that a particular type of interpersonal behavior will be followed immediately by a complementary behavioral response from an interaction partner?
2. Aggregated situational mutual influence. Taking a more molar approach to studying single interactions, other work has aggregated the behavior of each partner across the interaction into overall indices. Over the course of an interaction, do partners adjust their interpersonal behavior so that they become more complementary?
3. Mutual influence over multiple interactions. At the most macro level, some work has evaluated complementarity over multiple interactions. Are different types of interactions characterized by different degrees or types of complementarity?

*Act-by-act behavioral complementarity.* Strong, Hills, Kilmartin et al. (1988) studied interactions between same-sex, previously unacquainted individuals, where one of these individuals was a confederate who was enacting one of the eight octants of the interpersonal circle. Based on written transcripts, each speaking turn was categorized as falling into one of the eight octants of the interpersonal circle. This study showed evidence for complementarity on an act-by-act basis, such that the behavior of one individual (the confederate) increased the probability of a subsequent complementary act from the interaction partner. For instance, a dominant (i.e., leading) act produced an increased probability for a subsequent submissive (i.e., docile) act.

Tracey (1994, 2004) also investigated complementarity at the level of specific behavioral acts. He demonstrated that, controlling for base rates of the interpersonal behaviors corresponding with each octant, there is clear evidence for complementarity on both the left and right side of the circumplex. Similarly, Gurtman (2001) reanalyzed Strong, Hill, and Kilmartin's (1988) data controlling for base rates in a different way, and again found general support for act-by-act complementarity.

It is noteworthy that all but one study (Tracey, 2004; Study 1) of this type involved lab paradigms in which one of the interaction partners was a confederate; also, both partners were always female. These limitations suggest that more research is needed to evaluate whether act-by-act complementarity generalizes to more naturalistic, unscripted social interactions.

*Aggregated situational mutual-influence.* Of the studies that examine the process of mutual influence in aggregated situational behavior, the majority are between unacquainted pairs of people who are interacting in a lab setting. Overall, there tends to be very good support for interpersonal complementarity within this type of setting. Several studies have shown that during the course of an interaction, previously unacquainted dyads tend to exhibit both correspondence on affiliation and reciprocity on dominance (Locke & Sadler, 2007; Markey, Funder, & Ozer, 2003; Sadler & Woody, 2003). Furthermore, the results for such studies generalize across mixed-sex and same-sex dyads, across interactions that range in duration from five minutes to twenty minutes, and across a variety of joint activities, including relatively unstructured, cooperative, and competitive tasks.

To illustrate this type of finding, Panel A of Figure 8.2 shows a structural equation

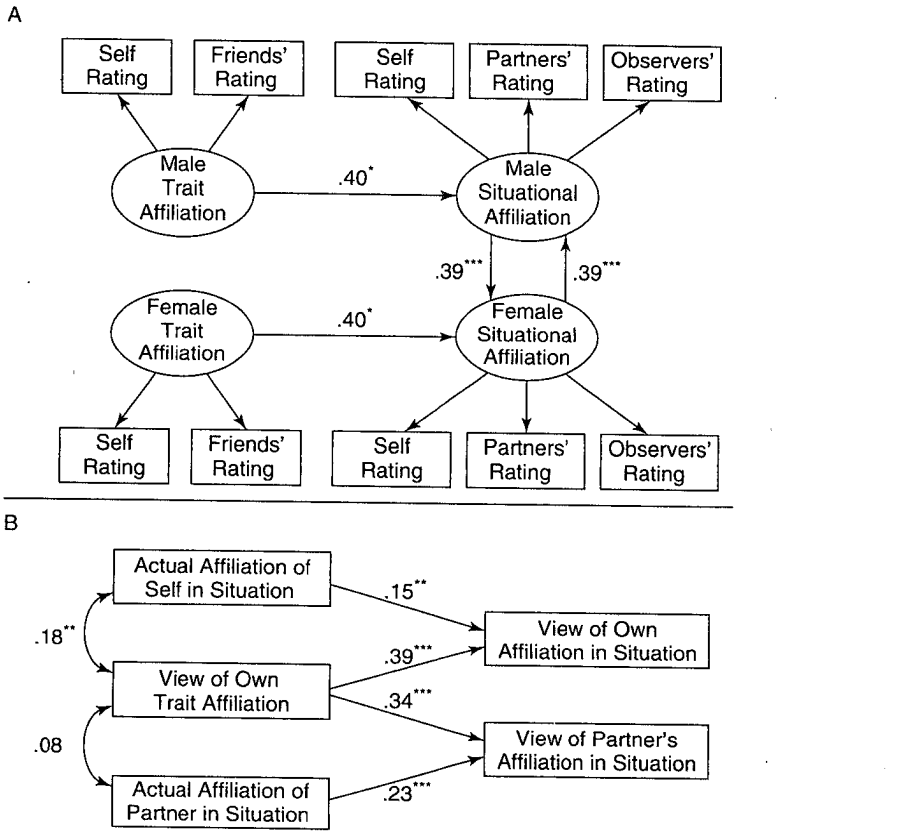


**FIGURE 8.2** Correspondence and Bias in Situational Affiliation
Panel A: Mutual-influence model of correspondence in affiliation. Panel B: Bias in perceptions of situational affiliation.
*Notes:* * $p < .05$. ** $p < .01$. *** $p < .001$. All coefficients are standardized; error variables have been omitted from the diagrams.
*Source:* Adapted with permission from Sadler and Woody, 2003.

model from Sadler and Woody (2003), who studied unacquainted dyads engaged in a cooperative task. The ovals denote latent or conceptual variables, and the rectangles denote measured variables. As the diagram indicates, the interactants' underlying levels of trait affiliation (to the left) were measured both by self-report and the report of friends. The interactants' situational patterns of behavior (to the right)—namely, their levels of expressed affiliation during the interaction—were also measured in a variety of ways: by self-report observations, partner-report observations, and the ratings of independent observers. The obtained coefficients for the paths among the latent variables, shown on the diagram, reveal that the impact of partners on each other's level of expressed affiliation is positive and just as strong as the contribution of their respective trait interpersonal styles. Using a similar model, Sadler and Woody also found that partners had a substantial negative effect on each other's levels of expressed dominance.

In a lab study involving female dyads (one member of each dyad was a confederate), Bluhm, Widiger, & Meile (1990) found support for correspondence on affiliation: Participants showed friendly behavior in response to a friendly confederate and

hostile behavior in response to a hostile confederate. Although no such mutual adjustment seemed to be occurring on dominance, it is likely that the scripted nature of interactions with a confederate interferes with the natural give and take that occurs in social interaction.

To date, these findings supporting complementarity in overall situational behavior mainly involve previously unacquainted pairs of individuals interacting in a lab setting. Thus, future research should address the phenomenon in contexts outside the lab.

*Mutual influence over multiple interactions.* In addition to studies of mutual influence processes within a single interaction, there is a growing body of literature that examines mutual influence over longer periods of time. Studies of this nature typically involve real-life circumstances such as interactions at home and in the workplace, between individuals who are well acquainted, such as friends, coworkers, and romantic partners.

One major type of investigation examines the extent to which individuals adopt complementary stances across multiple situations and interaction partners. An advantage of this approach is that it allows for the study of the ways in which context may influence expression of complementarity. For example, Moskowitz, Ho, and Turcotte-Tremblay (2007) collected information about people's interpersonal behavior over multiple interactions with a variety of individuals. Specifically, these authors had people complete self-report measures of their own interpersonal behavior and the behavior of their interaction partners for each social interaction that occurred in their everyday life over a 20-day period. The authors were interested in examining how the process of complementarity might differ depending on whether people were interacting in work versus nonwork settings, or in higher status versus lower status roles. They found that individuals tend to exhibit greater reciprocity on dominance in work than in nonwork settings, and less reciprocity when in a lower status role, compared to those in a higher status role. On the friendliness dimension, those in higher-status roles tend to show greater correspondence than those in lower-status roles. In a similar study, rather than examining type of setting and role, Fournier, Moskowitz, and Zuroff (2008) defined four interpersonal situations based on the partners' behavior: friendly-dominant, friendly-submissive, hostile-dominant, and hostile-submissive. Using these situational categories, they found strong evidence of complementarity.

A major second type of study investigates how mutual influence evolves over time *within the same dyad.* For instance, Markey and Kurtz (2006) studied the process of complementarity between female college roommates who had just moved in with each other. The authors collected information about the interpersonal behavior of each roommate at two time points: at the beginning of their time living together and then 13 weeks later. Within this period of time, the roommates' behavioral styles moved from being unrelated to each other to being highly reciprocal on dominance and highly correspondent on friendliness. In a similar vein, Tracey, Ryan, and Jaschik-Herman (2001) found that long-standing romantic partnerships and close friendships tend to be characterized by a high degree of complementarity: Those with trait styles that are friendly dominant tend to have relationship partners who are friendly submissive (and vice versa), whereas those with trait styles that are hostile dominant tend to have relationship partners who are hostile submissive (and vice versa). However, because the styles were measured at only one time point, a possible confound is that partners, at least to some extent, may have selected into complementary relationships rather than developing them through a mutual influence process over time.

Another important circumstance involving the same dyad over multiple interactions is the therapeutic relationship. Tracey, Sherry, and Albright (1999) collected information about complementarity between therapists and clients over the course of

six cognitive-behavioral therapy sessions and showed that therapists and clients tend to display a U-shaped function of complementarity over the course of treatment. Complementarity tends to be greatest at the beginning of therapy, followed by a decline during the middle sessions, and then a subsequent rise toward the termination phase.

One study investigated complementarity processes in larger groups. Wright and Ingraham (1986) had classes of eight students complete retrospective measures of interpersonal style for each of their classmates based on the students' interactions over the course of a school term. Using a social relations model to test actor, partner, and relationship effects, the authors showed that a large proportion of the dyads within the group exhibited correspondence on the affiliation dimension, and there were trends toward reciprocity on the dominance dimension.

#### Mutual Influence Processes and the Prediction of Outcome Variables

The foregoing body of research makes a strong case for the hypothesis that as people interact, they reshape each other's interactional behaviors; in addition, this mutual-influence process occurs on a range of time scales. But what are the effects of such mutual adjustments?

A few studies have investigated how mutual-influence processes may predict subjective and objective outcomes. In both therapist/client dyads and university undergraduate dyads, Tracey (2004) demonstrated that base-rate-corrected act-by-act complementarity was a strong predictor of perceptions of satisfaction and positivity. Similarly, Tiedens and Fragale (2003) found that individuals who adopt a complementary postural stance in relation to their interaction partner have more positive feelings about them.

There is also some evidence that objective outcomes are affected by this mutual influence process. For example, Tracey et al. (1999) showed that when therapist/client dyads have a more U-shaped pattern of complementarity over the course of therapy, clients tend to experience better treatment outcomes, such as reduction in the number and severity of symptoms. Thus, complementarity appears to contribute to the efficacy of interaction partners who are working together toward a common goal. Some work has also examined how low complementarity may produce detrimental outcomes. In particular, Tracey (2005) showed that dyads with decreased levels of act-by-act complementarity tend to experience greater levels of interpersonal distress in their lives. In summary, these studies, although few in number, suggest that further work on the effects of the mutual-influence process might be quite promising.

#### Studies of Processes Underlying Complementarity

It has often been assumed that adjustments toward greater complementarity are reinforced and maintained by their consequences for the partners (e.g., Kiesler, 1983; Tracey, 1994). In particular, as shown by some of the research reviewed earlier, complementary interactions may be more pleasant and satisfying for both partners. Thus, at least to some extent, adjustments that increase complementarity probably occur because of their reward value.

Although such reward value applies readily to the range of behaviors on the right side of the circumplex, involving some degree of friendliness (i.e., positive complementarity), it is not as clear how it would apply to the range of behaviors on the left side of the circumplex, involving various degrees of unfriendliness (i.e., negative complementarity) (e.g., Friedlander, 1993; Tracey, 1993). It is counterintuitive that negative complementarity, in which both partners are acting in an unfriendly fashion toward each another, would bring about feelings of satisfaction and harmony. Likewise, many people seeking psychotherapy for interpersonal difficulties have interaction styles that consistently evoke

complementary, but deeply unsatisfying responses from others, yet these patterns of behavior may be highly stable and resistant to change (Carson, 1969, 1982).

Proposed resolutions to this apparent paradox invoke the theme of self-validation, whereby people may unwittingly create a social environment that confirms their own preconceptions about themselves and others (Bowers, 1973; Carson, 1969; Wachtel, 1973). Specifically, people's preconceptions color their perceptions of an interaction, and these biased perceptions affect their actions toward other people. These actions, in turn, may evoke responses from others that confirm the preconceptions, in a circle of self-fulfilling prophecy. The apparent confirmation of expectancies (i.e., a sense of prediction and control) may reinforce behavior patterns even when these patterns lead to unsatisfying or self-defeating outcomes. For example, a person's hostile dominant style may be maintained by observations that most other people are feckless toadies (i.e., hostile submissive), awaiting direction. Such a person may not realize that it is actually his or her own behavior that is evoking this behavioral consistency in others. Kiesler (1996) called this important phenomenon the *interpersonal transaction cycle.*

In support of this idea, it is crucial to show that interpersonal styles are associated with biases in social perception that would tend to confirm or foster those styles. Panel B of Figure 8.2 shows a representative example of such a finding, again drawn from Sadler and Woody (2003).

The results for this regression model show that, controlling for the actual levels of affiliation shown by participants and their partners during an interaction, participants' self-perceived interpersonal style (View of Own Trait Affiliation) is an important predictor of their perceptions of both their own and their partner's levels of expressed affiliation. In short, people are biased to view both their own behavior and the responses of others in ways that are consistent with their own self-conception.

Similarly, Dodge and Somberg (1987) demonstrated that when presented with an ambiguous situation, aggressive children tend to perceive others as being more aggressive than do nonaggressive children. These findings, pertaining to the left side of the circumplex, suggest that those who are hostile tend to see their interaction partners as being more hostile than they actually are. This perceived hostility in others, in turn, would lend apparent confirmation to the person's hostile style, in the sense that it is better to "beat others to the punch." Some other research also demonstrates that people have cognitive expectancies for others to behave in ways that are complementary to their own style. Tiedens, Unzueta, and Young (2007) showed that people tend to expect others to behave in ways that are reciprocal to their own trait dominance, even when the participants have not met the other person.

It is worth mentioning that cognitive and related social factors may also inhibit complementarity. To illustrate, consider some factors that could interfere with Henry responding in a complementary fashion to Tom. First, if Tom sends mixed messages—for example, conveying a friendly message with a hostile tone of voice (Patterson, 1995)—or is otherwise inept about signaling his wishes, Henry may not be able to tell what kind of response Tom is inviting. Second, even if Tom's messages are reasonably clear to others, Henry may lack the required social-perception skill to decode Tom's behavior correctly. Third, even if Henry decodes Tom's overtures correctly, he may lack some of the social skills necessary to enact the complementary behavior in a clear or consistent way. Work by Duke and Nowicki (1992, 2005; Nowicki & Duke, 1994) on deficits in receptive and expressive nonverbal skills is consistent with the two foregoing scenarios, respectively (see also Lieberman & Rosenthal, 2001). Finally, even if all three of the preceding factors are favorable, Henry may have a motivational agenda that conflicts with behaving in

a complementary fashion (see Dryer & Horowitz, 1997; Horowitz et al., 2006).

Much research remains to be done to shed further light on the circle of linkages implied by the interpersonal transaction cycle. However, the central idea—that people unwittingly shape their social world, whether it is one they find satisfying or not—is intuitively appealing, as suggested by the following anecdote:

> A man was moving to a new town and stopped at a gas station there. While filling up, he asked the attendant, "Are people friendly here?" The attendant paused, looked him over, and replied, "It all depends; what were people like where you came from?"

## COMPLEMENTARITY AS INTERDEPENDENT SHIFTS, BURSTS, AND OSCILLATIONS

Having discussed previous research on complementarity, we now turn to advancing some new ideas about its component phenomena, ideas that we believe hold much promise. Although some of these ideas could conceivably be applied over larger time frames, here we will focus on understanding the phenomena that transpire over the course of a single interaction.

There are three fundamentally different ways in which two partners may adapt to each other's style. Figure 8.3 uses reciprocity

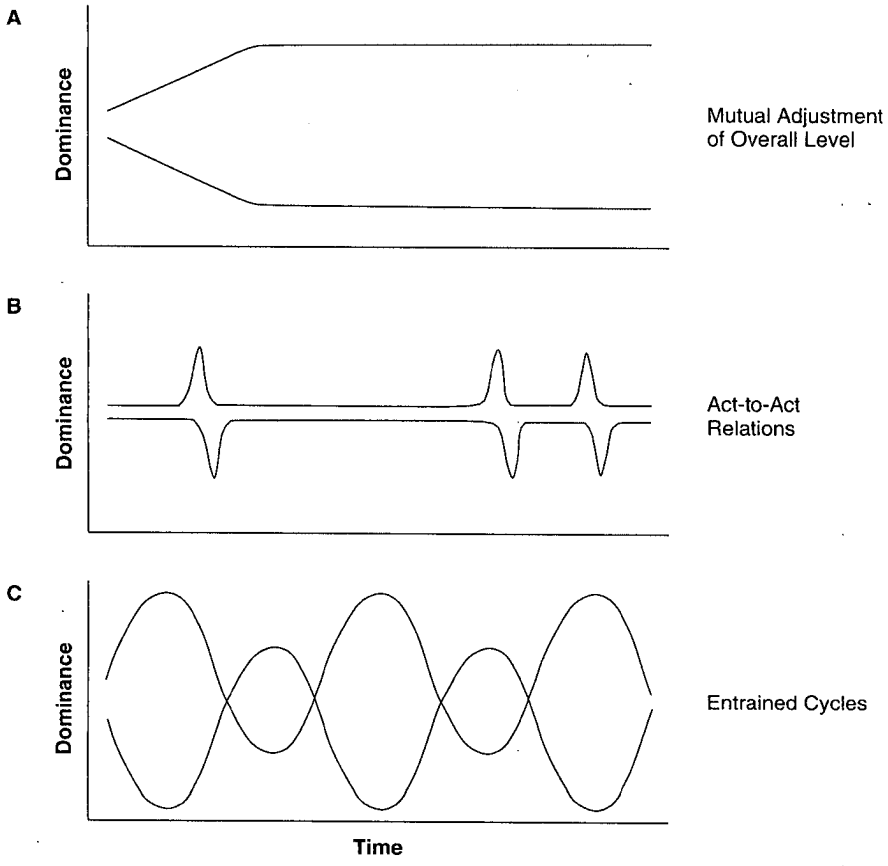


**FIGURE 8.3** Pure Types of Complementarity. Interdependent Shifts, Bursts, and Oscillations in Reciprocity on Dominance

on dominance to depict each of these possibilities as pure types.

First, partners may demonstrate mutual adjustment of overall level, as shown in Panel A. The left side of the plot at the top depicts an early phase of the interaction in which partners show opposite slopes as they make overall adjustments toward more reciprocal stances to each other. Eventually, these adjustments of overall level would typically stabilize, yielding the steady overall levels depicted across the rest of the plot. Thus, one major component of complementarity is *interdependent shifts*.

Second, partners may demonstrate interdependence in act-to-act relations, as depicted in Panel B. At irregular intervals, one person acts more dominant than his or her baseline, and the partner immediately responds by being more submissive than his or her respective baseline. The notion of irregularity—that is, more or less random occurrence across time—is important to distinguish this type of adjustment from the next one. Thus, a second major component of complementarity is *interdependent bursts*.

Third, partners may demonstrate entrained cycles, as depicted in Panel C. The partners show coordinated rhythms, occurring more or less regularly across time, in which as one partner becomes more dominant, the other becomes more submissive, and vice versa. These coordinated rhythms represent a form of dynamic equilibrium in which each partner's behavior varies over time but stays within desired limits, a process of attunement (Field, 1985). Thus, a third major component of complementarity is *interdependent oscillations*.

These three types of complementarity can coexist in various combinations. For example, one can imagine sine-wave oscillations superimposed on the shifts in overall levels depicted in Panel A. If the oscillations for one partner were 180 degrees out of phase with the oscillations for the other partner (that is, the peaks in one person coincided with the valleys in the other person, and vice versa), then the pattern would represent the expected reciprocity in entrained cycles. In contrast, if the oscillations for one partner were in phase with the oscillations for the other partner (with coinciding peaks and coinciding valleys), then the pattern would represent theoretically surprising anticomplementarity of dominance in the entrained cycles. It is important to note, as this example illustrates, that the issue of complementarity at the level of entrained cycles is completely distinguishable from the issue of complementarity at the level of overall adjustment of means—a dyad could be complementary at one level and not at the other level.

It is useful to briefly relate this threefold breakdown, which we adopted from the work of Warner (1998), to the insights and terminology of some other researchers. Cappella (1996) argued that it is essential to draw a clear distinction between correlated adjustments of overall level, which he termed *mutual influence*, and correlated patterns of change within an interaction (controlling for adjustments of overall level), which he termed *mutual adaptation*. Interdependent bursts and interdependent oscillations are two forms of mutual adaptation, whereas interdependent shifts are the same phenomenon as mutual influence. The possibility of interdependent oscillations in social interaction has attracted the attention of several researchers (e.g., Bernieri & Rosenthal, 1991; Burgoon, Buller, & Woodall, 1989; Condon & Ogston, 1971; Chapple, 1970, 1982; Davis, 1982; Hatfield, Cacioppo, & Rapson, 1994; Warner, 1988). Burgoon and colleagues (1995) proposed that such enmeshing of recurrent cycles be termed *interactional synchrony*.

#### Are We on the Same Wavelength?

In the study by Sadler and Woody (2003) that we have used as an example (Figure 8.2), all the behavior ratings—whether by self, partner, or independent observers—reflected an overall judgment over the entire interaction. For example, observers watched the video of the interaction separately for each partner. As they

watched the target person, they mentally tallied behaviors across time, and then at the end of the video they filled out a Social Behavior Inventory (SBI; Moskowitz, 1994). These SBIs provide overall levels of dominance and affiliation for each partner aggregated over the entire period of observation.

Thus, this study was purely an investigation of interdependent shifts; without time-dependent observations, it is not possible to capture interdependent bursts or oscillations. Kenny (1996) used the term *mutual influence model* to describe the type of structural equation model that Sadler and Woody (2003) applied to analyze these data, and this term is entirely consistent with the meaning reserved for *mutual influence* by Cappella (1996)—that is, *mutual influence* refers to the same phenomenon as *interdependent shifts*.

Sadler, Ethier, Gunn, Duong, and Woody (2009) used the same cooperative dyadic task as Sadler and Woody (2003), but added a new measurement technology to accommodate investigation of interdependent bursts and oscillations. In particular, as the observer watched the target person during an interaction, he or she made moment-to-moment, continuous ratings of behavioral dominance and affiliation using a computer joystick device. The observer could see on a display where his or her current rating was lying in the plane of the interpersonal circle, and the computer recorded the joystick position every half-second. To improve the reliability of the ratings, we had four observers independently watch the videos and use the joystick to record their moment-to-moment impressions, and then for each target person we averaged the four observers' ratings at each time point.

During the first few minutes of the 20-minute interaction period, dyads are often getting used to the task and settling into a stable pattern of interaction. Thus, we had observers make the continuous joystick ratings for the last 10 minutes of the interaction. This 10-minute observational period generates more than a thousand successive observations for each partner.

The top panels in Figure 8.4 show the resulting data for one dyad. The plot to the left provides the bivariate time series for affiliation (*bivariate* simply means that we include both partners), with the solid trajectory representing the female and the dashed trajectory the male. The plot to the right provides the corresponding bivariate time series for dominance.

Note that the plot for affiliation shows a clear difference in overall levels—namely that the female is always more affiliative than the male. In addition, both trajectories show a negative linear slope. However, our main interest is in the similarity of moment-to-moment variation between the two partners. There appears to be a somewhat modest tendency for the partners to share peaks in affiliation. In the plot for dominance, the overall levels are more similar and linear slopes are less evident. However, the strong inverse relation in the moment-to-moment variation between partners is quite striking.

How can we quantify the degree of coordination in moment-to-moment variation between the partners? One relatively obvious approach is simply to calculate the correlation between partners' scores over time. This is called a *cross-correlation*. In this dyad, the cross-correlation for affiliation is .45, and the cross-correlation for dominance is −.50. The signs of these correlations are consistent with the hypotheses of complementarity—that is, a tendency toward sameness on affiliation versus a tendency toward oppositeness on dominance.

Unfortunately, the cross-correlation is susceptible to a number of potential confounds. For example, one contributor to the cross-correlation is similarity of linear slopes, which is usually regarded as distinct from similarity of patterning over time. To correct for this problem, we can remove the linear trend from each time series and recompute the correlations. They turn out to be .31 for affiliation and −.57 for dominance. These detrended cross-correlations capture

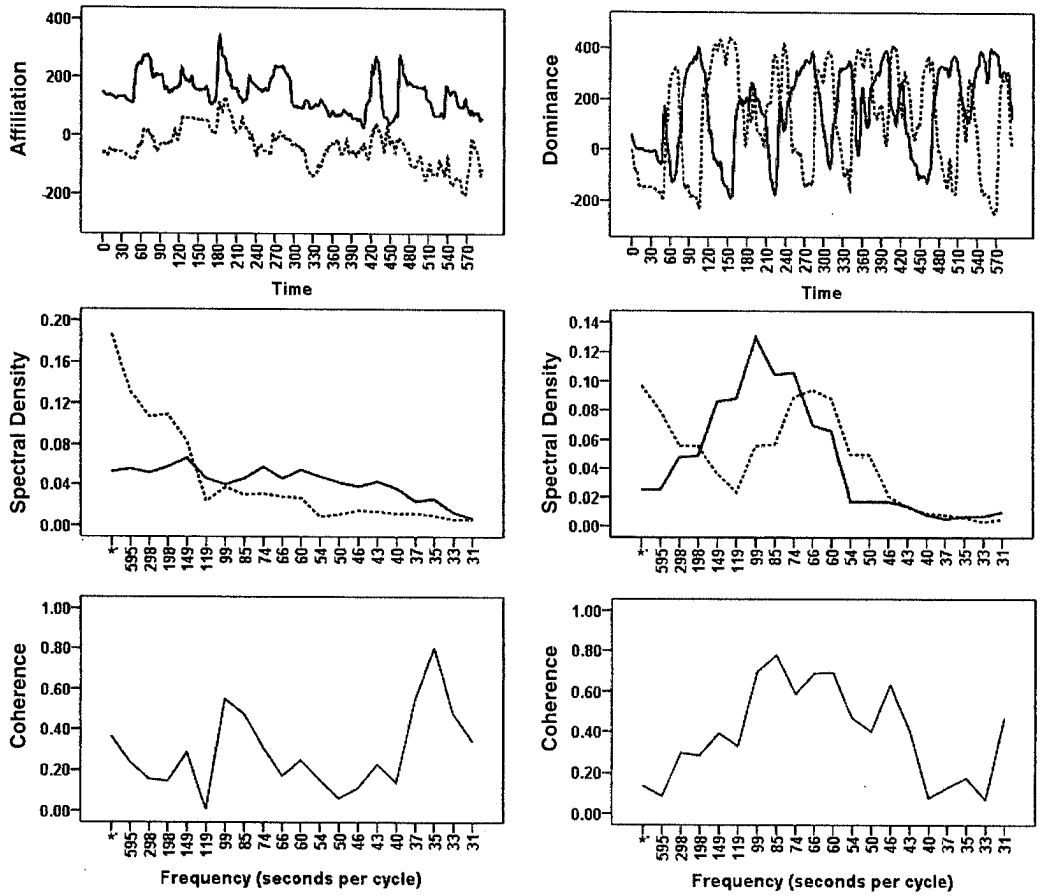


**FIGURE 8.4** Plots of Times Series, Spectral Density, and Coherence for Affiliation (left column) and Dominance (right column): Data from One Dyad
*Note:* The solid trajectory represents the female's data and the dashed trajectory represents the male's data. The spectral analysis extrapolates back to a cycle of unlimited length, denoted here with an asterisk.

better what is evident visually—that the coordination of patterning is stronger for dominance than for affiliation. Other ways to attempt to overcome potential confounds in cross-correlations are covered in some detail in Sadler et al. (2009).

For present purposes, the main shortcoming of the cross-correlation is that it does not distinguish among interdependent shifts, bursts, and oscillations; all three contribute to it. Distinguishing among these different types of effects requires a variance-decomposition strategy and the use of spectral analysis (Warner, 1998).

The first step is to model and remove overall trends. A regression analysis for each partner's time series provides the intercept at the beginning of the observation period, which indexes the average level at the beginning, and the linear slope, which indexes overall change over time. As detailed in Sadler et al. (2009), analysis of these intercepts and slopes over the entire sample of dyads yielded very strong evidence for interdependent shifts (that is, mutual adjustment of overall levels), in directions consistent with the hypotheses of complementarity.

Next, we can submit the detrended data to a procedure called *cross-spectral analysis*, which allows us to quantify the extent and nature of interdependent oscillations. The details of this procedure are somewhat technical and covered in Sadler et al. (2009); here we simply convey the gist. The lower panels of Figure 8.4 show some results of cross-spectral analyses of the bivariate time series at the top. Let's walk through these results for dominance (the right column):

In the middle is a plot of *spectral density profiles* for each partner. These tell us what proportion of the variance, along the Y-axis, is occurring at each component frequency, along the X-axis. The frequencies are the duration in seconds of a full sine wave. Here the female has a predominant tendency to show cycles with a duration of about a minute and a half (highest density at 99 s), whereas the male tends to show slightly shorter cycles (highest density at 66 s). However, the partners share substantial variance in cycles of around one to one-and-a-half minutes duration.

At the bottom is a plot showing the profile of the *coherence* across this spectrum of frequencies. The coherence indexes how closely related the partners' variations in amplitude are at each frequency. Akin to a squared correlation, it tells us how attuned the partners are at that frequency. Here the coherence values in the shared range of frequencies (one to one-and-a-half minutes duration) are quite high, above .60.

These rather detailed results need to be integrated into a simpler index. As our overall index of entrainment between partners, we computed the *average weighted coherence*. In computing this average, we weighted the coherence at each frequency by the proportions of variance for each partner at this frequency. The resulting value, which varies from 0 to 1, indexes how strongly entrained the partners are. Here, for dominance the average weighted coherence was .55.

Finally, a cross-spectral analysis provides us with information about the *phase relation* between the partners—that is, who is leading or lagging whom. A phase of 0 degrees would mean that the partners tend to be perfectly in synch, with peaks coinciding and troughs coinciding. In contrast, according to the hypothesis of reciprocity on dominance, we would expect this value to be near 180 degrees, because 180 degrees means that one partner's peaks occur at the same time as the other partner's troughs, and vice versa. Here the average phase was 174 degrees, which is very close to 180.

The corresponding results for the cross-spectral analysis of affiliation appear in the lower panels to the left in Figure 8.4. Compared to the results for dominance, on affiliation the partners show much less tendency to cycle at comparable frequencies, and the coherence values are generally lower. Accordingly, the resulting value for the average weighted coherence was a more modest .26. The average phase was −2 degrees, which is very close to zero and hence strongly consistent with moment-to-moment correspondence.

Such an analysis may be performed on the data from each dyad. Figure 8.5 shows the distribution of such results across a sample of 50 dyads. The results for coherence of affiliation (upper left) show values ranging from near zero, indicating no entrainment, to almost one, indicating near-perfect entrainment. The mean is about .5, indicating that the norm is moderate entrainment. For dominance (lower left), the range is just as striking, and the mean is about .4. (Coherence is like a squared correlation, so we do not expect it to have a negative value even for dominance.)

The results for average phase (shown on the right) require a scale that wraps around in a circle. The main thing to note here is that for affiliation and dominance there is no overlap at all in the distributions of phase. On the basis of phase alone, one could tell with perfect accuracy whether any bivariate time series is for affiliation or for dominance.

Moving beyond the cross-spectral analyses, the remaining issue is how to quantify interdependent bursts. For this purpose, trends and cycles are removed from the data and an entity called the cross-correlation

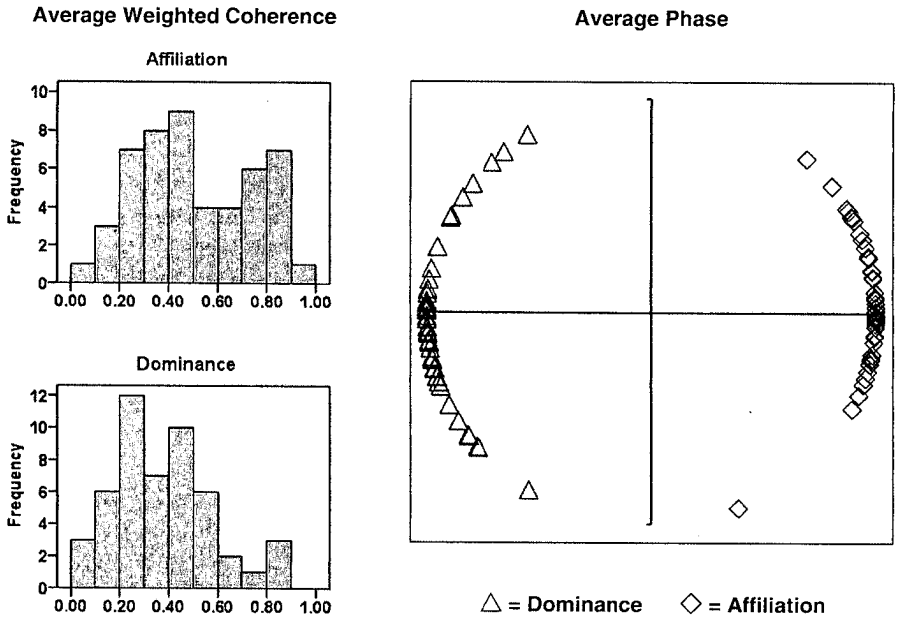


**FIGURE 8.5** Distributions of Average Weighted Coherence and Average Phase for Affiliation and Dominance across 50 Dyads
*Source:* Based on data from Sadler et al., 2009.

function is examined. Sadler et al. (2009) provide the details of this procedure. The results indicated a statistically significant tendency toward interdependent bursts in almost all the dyads, in the theoretically expected directions (i.e., positive correlations for affiliation and negative correlations for dominance). However, these phenomena accounted for far less variance than the interdependent oscillations.

In summary, the results of this study verified that interdependent shifts are a very important component of interpersonal complementarity, but added to this picture as a second important, reasonably independent component the phenomenon of interdependent oscillations. In future research, the very large entrainment differences between dyads may be used to predict interesting subjective and objective outcomes. Along these lines, Markey, Lowmaster, and Eichler (2010) used the joystick method and showed that positive cross-correlations on affiliation predict faster completion time and higher quality of collaborative tasks. Finally, although interdependent bursts occur in most dyads, they seem to be a more minor phenomenon.

## SUMMARY AND CONCLUSIONS

In this chapter, we characterized interpersonal complementarity as the diverse ways in which the interpersonal behaviors of people may fit together and influence each other. As we pointed out, it is unfortunate that the terminology classically adopted by interpersonal theorists (e.g., Kiesler, 1996) to describe such phenomena clashes with how the same terms are used by other psychologists (including the term *complementarity* itself). Nonetheless, the resulting literature, which we reviewed in some detail, is definitely of considerable interest to personality, social, clinical, and I/O psychologists. In particular, this literature shows that there are important subjective and

objective effects of different pairings of interpersonal styles, that people modify each other's interpersonal behaviors during interaction in lawful and important ways, and that a variety of mediating processes, involving cognitive and motivational factors, are involved in these effects.

A theme we would like to emphasize in closing is the key importance of variability in interpersonal behavior (Moskowitz & Zuroff, 2004). In previous accounts of the interpersonal circle, there has usually been much emphasis on relatively invariant behavior, which becomes more dramatic as one moves away from the center. For example, in Kiesler's (1983) depiction of the circle, as we move out from the origin in the direction of 10 o'clock, we pass from "suspicious/resentful" to "paranoid/vindictive" and the rigid interpersonal pathologies such as paranoia which, according to the model, lie on the periphery of the circumplex (Wiggins, 1982).

In contrast, the center area, near the origin, can seem comparatively dull and even ill-defined. For instance, consider the midpoint on the affiliation dimension. A person whose interpersonal behavior is so unvarying and nondescript that he or she shows neither distinctly friendly nor distinctly unfriendly acts would fall here. However, so would a person who varies a great deal and shows very friendly and very unfriendly behaviors with about equal frequency. Surely these patterns need to be distinguished.

Furthermore, other distinctions involving variability may be essential as well—namely, those having to do with entrainment. For example, consider a person whose level of friendliness varies widely, but who fails to entrain these variations to those of partners. This person, characterized by unpredictable or expectancy-violating fluctuations, may be just as problematic to others as a person who, say, is consistently very unfriendly.

In conclusion, there may be many interesting phenomena, vibrating and more or less entrained, that are hiding around the origin of the interpersonal circle. To study them we need to use, in effect, a temporal microscope that brings these patterns into focus.

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