

On Specificity in the Impact of Social Participation on Physical and Psychological Health

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Although it has been suggested that social participation is likely to be beneficial for health and well-being, there is little research demonstrating specifically which aspects of socializing may be responsible. This study distinguishes specific components of social interaction and health and examines differential relationships among them. Three distinct categories of social participation variables were posited: quality, quantity, and social traits. It was hypothesized that health problems would be more frequent among persons with poor quality interaction. The only exception to this prediction was that illnesses that are socially communicated were expected to be more prevalent among persons with a greater quantity of social participation, regardless of quality. Results confirmed these predictions for females. For males, the pattern of results was more complex, in that masculinity and femininity influenced the manner in which symptoms were expressed. These results supported the notion that social relations have a specific impact on health, and that if research is to provide useful information for intervention, we must learn more about which specific aspects of social participation are beneficial as well as how this occurs.

In recent years, a growing body of evidence has emerged indicating that the perception of social support is beneficial for mental and physical health. Although this research has employed diverse methods to study illnesses as disparate as depression, arthritis, and heart disease, a general conclusion seems to be shared—the presence of social support helps people fend off illness, and the absence of such support makes poor health more likely. (See Cobb, 1976; F. Cohen, 1979; S. Cohen & McKay, 1984; DiMatteo & Hays, 1981; Reis, 1984; Wallston, Alagna, B. M. DeVellis, & R. F. DeVellis, 1983, for reviews.)

The shared enthusiasm for this finding has not been matched by an equally well accepted

understanding of the factors responsible for the effect (Heller, 1979; Heller & Swindle, 1982). One reason for this gap has been the failure of researchers to systematically refine measures of social support to determine the underlying aspects of interaction to which the effect may be traced. That is, social support is typically assessed by questions such as "To what extent do you feel you can confide in your closest friend?" There are two problems with such questions.

First, they fail to distinguish the various types of social support from each other; for example, emotional support, tangible aid, advice, group belongingness (Cobb, 1976; S. Cohen & Hoberman, 1983). Some types of support may be more relevant to well-being than others. Second, because these questions deal with the *perception* of support, they do not tell us about the interactional antecedents of support. Presumably, perceptions of support are based on the pattern and content of actual interaction, including feelings communicated during these events. However, various cognitive and motivational factors may affect these judgments, so that socializing and support should be thought of as different phenomena. The potential impact of this

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distinction can be made apparent by a simple example. Suppose an irritable individual were to express dissatisfaction with both his friends and his health, all the while participating in interactions no different than those of another, less irritable individual. In this instance, perceived support and health would be related, although socializing and health would not.

The purpose of this research was to determine more specifically which aspects of social interaction are beneficial for health, and which are not. This goal required identifying and measuring separately different features of social interaction and then relating them to well-being. In previous research, Wheeler, Reis, and Nezelek (1983) found evidence indicating that, at the broadest level, three primary categories could be distinguished: quantity, quality, and social dispositions. Although the literature contains studies supporting each of these factors in and of itself, there are no available studies that permit contrast and comparison of all three. As a result one cannot discern the relative impact of these factors in facilitating good health (Heller, 1979; Mitchell & Trickett, 1980). For example, some studies have demonstrated that the emotional quality of relationships with others affects the degree or course of medical events (e.g., Barrera, 1981; Weisman & Worden, 1975). Other studies have focused on how the quantitative aspects of social interaction ameliorate illness, such as the number of acquaintances (Miller & Ingham, 1976) or friends (Wilcox, 1981), the frequency of contact (Berkman & Syme, 1979; Langlie, 1977; Larson, 1978), or social network density—an index of the extent and dispersion of social contacts (Eaton, 1978; Myers, Lindenthal, and Pepper, 1975; Wilcox, 1981). One recent study compared quality and quantity of interaction as determinants of general psychological well-being among elderly women (Beckman, 1981). Although both quality and quantity mattered, quality was more important.

There are many more studies in this literature. Three methodological problems prevent firm conclusions from most of this prior research. First, many studies only assess a single aspect of socializing, for example the number of close friends. Because any one parameter may be correlated with numerous

other parameters, relative efficacy cannot be determined from single-measure studies. Second, other studies have used items that confound various aspects. For example, "How often do you see your close friends?" inherently includes information about quantity and quality. Finally, many studies ask subjects to provide retrospective descriptions of general patterns of socializing over extended time spans. This technique is highly susceptible to distortion brought on by bias in memory, aggregation, and social judgment.

To obtain the necessary degree of specificity and objectivity, we used the Rochester Interaction Record (RIR). This technique, developed by Wheeler and Nezelek (1977), provides a detailed and accurate measure of a person's social behavior over time. Subjects complete a short fixed-format record for every interaction of 10 min or longer that occurs during a particular time interval. From the records, a number of different indices of quantity and quality of social contact are distinguished. Quantity includes such factors as number of different partners, frequency of contact, time spent socializing, and the average length of contacts. Quality refers to intimacy, self- and other-disclosure, pleasantness, satisfaction, initiation, and influence. These indices are tabulated over all of the person's interactions as well as sorted into same-sex, opposite-sex, and group categories.

Our reasoning suggests that quantity and quality of social interaction, and social dispositions will relate differently to health. Our first hypothesis is that social interaction quality will relate positively to health in most categories of illness. We based this hypothesis on two lines of reasoning. First, the personal relationships literature indicates that positive affect and intimacy are the most important factors that make for a satisfying, effective social life (Kelley, 1979; Rubenstein & Shaver, 1980; Wheeler, Reis, & Nezelek, 1983). Second, two recent studies on the perception of support reveal that emotional support seems to be more effective than other forms of support in bolstering well-being (Cohen & Hoberman, 1983; Schaefer, Coyne, & Lazarus, 1981). The only exception to this hypothesis is expected to occur for ailments that are transmitted via social contact, namely, most urinary-sexual disorders and infections, partic-

ularly of the upper respiratory tract. Because these are primarily a function of social exposure, we predict that social interaction quantity will relate positively to the frequency of such ailments. No differential predictions will be made for the social disposition variables, except that we expect them to relate positively to good health. Of course, it is desirable to be specific about health problems also (S. Cohen & McKay, 1984). Virtually all prior studies have either selected individual ailments or used summary health measures that obscure specific effects. As hypothesized above, some will relate to quality, others to quantity. For this reason, tests of the hypotheses will be followed by decomposition of the health measures into nine distinct categories of illness.

In passing, it is interesting to note Cobb's (1976) observation that college students have generally not been studied by researchers in this area, who tend to focus on children, adults, and the elderly.

Method

General Overview and Subjects

Two common methodological shortcomings of prior research are that social interaction is assessed by recollected summaries of extended time periods, and that self-reports of health and socializing are gathered simultaneously (Cohen & McKay, 1984; Reis, 1984; Wallston et al., 1983). Furthermore, data describing a short time interval can be affected by transitory circumstances. To eliminate these problems, health and interaction were measured independently, over an extended period of time. Healthfulness was assessed by examining students' health files for four years of college. Social interaction data were obtained from detailed records completed during two weeks of the student's senior year.

Subjects were 43 males and 53 females enrolled in a moderately sized, academically oriented private northeastern university. All participants lived on campus. They completed the interaction records for a period ranging from 7 to 18 days in November, chosen to minimize conflict with holidays and examinations. The mean number of days was 14.53, with a standard deviation of 1.98. During post-recording interviews, consent was obtained for abstracting information from student health files.

Procedure

Subjects were recruited from a student directory for a "research project on social interaction." At a brief meeting, the importance of understanding interaction patterns was explained, and the students' role as research collaborators was stressed. They were also told they would be paid \$20 for their participation. However, they were asked to

volunteer only if the opportunity to engage in the research itself was sufficiently interesting. No other incentives were provided.

The interaction record, a sample of which is shown in Figure 1, was to be completed for every interaction that lasted 10 min or longer. An interaction was defined as any encounter with another person(s) in which the participants attended to one another and adjusted their behavior in response to one another. For example, sitting next to someone in a lecture was not appropriate, whereas talking during the lecture for 10 min was. A more detailed description may be found in Wheeler and Nezlek (1977). It was suggested that subjects fill out the records at a uniform time, such as before going to sleep. A scratch sheet was provided to facilitate memory. To encourage daily recording, subjects were asked to return their completed forms and pick up blanks every few days. Throughout the study, a collaborative, nondeceptive atmosphere was maintained, which we believe aided the gathering of valid data. Confidentiality of the records was emphasized and closely guarded throughout.

At the conclusion of the record-keeping period, a brief interview with one of the researchers was held. During that session, the interviewer probed for difficulties, ambiguities, and potential sources of inaccurate data. In particular, subjects were urged to inform us of anything that might have impeded their accuracy. Because five subjects reported that their records contained major inaccuracies, their data were discarded. Immediately following this interview, subjects were photographed to obtain physical attractiveness ratings. They then completed a number of personality scales (see below). At a follow-up session two weeks later, they filled out a few additional trait scales. During a third session, scheduled and administered by different experimenters, the social skills measures were administered. These were held within a few days to 2 weeks of the original interview. Subjects were then paid and informed more fully as to the nature of the study.

Consent for obtaining data from their health records was requested during the postrecording interview. To minimize concern about confidentiality, only the total number of visits for various categories of symptoms would be collected. Furthermore, all data would be tabulated by Health Service personnel and only after the subject had graduated. Subjects were also informed that all presentations of data would be in large group summaries only, and that the records would be stored in a manner that assured anonymity.

The primary measure of healthfulness was the number of visits to the Health Service within several illness categories. A brief note is in order concerning this criterion. Certainly, the number of visits for treatment or diagnosis is not equivalent with healthfulness. Based in part on the reasons discussed earlier, we sought an objective measure of health symptomatology over a prolonged period of time that would be free of self-report biases. Because these data were collected routinely by Health Service at the time of treatment, they had the added advantage of not being created by recollection. Although it might have been desirable to code these records for the severity of the illness, staff shortages in the Health Service eliminated this possibility. Although health resource utilization is known to vary systematically

DATE _____ TIME _____ AM _____ LENGTH: _____ HRS _____ MINS
 PM _____

INITIALS _____ IF MORE THAN 3 OTHERS: _____

SEX _____ # OF FEMALES _____ # OF MALES _____

INTIMACY: SUPERFICIAL 1 2 3 4 5 6 7 MEANINGFUL _____

I DISCLOSED: VERY LITTLE 1 2 3 4 5 6 7 A GREAT DEAL _____

OTHER DISCLOSED: VERY LITTLE 1 2 3 4 5 6 7 A GREAT DEAL _____

QUALITY: UNPLEASANT 1 2 3 4 5 6 7 PLEASANT _____

SATISFACTION: LESS THAN EXPECTED 1 2 3 4 5 6 7 MORE THAN EXPECTED _____

INITIATION: I INITIATED 1 2 3 4 5 6 7 OTHER INITIATED _____

INFLUENCE: I INFLUENCED MORE 1 2 3 4 5 6 7 OTHER INFLUENCED MORE _____

NATURE: WORK TASK PASTIME CONVERSATION DATE _____

Figure 1. The Rochester Interaction Record

between individuals (Gottlieb, 1976), usage is typically greatest among the educated middle-class such as our subjects and when care is covered by a prepaid insurance fee. As the student health insurance policy required participants to receive all services under their auspices, the tallies included all medical care received in college. Eight subjects who did not participate in the University Health Plan were excluded from the analyses. Their interaction records did not differ substantially from the remainder of the sample.

The number of health-related visits for each of nine categories of symptoms was computed for each subject's total four years at the school, and for their senior year. This latter measure ultimately contained too little variability to permit meaningful analyses and was discarded. The former measures were normalized via log transformations whenever the degree of skew made this desirable. The mean number of visits for males was 9.55; for females, it was 13.52, $t(86) = 2.17$, $p < .05$.

Social Competence Measures

Physical attractiveness. All subjects were photographed in a uniform manner to encompass mid-thigh to over-the-head areas. These slides were then rated by a group of 57 females and 30 male students at a nearby university. Ratings of attractiveness were obtained on a 15-point scale. Judges were instructed to use their own personal standard and were given 20 seconds to rate each slide. Further details may be found in Reis et al., (1982).

Self-esteem. Social self-esteem was assessed by a short-form version of the Texas Social Behavior Inventory, a 15-item self-report measure (Helmreich & Stapp, 1974). Cronbach's alpha, a measure of internal consistency, was .82 in our sample.

Loneliness. Two different instruments were used: the 20-item UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980) and the 8-item NYU Scale (Rubenstein

& Shaver, 1980). For the former, Cronbach's alpha was .93; for the latter, it was .82.

Self-consciousness scale. Self-consciousness was measured by the Fenigstein, Scheier, and Buss (1975) scale. The three subscales of this instrument are, along with their alpha coefficients: Public Self-consciousness (.77), Private Self-consciousness (.75), and Social Anxiety (.68).

Machiavellianism. This trait was measured by a 20-item modification of the Christie et al. scale (Christie & Geis, 1970), altered by eliminating one sexist item. Its alpha coefficient was .73.

Sex-role orientation. Masculinity, femininity, and masculinity-femininity (bipolar) were assessed via the 24-item Personal Attributes Questionnaire (Spence, Helmreich, & Stapp, 1975). Cronbach's alpha for these three scales was .61, .73, and .63, respectively.

Rejection and trust. Because we could find no pre-existing standardized measures of these traits, items were specially written for this study (see Reis et al., 1982, for details). Each scale contained 7 items. Alpha coefficients for males: were: fear of rejection by opposite sex = .73; same sex = .48; trust of opposite sex = .77; same-sex = .53, and for females: fear of rejection by opposite sex = .75; same-sex = .74; trust of opposite-sex = .67; same-sex = .64.

Social skills. All subjects were contacted by telephone and scheduled for individual testing by an undergraduate research assistant who was not connected with the other aspects of the research and who was unaware of the variables and hypotheses. During that session that completed a series of social competence measures: the Dating and Assertion Questionnaire (DAQ; Levenson & Gottman, 1978); the Social Avoidance and Distress Scale (SAD; Watson & Friend, 1969); Fear of Negative Evaluation Scale (FNE; Watson & Friend, 1969); Rathus Assertiveness Schedule (RAS; Rathus, 1973); Behavioral Role-Playing Assertion Test (BRAT; McFall & Lillesand, 1971), and the Heterosexual Adequacy Test (HAT; Perri & Richards, 1979).

Construction and Nomenclature of Interaction Variables

From the raw interaction records, composite indices were created in the following manner: *length*—mean reported length of all interactions; *per day*—mean reported number of interactions per day; *time per day*—mean reported length summed across all interactions per day; *number of others*—different individuals interacted with during the entire record-keeping period, corrected for the number of days; and *percentage*—percentage of all interactions falling into each category. *Intimacy, self-disclosure, other-disclosure, pleasantness, satisfaction, initiation, and influence* were all computed as the mean value reported across all interactions. To consolidate these individual measures, a *meaningfulness* index was created by summing across the first five quality scales.

Each of these categories was then subdivided in accordance with the sex composition of the encounter: *same sex*—interactions including up to three other persons of the same sex; *opposite sex*—interactions including up to three members of the opposite sex; *mixed sex*—interactions including up to three others, at least one of each sex; and *group*—interactions including more than three other people. *Overall* measures incorporated all interactions.

The reliability of the journal entries could not be assessed formally, owing to the anonymity of the initials used to report partners. However, 17 roommate pairs participated in the study and could be identified in each other's records. The number of times each roommate's initials appeared in the other's records was computed for days they both kept the diaries. The intraclass correlation coefficient between their records, which does not correct for mean or variance differences within a pair, was .81, indicating a substantially high degree of mutual reporting.

Categorization of Health Related Visits

The nature of all visits to the University Health Service was coded by a local modification of the International Classification of Health Problems in Primary Care (ICHPPC, 1975). These diagnoses were entered by the attending physician or nurse, who was unaware of this research, at the time of service. Because of the use of a predetermined coding system, it was impossible to distinguish multiple visits for a single ailment from multiple illnesses. Consequently, each visit was given equal weight in the counts that follow. Administrative examinations (e.g., travel immunizations and employment physicals) and routine maintenance or observation visits (e.g., allergy shots, obesity, diabetes shots, and pregnancy) were excluded from the data. Based primarily on the ICHPPC outline and the desire to create classes with reasonable frequencies for analysis, nine illness categories were tallied:

(a) *Mental Health*, such as transient disturbances, drug abuse, psychotic reactions, and interpersonal problems.

(b) *Infections*, such as strep throat, influenza, upper respiratory problems likely to be infections, herpes, rubella, infectious hepatitis, pediculosis, and diarrhea.

(c) *Blood, Circulatory and Blood-Forming Organs*, such as hypertension, anemia, heart disease, phlebitis, hemorrhoids, edema, and other heart diseases.

(d) *Nervous System and Mental Disorders*, such as

paresthesia, dizziness, malaise, headache, fainting, sleep disorders, and sexual performance problems.

(e) *Digestive and Gastrointestinal Disorders*, such as nausea, dysphagia, constipation, and pain in the mouth or abdominal area.

(f) *Urinary and Sexual Organs*, such as cystitis, monilia, menstrual problems, urethritis, venereal disease, and other urinary/sexual organ disorders.

(g) *Skin and Subcutaneous Tissue*, such as boils, eczema, acne, lymphadenitis, rashes, sebaceous cysts, corns and callouses.

(h) *Musculoskeletal System and Connective Tissue*, such as arthritis, bursitis, and chronic pain in bones, muscles or joints.

(i) *Accidents*, such as broken bones, sprains, lacerations, poisonings, burns, and animal bites.

Three further summary classifications were then created in addition to the above. Because the two psychosocial categories include those ailments that have been postulated to be related to social interaction, they serve as the central tests of our hypotheses.

(j) *Psychosocial-Interpersonal*, any of the above disorders that have, in the literature, been implicated to be caused or exacerbated by stress, psychosocial dissatisfaction, and are primarily communicated by social contact. Included in this category were most infections and urinary-sexual disorders transmitted via contact.

(k) *Psychosocial-Personal*, any of the above disorders that have, in the literature, been implicated to be caused or exacerbated by stress or psychosocial dissatisfaction, and that are not communicated socially. Included herein were most mental health and nervous system disorders, hypertension, elevated blood pressure, asthma, gastrointestinal disorders such as constipation and heartburn, undiagnosed pains in bones, joints, muscles, and organs, eczema, dizziness, headache, menstrual problems, and malaise.

(l) *Total*. The total number of visits, regardless of category.

Copies of the complete coding manual are available from the first author.

Data Analytic Strategy

Multiple regression analysis was used to estimate the total proportion of variance in health visits accounted for by social interaction. Although this analysis controls for spurious over-estimation of the effects by entering variance shared by multiple predictors only once, it can obscure the conceptual meaning of the obtained results because variance shared by different predictors is unthoughtfully assigned to one and only one of them (J. Cohen & P. Cohen, 1975). As a result, with a large set of predictor variables, a computer printout might identify one as significant and another as irrelevant, even though they share largely the same predictive impact. To counteract this problem, the simple Pearson correlations for variables that were included in the regression analysis were used to determine the conceptual contributions to the overall R^2 .

These statistics tell us how well each variable relates to the dependent variable by itself. All correlations that attained an alpha level of at least $p < .10$ will be listed, as they may be informative as to the content of the

relationship. The multiple R^2 should be used to gauge the magnitude of the overall effect. A simple stepwise procedure was used for the regression analyses, terminating either when the increment to R^2 was nonsignificant at $p < .05$, or when the addition was due to suppression of error variance in the predictors rather than better accounting for health visits. This latter criterion was deemed appropriate, given the generally poor replicability of suppressor variables (Horn & McArdle, 1980).

Given the large number of predictor variables, chance is a problem. We have attempted to cope with this issue in three ways. First, only those illnesses categories for which the number of significant predictors exceeded chance will be tabled and discussed (cf. Table 5). Second, the value of multiple R^2 will be used to gauge of the strength of relationship. Finally, only results that produced meaningful and consistent patterns across related predictors will be used to draw conclusions.^{1,2}

Results

Because in prior studies (Reis et al., 1982; Wheeler & Nezelek, 1977) the meaning and correlates of social interaction have been different for females and males, the analyses were conducted separately by sex. Summary indices will be presented first, followed by specific illness categories.

Health Visits and Social Interaction: Females

Both the Personal and Interpersonal summary variables were significantly related to social interaction. As predicted, visits for health problems classified as psychosocial-personal were more prevalent among females with a qualitatively poorer social life (see Table 1). Such women felt less intimacy, self-disclosure, other-disclosure, pleasantness, and satisfaction in interactions with the same and opposite sex. Consistent with this result, fear of negative evaluation and loneliness were also more common among women with psychosocial-personal health problems. Thus, our reasoning regarding the role of meaningfulness was substantiated. Also as expected, psychosocial-interpersonal disorders related to interaction quantity. Women who socialized more, particularly with more different people, were seen more often for treatment of these problems.

Interpretation of the total visits variable must be cautious, as it is an amalgam of categories that may relate to interaction differently. Generally, this index mirrored most of the results presented above. Visits for

health care were more frequent among females who reported less pleasant interactions, had more interactions per day with more partners, felt they influenced their interactions more, were more masculine and socially self-confident, were less afraid of rejection by males, and were less physically attractive; in short, although they may have been more socially active and confident, females who reported their social contacts as less meaningful tended to seek more health care.

Table 2 elaborates these general results by distinguishing the specific types of ailments. Women who had more frequent mental health services were higher in fear of negative evaluation, and simultaneously reported lower intimacy and disclosure in same-sex interaction. Thus, the combination of interpersonal apprehension and less meaningful interaction, particularly with female partners, produced strain and the need for consultation. The importance of contact with females in staving off emotional dissatisfaction has been demonstrated recently (Rubenstein & Shaver, 1980; Wheeler et al., 1983). A related pattern emerged in two other categories. Lesser satisfaction was reported by women with more visits for nervous system and mental disorders.

¹ We might also mention that we chose not to test the stress-buffering hypothesis for two reasons. As readers familiar with this literature will know, this hypothesis predicts an interaction between stress and social support, rather than separate main effects. Much of the prior research in this area in fact examines main effects, although claiming to test the buffering hypothesis. Even studies that find evidence for the buffering interaction tend to generate main effects of at least equivalent prevalence and strength (cf. Appendices A and B, La Rocco, House, & French, 1980). Furthermore, given a large enough sample, an interaction in the population would yield two main effects as well (S. Cohen & McKay, 1984). Second, we sought to examine how the specific aspects of social participation relate to health, in and of themselves. As Henderson (1980) has pointed out, the absence of social support may be inherently harmful. However, it might be noted that the four years of college generally produce moderate-to-high levels of stress. Thus it would seem safely assumed that most of our subjects experienced more than threshold levels of stress during the study.

² The results that follow indicate linear relations that emerged. In the interest of caution, numerous attempts at finding nonlinear relations were conducted. For example, one might expect a quadratic fit, or one which is truncated at 0 versus 1. None of these relations was anticipated to yield a better solution, and none did.

These women also socialized less frequently with males, and when they did, it was likely to be other-initiated. Less satisfying and less pleasant interactions were also characteristic of females who visited the Health Service more often for blood and circulatory disorders. This may be related to the stress—Type A behavior pattern that promotes cardiovas-

cular disease (e.g., Glass, 1977), in that women with more frequent blood and circulatory disorders also reported more influence in group interaction, and more self-initiated interactions with males.

As with the interpersonal summary index, the number of visits for the care of infectious disorders was clearly related to the quantity

Table 1
Correlations between Summary Health Indicators and Social Interaction: Females

Psychosocial-personal $R^2 = .29, F(3, 46) = 6.30$		Psychosocial-interpersonal $R^2 = .24, F(2, 47) = 7.38$	
Interaction quality:		Interaction quantity:	
Meaningfulness		Number of others, same sex	.35
same sex	-.25	opposite sex	.33
opposite sex	-.37	Number per day, overall	.29
mixed sex	-.23	opposite sex	.24
group	-.27	Time per day, overall	.26
Intimacy, overall	-.25		
opposite sex	-.28	Social dispositions:	
Other disclosure, overall	-.26	WHAT	.27
group	-.26		
opposite sex	-.23	Initiation and influence:	
Pleasantness, overall	-.41	Influence, overall	-.30
mixed sex	-.33	same sex	-.32
group	-.35		
same sex	-.31		
opposite sex	-.36		
Satisfaction, overall	-.43		
same sex	-.26		
opposite sex	-.44		
mixed sex	-.29		
Social dispositions:			
FNE	.25		
Loneliness (UCLA)	.30		
Total visits $R^2 = .34, F(3, 46) = 8.04$			
Interaction quality:			
Meaningfulness, opposite sex	-.23		
Satisfaction, opposite sex	-.25		
Pleasantness, overall	-.30		
group	-.28		
same sex	-.25		
mixed sex	-.27		
Interaction quantity:			
Number of others, same sex	.38		
opposite sex	.28		
Number per day, overall	.29		
mixed sex	.24		
Social dispositions:			
Masculinity	.34		
Social Self-esteem	.25		
Physical Attractiveness	-.32		
Rejection by males	-.28		
Initiation and influence			
Influence, overall	-.31		
same sex	-.32		
mixed sex	-.27		

of social participation. More frequent visits were evidenced by females who had a greater number of interactions per day with more different others. They were also less physically attractive and more masculine. Interaction quantity also related to treatment for skin

Table 2
Specific Health Categories: Females

Mental health $R^2 = .19, F(2, 47) = 5.51$		Infections $R^2 = .25, F(2, 47) = 7.95$	
Meaningfulness, same sex	-.27	Number per day, overall	.34
Intimacy, same sex	-.30	group	.28
Self-disclosure, same-sex	-.29	same-sex	.25
Other-disclosure, same-sex	-.28	mixed	.31
opposite-sex	-.24	Number of others, same-sex	.39
FNE	.25	opposite-sex	.31
		Masculinity	.26
		Physical Attractiveness	-.31
		Influence, overall	-.30
		same-sex	-.36
Blood, circulatory disorders $R^2 = .24, F(3, 46) = 4.96$		Nervous system and mental disorders $R^2 = .20, F(2, 47) = 5.90$	
Pleasantness, overall	-.27	Meaningfulness, group	-.25
mixed sex	-.25	Satisfaction, overall	-.23
opposite sex	-.28	group	-.35
Satisfaction, opposite sex	-.23	mixed sex	-.34
Length, same-sex	.25	Pleasantness, group	-.27
Initiation, opposite sex	-.28	mixed sex	-.27
mixed sex	-.26	Number per day, opposite sex	-.26
Influence, group	-.25	Time per day, opposite sex	-.24
mixed	-.32	Percentage, opposite sex	-.26
		Private Self-Cons.	.25
		Machiavellianism	.30
		Initiation, opposite sex	.29
Gastrointestinal disorders $R^2 = .28, F(2, 47) = 8.99$		Skin and subcutaneous $R^2 = .42, F(4, 45) = 8.19$	
Percentage, same sex	-.25	Meaningfulness, same sex	-.24
Masculinity	.39	Intimacy, overall	-.32
Public self-consciousness	-.38	same sex	-.33
Rejection by males	-.30	opposite sex	-.28
Trust of males	.24	Self-disclosure, same sex	-.26
		Satisfaction, group	.24
		Number of others,	
		opposite sex	.30
		Number per day,	
		opposite sex	.32
		Time per day, opposite	.27
		Percentage, same sex	-.31
		opposite sex	.27
		DAQ	.25
		Social self-esteem	.29
		Social anxiety	-.26
		Rejection by males	-.29
		Initiation, overall	.29
		same sex	.26
		Influence, overall	-.29
		same sex	-.23
		opposite	-.31
		mixed	-.27

and subcutaneous tissue ailments. Females with more visits for care of such problems interacted more frequently with more different males, and spent a smaller proportion of their social time with females. Generally, they reported their interactions as less intimate, and felt they had greater influence during the interaction. These women also tended to be less afraid of rejection by males, less socially anxious, and more assertive and self-confident. The picture that emerges, then, is of more frequent visits for skin and subcutaneous tissue problems among females who interacted a great deal with males, and who, despite their social competence and confidence, were not experiencing a great deal of intimacy.

A similar profile appeared for females with musculoskeletal problems. More frequent visits in this category were associated with greater assertiveness, self-esteem, Machiavellianism, and private self-consciousness, and less physical attractiveness. Women with musculoskeletal problems also interacted more frequently in groups, both large and small, and experienced same-sex and opposite-sex interaction as less pleasant. This pattern extended to acute accidents as well. Accidents were more common among women with more frequent group interaction (although these tended to be shorter in length), less reported pleasantness and intimacy, more self-initiation and assertiveness, and less physical attractiveness. Thus, chronic musculoskeletal problems and accidents seem to occur among more assertive, less attractive females who have less pleasant, more prevalent group interactions. Although this might be due in part to participation in sports, team activities generally involve groups larger than three, and would not fall into the mixed-sex category. They also would not account for less pleasant same- and opposite-sex interaction. Urinary and sexual disorders did not produce results exceeding chance.

By and large, our predictions regarding the health correlates of social interaction in females were supported. Psychosocial–personal ailments were more common among women with qualitatively poorer interactions. Most of this relationship stemmed from mental health visits, nervous system and mental disorders, blood and circulatory disorders, skin

and subcutaneous tissue problems, musculoskeletal disorders, and accidents. In contrast, the greater frequency of psychosocial–interpersonal visits by females with quantitatively more socializing was mostly due to infections.

Health Visits and Social Interaction: Males

The three summary variables produced less extensive results for males (see Table 3). Contrary to the hypothesis, males with more frequent psychosocial–personal problems interacted more frequently with more different females, at the expense of socializing with males. At the same time, they were less trusting of females and more afraid of negative evaluation. Thus, while they socialized more with females, it was a less comfortable experience. Psychosocial–interpersonal visits did not produce significant results beyond chance. However, as discussed earlier, if any of the specific ailment categories were to have yielded conflicting patterns, then the effects might cancel out in a summary index. Accordingly, Table 4 presents the results for the nine distinct categories.

Visits for mental health problems were predicted by a consistent set of social traits. Males who were seen more often were lonelier, higher in social avoidance and distress, more fearful of negative evaluation, less socially skilled, less assertive, more socially anxious, more concerned about their impression of themselves, more feminine, and less trusting of females. Thus, the pattern that emerges is of a male who is reluctant and anxious in social situations, even though he is no less active. Moreover, his higher level of activity may induce mental health problems, given a background of skills and attitudes that would not seem to facilitate socializing.

In direct contrast to this result are the findings for nervous system and mental disorders. Males with more visits for these reasons reported longer and more pleasant interactions with females, spanning more time per day. They interacted with a greater number of females, and were more assertive and masculine, less socially anxious, and less lonely. In other words, they tended to socialize frequently, enjoyably, and assertively with females. This result diverges from that of mental health visits, despite the similarity of

Table 3
Correlations Between Summary Health Indicators and Social Interaction: Males

Psychosocial-personal $R^2 = .36, F(2, 35) = 9.63$		Psychosocial-interpersonal $R^2 = .28, F(2, 35) = 6.64$	
Interaction quantity:		Interaction quality:	
Number of others, opposite sex	.42	Satisfaction, mixed sex	.26
Percentage, same-sex opposite sex	-.26	Social dispositions:	
Time Per Day, opposite sex	.35	FNE	.29
Number Per Day, opposite sex	.28	Masculinity	.31
Social dispositions:			
FNE	.34		
Trust of Females	-.31		
Total visits $R^2 = .60, F(4, 33) = 12.13$			
Interaction quantity:			
Number of others, opposite sex	.38		
Social dispositions:			
FNE	.39		
Masculinity	.35		
Machiavellianism	.32		
Initiation and influence:			
Initiation, overall same sex	-.26		
	-.27		

the two categories. The meaning of this discrepancy will be commented on in the Discussion section. The difference probably accounts for the weak findings for the psychosocial-interpersonal summary variable, supporting our argument for specificity.

Visits for disorders of the urinary-sexual system yielded a strong and consistent pattern. The less meaningful a male's interactions were, the more often he was seen for treatment. Note that this was true regardless of whether the interactions included females, males, or both. Such males were also more masculine (on the bipolar scale) and less trusting of other males.

More frequent musculoskeletal problems occurred in males who interacted more often with more different females. Generally, these males were more assertive regarding dating, more Machiavellian, more physically attractive, and less fearful of rejection by females. Accidents, which were predominantly acute musculoskeletal trauma, were predicted by a greater frequency and prevalence of mixed sex and group contact as well as masculinity. Infections, gastrointestinal disorders, and skin and subcutaneous tissue problems did not

relate to interaction beyond chance expectations.

In summary, although the global indices did not support the hypotheses for males, the specific categories furnished relevant evidence. Interaction quality or social traits related as expected to mental health visits and urinary-sexual ailments; nervous system and mental disorders yielded a contradictory result. Interaction quantity was associated with musculoskeletal problems and accidents.

Discussion

Overall, our hypotheses were confirmed for females, but not for males. The large number of correlation coefficients computed suggests that chance might be a factor, however. Table 5 is an attempt to deal with this issue as well as to summarize the myriad of results in a coherent way. The meaningfulness composite was excluded from the calculations to avoid redundancy. The final column lists those categories that produced significant effects beyond what might have been expected by chance. Interaction variables accounted for significant variance in all but four illness categories using this criterion.

Table 4
Specific Health Categories: Males

Mental health $R^2 = .31, F(2, 35) = 7.91$		Nervous system and mental disorders $R^2 = .39, F(3, 34) = 7.18$	
Pleasantness, mixed sex	-.27	Pleasantness, overall	.32
Self-disclosure, opposite sex	.26	opposite sex	.36
HAT	-.35	Satisfaction, overall	.35
BRAT	.34	Time Per Day, overall	.39
RAS	-.28	opposite sex	.36
SAD	.31	Length, overall	.34
FNE	.26	group	.26
Loneliness (NYU)	.37	same-sex	.26
Femininity	.28	opposite sex	.29
Masculine-feminine	-.28	mixed sex	.33
Private self-consciousness	.45	Number of others,	
Social anxiety	.30	opposite sex	.41
Trust of females	-.30	Percentage, same-sex	-.28
		opposite sex	.29
		DAQ	.35
		Assertiveness	.30
		Dating assertiveness	.28
		Loneliness (NYU)	-.36
		Masculinity	.38
		Social anxiety	-.29
		Initiation, group	.36
Urinary and sexual disorders $R^2 = .34, F(2, 35) = 9.03$		Blood, circulatory disorders $R^2 = .46, F(2, 35) = 14.96$	
Meaningfulness		Pleasantness, overall	.28
same sex	-.42	opposite sex	.30
opposite sex	-.42	mixed sex	.35
mixed sex	-.38	Satisfaction, mixed sex	.33
group	-.25	Time per day, overall	.30
Intimacy, overall	-.46	opposite sex	.30
same sex	-.48	Number per day, overall	.27
opposite sex	-.37	Number of others, same sex	.47
mixed sex	-.46	FNE	.27
Self-disclosure, overall	-.42	Trust of males	-.28
same sex	-.40		
opposite sex	-.46		
mixed sex	-.41		
Other-disclosure, overall	-.45		
group	-.31		
same sex	-.44		
opposite sex	-.44		
mixed sex	-.46		
Length, same sex	-.27		
Masculine-Feminine	.41		
Private self-consciousness	-.27		
Trust of males	-.46		
Accidents $R^2 = .28, F(2, 35) = 6.89$		Musculoskeletal $R^2 = .45, F(4, 33) = 6.79$	
Self-disclosure, mixed sex	-.28	Number per day, overall	.26
Number per day, mixed sex	.34	opposite sex	.33
Time per day, group	.29	Number of others,	
mixed	.30	opposite sex	.28
Number of others, opposite sex	.27	Percentage, group	-.29
Percentage, same-sex	-.36	opposite sex	.27
mixed	.36	DAQ	.37
Loneliness, (NYU)	-.26	Dating assertiveness	.39
Masculinity	.39	Machiavellianism	.35
Masculine-Feminine	.35	Physical attractiveness	.27
Trust of females	.26	Rejection by females	-.29
		Influence, overall	-.28
		mixed sex	-.34

For females, Psychosocial-Personal problems related to affectively poor socializing. This pattern extended to intimacy, other-disclosure, pleasantness, and satisfaction, mostly with the opposite sex, but with the same-sex and groups as well. Women with more psychosocial-personal ailments were also lonelier and more afraid of negative evaluation. Note that women with these problems were not isolated in any quantitative sense, rather, the poor quality of those interactions that did occur evidently related to somatic problems. From the more specific categories, we may infer that these symptoms were primarily mental health, nervous system and

mental disorders, blood-circulatory and skin-subcutaneous tissue problems. Although the first is generally psychological in nature, the latter three imply a nexus between the psychological and the somatic.

Perhaps the most important implication of this finding is the attention it focuses on interaction quality. Much prior research, not to mention nonempirical commentary, interprets the social support—social networks literature as indicating that the more one socializes, the better off one will be. Our research suggests this conclusion misses the mark. Instead, the results point to interaction quality as the primary factor. Good health may be

Table 5
Summary of Significant Contributors to Health-Interaction Relationships

	Social dispositions	Interaction quantity	Interaction quality	Initiation and influence	
Chance expectation ^a	2.2	2.1	2.5	1.0	Predominating factor
Females					
Interpersonal	1	5	0	2	Quantity
Personal	2	0	14	0	Quality
Mental Health	1	0	4	0	Quality
Infections	2	6	0	2	Quantity
Circulatory	0	1	4	4	Quality
Nervous & Mental	2	3	5	1	Quality
Gastrointestinal	4	1	0	0	Dispositions
Urinary or Sexual	3	1	0	0	—
Skin	4	5	5	6	All
Musculoskeletal	6	6	4	2	Dispositions, quantity
Accidents	2	9	5	4	Quantity
Total	4	4	5	3	All
Males					
Interpersonal	2	0	1	0	—
Personal	2	5	0	0	Quantity
Mental health	11	0	2	0	Dispositions
Infections	2	0	0	1	—
Circulatory	2	4	4	0	Quantity, quality
Nervous and mental	6	10	3	1	Quantity, dispositions
Gastrointestinal	1	1	1	0	—
Urinary or sexual	3	1	13	0	Quality
Skin	0	1	1	2	—
Musculoskeletal	5	5	0	2	Dispositions, quantity
Accidents	4	6	1	0	Dispositions, quantity
Total	3	1	0	2	—

^a Chance was determined as the number of correlations computed that might be expected to reach the .10 level of significance; i.e., 10%.

facilitated not by having many interactions, but by affective closeness in those interactions that do occur. This is consistent with other studies that point to quality, as opposed to mere presence or quantity (Beckman, 1981). It also supports recent evidence that the perception of emotional support may be more important than other components of social support (S. Cohen & Hoberman 1983; Schaefer, Coyne, & Lazarus, 1981).

This relationship was not confirmed among males, most likely because of the sharp divergence between the mental health and nervous system disorder categories. Mental health visits were best accounted for by a cluster of social traits indicating lower social skills, greater anxiety, higher femininity, and greater loneliness. Nervous system and mental disorders, on the other hand, were more likely among males who interacted more frequently with more different females, who reported these interactions as more pleasant, who were more masculine and assertive, and who were less socially anxious and lonely. We have no ready explanation for this reversal.

One speculation might center on the impact of masculinity and femininity on the expression of somatic symptoms. Traditionally, masculine personalities are alleged to "present a strong front," and would be less likely to admit emotional weaknesses or problems. Femininity is more closely linked to the expression of feelings, no doubt including problems and conflicts as well. As a result, a person high in femininity would be more likely to present emotional difficulties that would be categorized as Mental Health problems, according to the ICHPPC coding system. A nonexpressive masculine person might be more apt to deny such problems and to internalize them instead.

These conflicts might then evidence themselves in somatic complaints, which do not involve acknowledging emotional problems. When this process occurs without awareness, it is referred to as a somatoform disorder in the DSM III (American Psychiatric Association, 1980). Recall that this category included maladies such as insomnia, headaches, sexual problems, and malaise. These symptoms may derive from unexpressed stress or tension, a process more likely among more masculine personalities. This interpretation, we repeat,

is speculative and requires future research. However, it may account for the contradiction between these two symptom categories as well as their cancelling effect in the aggregated Psychosocial-Personal category. It is interesting to note that both personal and interpersonal disorders were strongly correlated with fear of negative evaluation, such that more fearful males went for treatment more often. As this variable indicates underlying anxiety and stress about social interaction, it may provide a basis for symptomatology.

Interaction quality did predict urinary and sexual disorders among males, in that visits for these ailments were more common in males who had less intimate and less-disclosing interactions across all categories, and who were more masculine on the bipolar scale of the PAQ. These males may avoid intimate relationships generally, a tendency that might bring them into sexual contact more often with less well-known others and make sexually-transmitted symptoms more of a problem.

Our second hypothesis was also confirmed only for females. Psychosocial-interpersonal illnesses were more frequent among females who socialized more frequently with more different others. This result stemmed from visits for treatment of infections, confirming in a novel way the role of social contact in spreading infectious diseases. It is interesting that frequency and breadth of contact predicted such illnesses, whereas other quantitative measures, such as time per day, did not. Likewise, it is noteworthy that the affective quality of social life did not predispose either sex to infection.

One instance in which the sexes were similar occurred in the interaction patterns associated with accidents and chronic musculoskeletal problems. These ailments were more common among women who were more assertive, spent more time in group and mixed-sex activity, reported less pleasant interactions, and were less physically attractive. Males who had more accidents also spent more time in groups and mixed-sex company, and were more masculine. Males with chronic musculoskeletal problems were more assertive, as were females, and more attractive. The fact that physical attractiveness reverses sign for the sexes may indicate a sex difference in how a muscular body is evaluated. Mus-

cular females are not seen as attractive, while muscular males are. Both are more likely to engage in sports, where accidents occur and chronic problems develop.

One other finding bears brief discussion. Skin and subcutaneous tissue treatment visits were more frequent among females who socialized more with males, albeit with somewhat less reported intimacy. Such females felt they had more influence over their interactions generally, were more socially assertive, less anxious, and less afraid of rejection by males. The picture that emerges is of a socially active and confident female who focusses her social time on males. Her frequency of visits for skin and subcutaneous tissue care may reflect a concern over these aspects of appearance, rather than more severe symptoms. Interestingly, these females were not rated as more or less physically attractive, $r(48) = .10$. They may just have attached more importance to appearance.

Note on Methodology

Methodologically, this study eliminated many of the technical problems that have troubled prior research (S. Cohen & McKay, 1984; Wallston et al., 1983). The social interaction data were not gathered by recollection, or from a sample of ill persons; subjects were blind to the issue of health until after the social participation data had been amassed; specific components of both health and social interaction were studied; and the data possessed greater objectivity than is usually the case. Nevertheless, there are numerous objections that might be raised, as is often the case with correlational data sets compiled in naturalistic settings. One concerns the role of chance in these data, given the large number of predictor variables. We have attempted to control for this factor by using multiple regression, and more importantly, by giving interpretative significance only to those dependent variables that related to more predictors than expected by chance, and that yielded a meaningful and reasonably consistent pattern to results. The final test will be replication, which we hope to encourage.

Another concern pertains to the time levels of measurement. One might ask: Why should

four years of health-care visits relate to two weeks of social interaction during the senior year? Certainly, it would have been desirable to collect interaction records over the student's four years in college. As this was logistically unfeasible, we were forced to rely on the stability of social participation patterns over this time. To the extent that social behavior follows a homogenous course, the 2-week sample would represent an adequate estimate of the person's long-term social experience, subject to sampling error. The data of Wheeler and Nezelek (1977) suggest that this assertion is tenable. Regardless, we fully expect that longer intervals of data collection, or perhaps varied time intervals, would have produced stronger relationships. Yet the fact that coherent and significant results did emerge indicates that this single sample of social episodes provided a reasonable estimate of a far longer record of social involvement. In other words, social participation is at least somewhat stable.

Alternatively, it might be argued that particular categories of illness cause people to avoid particular types of contact with others. This would be an interesting point of view, and in general, one that is consistent with our theorizing. For example, females with Psychosocial-Personal problems may shun meaningful interactions. The only argument we can offer against this position is that health problems were not rampant in this sample; the mean number of visits over four years was 11.81. A time-series design would be helpful to examine this important possibility.

In conclusion, in our future research, we hope to learn more about the role of psychosocial factors in health and illness by distinguishing the various parameters of social interaction and then investigating their differential impact on health. Such knowledge would provide a powerful tool for diagnosis and treatment.

References

- American Psychiatric Association. (1980). *Diagnostic and Statistical manual of mental disorders (3rd ed.)* Washington, DC: Author. 1980.
- Barrera, M., Jr (1981). Social support in the adjustment of pregnant adolescents: Assessment issues. In B. H.

- Gottlieb (Ed.) *Social networks and social support* (pp. 69-96). Beverly Hills, CA: Sage.
- Beckman, L. J. (1981). Effects of social interaction and children's relative inputs on older women's psychological well-being. *Journal of Personality and Social Psychology*, *41*, 1075-1086.
- Berkman, L. F., & Syme, S. L. (1979). Social networks, host resistance, and mortality: A nine-year follow-up of Alameda County residents. *American Journal of Epidemiology*, *109*, 186-204.
- Christie, R., & Geis, F. L. (Eds.) (1970). *Studies in Machiavellianism*. New York: Academic Press.
- Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine*, *38*, 300-314.
- Cohen, F. (1979). Personality, stress and the development of physical illness. In G. Stone, F. Cohen & N. Adler (Eds.) *Health psychology—A handbook* (pp. 77-111). San Francisco: Jossey-Bass.
- Cohen, J., & Cohen, P. (1975). *Applied multiple regression/correlation analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.
- Cohen, S., & Hoberman, H. M. (1983). Positive events and social supports as buffers of life change stress. *Journal of Applied Social Psychology*, *13*, 99-125.
- Cohen, S., & McKay, G. (1984). Social support, stress and the buffering hypothesis: A review of naturalistic studies. In A. Baum, J. E. Singer & S. E. Taylor (Eds.) *Handbook of psychology and health*, (Vol. 4, pp. 253-267). Hillsdale, NJ: Erlbaum.
- DiMatteo, M. R., & Hays, R. (1981). Social supported serious illness. In B. H. Gottlieb (Ed.) *Social networks and social support* (pp. 117-148). Beverly Hills, CA: Sage.
- Eaton, W. W. (1978). Life events, social supports, and psychiatric symptoms: A reanalysis of the New Haven data. *Journal of Health and Social Behavior*, *19*, 230-234.
- Fenigstein, A., Scheier, M. F., & Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology*, *43*, 522-527.
- Glass, D. C. (1977). *Behavior patterns, stress, and coronary disease*. Hillsdale, NJ: Erlbaum.
- Gottlieb, B. H. (1976). Lay influence on the utilization and provision of health services: A review. *Canadian Psychological Review*, *17*, 126-135.
- Heller, K. (1979). The effects of social support: Prevention and treatment implications. In A. P. Goldstein & F. H. Kanfer (Eds.) *Maximizing treatment gains: Transfer enhancement in psychotherapy*. (pp. 353-382). New York: Academic Press.
- Heller, K., & Swindle, R. W. (1982). Social networks, perceived social support and coping with stress. In R. D. Felner, L. A. Jason, J. Moritsugu, & S. S. Farber (Eds.) *Preventive psychology: Theory research and practice in community intervention* (pp. 87-103). New York: Pergamon.
- Helmreich, R., & Stapp, J. (1974). Short forms of the Texas Social Behavior Inventory, an objective measure of self-esteem. *Bulletin of the Psychonomic Society*, *4*, 473-475.
- Henderson, S. (1980). A development in social psychiatry: The systematic study of social bonds. *Journal of Nervous and Mental Disease*, *168*, 63-69.
- Horn, J. L., & McArdle, J. J. (1980). Perspectives on mathematical/statistical model building (MASMOB) in research on aging. In L. W. Poon (Ed.) *Aging in the 1980's: Psychological Issues* (pp. 503-541). Washington, DC: American Psychological Association.
- International Classification of Health Problems in Primary Care (ICHPPC)*. (1975). Chicago: American Hospital Association.
- Kelley, H. H. (1979). *Personal relationships: Their structure and processes*. Hillsdale, NJ: Erlbaum.
- Langlie, J. K. (1977). Social networks, health beliefs, and preventive health behavior. *Journal of Health and Social Behavior*, *18*, 244-260.
- La Rocco, J. M., House, J. S., & French, J. R. P., Jr. (1980). Social support, occupational stress, and health. *Journal of Health and Social Behavior*, *21*, 202-218.
- Larson, R. (1978). Thirty years of research on the subjective well-being of older Americans. *Journal of Gerontology*, *33*, 109-125.
- Levenson, R. W., & Gottman, J. M. (1978). Toward the assessment of social competence. *Journal of Consulting and Clinical Psychology*, *46*, 453-462.
- McFall, R. M., & Lillesand, D. B. (1971). Behavior rehearsal with modeling and coaching in assertion training. *Journal of Abnormal Psychology*, *77*, 313-323.
- Miller, P. McC., & Ingham, J. G. (1976). Friends, confidants and symptoms. *Social Psychiatry*, *11*, 51-58.
- Mitchell, R. E., & Trickett, E. J. (1980). An analysis of the effects of determinants of social networks. *Community Mental Health Journal*, *16*, 27-44.
- Myers, J., Lindenthal, J., & Pepper, P. (1975). Life events, social interaction and psychiatric symptomatology. *Journal of Health and Social Behavior*, *16*, 421-427.
- Perri, M. G. & Richards, C. S. (1979). Assessment of heterosocial skills in male college students: Empirical development of a behavioral role-playing test. *Behavior Modification*, *3*, 337-354.
- Rathus, S. A. (1973). A 30-item schedule for assessing assertive behavior. *Behavior Therapy*, *4*, 398-406.
- Reis, H. T. (1984). Social interaction and well-being. In S. Duck (Ed.), *Personal Relationships V: Repairing Personal Relationships* (pp. 21-45). London: Academic Press.
- Reis, H. T., Wheeler, L., Spiegel, N., Kernis, M., Nezlek, J., & Perri, M. (1982). Physical attractiveness in social interaction, II: Why does appearance affect social experience? *Journal of Personality and Social Psychology*, *43*, 979-996.
- Rubenstein, C., & Shaver, P. (1980). Loneliness in two northeastern cities. In J. Hartog & R. Audy (Eds.) *The anatomy of loneliness*. New York: International Universities Press.
- Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA Loneliness scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, *39*, 472-480.
- Schaefer, C., Coyne, J. C., & Lazarus, R. S. (1981). Social support, social networks and psychological functioning. *Journal of Behavioral Medicine*, *4*, 381-406.
- Spence, J. T., Helmreich, R., & Stapp, J. (1975). Ratings of self and peers on sex-role attributes and their relation to self-esteem and conceptions of masculinity and femininity. *Journal of Personality and Social Psychology*, *32*, 29-39.

- Wallston, B. S., Alagna, S. W., DeVellis, B. M., & DeVellis, R. F. (1984). Social support and health. *Health Psychology, 4*, 367-391.
- Watson, D., & Friend, R. (1969). Measurement of social-evaluative anxiety. *Journal of Consulting and Clinical Psychology, 33*, 448-457.
- Weisman, A. D. & Worden, J. W. (1975). Psychosocial analysis of cancer deaths. *Omega, 6*, 61-75.
- Wheeler, L., & Nezlek, J. (1977). Sex differences in social participation. *Journal of Personality and Social Psychology, 35*, 742-754.
- Wheeler, L., Reis, H. T., & Nezlek, J. (1983). Loneliness, social interaction, and sex roles. *Journal of Personality and Social Psychology, 943-953*.
- Wilcox, B. L. (1981). Social support, life stress, and psychological adjustment: A test of the buffering hypothesis. *American Journal of Community Psychology, 9*, 371-386.

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