

Sociability: Traits, Settings, and Interactions

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Sociability was examined in relation to the trait, setting, and interaction controversy. Sociability, measured behaviorally as verbal participation in an unstructured conversation, was expected to be greater for participants who were affiliative and exhibitionistic but not defensive (traits); for "sociopetal" seating arrangements and for greater environment-elicited pleasure, arousal, and dominance (settings); and for interactions among and between these trait and setting measures. Sociability did, as hypothesized, increase with the traits of affiliativeness and exhibitionism, the setting variables of pleasure and arousal, one Person \times Person interaction, and one Setting \times Setting interaction. However, seating arrangements and 12 Person \times Setting interactions were notably unrelated to sociability; assertions that Person \times Setting interactions account for large portions of variance in behavior are unsupported. Instead, the results suggest that more attention should be paid to the predictive utility of interactions among person measures and among setting measures.

By now it is clear that sociability, defined here as verbal participation, is influenced by a wide range of variables, from the subtle microkinesic cues people display in entering a meeting room (Cary, 1976) to the enduring interpersonal relationships making up a group's personality, or "syntality" (Cattell, 1948). Person-based measures have been the most frequently studied correlates; two decades ago Mann (1959) could already review 17 studies of the relationship between individual difference measures and verbal activity rate.

On the other hand, interest in the relationship of physical setting variables to verbal interaction began as an afterthought (Steinzor, 1950) but increased with the general upsurge of interest in the physical environment and behavior (e.g., Osmond, 1957; Sommer, 1969).

Very few studies of sociability have included both person and environment measures in the same investigation or investigated statistical interactions between them.

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However, the literature is now strong enough to allow the listing of many univariate hypotheses with some confidence (see Shaw, 1976, especially pp. 148-153 and 185-193). These can provide the basis for empirical investigations of how individuals and environments interact to produce different quantities or qualities of social interaction.

Since Mischel's (1968) review, the debate on persons, settings, and interactions has sharpened (e.g., Alker, 1972; Bowers, 1973; Endler, 1975). One conclusion to be drawn from the debate is that more studies of specific criteria should be performed in a framework that allows direct comparison of person, environment, and interaction measures as predictors. Only as studies of a broad sample of behaviors accrue can theoretical claims be evaluated.

The present operational definition of sociability is based on its dictionary definition and on examination of prominent scales used to measure it. Webster's New World Dictionary of the American Language defines sociable as "friendly," "affable," and "characterized by informal conversation." Eysenck's Sociability factor includes many items indicating willingness or unwillingness to verbally interact with others, such as "Do you like talking to people so much that you

would never miss a chance of talking to a stranger?" and the negatively scored "Are you mostly quiet when you are with other people?" (Eaves & Eysenck, 1975). Similar items are found on the California Psychological Inventory scale Sociability. Verbal participation in an unstructured group situation therefore seemed a reasonable behavioral indicator of sociability.

In selecting trait measures as predictors, the goals were to find measures developed with a high level of concern for psychometric properties of scales and to find those that from theoretical considerations could be hypothesized to correlate with the sociability criterion both positively and negatively in the manner of the convergent-discriminant approach. The Personality Research Form (PRF; Jackson, 1974) meets these goals within the framework of a single inventory.¹ From the most relevant conceptual category of PRF scales (Degree and Quality of Interpersonal Orientation), three scales were selected for their clear theoretical relationship to sociability. The defining adjectives of Affiliation (AF) include: sociable, affable, gregarious, and genial. Those for Exhibition (EX) include: expressive, entertaining, spell-binding, and demonstrative. Those for the trait expected to correlate negatively with sociability, Defence (DE), include: resists inquiries, guarded, wary, and secretive.

Four setting measures were selected. One was Osmond's (1957) "sociopetal-sociofugal" (SP-SF) dimension. The SP-SF dimension was chosen because of its hypothesized relevance to verbal participation and because it appears to encompass several other setting cues that affect social interaction, including eye contact (Argyle & Cook, 1976), interaction distance (Hall, 1966), and angle of orientation between conversers (Mehrabian & Diamond, 1971a, 1971b). Osmond proposed that more social interaction can be expected in SP settings. Although the SP-SF dimension is frequently cited in environment-behavior discussions, it should be noted that only one study has explicitly examined it (Holahan, 1972); the SP-SF verbal participation hypothesis was supported in that instance. In a less direct test, however, Mehrabian and Diamond (1971b) found no differences in amount of

conversation among four furniture arrangements.

The other setting measures selected refer to emotional qualities of the environment, which have been investigated in a series of studies by Mehrabian and Russell (1974, 1975; Russell & Mehrabian, 1978). In the 1978 study, a self-report measure of the desire to affiliate was significantly related to setting-elicited Pleasure (P), Arousal (A), and Dominance (D) and certain interactions among these affect dimensions.

Among the few studies of sociability that have examined Person \times Setting interactions are those of Mehrabian and Diamond (1971a, 1971b). As in the Mehrabian and Russell studies, certain interactions were significant, but the unsettling tendency for specific interactions to fail to cross-validate is evident when the two 1971 studies are compared.

The tendency of interactions not to replicate tempts one to dismiss their long-range value as behavior predictors. However, two considerations militate against the abandonment of interactions at this time. First, more experience with them is required to confirm or deny this apparent fickleness. There simply have not yet been enough studies of interaction effects on social behavior. Second, a prevalent aspect of the zeitgeist is toward acknowledging or championing interactionism (e.g., Bowers, 1973; Endler, 1975). Third, some kinds of interactions are especially understudied, including Person \times Person (cf. Carlson, 1971) and Setting \times Setting interactions.

In the present study, three kinds of interactions are considered. First, intrapersonal interactions, or trait configurations, represent patterns of traits that, hypothetically, increase the ability to predict social behavior beyond the contributions of trait main effects. For example, a person high on Affiliation is expected to participate more in a conversation. It may be reasonable to hypothesize that such a person's conversational participation might be additionally en-

¹ The California Psychological Inventory contains a scale that seemingly is more appropriate to this study (Sociability), but it is not as valuable in providing other scales relevant to verbal interaction.

hanced if the individual is exhibitionistic, that is, an Affiliation \times Exhibition interaction.

Second, interactions of person and setting measures may affect social behavior. Thus, a sociopetal setting might reasonably be expected to produce more social interaction if a person in it is trait affiliative. In general, Person \times Setting interactions have received more attention (e.g., Endler, 1975) than the other two types.

Third, interactions among the environment measures may influence social behavior. Mehrabian and Russell's (1975) results, for example, lead to a hypothesis of increased verbal participation with $P \times D$, $P \times A$, and $P \times A \times D$.

The purpose of the present study was to investigate the value of the aforementioned trait and physical setting measures separately and as interactions as predictors of sociability, that is, the frequency with which individuals will verbally participate in an unstructured conversation.

Method

Subjects

Participants in the study were recruited on a voluntary, unpaid basis from university introductory psychology classes. In the classroom announcement, they were asked to join in a study of personality and the environment, which would include personality testing. The students were told that they would receive results from the tests at the session. A total of 60 participants (16 males and 44 females) were formed into 20 triads. Seven triads were all-female, 10 were two thirds female, and 3 were two thirds male.

Procedure and Materials

When a participant arrived at the laboratory, he or she was escorted to an individual booth. There a form of the PRF (Form E; Jackson, 1974) was administered, which embedded the AF, DE, and EX scales among others less directly related to verbal participation (Nurturance, Autonomy, and Dominance). The purpose of the embedding procedure was to dilute the salience of the social interaction quality of the AF, DE, and EX scales.

After all three participants in the session had completed the PRF, they were brought together and ushered into the experimental room. Since recruitment was based on returning the test results to the subjects, the experimenter explained the group waiting situation by stating that it was more efficient to administer the test

in groups than to individuals. Upon entering the room, they were told that scoring the test would take about 10 minutes. They were asked to take a seat and wait.

The room was regularly used for group meetings and experiments. It was 3.0 m \times 2.9 m, carpeted and paneled, and had drapes over three walls. Two walls contained large one-way mirrors, which were partly covered by drapes. Three armchairs of modern Scandinavian design were available, and a table with magazines was also present. The situation in which participants found themselves was an unstructured one. It resembled everyday situations in that (a) no leader was assigned; (b) one was waiting with others, as in a doctor's office or airport waiting area; and (c) the waiting was more or less public.

All triads experienced the same setting and procedure, except for the SP-SF manipulation. For half of the groups (in a preplanned alternating order), the chairs were placed in a circle around the table (SP condition). The remaining triads entered the room to find a row of equally spaced chairs against the wall, all facing the same direction, with the table in front of them (SF condition).

These arrangements (circle and row) are not the strongest possible manipulation of the sociopetal variable. One could, for example, contrast inward-facing circles with outward-facing circles. The circle versus row contrast was selected because it seemed to provide a reasonable contrast based on the classic descriptions of SP-SF (e.g., Osmond, 1957; Sommer, 1969) and because it promotes greater experiential realism (cf. Paterson, 1977) in the subjects than would a stronger but less typical seating arrangement such as an outward-facing circle. The reading material was present in both conditions to provide some choice of activity for participants (cf. Sommer, 1969, p. 84).

The experimenter left the group and went to another room to hand score the tests. An assistant monitored the social interaction of the group from a room adjoining the experimental room. All sessions were audiotaped, using a hidden microphone, for later reliability checks of the scoring. The scoring system consisted of recording on a prepared sheet which, if any, group members were engaged in speaking during 120 successive scoring intervals 5 sec apart. The 10-min session length was selected after pilot study observations showed that verbal participation rates for four groups varied very little over the four quartile periods of 20-min sessions.

The assistant wore headphones. Through one channel she could hear the conversation, and through the other she could hear a prerecorded series of tones, which served to mark the intervals. Scoring intervals of 500 msec were heralded and terminated by tones lasting 250 msec. Any participant whose voice could be heard during the scoring interval was noted. The scoring system can be viewed as a long series of repeated measurements of each participant's sociability. From a subjective point of view, the total scores very accurately reflect actual participation rates. Objectively, the scoring system was found to be reliable. Correlations between the live scoring and later scoring from the tapes by a different scorer ranged from 88% to 97% on eight tape samples totalling 1,076 intervals.

At the end of each session, participants completed a questionnaire including biographical information and the P, A, and D affect measures. The P, A, and D scales can be found in Mehrabian and Russell (1974). Subjects were then debriefed. They were given their personality scores in broad terms (i.e., high, medium, low) and informed that the PRF is a measure of traits in the normal range and that no score should be taken as an indication of pathology. Each subject was queried carefully about possible negative affect arising from the taping; none showed any. Possibly this was because, due to the public nature of the waiting situation, no participant engaged in self-disclosure that might be considered risky or private.

Results

Interdependence of Participants' Sociability Scores

It is reasonable to expect that the social participation of a given participant may be dependent on the social climate. For example, one can imagine an introvert speaking more than usual, because extraverts in the group draw out the introvert's opinions. However, interdependence can be viewed as an empirical question. The intraclass correlation coefficient r_1 provides a measure of the dependency of participants' speaking totals as a function of group membership. When computed (Steel & Torrie, 1960, pp. 190-191) for the present data, r_1 had a value of .09. The F ratio for this relationship, with 19 and 59 degrees of freedom, is .738 ($p > .75$). Thus, individual participation in the groups was statistically independent of group membership. Subsequent analyses employed the individual as the behavioral unit.

Sociability Scores and Main Effects

The percentage of intervals during which the mean participant spoke was 26.2, with a standard deviation of 16.7. The range of individual differences in sociability is further illustrated by noting that participation varied from 0% to 68% of the intervals.

Table 1 presents the Pearson correlation coefficients among the principal measures. The results indicate that conversation scores were, as hypothesized, significantly related to the trait measures AF and EX and to the environment measures P and A. The DE, D, and SP-SF hypotheses were not confirmed. The latter finding is surprising, given Holahan's (1972) confirmatory results and the intuitive appeal of the sociopetal concept, which has, more than any empirical evidence, caused it to be routinely presented in textbooks as an important determinant of conversational participation.

Sociability did not significantly vary with any of several covariates, including sex, size of hometown, birth order, population density of the family home, acquaintance with other group members, PRF-Autonomy, and PRF-Dominance. PRF-Nurturance was marginally significantly correlated ($r = .23$, $p < .05$).

Sociability Scores and Interactions

Potential interactions among the variables are numerous. However, depending on the

Table 1
Correlations Among Sociability Scores and Independent Variables

Measure	1	2	3	4	5	6	7	8
1. Sociability	—							
2. Affiliation	.40**	—						
3. Exhibition	.38**	.49**	—					
4. Defence	-.6	.08	.05	—				
5. Sociopetal-sociofugal arrangement	.03	-.01	.07	.04	—			
6. Pleasure qualities	.40**	.17	.12	-.07	-.07	—		
7. Arousing qualities	.24*	.16	.09	-.19	.11	.31**	—	
8. Dominance-eliciting qualities	.15	.19	.18	.00	.06	.36**	.18	—

Note. $N = 60$. The direction of significant criterion correlations is that participants verbalized more if they were higher on Affiliation and Exhibition. Results for both seating arrangements are combined in the table, since SP-SF is not significantly related to any other variable.

* $p < .05$. ** $p < .01$.

theoretical priorities an investigator chooses, they can be classed into the three groups. The confirmed trait theorist presumably would search first among the interactive effects of AF, EX, and DE to explain sociability. Correlations of sociability with the interactions (displayed in Table 2) were computed by partialing out the main effect components of the interactions first; it is sometimes forgotten that the product of two variables is not the same as the interaction term involving those two variables (Cohen & Cohen, 1975, p. 295). One intrapersonal interaction reached significance: EX \times DE. The suggestion is that individuals who are high on Exhibition are more sociable if they are also trusting (low on DE).

The strong Person \times Setting interactionist would presumably search primarily among that class of interactions for an explanation

of participation rates. Unfortunately, none of the 12 Person \times Setting interactions reached significance.

The strong environmentalist would anticipate interactions, if any, among setting measures. One of these was significant: SP-SF \times P. Upon examination of this interaction, the correlations between P and sociability are .09 in the sociopetal condition and .62 in the sociofugal condition. In other words, the pleasurable qualities of the room are much more salient for conversation in sociofugal settings.

Predicting Sociable Behavior

Multiple regression analysis allows for an estimate of the combined potency of several independent variables to explain variances in a dependent measure. A stepwise procedure was used in this study to illustrate how contrasting theoretical approaches (trait, situationist, interactionist) might lead to rather different explanations of sociability had the study excluded measures from the competing approaches.

The trait theorist applying multiple regression to this problem would discover that AF significantly predicts sociability, but EX, DE, and the trait interactions do not add to the prediction. Equation 1 represents a pure trait perspective on the data of this study: Affiliative participants spoke more.

$$\text{Sociability} = .40 \text{ AF } (.40, .16) \quad (1)$$

The coefficient of AF is the standardized beta weight and the values in the parentheses are the multiple correlation coefficient and proportion of sociability variance accounted for by the equation.

The pure environmentalist analysis (Equation 2) finds only P as a significant predictor; SP-SF, A, D, and interactions thereof add nothing.²

² Strictly speaking, the situation is more complicated. If both SP-SF and the SP-SF \times P interaction are entered into Equation 2, the SP-SF \times P (but not the SP-SF) term would contribute significantly. This is consistent with Table 2, where the partialled SP-SF \times P interaction is reported to be significant. However, since one of the main effects on which the entry of SP-SF \times P is dependent is insignificant, both SP-SF and the interaction must be omitted from this equation. In

Table 2
Partialled Correlations of Interactions With Sociability

Interaction	R
Person \times Person	
EX \times AF	-.06
AF \times DE	-.02
EX \times DE	.22*
Person \times Setting	
EX \times P	.12
EX \times A	-.21
EX \times D	.00
AF \times P	-.03
AF \times A	.01
AF \times D	-.02
DE \times P	-.13
DE \times A	-.12
DE \times D	-.11
EX \times SP-SF	-.09
AF \times SP-SF	.17
DE \times SP-SF	-.04
Setting \times Setting	
P \times A	-.02
P \times D	.02
A \times D	.14
P \times A \times D	-.06
SP-SF \times P	.28**
SP-SF \times A	.11
SP-SF \times D	.16

Note. EX = Exhibition; AF = Affiliation; DE = Dependence; P = Pleasure; A = Arousal; D = Dominance; SP-SF = Sociopetal-Sociofugal.

* $p < .05$. ** $p < .02$.

$$\text{Sociability} = .40 P \quad (.40, .16) \quad (2)$$

Interestingly, vis-à-vis the ancient trait versus environment arguments, the trait and setting approaches account for nearly identical amounts of variance.

An approach utilizing both person and setting measures is more fruitful. Equation 3 shows that both AF and P contribute importantly (a 50% increase in explained variance) to the explanation of sociability.

$$\begin{aligned} \text{Sociability} = & .35 \text{ AF} + 1.10 \text{ P} \\ & - .52 \text{ SP-SF} + 1.02 \text{ SP-SF} \\ & \times \text{P} \quad (.59, .35) \quad (3) \end{aligned}$$

In addition, the SP-SF variable is significant, but not because it directly predicts sociability; rather because it moderates the SP-SF \times P interaction in its direct relation with the criterion.

The result is that four variables combine for a multiple correlation of .59 and account for 35% of the variance in sociability in this sample. Note, however, that Person \times Setting interactions play no role at all. In Equation 3, the important interaction term is a Setting \times Setting interaction. As always, these regression equations are subject to shifts, and population regression equations may differ from those reported here. However, this equation has ample statistical power (cf. Cohen, 1977, chap. 9).

Discussion

Verbal participation rates in the small groups studied are significantly related to personality traits (AF and EX), to environment measures (P and A), to an interaction between two environment variables (SP-SF \times P), and to a particular trait configuration (EX \times DE). Not all of these variables account for independent portions of the variance in participation rate. Regression anal-

ysis indicates that personality, environment, and interaction measures complement one another to provide a better explanation of sociability than would any alone.

Environment Measures

The lack of confirmation of the SP-SF main effect is rather surprising. The participants were clearly arranged in contrasting seating patterns, for which Holahan (1972) and Mehrabian and Diamond (1971a) found differing amounts of conversation. However, in support of present findings, it should be recalled that Mehrabian and Diamond (1971b) found no differences in amount of conversation for four seating arrangements.

If the concept of sociopetality is closely examined, it may be seen to be composed of two elements, orientation and distance (cf. Mehrabian & Diamond, 1971a; Sommer, 1962). Possibly, sociability is related differently or complexly to these two elements. Mehrabian and Diamond (1971a) found distance but not orientation to be correlated with speaking rate. Holahan's confirmatory study varied distance much more than orientation. The present study varied orientation more than distance, with disconfirmatory results. Yet extremes of distance or orientation seem bound to affect conversation (Sommer, 1962). The construct requires more intensive study with specific regard to distance and orientation.

P and A were, however, confirmed as significant correlates of sociability, supporting the commonsense notion that social interaction flows more easily in pleasurable and arousing surroundings than in ugly and spurious ones.

Traits

Support for AF and EX as significant predictors of conversational participation was not unexpected. The present results can be viewed as an instance of behavioral validation of traits, which will be welcomed by personality researchers, who have been on the defensive for at least a decade. Findings that might have been taken for granted a

Equation 3, both predictors will take their places in the equation with justification: SP-SF has now become a significant predictor within the overall context of Equation 3, acting as a moderator variable. By itself, of course, it still is insignificantly correlated with the sociability criterion. For a full discussion of the dynamics of interaction terms, see Cohen and Cohen (1975), especially pp. 310-314.

dozen years ago require special note after Mischel's (1968) famous criticisms.

Interactions

Interactions, in general, were not significant predictors. Part of the instability of interactions may be due to their subtlety. In general, real (i.e., population) but subtle and mild effects require larger samples than do main effects. Still, of the 22 interactions examined, only 2 were significant. Although interactions have an intuitive appeal as behavioral explanations, two problems with empirically investigating them are (a) their tendency not to replicate and (b) the difficulty of a priori hypothesizing, which among many of them should be significant.

The SP-SF \times P interaction ($p < .02$) is noteworthy; its inner pattern of correlations suggests that the perceived pleasure of a physical setting is much more salient for conversation in sociofugal arrangements than in sociopetal arrangements. One reason for this may be that in SP settings, where orientation is more nearly face to face, the perceptual field is dominated by people. In SF settings, where others in the group are not so readily placed in one's visual field, qualities of the environment become more salient. The interaction appears to suggest that if a sociopetal arrangement already exists, and one wishes to encourage social interaction, the pleasantness of the surroundings need not be of particular concern. In a sociofugal setting, however, the pleasantness of the surroundings is more important. If one wishes to discourage interaction, for example, it appears that the surroundings should be unpleasant. Cynics may claim that this effect was discovered long ago by designers of mental hospital wards, airport and bus waiting areas, and other institutional settings.

An intriguing finding is that the significant interactions were not Person \times Setting interactions. To the extent that the present results are generalizable to other samples and behaviors, they are damaging to the Person \times Setting interactionist position. On the other hand, they imply that more attention should be paid to interactions that rep-

resent (a) patterns of traits and (b) patterns of environmental cues. Both kinds of patterns are widely presumed to be important regulators of behavior, yet neither receives even as much research attention as Person \times Setting interactions, which themselves are still underresearched.

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