
Interpersonal Complementarity, Gender of Interactants, and Performance on Puzzle and Word Tasks

Sharon Duke Estroff
Stephen Nowicki, Jr.
Emory University

Using a circumplex model of interpersonal acts, subjects were placed in complementary (reciprocal on control and similar in affect) or anticomplementary (similar on control and reciprocal in affect) dyads to test Sullivan's assumption that complementary transactions facilitate relationships. It was predicted that complementary dyads would perform better than anticomplementary ones on jigsaw puzzle and word generation tasks. Both hostile and friendly types of complementary dyads were composed of mixed- and same-gender pairings. Analyses revealed, as predicted, that whether they were hostile or friendly, complementary dyads performed better than anticomplementary ones on the jigsaw puzzle task and tended to perform better on the word generation task. However, in addition, it was found that hostile complementary dyads with a male dominant and a female submissive consistently put fewer pieces of the jigsaw puzzle together than the other complementary pairings. Results are discussed within an interpersonal theory framework, and suggestions are made for future researchers to examine complementary transactions for varying lengths of time and conditions.

Contemporary interpersonal theory (Anchin & Kiesler, 1982; Andrews, 1990; Carson, 1969; Kiesler, 1988; Wiggins, 1982) is based on concepts offered by Sullivan (1953). Sullivan was among the first theorists to stress the primary importance of interpersonal relationships in human functioning and personality. He theorized that only through interpersonal relationships, real or imaginary, can individuals achieve satisfaction of their basic biological needs and security from the potentially negative effects of anxiety. Transactions with others that lead to satisfaction and security, primarily because they confirm self-concepts, are called *complementary*.

Because Sullivan failed to provide a systematic way to define the kinds of transactions that would be complementary, it has fallen to contemporary interpersonal

theorists to develop models of interpersonal differences, such as the Interpersonal Circle, to guide research programs (Carson, 1969; Kiesler, 1983; Leary, 1957; Wiggins, 1982).

The validity of these circumplex approaches has been supported by research (e.g. Carson, 1969; Paddock & Nowicki, 1986; Plutchik & Conte, 1986; Wiggins, 1982, in press). The cited authors all generally assume that interpersonal behavior is a blend of two primary needs: control (dominance, status) and affiliation (friendliness). That is, "people interacting with each other continually are negotiating two major relationship issues: how friendly or hostile they will be with each other, and how much in charge or in control each will be in their encounters" (Kiesler, 1991, p. 448).

It is through the application of the Interpersonal Circle that Sullivan's complementary relationships can be defined; complementary transactions occur when they confirm interactants' self-presentation in regard to control and affiliation. Because complementarity results from reciprocity on the control dimension (i.e., dominance "pulls for" submission; submission "pulls for" dominance) and similarity on the affiliation dimension (friendliness "pulls for" friendliness; hostility "pulls for" hostility), it is most likely to occur with friendly dominant/friendly submissive and hostile dominant/hostile submissive pairings. Using this same logic, interactions where self-presentations are completely denied are called anticomplementary and where they are partially denied, noncomplementary.

Authors' Note: Correspondence should be addressed to Stephen Nowicki, Jr., Department of Psychology, Emory University, Atlanta, GA 30322.

PSPB, Vol. 18 No. 3, June 1992 351-356
© 1992 by the Society for Personality and Social Psychology, Inc.

Research completed to evaluate the worth of Sullivan's concept of complementary transactions has provided partial confirmatory evidence. After reviewing 21 studies that empirically tested the theory of interpersonal complementarity, Kiesler (1983) concluded, "A growing body of empirical research confirms . . . complementarity . . . [18 references are given in support] . . . with some mixed results [3 references]" (p. 201). However, Orford (1986) was more cautious in his conclusions. He reviewed 14 of the studies examined by Kiesler and 4 additional ones (Billings, 1979; Blumberg & Hokanson, 1983; MacKenzie, 1968; Raush, 1965) and concluded that there was support for complementarity, but only for the friendly side of Leary's circumplex. Orford agreed with Kiesler that researchers needed to be mindful of other conceptual and methodological factors that might affect complementary transactions, such as status of the interactants and duration of the relationship. Important to the present study, Kiesler (1991) suggested, among other things, that researchers needed to examine behavioral outcomes of same- and mixed-gender relationships in regard to complementary transactions.

Most interpersonal researchers have looked at the sequence of interpersonal events as a way of assessing the validity of the complementarity concept. However, following the suggestion of Kiesler (1991), we want to focus on behavioral outcomes of individuals placed in complementary and anticomplementary relationships. More specifically, in the present study, we wanted to know who achieved more. Because complementary pairings are confirming each other's self-concepts and becoming more "secure," we predict that they will work more effectively together than transactional pairings characterized by anticomplementarity. Behavioral outcomes on both the friendly and the hostile sides of the Interpersonal Circle were evaluated. Lastly, we wanted to examine the performance of dyads differing in gender makeup. Although previous researchers have not evaluated the possible impact of transactions within same- and mixed-gender pairs, the wealth of research reflecting gender differences suggests that differences may be present (e.g., Deaux, 1985). However, although it might be possible to predict that men would be more dominant and women more submissive in interactions, these characteristics of men and women are equated within interpersonal styles. For example, men and women who are friendly dominant have comparable levels of dominance. Therefore, because the major purpose of the present study was to examine whether complementary transactions were associated with behavioral outcomes like achievement, no predictions were made regarding the impact of gender on performance outcome.

METHOD

Subjects

Subjects were 80 men and 80 women students at Emory University who participated in this study in partial fulfillment of the requirements for their introductory psychology course. They were selected from a pool of 193 subjects to make sure interactants were comparable in intensity scores within dyads and across cells. The subjects were White and ranged in age from 18 to 23 years.

Measures

Interpersonal style. To assess interpersonal style, the 134-item Interpersonal Adjective Check List (ICL) was used (LaForge & Suczek, 1955; Leary, 1957). The construct validity of the ICL has been substantiated in well over 200 studies (Taulbee & Clark, 1982). To score the ICL, two summary scores are computed: one for the status dimension and one for the affiliation dimension. The formulas are adopted from LaForge (1977).

A positive status score indicates dominance, and a negative status score indicates submission. Similarly, a positive affiliation score means friendliness, and a negative affiliation score reflects hostility. In the present study, subjects were described in terms of quadrant categories determined by their summary scores: Friendly Dominant (FD), Friendly Submissive (FS), Hostile Dominant (HD), and Hostile Submissive (HS).

Subjects' interpersonal style was the combination of the status and affiliation scores. Subjects who were placed together in dyads had comparable intensity scores. Interactants' intensity scores did not differ across quadrants. Dyads were either complementary or anticomplementary and were composed of either same- or different-sex partners. There were equal numbers of subjects in all cells.

Performance tasks. Each dyad was given two cooperative tasks to complete. In the primary performance task, subjects were asked to complete a jigsaw puzzle. Puzzle tasks have been used successfully in previous studies (e.g., McLeod & Nowicki, 1985). The jigsaw puzzle chosen for use in the present study had to be difficult enough to challenge college students to work together and bring their interpersonal styles into action. If the puzzle were too simple, one person could successfully put the pieces together without help, and there would be no interaction. After pilot work with five dyads and three different puzzles, a 300-piece puzzle depicting a country scene was chosen for use in the present study. It was rated as a difficult puzzle by the manufacturer and as of above-average difficulty by pilot subjects.

Each dyad was presented with the puzzle pieces arranged on a board that was 3 ft by 5 ft. The beginning arrangement of pieces was the same for each dyad.

In the other task, subjects were to generate as many words as they could in 3 min from the word *Washington*. Previous research (Ekstrand, 1979) found that complementary same-sex dyads tended to generate more words, though not significantly more, than dyads who were anticomplementary.

Interview. When the subjects met for the first time, they were asked to "interview" each other, using a series of questions developed by the authors. The questions included name, home town, college major, present address, favorite course, favorite teacher, hobbies, and interests. Ostensibly the subjects completed the questions to acquire information needed by the experimenters; however, the data collection procedure also served to familiarize the subjects with each other and to help expose their favored interpersonal styles.

Procedure

The experiment was divided into two sessions. During the first session, subjects completed the ICL in a large group setting, and times were scheduled for dyads to meet for the second part of the experiment.

Subjects' interpersonal styles were determined from their ICL scores, and each subject was paired with another subject whose interpersonal style was of similar intensity. Dyads were either complementary (hostile or friendly) or anticomplementary and of same-sex or mixed-sex composition.

When subjects reported to the experiment, they were asked to wait together in a quiet place. After 5 min, an experimenter (one of two 21-year-old women) arrived and took them to the study room. When the subjects entered the room, they were seated at a large desk, and each was given a copy of the survey questions. They were told that this was a study of friendship formation and that they were to ask each other the questions on the forms so that they could gather information and get to know each other at the same time.

After the subjects completed their interactive interview, the experimenter took them over to a large table. They were given either the word generation or the jigsaw puzzle task as the first task. A brief intermission followed while materials were collected, and the second task was then administered. When the subjects completed their participation, they were debriefed concerning the purpose of the study, asked not to tell other potential subjects about the experiment, and thanked for their help.

TABLE 1: Mean Number of Puzzle Pieces Put Together by Composition of Dyads

Gender Makeup of Dyads	Degree of Complementarity in Dyad			
	Complementary		Anticomplementary	
	Friendly ^a	Hostile ^b	Dominant ^c	Submissive ^d
Same gender (males)	47.1	41.6	28.4	36.9
Same gender (females)	39.1	38.5	33.1	36.1
Mixed gender	42.2 ^e	21.4 ^c	31.2 ^f	29.4 ^g
Mixed gender	44.6 ^h	67.6 ^h	28.6 ⁱ	33.6 ^j

NOTE: Each cell contains 5 dyads.

a. Friendly dominant with friendly submissive.

b. Hostile dominant with hostile submissive.

c. Friendly dominant with hostile dominant.

d. Friendly submissive with hostile submissive.

e. Male dominant with female submissive.

f. Male hostile with female friendly.

g. Male hostile with female friendly.

h. Female dominant with male submissive.

i. Female hostile with male friendly.

j. Female hostile with male friendly.

RESULTS

There was clear support for the hypothesis that complementary dyads would perform better than anticomplementary ones when the performance measure was the number of jigsaw puzzle pieces put together. There was also a trend in the predicted direction for performance on the word generation task. In addition, it was found that when complementary dyads were hostile in nature and composed of different-gender partners, the gender of the dominant member of the pair significantly influenced the dyads' performance on the jigsaw puzzle measure. If women had the hostile dominant style, the dyads' performance was the best of all possible pairs; if men had the hostile dominant style, the dyads' performance was the worst of all possible pairs. The analyses that led to these results are presented next.

To examine the hypothesis that complementary dyads would perform better than anticomplementary ones, a 2 (Type of Relationship) by 2 (Affect of the Style) by 4 (Gender Makeup of the Dyad) analysis of variance was computed for number of jigsaw puzzle pieces put together and for number of words derived from the word *Washington*. The means for these analyses are presented in Tables 1 and 2.

Consistent with the complementarity hypothesis, the three-way analysis of variance for number of jigsaw puzzle pieces showed a significant main effect for type of relationship, $F(1, 74) = 4.65$, $p < .05$, and a significant three-way interaction, $F(3, 74) = 4.01$, $p < .05$. The main effect

TABLE 2: Mean Number of Words Created by Composition of Dyads

Gender Makeup of Dyads	Degree of Complementarity in Dyad			
	Complementary		Anticomplementary	
	Friendly ^a	Hostile ^b	Dominant ^c	Submissive ^d
Same gender (males)	32.1	30.4	27.5	28.9
Same gender (females)	34.1	33.4	29.1	30.1
Mixed gender	30.6 ^e	31.5 ^e	28.8 ^f	31.1 ^g
Mixed gender	33.3 ^h	32.6 ^h	30.1 ⁱ	29.4 ^j

NOTE: Each cell contains 5 dyads.

a. Friendly dominant with friendly submissive.

b. Hostile dominant with hostile submissive.

c. Friendly dominant with hostile dominant.

d. Friendly submissive with hostile submissive.

e. Male dominant with female submissive.

f. Male hostile with female friendly.

g. Male hostile with female friendly.

h. Female dominant with male submissive.

i. Female hostile with male friendly.

j. Female hostile with male friendly.

indicated, as predicted, that complementary dyads ($M = 42.3$) put significantly more pieces of the puzzle together than anticomplementary ones ($M = 30.2$). Newman-Keuls procedures were instituted to find the source of the three-way interaction. They indicated that hostile complementary mixed-gender dyads with women having the dominant style put more pieces of the puzzle together ($M = 67.6$) than hostile complementary mixed-gender dyads with men having the dominant style ($M = 21.4$).

On the word production task, as it had in the Ekstrand (1979) study, the main effect for subjects' performance approached significance, $F(1, 74) = 2.68$, $p < .10$; complementary dyads tended to generate more words ($M = 32.2$) than anticomplementary ones ($M = 29.2$). None of the other main or interaction effects reached significance.

To test the reliability of the unpredicted differential performance of mixed-gender hostile complementary dyads in comparison with mixed-gender friendly complementary dyads, an additional set of 40 subjects completed the experimental procedures, 10 in each of the following cells: hostile complements, men dominant; hostile complements, women dominant; friendly complements, men dominant; friendly complements, women dominant.

The 2 (Affect: hostile or friendly) by 2 (Men or Women Dominant) analysis of variance for number of puzzle pieces put together showed a significant interaction, $F(1, 36) = 4.99$, $p < .05$. Consistent with results from the initial analysis, tests for simple effects, $F(1, 36) = 4.10$, $p < .05$, revealed that hostile complementary dyads with men dominant put fewer pieces of the puzzle together ($M = 24.8$) than hostile complementary dyads with women dominant ($M = 41.6$). In fact, they also put fewer pieces

of the puzzle together than either of the friendly complementary dyads (men dominant, $M = 43.8$; women dominant, $M = 41.2$), who did not differ from the hostile complementary dyads with the women dominant.

As in the initial data set, there were no significant differences among the dyads in the production of words from the word *Washington*.

DISCUSSION

There was clear support for the complementarity hypothesis when dyads were asked to put pieces of a puzzle together and a tendency for support when they were asked to generate words. This pattern of results suggests that complementarity between individuals had its greatest impact on the jigsaw puzzle task, a task that required members of dyads to interact more than they had to in the word generation procedure. Compared with the word generation task, the jigsaw puzzle process was more likely to require the development of a cooperative strategy between members of a dyad; some way of working on the task had to be agreed on so that participants could work comfortably together to meet the goal assigned by the experimenter. While working on the jigsaw puzzle, the interactants had to move around the table in order to pass puzzle pieces to each other and to put pieces of the puzzle together. Feedback and informal observations suggested that interactants often spoke to each other while completing the puzzle task. This kind of interaction was missing from the word generation task, in which participants generally remained seated and quietly wrote words down and then compared their word lists to see how many unique words they had found. This lack of conversation between the participants on the word generation task probably played some part in the failure of complementarity to affect dyadic performance. However, the difference in performance between complementary and anticomplementary dyads nevertheless approached significance in the predicted direction. It is conceivable that if the parameters of the word generation task were changed to encourage more interaction between the participants, the differences might reach significance. On the basis of the data from both the present study and Ekstrand's (1979), it seems clear that the procedures for the word production task, as they are now constituted, do not produce differences in behavioral performance between complementary and anticomplementary dyads.

As suggested, researchers have usually attempted to evaluate the assumption of complementary transactions by studying the sequence of subjects' vocalizations rather than by seeing whether individuals placed together in complementary and anticomplementary dyads perform

differently. This may be an unfortunate research emphasis, because perhaps the most valid test of the concept of interpersonal complementarity should be what people do, not what they say. However, few investigators have examined the behavioral performance of dyads categorized as complementary or anticomplementary, let alone examining how hostile and friendly complements or the sex of interactants might influence behavioral outcomes of such interactions. Therefore, there are few data with which to directly compare the present result that complementary dyads, regardless of their affect, outperformed anticomplementary ones on the jigsaw puzzle task. This finding is important because it begins to establish the worth of a basic assumption of Sullivan's theory: that certain combinations of interpersonal style should work together more favorably than others.

Further, because support for the complementarity hypothesis was found after only a brief interaction, it would be expected that with more time performance differences between interactants should increase. In this regard, Nowicki and Manheim (1991) had complementary and anticomplementary women dyads interact for either 5 or 75 min. They found that women in complementary dyads liked each other more than those in anticomplementary dyads only when they had the chance to interact for 75 min.

Future studies should involve the interactants in a variety of tasks and for different lengths of time in an attempt to understand more fully how complementarity leads interactants to work more effectively with each other. It also appears that besides duration of interaction, gender of the interactants needs additional research attention (Kiesler, 1991). Gender had a significant impact on performance when dyads were complementary along the hostile dimension. It is to a further discussion of that finding that we now turn.

Although there was no overall difference between hostile and friendly complementary dyads, they both performed significantly better than anticomplementary pairings. However, it was within hostile complementary mixed-gender dyads that performance was found to differ depending on whether the man or the woman was dominant. What remained consistent across initial and additional data analyses was the finding that when males were dominant and females submissive in a hostile complementary dyad, the dyad put fewer pieces of the puzzle together than in any of the other complementary pairings. In fact, the performance of these dyads was more similar to that of anticomplementary dyads than to that of complementary ones.

It is difficult to know what about the hostile dominant men may have contributed to the lower performance of the dyad. Informal observations of them when they were

paired with hostile submissive women suggested that they may have been more likely than hostile and friendly dominant men with other types of partners to make fun of the study and to be uncooperative in doing the experimental tasks. In one instance, a hostile dominant man "jokingly" disturbed the pieces of the jigsaw puzzle that his hostile submissive woman partner had attempted to put together. However, it may also be that hostile submissive women may behave in ways that trigger oppositional aspects of the hostile dominant men's style. Likewise, performance may have suffered because hostile submissive women may be all too familiar with the behavior of hostile dominant men, which may have evoked learned ways of passive-aggressively dealing with their hostile dominance. That is, hostile dominant men may have wanted to compete but been foiled by hostile submissive women's subtle stalling or encumbering tactics. It would be interesting to videotape the puzzle process and examine it for information regarding any of these and other reasons for the lowered performance of hostile complementary transactions with men dominant and women submissive.

In any case, more information is needed for understanding the impact of differing degrees of complementarity and the process through which such impact takes place. Future researchers should examine combinations of interpersonal styles and gender pairings performing a variety of competitive and cooperative tasks for differing lengths of time. With men and women increasingly being asked to work together in many different settings, the results of such research would be both practically and theoretically interesting.

REFERENCES

- Anchin, J. C., & Kiesler, D. J. (Eds.). (1982). *Handbook of interpersonal psychotherapy*. Elmsford, NY: Pergamon Press.
- Andrews, J. D. W. (1990). *The active self in psychotherapy*. New York: Gardner.
- Billings, A. (1979). Conflict resolution in distressed and nondistressed married couples. *Journal of Consulting and Clinical Psychology*, 47, 368-376.
- Blumberg, S. R., & Hokanson, J. E. (1983). The effects of another person's response style on interpersonal behavior in depression. *Journal of Abnormal Psychology*, 92, 196-209.
- Carson, R. (1969). *Interaction concepts of personality*. Hawthorne, NY: Aldine.
- Deaux, K. (1985). Sex and gender. *Annual Review of Psychology*, 36, 49-81.
- Ekstrand, M. (1979). *Interpersonal effects of competition and cooperation among college students*. Senior honors thesis, Emory University, Department of Psychology.
- Kiesler, D. J. (1983). The 1982 Interpersonal Circle: A taxonomy for complementarity in human interactions. *Psychological Review*, 90, 185-218.
- Kiesler, D. J. (1988). *Therapeutic metacommunication: Therapist impact disclosure as feedback in psychotherapy*. Palo Alto, CA: Consulting Psychologists Press.
- Kiesler, D. J. (1991). Interpersonal methods of assessment and diagnosis. In C. R. Snyder & D. R. Forsyth (Eds.), *Handbook of social and clinical psychology: The health perspective*. Elmsford, NY: Pergamon Press.

- LaForge, R. (1977). *Using the ICL*. Mill Valley, CA: Author.
- LaForge, R., & Suczeck, R. F. (1955). The interpersonal dimensions of personality: III. An interpersonal check list. *Journal of Personality*, 24, 98-112.
- Leary, T. (1957). *Interpersonal diagnosis of personality*. New York: Ronald Press.
- MacKenzie, M. H. (1968). *The interpersonal behavior of normal and clinic family members*. Unpublished doctoral dissertation, Michigan State University.
- McLeod, M., & Nowicki, S. (1985). Interpersonal style and cooperative behavior in school age children. *Journal of Personality*, 117, 85-89.
- Nowicki, S., Jr., & Manheim, S. (1991). Interpersonal complementarity and time of interaction in female relationships. *Journal of Research in Personality*, 25, 322-333.
- Orford, J. (1986). The rules of interpersonal complementarity: Does hostility beget hostility and dominance, submission? *Psychological Review*, 93, 365-377.
- Paddock, J. R., & Nowicki, S. (1986). An examination of the Leary circumplex through the Interpersonal Check List. *Journal of Research in Personality*, 20, 107-144.
- Plutchik, R., & Conte, H. R. (1986). Quantitative assessment of personality disorders. In J. O. Cavenar, Jr. (Ed.), *Psychiatry* (Vol. 1, pp. 1-13). Philadelphia: Lippincott.
- Raush, H. L. (1965). Interaction sequences. *Journal of Personality and Social Psychology*, 2, 487-499.
- Sullivan, H. S. (1953). *The interpersonal theory of psychiatry*. New York: Norton.
- Taulbee, E. S., & Clark, T. L. (1982). *A comprehensive annotated bibliography of selected psychological tests: Interpersonal Check List, MMPI, Short Form, The Blacky Pictures*. Troy, NY: Whitson.
- Wiggins, J. S. (1982). Circumplex models of interpersonal behavior in clinical psychology. In P. C. Kendal & J. N. Butcher (Eds.), *Handbook of research methods in clinical psychology* (pp. 183-221). New York: Wiley.
- Wiggins, J. S. (in press). Agency and communion as conceptual coordinates for the measurement and understanding of interpersonal behavior. In D. Cicchetti & W. Grove (Eds.), *Thinking critically about psychology: Essays in honor of Paul E. Meehl*. New York: Cambridge University Press.