

The Interpersonal Circumplex as a Behavior Map

Robert Gifford and Brian O'Connor
University of Victoria, British Columbia, Canada

Using lexical and statistical techniques, Wiggins (1979) developed a comprehensive taxonomy of trait-descriptive terms in the domain of interpersonal behavior, the interpersonal adjective scales. The interpersonal adjective scales fulfill the qualities required of circumplex models, and their internal psychometric characteristics are sound. So far, however, little evidence about how the interpersonal adjective scales are related to actual interpersonal behavior has been advanced. Indeed, researchers have criticized them as merely tapping response styles or cognitive categories. Two studies confirm the hypothesis that social behaviors (preferred interpersonal distance and conversational participation) are ordered by the interpersonal adjective scales in an incremental manner that strongly accords with the theoretical basis of the circumplex. The interpersonal adjective scales do not merely represent cognitive categories for dispositions, nor are they merely a function of response biases; they map actual interpersonal behaviors.

Wiggins (1979) has offered a system of constructs that is one culmination—Conte and Plutchik (1981) and Kiesler (1983) are others—of a long tradition: the attempt to find order among interpersonal behavior tendencies. Wiggins's interpersonal adjective scales represent a taxonomic system for the interpersonal trait domain that follows several other attempts (e.g., Leary, 1957; Schaefer, 1959; Stern, 1970) to order words that describe the ways people interact.

After he sorted through, selected, factored, and discarded trait-descriptive adjectives, Wiggins arrived at an interpersonal circle that has two primary dimensions, dominance and warmth. These dimensions are familiar enough. Because many psychologists since Freud have continued to find that concepts resembling power and love are the basic interpersonal dimensions, personology may claim the discovery of something at least as real as photons and quarks.

Wiggins's particular contribution has been to develop a psychometrically sound way to measure these dimensions and their hybrids. The resulting eight scales (see Figure 1) are internally consistent and possess proper circular characteristics; that is, they intercorrelate in a pattern as close to the theoretical pattern of an ideal circle (circumplex) as may be expected.

A number of observers grant this much, but they protest that the interpersonal adjective scales are little more than an elegant statement of a near-universal implicit personality theory. Shweder and D'Andrade (1979), for example, viewed such models as reflections of the *cognitive ordering* of interpersonal behavior by observers, rather than an *objective ordering* of these behaviors by actors in the real world. They suggested that the circumplex maps the observer's organization of traits, but not the actor's actual behavior. Recent work (Weiss & Mendelsohn, 1986) suggests that Shweder and D'Andrade's *systematic distortion* hypothesis is unlikely, but even the developers of an in-

terpersonal circle admitted that it is uncertain whether "the circular organization of trait terms . . . reflects only the structure of the personality trait, or whether it is representative of the way people actually behave" (Conte & Plutchik, 1981, p. 707).

A different form of skepticism argues that the interpersonal adjective scales may be explained in terms of response biases. Jackson and Helmes (1979) simulated the responses of 500 subjects to the taxonomy. Factor analysis of the simulated responses yielded two factors that accounted for almost 95% of the variance; these two factors closely resembled the salience and threshold dimensions from Jackson's theory of stylistic responding. Jackson and Helmes stopped short of claiming that the new taxonomy taps "nothing but" response style, but they asserted that response style represents a plausible alternative explanation for Wiggins's results.

Together, these criticisms raise the question of whether the interpersonal adjective scales and other versions of the interpersonal circle merely map the way observers think about interpersonal behaviors or whether they can map or order the behaviors themselves.

Wiggins (1979) presented the interpersonal adjective scales as a systematic account of the interpersonal variables themselves, but he suggested the scales might be used as an assessment tool. The ability to predict actual behavior is one of the crucial *raison d'être* for personality assessment scales. Unfortunately, as Aries, Gold, and Weigel (1983) observed, studies of personality and behavior have often used *reported acts* as the behavioral criteria. Because reported acts are also subject to cognitive filtering and distortions, critics of the interpersonal adjective scales adhere to their charge that the scales merely tap implicit personality theories. The interpersonal adjective scales have not as yet been grounded in real, sweaty interpersonal encounters.

Wiggins (1979, p. 399) has described the interpersonal adjective scales as "potentially falsifiable." Criticisms that the structure exists only in the head of the observer led us to consider the falsifiability challenge in the sense of the circumplex as a

Correspondence concerning this article should be addressed to Robert Gifford, Department of Psychology, University of Victoria, Victoria, British Columbia, Canada V8W 2Y2.

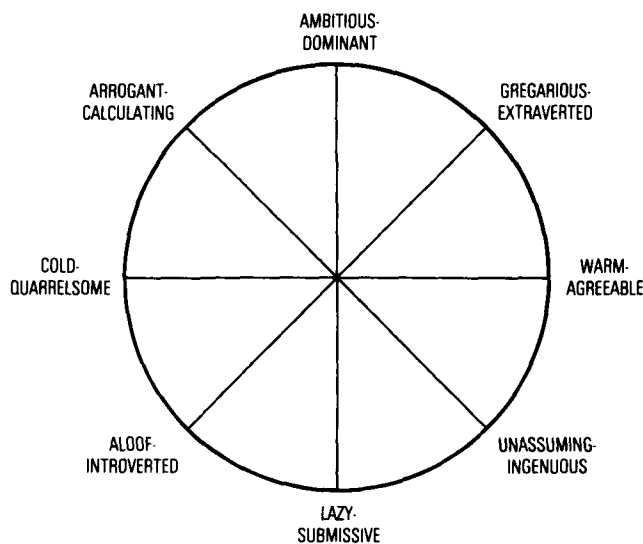


Figure 1. The interpersonal adjective scales.

device for mapping real behavior. This raises the question of what such a map would look like.

Each interpersonal act is presumably prototypical—to varying degrees—of a vector of the interpersonal adjective scales. That vector may coincide exactly with one of the eight scales around the circumplex, or it may happen to point to a space between them. Personal space or preferred interpersonal distance (IPD) serves as an example. Although IPD is affected by the social and physical environment as well as a person's pattern of dispositions (Gifford, 1987), one may hypothesize that large IPD is most characteristic of people with high scores on the interpersonal adjective scales' Aloof-Introverted or Cold-Quarrelsome scales. Thus, IPD should be most strongly correlated with one of these scales.

Interpersonal distance in fact correlates most strongly with Cold-Quarrelsome (Gifford, 1982). Given the structure of the circumplex, IPD should be slightly less correlated with scales adjacent to Cold-Quarrelsome (i.e., Aloof-Introverted and Arrogant-Calculating). Scales one step further removed should exhibit smaller correlations. At the dimension perpendicular to Cold-Quarrelsome (i.e., the vertical axis including Ambitious-Dominant and Lazy-Submissive), correlations should be minimal. Beyond this point, correlations should begin to rise again (but should be oppositely signed) until another maximum is reached 180 degrees from Cold-Quarrelsome at Warm-Agreeable.

If the interpersonal circumplex maps behavior, other interpersonal acts ought to exhibit similar patterns. The vectors indicating their maximum correlation or most prototypical location around the circumplex could, of course, point to scales other than Warm-Agreeable, or even to spaces between scales. However, the incremental rise and fall of correlations as described should be observed.

Study 1

The data for this study were collected by Gifford (1982). The original purpose was to investigate the effects of several influ-

ences and their interactions on preferred IPD, but the data allow an initial test of the mapping hypothesis using self-reported acts.

Method

Forty-two participants (22 male, 20 female) were recruited on a voluntary basis from undergraduate psychology classes and were asked to complete Wiggins's (1979) interpersonal adjective scales.

The participants were also asked to indicate their IPD choices in 18 social situations. The social situations were those developed in a taxonomy meant to represent an ecologically valid, representative sampling of social situations (Gifford, 1982). The three primary dimensions of the taxonomy were attraction, status, and type of activity. Included were three levels of attraction of the participant for the other (like, neutral, dislike), three levels of status (participant higher, equal, and lower than other), and two kinds of activity (cooperative or competitive).

The social situations were presented as vignettes that systematically varied these three dimensions in a $3 \times 3 \times 2$ matrix. For example, the vignette representing positive attraction to the other, high status for participant, and cooperative activity read as follows:

Your relatives are visiting during a holiday. Your favorite among your uncle's children asks you to help with a geography assignment. You're supposed to name cities and the child will say which country they are in. You agree to do it, and go off to a quiet room.

Each participant was asked to envision another person of the same sex who would be the other person in each vignette.

To determine whether the participants perceived the 18 situations as we intended, a separate sample of five judges, peers of the participants who were blind to the intended levels of attraction, status, and type of activity in the vignettes, rated the degree of each of the dimensions depicted in each vignette.

Reliability, measured as the mean correlation among the five judges, was .72 for attraction, .78 for status, and .79 for cooperation-competition. The Spearman-Brown formula predicted that the reliability of these ratings for the main sample of 42 participants would be .88, .96, and .97, respectively. Thus, one can conclude that the participants perceived the vignettes as we intended.

Participants read each vignette and then considered a prepared sheet depicting a room. The room was shown as a 9×12 cm rectangle drawn on a sheet of 13×21 cm paper. Two chairs were shown just outside the door to the room. On the basis of the size of the chairs, the lifeseize scale of the room would be about 5×7 m and would contain two adjacent tables measuring 2×4 m and 1×1 m. The room size and table arrangement were chosen to allow the participants a wide range of possible distances and angles for chair placement.

The participants were instructed to imagine entering the room with the other person and to "offer" the other person a chair by "placing" the chairs (drawing them) in the room where the participant would feel most comfortable under the circumstances described in the vignette. One such room was used for each situation; thus, the data consist of 42 participants' responses to each of 18 situations.

The dependent measure of interest here is the chosen distance from chair center to chair center, summed over the 18 situations to provide a generalized measure of each participant's preferred IPD across the systematically varied set of social situations.

Results

Self-reported IPD and the interpersonal adjective scales. Gifford (1982) found the strongest positive correlation with preferred IPD at Cold-Quarrelsome (.50) and the strongest negative correlation at Extraverted-Gregarious (-.35). That study

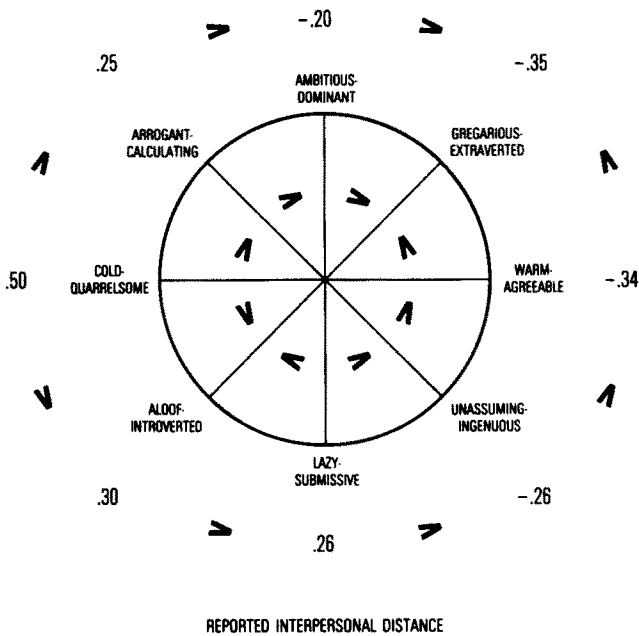


Figure 2. The predicted ordering of correlations (outer circle of inequality symbols) and means (inner circle of inequality symbols) for self-reported interpersonal distance.

showed, therefore, that a single interpersonal adjective scale (Cold-Quarrelsome) could account for about 25% of the variance in generalized personal space preferences, with the remainder presumably attributable to other personal, social, and physical setting factors.

In this study, the focus is on the patterning of correlations around the circumplex. We hypothesized that preferred IPD is most relevant to how Cold-Quarrelsome an individual is and least relevant to traits orthogonal to Cold-Quarrelsome. As a result, we expected to observe an incremental pattern for the eight interpersonal adjective scales as a whole. The computed correlations and the inequality symbols (outer circle) showing their incremental pattern are displayed in Figure 2.

As may be seen, the predicted pattern largely holds. Beginning with the maximum at Cold-Quarrelsome, the magnitude of correlations diminishes around the circumplex in both the upper (dominance) and lower (submissive) hemispheres of the circumplex. Once they become negative, they rise in an orderly manner to another maximum approximately 180 degrees away. The correlations at Gregarious-Extraverted and Warm-Agreeable are so close that it cannot be determined which might be the true terminus of IPD. Of course, the precise location of the terminus may well lie somewhere between the two scales.

If we assume that the behavior axis for preferred IPD is best marked (among the established marker scales of the interpersonal adjective scales) by Cold-Quarrelsome and Warm-Agreeable, Figure 2 contains just one minor reversal from the predicted pattern: the one point difference between Gregarious-Extraverted and Warm-Agreeable. We define a "reversal" as an instance in which an interpersonal adjective scale has a greater correlation than its neighbor when the neighbor should have had the greater score.

One concern we had about these encouraging results was that the scores of all participants were used for computing the correlations at each of the eight locations around the circumplex. The eight correlations therefore are not based on independent samples; the observed pattern is partly a function of this nonindependence in subjects' scores.

The very nature of the circumplex, however, makes comparison among independent samples difficult. One research strategy might be, for example, to identify separate samples of people who have high scores on each interpersonal adjective scale. Unfortunately, these people will also have quite high scores on adjacent interpersonal adjective scales. Thus, independence in the sense of separate samples of subjects could be accomplished in theory (although measuring the real interpersonal behaviors of the very large total sample required would be quite expensive), but independence in the sense of samples that have unrelated patterns of traits cannot—particularly when comparing adjacent traits on the circumplex. Nevertheless, we offer our own partial solution to this problem in the next section.

Mean interpersonal distance choice by interpersonal adjective scale. We wished to compare the mean preferred IPD for each interpersonal adjective scale with those of neighboring scales using independent samples. This would enable the comparison of means rather than correlations. To achieve an independent-sample comparison between participants who are necessarily similar, we used the following strategy. Each participant's scores for two adjacent traits were compared. We placed participants whose standard scores were higher on Trait A in one group and those whose standard scores were higher on Trait B in another. Thus, although scores on both traits might be high (or low), each participant was placed in the most appropriate interpersonal adjective scale category.

The mean IPD of the two groups was then computed and compared. By repeating this method for each of the eight adjacencies in the circumplex, a picture of the comparative IPD preferences for each interpersonal adjective scale was built. The inner circle of inequality symbols in Figure 2 shows the results of this analysis. Once again, an ordered pattern appears: Preferred IPD incrementally shrinks from the circumplex's lower left quadrant to its upper right quadrant. Two reversals occur on either side of Aloof-Introverted. As with the pattern of correlations, however, the picture is clear: The IPD behavior axis may be drawn in the vicinity of the Agreeable-Quarrelsome or Gregarious-Aloof dimensions.

Discussion

The interpersonal circumplex appears to be more than a set of cognitive categories or response biases. This study shows that a broadly based measure of IPD is well mapped by the circumplex. In particular, it seems that a behavior axis drawn somewhere between the Agreeable-Quarrelsome or Gregarious-Aloof dimensions marks a watershed. Agreeable and gregarious people express the smallest IPD preferences; 180 degrees away, quarrelsome and aloof individuals show the largest. This in itself is not news to personal space researchers. A more important finding is the high degree of incremental patterning found around the circumplex between the two termini of the IPD behavior axis.

This study was not without its limitations. Foremost among these was our use of a self-report measure, even though it was based on an ecologically representative sample of social situations. Nevertheless, the incremental hypothesis has received support for at least one type of reported act.

Study 2

In this investigation, we sought to extend the range of interpersonal behaviors from personal space preferences to a broader range of typical activities and to move from self-reported acts to actual behaviors. We selected the free-ranging conversation as a natural arena for examining the interpersonal adjective scales in relation to verbal and nonverbal interpersonal behaviors.

Method

Subjects and setting. Sixty undergraduates participated in groups of 3. The 20 same-sex groups were equally divided between men and women. The subjects were drawn from the psychology department's subject pool, and they participated on a volunteer basis for a study of "conversational patterns." The conversations took place in a 5.0 m × 6.7 m laboratory room that is carpeted, has paintings on the wall, and resembles an informal waiting room. The participants sat in chairs arranged in a semicircle. They were made aware that they were being videotaped, but to reduce self-consciousness, the cameras were placed in smoked-glass cabinets. To allow an unobstructed view of all participants for later scoring of verbal and nonverbal behavior, we used two cameras placed at right angles.

Procedure. In a prior session, participants completed the interpersonal adjective scales. Upon arrival at the conversation session, they were introduced to one another and asked to take a seat. They were given a list of suggested topics but were encouraged to converse on any topic they chose. The conversations were allowed to proceed for about 15 min.

Behaviors. A number of measures of conversational involvement were coded from the videotapes. We derived several of these from Bales's (1970) Interaction Process Analysis scheme. The first, *acts initiated* (AI), indexes the number of occasions on which a participant originated a whole verbal unit, which could be a sentence, paragraph, or an extended dialogue (Bales, 1970). Responses such as "oh yeah" and "really" were scored as single acts. Two acts were scored when, for example, a participant answered someone else in the group and then, after two or three sentences, brought up another topic.

We categorized AI on the basis of whether the verbal units were addressed to the group as a whole (AI group) versus those addressed to a specific person (AI individual). The number of questions asked (questions) was counted. The amount of time that participants spent talking about themselves (self-talk), about someone else in the group (other talk), and about neutral topics (neutral talk) were also measured.

In addition to these measures of verbal participation, we also coded four nonverbal behaviors: the amount of time spent gazing at other participants (gaze), the amount of time spent gesturing (gestures), the degree to which participants' arms were held in an open versus wrapped position (wrap), and the percentage of time participants showed a noticeably positive facial expression (smile).

The verbal behaviors were scored for 14 min of the conversation, and the nonverbal behaviors, because of a shortage of funds, were scored for a 5-min period in the middle of the conversation.

Results

Reliability of measures. Because only a single rater scored the nonverbal behaviors for all 60 participants, we estimated

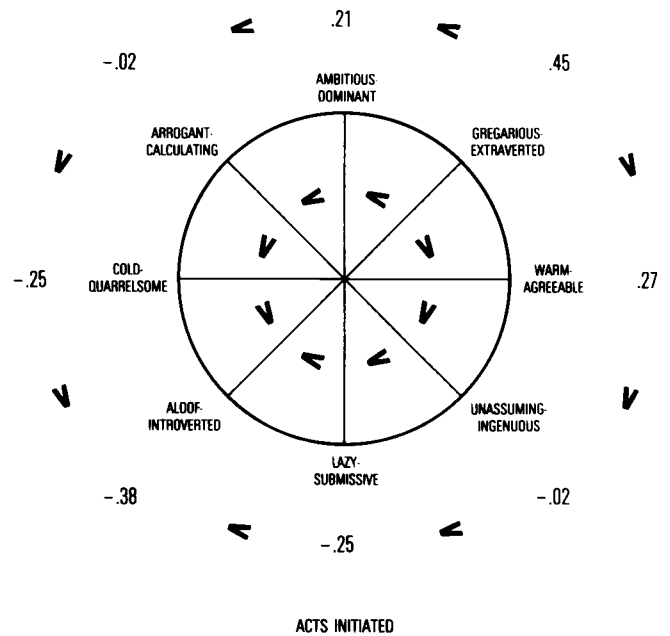


Figure 3. The patterning of correlations and means for acts initiated.

the reliability of the nonverbal behaviors by asking two trained assistants to independently score the behavior of three groups (9 participants). The reliability of a single rater, corrected by the Spearman-Brown formula to estimate reliability over the full sample (Guilford, 1956, pp. 281, 452), was calculated as .98 for wrap, .99 for gaze and gestures, and .79 for smile. The reduced amount of scoring time did not impair the reliability of the nonverbal measures.

We computed the reliability of the verbal behaviors by asking two trained observers to score independently the behavior of 15 participants. Reliability, estimated as for the nonverbal behaviors, was .95 for AI, .75 for AI group, .85 for AI individual, .97 for questions, .97 for self-talk, .99 for other talk, and .93 for neutral talk. Again, reliability appeared to be more than adequate.

Patterns of correlations and means. To ascertain the degree of association among the conversational involvement measures, Pearson correlation coefficients among them were computed. As might be expected, a few correlations were quite high. For example, AI and AI individual were correlated .81, and questions and other talk were correlated .77. However, most of the other correlations were more modest. The mean correlation (computed using Fisher's *r*-to-*z* transformation) was .29. We were satisfied that although a sample of conversational involvement behaviors cannot be completely independent of one another, they represented a series of reasonably distinct tests of the mapping hypothesis.

We computed the correlations and means for each behavior in the same way as in Study 1 and then plotted their pattern on the circumplex. For visual examples, see Figures 3, 4, and 5 and for the complete numerical data see Table 1.

As can be seen, a strong incremental pattern resulted for most behaviors. Reversals—defined earlier—are deviations from the ideal predicted pattern. For each behavior diagram, 16 compar-

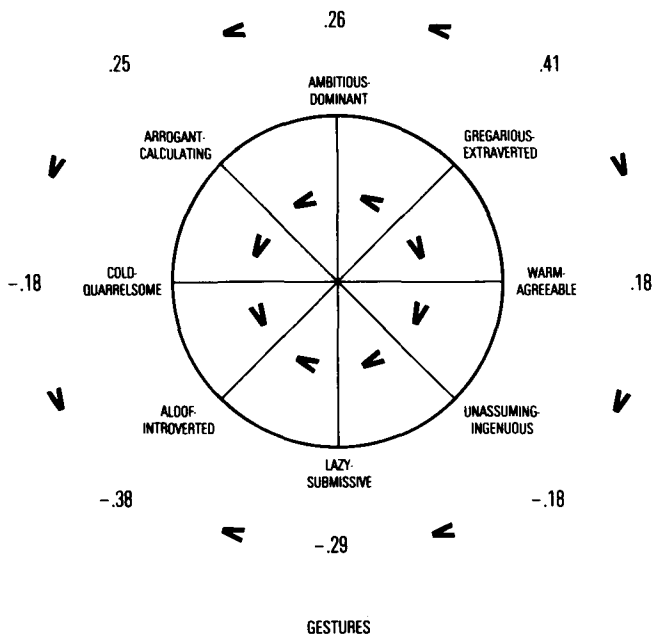


Figure 4. The patterning of correlations and means for gestures.

isons can be made (8 correlations and 8 means). Three behaviors (AI, AI individual, and gestures) showed zero reversals from the ideal behavior map, two (questions and smile) showed only one reversal, and two showed two reversals (other talk and wrap). Acts initiated group and self-talk showed three reversals, neutral talk showed four, and gaze showed seven.

No inferential statistic seemed perfectly relevant to the task of testing the significance of the patterning observed, but we searched for an appropriate test for our unusual patterning hypothesis. The best test may be a simple analysis based on the binomial theorem. If we assume that each comparison between neighboring interpersonal adjective scales has an equal chance of going either way, the probability of finding a pattern with n reversals from the ideal model may be computed. Because the eight tests around the circumplex may not be fully independent, the binomial theorem approach may not be ideal, but we are unaware of any better test. The probability of finding zero reversals in a 16-comparison circumplex by chance is about 1 in a 100,000; that of finding one reversal is about 2 in 10,000; that of finding two reversals about 16 in 10,000; that of three reversals about 8 in 1,000. Comparison of these probabilities with the number of reversals found demonstrates that the circumplex orders these actual behaviors, which are measured separately from the interpersonal adjective scales themselves, in an convincing fashion. Regardless of the adequacy of the binomial theorem approach to testing the patterning hypothesis, the data seem to speak for themselves.

Nonoptimal patterning. The one behavior that manifests a large number of reversals is gaze. The overall degree of patterning of the other behaviors astounded us, but gaze represented an interesting exception. Although all the behaviors studied are interpersonal, they may vary in the degree to which people can control them. A person's dispositions, as assessed by interpersonal adjective scales, may have less effect on behaviors that are

influenced more by a conversational partner or other situational factors. Intuitively, AI and gestures would seem to be more under the control of the individual, but gaze may be a more mutual act (cf. Argyle & Cook, 1976, p. 110; Exline & Fehr, 1982, p. 118).

To investigate this idea, we returned to our videotapes to assess another typical conversational behavior that we felt people have decidedly little control over, acts received. As its name implies, acts received indexes the number of instances in which a participant is the target of another participant's verbal output. Observer reliability for acts received was .91. Acts received's patterning is definitely noncircular: the total number of reversals is five. This provides some evidence that the circumplex maps interpersonal behaviors, but it may map acts that are less constrained by the direct input of others in the social interaction (such as AI and gestures) much better than it maps acts that are more dependent on the input of others (acts received and gaze). This, of course, is an issue that deserves further attention from researchers.

Similarity of behavior axes. Perusal of Table 1 reveals a strong tendency for the behavior axes in this study to be aligned roughly from Aloof-Introverted to Gregarious-Extraverted. Each trait of the interpersonal adjective scales is presumably related to one or more prototypical interpersonal act, and one would presume that different traits are relevant to different acts. We therefore expected the behavior axes to be oriented more variably around the circumplex.

A review of the interpersonal adjective scales' conceptual foundations shows that Wiggins (1979) relied on the facet approach of Foa and Foa (1974). A fundamental facet in their approach is whether people are accepting or rejecting. At one extreme, gregarious-extraverted people are very accepting (they accept the love and status of both self and other). At the other extreme, aloof-introverted people reject the love and sta-

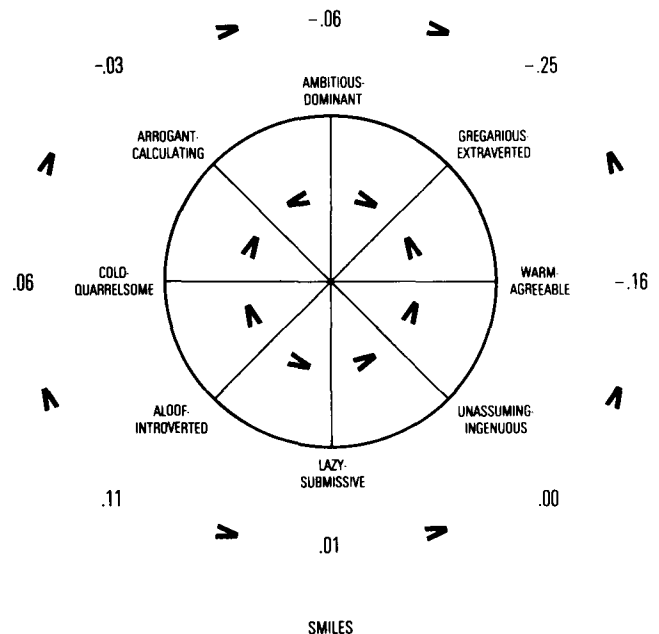


Figure 5. The patterning of correlations and means for smiles.

Table 1
Means, Correlations, and Number of Reversals for Nonverbal Behaviors in Studies 1 and 2

Disposition	M 1	M 2	Direction	r	Direction	Disposition	M 1	M 2	Direction	r	Direction
Study 1: Reported interpersonal distance						Study 2: Self-talk (<i>continued</i>)					
NO	551	568	-	-.35	-	BC	57.2	63.5	-	.19	+
LM	541	571	-	-.34	-	PA	52.7	68.6	-	.18	-
JK	501	606	-	-.26	-	Reversals			1		2
HI	563	554	+	.26	-	Study 2: Other talk					
FG	518	592	-	.30	-	NO	12.7	9.3	+	.34	+
DE	612	500	+	.50	+	LM	12.3	9.3	+	.32	+
BC	603	515	+	.25	+	JK	10.3	11.5	-	-.14	+
PA	576	541	+	-.20	+	HI	11.5	10.4	+	-.17	+
Reversals			2		1	FG	9.9	11.8	-	-.29	-
Study 2: Acts initiated						DE	11.6	10.1	+	-.28	-
NO	53.6	44.4	+	.45	+	BC	8.7	13.0	-	-.21	-
LM	52.4	44.7	+	.27	+	PA	8.6	13.3	-	.17	-
JK	50.8	46.4	+	-.02	+	Reversals			2		0
HI	49.9	47.6	+	-.25	+	Study 2: Neutral talk					
FG	46.2	51.1	-	-.38	-	NO	198	165	+	.13	+
DE	45.9	51.5	-	-.25	-	LM	195	165	+	.01	-
BC	46.0	51.4	-	-.02	-	JK	180	181	-	.04	+
PA	43.8	53.9	-	.21	-	HI	202	163	+	-.03	+
Reversals			0		0	FG	187	174	+	-.12	+
Study 2: Acts initiated to group						DE	160	201	-	-.22	-
NO	12.1	10.1	+	.30	+	BC	178	184	-	-.04	-
LM	13.2	8.7	+	.24	+	PA	168	194	-	.05	-
JK	13.1	8.8	+	.04	+	Reversals			2		2
HI	10.5	11.5	-	-.18	+	Study 2: Gaze					
FG	11.4	10.7	+	-.20	+	NO	68.3	69.9	-	.14	-
DE	9.5	12.5	-	-.22	-	LM	70.9	67.4	+	.20	+
BC	9.8	12.3	-	-.02	-	JK	68.4	70.1	-	.02	-
PA	10.2	11.9	-	.21	-	HI	70.9	67.8	+	.07	+
Reversals			2		1	FG	67.7	70.7	-	-.05	+
Study 2: Acts initiated to individuals						DE	68.7	69.7	-	-.13	-
NO	39.9	31.8	+	.39	+	BC	72.0	66.3	+	.10	+
LM	37.1	33.9	+	.21	+	PA	64.5	74.2	-	.02	-
JK	36.2	34.9	+	-.07	+	Reversals			3		4
HI	39.0	32.8	+	-.24	+	Study 2: Gestures					
FG	32.6	38.6	-	-.40	-	NO	11.1	5.8	+	.41	+
DE	34.2	36.9	-	-.16	-	LM	10.8	5.6	+	.18	+
BC	33.5	37.6	-	-.02	-	JK	9.9	6.7	+	-.18	+
PA	31.3	40.1	-	.21	-	HI	9.9	6.9	+	-.29	+
Reversals			0		0	FG	7.2	9.4	-	-.38	-
Study 2: Questions						DE	3.9	12.6	-	-.18	-
NO	6.7	6.1	+	.39	+	BC	7.9	8.7	-	.25	-
LM	7.5	5.2	+	.37	+	PA	6.8	9.8	-	.26	-
JK	6.4	6.3	+	-.13	+	Reversals			0		0
HI	7.0	5.8	+	-.26	+	Study 2: Wrap					
FG	5.8	6.9	-	-.34	+	NO	3.7	4.2	-	-.30	-
DE	6.1	6.6	-	-.40	-	LM	3.6	4.4	-	-.17	-
BC	5.4	7.3	-	-.26	-	JK	3.7	4.3	-	.03	-
PA	5.3	7.6	-	.18	-	HI	3.6	4.3	-	.08	-
Reversals			0		1	FG	4.2	3.7	+	.35	+
Study 2: Self-talk						DE	4.3	3.6	+	.06	+
NO	68.0	53.6	+	.28	+	BC	3.8	4.1	-	-.12	-
LM	62.5	58.1	+	.15	+	PA	4.3	3.6	+	-.04	+
JK	68.4	51.8	+	.06	+	Reversals			1		1
HI	60.0	60.7	-	-.19	-	Study 2: Wrap					
FG	56.7	64.0	-	-.16	-	NO	3.7	4.2	-	-.30	-
DE	50.1	70.6	-	-.12	-	LM	3.6	4.4	-	-.17	-

Table 1 (continued)

Disposition	M 1	M 2	Direction	r	Direction	Disposition	M 1	M 2	Direction	r	Direction
Study 2: Smiles						Study 2: Acts received					
NO	82.1	84.3	-	-.25	-	NO	37.5	34.4	+	.23	+
LM	81.5	85.2	-	-.16	-	LM	35.7	35.9	-	.10	-
JK	82.2	84.4	-	.00	-	JK	37.7	33.8	+	.22	+
HI	82.9	83.5	-	.01	-	HI	40.1	32.3	+	.10	+
FG	83.9	82.6	+	.11	+	FG	34.5	37.2	-	-.22	-
DE	84.1	82.4	+	.06	+	DE	38.9	32.8	+	-.13	+
BC	82.8	83.7	-	-.03	+	BC	36.4	35.3	+	-.23	-
PA	85.1	81.3	+	-.06	+	PA	32.6	39.2	-	-.01	-
Reversals			1		0	Reversals			3		2

Note. Interpersonal adjective scales are as follows: NO = Gregarious-Extraverted; LM = Warm-Agreeable; JK = Unassuming-Ingenuous; HI = Lazy-Submissive; FG = Aloof-Introverted; DE = Cold-Quarrelsome; BC = Arrogant-Calculating; and PA = Ambitious-Dominant. M 1 is the mean amount of behavior (e.g., number of smiles) of participants whose standard scores on a given disposition were higher than their standard scores on the next-listed disposition. M 2 is the mean amount of behavior for participants whose standard scores on the disposition were lower than their standard scores on the next-listed disposition. A plus sign in the first Direction column indicates that M 1 exceeds M 2; a minus sign indicates that M 2 exceeds M 1. A plus sign in the second Direction column indicates that the correlation between the disposition on the same line and the nonverbal behavior was more positive than the equivalent correlation for the disposition on the line below. In both cases, the prediction is for four successive plus signs followed by four successive minus signs. Reversals are the number of deviations from this prediction.

tus of both self and other. The dimension found so frequently in this study coincides with the maximum and minimum in social "acceptingness."

We entertained the idea that this dimension might be a universal, and we even gave it a name (*grexalin*). The theory underlying the interpersonal adjective scales, however, would predict that different axes would emerge for different kinds of interpersonal encounters. Our research involved relatively pleasant conversations among peers; perhaps when status or competition are more salient, such as in meetings between employers and employees or among business partners, other dimensions will become more salient.

General Discussion

The principal advantage of the Interpersonal Circle is that it provides a theory-based definition of the universe of content of interpersonal behavior within which the expected relationship between a given vector of interpersonal behavior and all other vectors of interpersonal behavior may be specified with geometric precision with reference to the two orthogonal coordinates of *status* (power, agency, dominance) and *love* (solidarity, communion, affiliation). (Wiggins & Broughton, 1985, p. 2)

Study 2 advances this claim from one based in research on semantics and reported acts to one based in research with actual behaviors. Together, these two studies demonstrate that reported personal space and several conversational behaviors, particularly those over which people have more control, can be mapped on the interpersonal circle. That the interpersonal adjective scales, which admittedly were developed from a purely lexical-statistical basis, so successfully order actual behavior lends strong support to the idea that they are not merely a mental map of dispositions, nor a fancy way to measure response bias.

Confirmation of the mapping hypothesis opens many vistas for research, assessment, and theory. Researchers will locate the behavior axes of many other interpersonal acts. They will an-

swer the grexalin question (whether other alignments of interpersonal acts exist). Those involved in personality assessment can use the interpersonal adjective scales with the confidence that numerous real behaviors may be predicted from and are ordered by them. Theoreticians can begin to examine the structure of interpersonal behavior from an empirical base.

An interesting parallel may be drawn between efforts by personologists and cartographers. Both have long struggled to devise systems to order the phenomena they study. Personologists have tried to structure interpersonal behaviors and the cartographers have tried to structure geographic knowledge. The key cartographic concepts of latitude and longitude were proposed about the same time (i.e., in the second century A.D.) that Galen proposed the first personality coordinates, choleric-phlegmatic and sanguine-melancholic. Latitude was always easy to measure, but longitude was not accurately measurable—particularly at sea, where it was most needed—until the perfection of the chronometer in the 1750s. Then different groups struggled over where the prime meridian was to be located for another century, until 1884, when an international congress placed it at Greenwich, England.

The equivalents of latitude and longitude in the interpersonal domain have long been known to be power and love. But measuring human tendencies has proved more difficult than measuring physical concepts, and only in the last 50 years have researchers reported two-dimensional circular orderings of interpersonal variables (Schaefer, 1961).

It has taken until the last few years to develop an instrument that measures these concepts about as well for personology as the chronometer measured longitude for cartography. Cook's voyages in the 1780s demonstrated the practical power of the new tool in accurately navigating and mapping the new world.

Aided by the lure of a very large government prize, the invention of the chronometer put cartography 2 centuries ahead of personology. But it took cartographers another 100 years after they were capable of accurately measuring longitude to agree

just where to place their prime meridian. Each nation wanted it drawn through one of its own cities. This reminds us of attempts by different personologists to use their own versions of the interpersonal circle to orient or explain the interpersonal circles of others. In the Age of Discovery, considerable confusion about the location of New World places resulted when navigators recorded their longitudes in relation to different prime meridians. If personologists could learn from the lesson of the cartographers, they might make up considerable lost scientific time by agreeing on a Greenwich (a standard interpersonal circle) in less than a century.

Compared with the 70,000-mile voyage of Cook, the present voyage is modest indeed, perhaps equivalent to the successful navigation of the 26-mile Strait of Georgia between Victoria and Vancouver, but it does show the practical mapping value of the interpersonal circle. Now all we need, apart from more ambitious voyages, is that international conference to establish the location of the prime meridian.

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