

## Sociability: Personality, Social Context, and Physical Setting

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Sociability, measured as amount of participation in a peer-group conversation, was examined as a function of traits, social context, and physical setting. Same-sex quartets of 13- to 17-year-old students discussed a topic selected by an outsider and a topic of the group's own choice. Amount of participation was expected to vary with personality (Affiliation, Defence, and Dominance), social context (level of Acquaintance and Friendship in the group), physical setting (Seating Arrangement), and interactions among these. Participants rate was significantly related to Affiliation, level of Friendship, a Person  $\times$  Setting interaction (Seating Arrangement  $\times$  Defence) and a Person  $\times$  Person interaction (Affiliation  $\times$  Defence). These relationships are discussed as they relate to a model of sociability and as they bear on the Person  $\times$  Situation issue.

This study investigates two overlapping problems, one concerned with understanding the conditions that influence differential participation in conversations and a second concerned with person and setting variables as determinants of social behavior. Although these two problems each have a considerable history, few studies have addressed them jointly.

Sociability, measured as participation in a leaderless peer-group discussion, has been studied for a long time (e.g., Mann, 1959). Its correlates have been reviewed and summarized (e.g., Shaw, 1976). The influences on sociability may be classed into three main categories: *person-based variables*, *social context variables*, and *physical setting variables*. Our simple descriptive model states that most of the variance in sociability may be accounted for by these three kinds of variables and interactions among them.

The evidence concerning traits, a major subcategory of person-based variables, and conversational participation is relatively clear in suggesting that various measures of *dispositional sociability* are significantly related to amount of participation in small groups (Bass, McGehee, Hawkins, Young, & Gebel,

1953; Cattell & Stice, 1960; Cheek & Buss, 1981; Gifford, 1981; Ickes & Barnes, 1978; Mehrabian & Diamond, 1971a, 1971b). In addition, measures of *dominance* or *ascendance* have been consistently related to amount of participation (Bass, Wurster, Doll, & Clair, 1953; Haythorn, 1953; Shaw, 1959; Watson, 1971). On a third dimension, which might be called *wariness* or *suspiciousness*, the evidence suggests that high scorers have low participation rates (Haythorn, 1953). In sum, these studies lead to the conclusion that personality is related to amount of participation in conversations.

Fewer studies of the effect of social context have been reported. One of the most salient features of the social context of a conversation is the degree of acquaintance or friendship in the group. Some work (e.g., Jourard & Friedman, 1970; Lott & Lott, 1961) supports the intuitive notion that individuals interact more with friends than with strangers.

Among physical setting variables related to conversational participation, one of the most discussed is Osmond's (1957) distinction between "sociopetal" and "sociofugal" arrangements. Sociopetal arrangements are said to facilitate social interaction, presumably by orienting people toward one another at conversationally appropriate distances. Examples include the dining table, the igloo, and the board meeting table. Sociofugal arrangements are said to discourage social interaction by orienting people away from one another. Straight rows of chairs, such as in many

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classrooms and airports, are usually cited as examples of sociofugal seating, although a few extreme sociofugal arrangements exist that actually arrange people in nearly back-to-back seating. Although the sociopetal-sociofugal hypothesis has face validity and is frequently cited in social and environmental psychology textbooks, surprisingly little research directly bearing on it has been reported. However, three studies (Holahan, 1972; Mehrabian & Diamond, 1971a, 1971b) support the idea, although support in the latter two studies is partial in that angle of orientation, but not distance, was related to conversational participation. In a recent study, Gifford (1981) found no difference in conversation participation between sociopetal and sociofugal arrangements.

Few of the many studies of conversational participation have tried to assess the impact of more than one category of influence. Mehrabian and Diamond's two studies (1971a, 1971b) are exceptions; they investigated both person and physical setting variables. However, they did not examine the role of social context. In fact, in the second of these reports, the experimenters took precautions to "insure that members of a group were unacquainted" (Mehrabian & Diamond, 1971b, p. 287).

The continuing controversy over the relative importance of person, setting, and Person  $\times$  Setting variables as predictors of behavior, fueled by Mischel's (1968) arguments, prompted a recent reexamination of the issue with respect of conversational participation in small peer groups (Gifford, 1981). Gifford found that person (trait) measures, Affiliation (AF), Exhibition (E), and setting measures (emotion-eliciting qualities of the environment) predicted amount of participation, but that Person  $\times$  Setting interactions did not. He did find that certain Person  $\times$  Person and Setting  $\times$  Setting interactions were significant predictors, however, and suggested that such interactions have been overlooked in the debate. However, one limitation of the Gifford study, as in the Mehrabian and Diamond studies, is that social context was not examined.

The present study examines person, social context, and physical setting effects on sociability in small peer groups.

## Method

### *Subjects*

After permission was obtained from the university's Human Subjects Committee, the School Board, the principals, and the classroom teachers, the voluntary participation of students was solicited for a study of "personality and conversation patterns" in which, students were told, they would respond to personality questionnaires and later be videotaped in a conversation.

The participants were 84 mainly white, middle-class students at one senior high school and one junior high school in the same catchment area of Victoria, British Columbia. They included 36 males and 48 females in the 8th, 10th, and 12th grades. This slightly heterogeneous sample was selected to broaden the generalizability of the study's results. This choice, however, raises the question whether sex or age are related to sociability; if they are, other results in the study might be confounded. Some studies report age differences in amount of participation, whereas others report none (cf. Shaw, 1976; pp. 163-164).

As for gender, although some work confirms that males and females have different social interaction styles, little research supports the idea that adolescent males and females differ in amount of participation. The only study of adolescent social participation that we could find reported no differences between the sexes (Coutts & Schneider, 1976, cited in Minton & Schneider, 1980). However, because these variables are so generally salient, their effect on sociability will be considered in the analyses of the data.

### *Materials and Procedure*

The personality instrument chosen was Jackson's Personality Research Form (PRF; Jackson, 1974). The PRF was selected because it best seems to characterize the specific dimensions of personality that this study is concerned with, in terms of scales and item content (cf. Nicholls, Licht, & Pearl, 1982). The individual who scores high on Defence, (DE) is said to resist inquiries and to be wary, guarded, and secretive. One who scores high on Dominance (D) is alleged to be assertive, persuasive, directing, and influential. The person scoring high on Affiliation (AF) is described as affable, genial, friendly, sociable, and gregarious.

The participants were administered these scales from the PRF during one class period. From 1 to 3 weeks later, depending on the students' availability due to varying classroom demands, the experimenter returned for the conversation portion of the study. On this occasion, the experimenter asked for volunteers and selected 4 students of the same sex, at random, from different areas of the classroom. The students were escorted to another room in the school that had been arranged for the videotaping of the conversation.

All groups experienced the same basic physical setting, that is, an informal room about 5 m  $\times$  10 m usually used for the shelving of educational materials. The difference was in the seating arrangement; before bringing the students to the room, the experimenter had placed four chairs either in a straight row or in a horseshoe arrangement. In both arrangements, adjacent chairs were

placed about 80 cm apart (center to center). Participants were asked to take a chair. They were asked not to move their chairs "because we have carefully set them up for the videotaping."

Because we did not wish to deceive the participants, no attempt was made to conceal the camera. To partially overcome any reactive effects of the camera, students were exposed to it for several minutes before data collection began. During the first minutes (before data collection) some students appeared to "play to the camera." However, such camera-instigated behavior quickly diminished for most groups. Three groups (not among the 84 final participants) were excluded from the study because they moved their chairs or moved out of their chairs. Of course, even the students who remained in the study may have altered their behavior, including the verbal behavior of interest, for the camera. If one chooses not to deceive subjects, some reactive effects are almost inevitable.

In defense of this choice, it should be noted that in everyday conversations one is also "on stage," at least for the others in the group, and that sometimes our conversations are audible to nonparticipants. Thus, the public nature of the conversations in this study is, to some extent, ecologically valid.

The conversations had two parts, an unstructured portion (no prescribed topic), and a structured portion (prescribed topic), each 5 min long. This, again, was an attempt to increase the generalizability of the results. In everyday social interaction, some conversations have no set topic, some have predetermined agenda, and others are partly structured and partly unstructured. We expected no difference in amount of participation in the two parts of the conversation; but as with sex and gender, the data analyses consider the possibility of differences.

The experimenter informed the participants that further instructions were forthcoming from a tape recorder in the room, and departed. The absence of the experimenter was designed to encourage conversational freedom. A tape-recorded message then informed the participants that the first (unstructured) part of the conversation might begin; participants could talk about whatever they wished, or they could choose not to talk.

After 5 min, a tape-recorded message asked for the group's attention and informed the participants that the second (structured) portion of the conversation would follow. The group was to listen to three instrumental excerpts from popular record albums and then to discuss three questions: (a) Which music was the best? (b) Were any of the songs played by the same musical group? (c) If so, which two songs? The three short musical excerpts followed, and then the participants were asked to begin discussing the questions.

The social context measures, Acquaintance (AC) and Friendship (F), were obtained after the conversation. Participants were asked to indicate their degree of acquaintance with other group members by answering the question, How long have you known each of the others? Response categories were: *ever since I can remember, 8 to 10 years, 5 to 7 years, 2 to 4 years, about 1 year, since this school year started (about 8 months), and less than 8 months*. The degree of friendship was reported in response to the question, How would you describe each of the others in relation to you? Response categories were: *my best friend, a good friend, a friend, not really a friend (just someone I know), and someone I try to avoid*.

AC and F were computed as the sum of each individual's ratings of the relationship with his or her 3 coparticipants. These questionnaire responses were obtained in confidence.<sup>1</sup>

The scoring of the participation dependent measure has been described in detail elsewhere (Gifford, 1981). Briefly, a trained scorer watches a videotape of the conversation and marks on a prepared form which, if any, participants were speaking during a 250-ms scoring interval every 5 s. The soundtrack from the videotape is heard through one side of a set of headphones, while a tape prepared with the timed scoring intervals is heard through the other side. This time-sampling method produced 120 incidences of speaking or salience for each group member (60 in the unstructured portion and 60 in the structured portion), which were summed to obtain the measure of conversational participation. Sociability, of course, is reflected in more than one's verbal output. In this study, we focus on conversational participation as the measure of sociability. Cheek and Buss (1981) found in a study including five indicators of sociability that four of these, including participation rate, yielded the same pattern of results. Nevertheless, we have examined other measures of sociability elsewhere (Gifford, 1982).

The debriefing period included an explanation of the goals of the study, that is, to understand and predict conversation patterns. An added benefit to the students was an opportunity to view part of their conversation on the video monitor; this seemed to make the experience more valuable to the participants.

## Results

### *Reliability of Measures*

The reliabilities of the trait measures are reported in Jackson's (1974) manual. The internal consistency of AF (.86) is satisfactory, and those of DE (.66), and D (.67) were judged adequate.

The reliability of the sociability dependent variable, measured as percentage agreement between two independent scorers in several tape samples in the Gifford (1981) study, ranged from 88% to 97% for eight samples of tape, totaling 1,076 scoring intervals.

### *Interdependence of Sociability Scores*

The conversational participation of group members may reasonably be expected to be dependent on the participation rate of other group members. However, this is an empirical question. An indication of the degree of

<sup>1</sup> Several indices of the emotion-eliciting qualities of the environment were also included (cf. Gifford, 1981). Unfortunately, the reliabilities of these scales were less than .50 and they were therefore omitted from the data analysis.

mutual influence in conversational participation is provided by the intraclass correlation (Steel & Torrie, 1960, p. 190–191). Computed for the present data, the correlation was  $-.17$  ( $p > .50$ ). The trend of the results is such that when one member of the group participates more, other members participate less. However, this trend is not even marginally significant. Thus, individual participation scores are independent of group membership. This independence of individuals' scores, incidentally, replicates Gifford's (1981) findings. The following analyses employ the individual as the unit of analysis.

#### *Participation in Structured Versus Unstructured Conversations*

Participation was measured by counting the percentage of scoring intervals during which each group member spoke. Although raw scores are not different from percentage scores because all sessions were the same length, the scores were converted to percentages to better convey a sense of how much time was spent verbalizing by each individual as a proportion of total session time. Mean scores by portion of the conversation were 27.0% for the unstructured portion and 28.3% for the structured portion. A  $t$  test of the difference showed that sociability did not significantly vary between portions of the conversation,  $t(79) = .97$ ,  $p > .30$ . Sociability scores from the two portions of the conversation were therefore pooled. The resultant mean sociability score for the whole conversation was 27.6% with a standard deviation of 12.0 and a range from 0% to 57% of intervals.

#### *Sex, Age, and Participation*

To determine the relation between sex, age, and participation, Pearson correlation coefficients among the three variables were computed. The correlation between sex and participation was  $.09$ , ( $p > .20$ ), whereas that between grade and participation was  $-.19$ , ( $p = .05$ ). The trend of this marginally significant result is that younger students participated more than older ones. Neither sex nor age is strongly related to participation, but because of the slight age-participation relation

and our decision to use a mildly heterogeneous sample in terms of age and sex, subsequent analyses take these variables into consideration as covariates.

#### *Participation and the Main Effects*

The sociability scores were next related to the principal predictors in the study. Table 1 reports the Pearson correlation coefficients between sociability and the six main variables. To estimate the relation between sociability and each main predictor with the effects of other predictors held constant, the correlations reported in the second column of Table 1 have been partialled; those variables partialled out included all other main effects plus sex and age.

Sociability was unrelated to seating arrangements ( $r = .06$ ). Participation in these conversations was not influenced by whether the chairs were in a straight row or in a horseshoe arrangement. AC was not a significant predictor of sociability ( $r = -.04$ ), but F correlated  $.31$  with sociability ( $p < .005$ ). Among the trait measures, AF was positively correlated with participation ( $r = .31$ ,  $p < .005$ ), whereas DE and D were not significantly correlated with sociability.

#### *Sociability and Interactions*

Although many have supported the idea that the best understanding of behavior may be attained by greater attention to interactions between person and setting (e.g., Bowers, 1973; Endler, 1975), evidence in the domain of sociability so far indicates that, whereas interaction terms are sometimes significant (e.g., Mehrabian & Diamond, 1971a, 1971b), insufficient attention has been paid to other kinds of interaction terms, such as those among situation variables and those among person variables (Gifford, 1981).

To investigate the role of Person  $\times$  Person interactions and Setting  $\times$  Setting interactions as well as Person  $\times$  Setting interactions, interactions of all three types were investigated as correlates of sociability. In each case the correlation between the interaction term and the dependent variable was measured after partialing out the main effects plus sex and grade, to ensure that the interaction's relation to sociability, if any, was over and above that

Table 1  
Simple and Partial Correlations Between Sociability and the Main Predictors and Interactions

Main effects	Simple	Partial
Affiliation	.31***	.31***
Defence	.08	.14
Dominance	-.02	-.03
Friendship	.31***	.29***
Acquaintance	-.04	-.08
Seating Arrangement	.06	.15
Person × Person interactions		
Affiliation × Defence	.20*	-.21*
Affiliation × Dominance	.14	.00
Defence × Dominance	.07	.14
Person × Physical Setting interactions		
Affiliation × Seating Arrangement	.28***	-.03
Defence × Seating Arrangement	.15	.30***
Dominance × Seating Arrangement	.06	.15
Person × Social Context interactions		
Affiliation × Friendship	-.13	-.02
Affiliation × Acquaintance	.27***	-.07
Defence × Friendship	.01	-.07
Defence × Acquaintance	.09	.00
Dominance × Friendship	.10	-.05
Dominance × Acquaintance	.01	.05
Physical Setting × Social Context interactions		
Seating Arrangement × Friendship	.11	.03
Seating Arrangement × Acquaintance	.08	.09
Social Context × Social Context interactions		
Friendship × Acquaintance	.19*	-.02

Note. In the partials, all main effects plus sex and grade are controlled.  
\*  $p < .05$ . \*\*  $p < .02$ . \*\*\*  $p < .01$ .

of its own main effect components (Cohen & Cohen, 1975, p. 292), the other primary predictors, as well as sex and age. The correlational approach to the analysis of interactions is less well-known than the analysis of variance (ANOVA) approach.

However, as Cohen and Cohen demonstrate, the correlational approach has all the advantages of the ANOVA approach plus some advantages not offered by the ANOVA approach. Perhaps most important in the present context is the ability of the correlational approach to use all the information in data consisting of continuous measures; when me-

dian and other kinds of splits are made in scores to suit ANOVA, considerable information is unnecessarily discarded.

The significant interaction terms are displayed in Table 1. As may be seen, two interactions are significantly related to sociability when other variables are held constant (second column). The significant Person × Person interaction indicates that when individuals are very affiliative and not very defensive, they participate more in the conversation (see Figure 1). The second significant partialled interaction is a Person × (Physical) Setting interaction. The nature of this relation

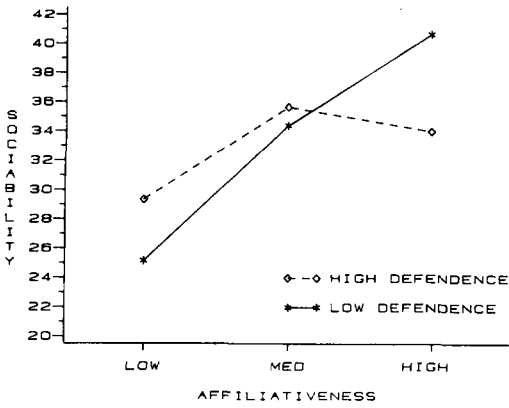


Figure 1. Sociability as a function of the two personality variables, Affiliativeness and Defenceence.

is that defensive individuals participate more when they are in sociofugal seating arrangements and less when they are in sociopetal arrangements, relative to nondefensive individuals (see Figure 2).

*Multiple Regression Analysis of Sociability*

Regression analysis of sociability was undertaken in an attempt to understand the relative and collective potency of the four significant predictors (second column, Table 1).

The result of the initial analysis is summarized in the equation below. The coefficients are standardized (beta) weights; the predictive power of the variables may be compared. The parenthetical figures are the multiple correlation and the percentage of variance accounted for.

$$\text{Sociability} = .52 \text{ AF} + .28 \text{ F} - .35 \text{ AF} \times \text{DE} + .49 \text{ DE} \times \text{SA} \quad (.50, .25)$$

The equation suggests that a personality measure (AF) and a Person  $\times$  (Physical) Setting interaction (DE  $\times$  SA) have the most impact on sociability, but that a Person  $\times$  Person interaction (AF  $\times$  DE) and a social context variable (F) are also important predictors of sociability.

To once again consider sex and age as covariates, an analysis of covariance (ANCOVA) in multiple regression terms (Cohen & Cohen, 1975, chap. 9) was computed. Basically, this analysis involves determining whether the

percentage of variance accounted for by the predictors plus the covariates significantly exceeds the percentage of variance accounted for by the predictors alone. Sex and grade added only 2% (from 25% to 27%). An *F* test of this increase (Cohen & Cohen, 1975, p. 346) indicated that this was not a significant increase.

Discussion

The goal of the study was to assist in the understanding of two related problems, the determinants of sociability and Person  $\times$  Setting influences on behavior. The results clearly demonstrate that sociability is a function of dispositions brought to a setting by an individual, the social context of that setting, and the physical arrangement of the setting. In terms of the Person  $\times$  Setting issue, sociability is a function of the person, the social context and two kinds of interactions—one of the Person  $\times$  Setting variety that has often been advocated, and one of the Person  $\times$  Person variety that has not often been studied. The following paragraphs discuss the results as they apply to both problems.

Most early researchers, as reviewed by Shaw (1976), emphasized traits as influences on conversational participation. A few early researchers (e.g., Sommer, 1969; Steinzor, 1950) noted the impact of physical arrangements on conversation patterns. Later, Mehrabian and Diamond (1971a, 1971b) began to apply

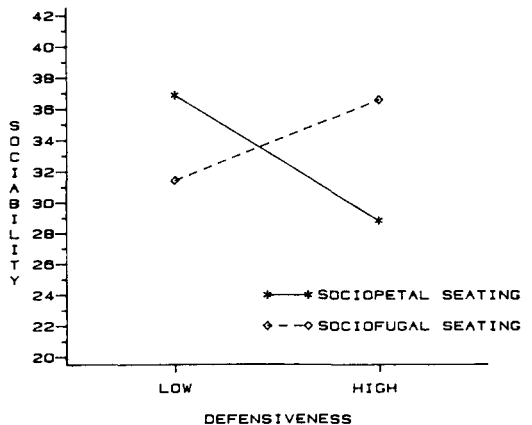


Figure 2. Sociability as a function of a personality variable (Defensiveness) and a physical setting variable (Seating Arrangement).

the multivariate approach to sociability, investigating both dispositional and physical setting measures. Nevertheless, the Mehrabian and Diamond studies did not account for large amounts of variance in sociability (6%, 6%, 6%, 16%, and 21% for five equations predicting various measures of participation rate). This implies that some important variables remained to be considered.

The present study hypothesized that in addition to person and physical setting variables, social context should help explain sociability. Indeed, the level of friendship in the group was an important contributor to a regression equation that accounted for 25% of the variance in sociability.

### *Traits*

Conversational participation was significantly predicted by AF, a finding that now has been reported consistently for 30 years, going back to Bass et al. (1953). The other two trait measures were not so valuable, at least as main effects. Even though Jackson (1974) describes the high scorer on his D scale as assertive, persuasive, and directing, D did not translate into greater participation. The individual with a high score on DE is alleged to be wary and guarded; the results indicate that this does not mean that across all situations such an individual will contribute less to a discussion, but that the individual's contribution will vary depending on (a) how affiliative he or she is and (b) what the seating arrangement is. These interactions will be discussed later.

If one views the present effort as a trait validation study, the results support Jackson's AF scale, but suggest that DE and D are not uniformly associated with decreased and increased sociability, respectively, at least as measured in terms of verbal output. This may not be damaging for the D scale. One explanation may be that D is not associated with any special quantity of speech, but is more clearly expressed in the choice of words and in nonverbal channels (cf. Keating, Mazur, & Segall, 1977).

### *Situations*

This study examined both social and physical aspects of the situation. One measure of

the social situation, degree of friendship in the group, predicts participation, but another, length of acquaintance, does not. This contrast suggests that the quality of a relationship has more impact on sociability than does the temporal quantity of the relationship.

Seating Arrangement, the physical situation variable, SA, had no general relation to sociability. This contrasts with some earlier work, but replicates the findings of Gifford (1981). The Gifford and the Mehrabian and Diamond studies, however, all report significant Personality  $\times$  Seating Arrangement interactions, and the present study confirms this. We would tentatively conclude that, in general, seating arrangements interact with personality to predict sociability, but have no main or universal effect on it.

### *Interactions*

Sociability is significantly predicted, in this study, by a personality pattern, over and above the ability of the separate components of that pattern to predict sociability. This Person  $\times$  Person interaction (AF  $\times$  DE) represents a category of predictor that has not had many recent champions, although 25 years ago personality researchers spent much effort on personality configurations. Together with the Gifford (1981) findings, the present study indicates that personality researchers should again be examining patterns of dispositions; these studies indicate that in terms of predicting behavior, the whole may be different from, and complementary to, the sum of the parts. A recent study of shyness and sociability (Cheek & Buss, 1981) illustrates how a behavior such as conversational participation is better predicted by knowing both whether an individual is shy and whether the individual is dispositionally sociable than by knowing either tendency alone.

The second significant interaction suggests that defensive individuals "open up" conversationally in sociofugal seating arrangements but "clam up" in sociopetal arrangements (relative to less defensive individuals). One way of understanding this finding might be to consider the amount of visual surveillance possible in the two kinds of seating arrangements. In the sociopetal (horseshoe) arrangement, individuals are physically directed to-

ward one another; it is easy to scan other group members visually. Defensive individuals may respond to this increased surveillance by increasing their wariness, which might well dampen their verbal output.

In sociofugal (row) seating, individuals are probably under less direct surveillance by other group members. Defensive individuals may feel less need to guard themselves under sociofugal conditions; they might then contribute more to the conversation. In general, we suggest that one important effect of different seating arrangements is to vary the amount of visual scrutiny that occurs in a conversation and that defensive individuals respond to this variation by contributing more or less to the discussion.

Comparison of the results of this study with those of Gifford (1981) show that both interactions that were significant in this study were not significant in the previous one. Despite their theoretical importance, the tendency of interactions not to replicate is disturbing. Other studies (cf. Mehrabian & Diamond, 1971a, 1971b) have reported inconsistent predictiveness of interactions. In general, interactions have less statistical power than main effects (Cohen & Cohen, 1975); larger sample sizes are necessary to detect significant effects. The discrepancy between the present study and Gifford's (1981) study may be due to differences in sample size: The present one had 50% more subjects than the earlier one, and the two studies examined different age groups in different regions of the country in different physical settings. Interaction terms may be sensitive to any of these factors.

However, if they are and the difference in results is not due merely to the increase in sample size, it would be necessary to conclude that although interactions are of theoretical importance, they are not very robust. Of course, this does not mean interactions should be ignored. In other sciences, some very small effects are considered to be crucial (consider the recent extremely intensive search for W and Z particles in physics). If an effect appears once and not on second glance, the proper approach is to further investigate the conditions that determine when the effect occurs, not to discount the effect. The productive examination of interactions will require more

effort, larger sample sizes, and more exact specification of the social and environmental conditions in our experiments.

This study clearly shows the value of interactions as predictors of sociability. Any model of sociability will have to include them. This should not, however, be interpreted as unconditional support for any one type of interaction (e.g., Person  $\times$  Setting interactions). Plain, unadorned trait main effects are also significant predictors of social behavior. Finally, whereas accounting for 25% of the variance not only compares favorably with other studies in the area but also can be an important amount in very practical terms (cf. Rosenthal & Rubin, 1982), it is challenging to note that some important predictors must still be missing from our multivariate model.

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