Strangers, Friends and Happiness[1]

GSS Technical Report No. 72

Summer, 1986

Ronald S. Burt

Department of Sociology
Columbia University
New York, NY 10027

---

[1]This note is a by-product of support from the National Science Foundation Sociology Program (SES-8208203) and the Measurement Methods and Data Improvement Program (SES-8513327) and has been produced as part of the Research Program in Structural Analysis housed at Columbia University's Center for the Social Sciences. I appreciate Wen Xie's able assistance in replicating the data analysis to ensure the accuracy of the reported results. Persons interested in zero-order effects or more detailed analysis of the data are referred to the public domain GSS data tape (Davis and Smith, 1985) available from the Inter-University Consortium for Political and Social Research or the Roper Public Opinion Research Center (Box U-164R, University of Connecticut, Storrs, CT 06268). Persons interested in easy access to the network data in particular are referred to a codebook and microcomputer diskette available by requesting Technical Report #TR1, "The 1985 General Social Survey Network Data," from the Center for the Social Sciences (Columbia University, New York, NY 10027). Requests for the technical report should be accompanied with a $10 check made out to the "Research Program in Structural Analysis" to help cover duplication and mailing costs. The diskette is in DOS 360K format for an IBM microcomputer. It contains all of the network data, summary network density data, and selected respondent background variables.

Strangers, Friends and Happiness

Using network data obtained in the 1985 General Social Survey, expressions of happiness are shown to increase with the size of a person's discussion network and decrease with the prevalence of strangers in the network. The density of especially close relations in the network has no direct effect on happiness. It is the negative impact of strangers rather than the positive impact of close relations that determines expressions of happiness. The network size and stranger effects remain strong even after respondent differences in socioeconomic status, age, sex, race, and domestic situation are held constant. However, it is clear that an almost certain route to strengthening the network measures to predict well-being lies in studying how happiness varies with the position of a spouse or other domestic partner in the respondent's network.

It is commonly assumed that expressions of happiness and well-being are associated with social density, having many strong relations with strongly interconnected people. This assumption is played out in the network of relations surrounding an individual, what Rossi (1966) aptly termed the individual's interpersonal environment, where density varies between two extremes.[2] At the high end of density, suppose that you are discussing a topic important to you with someone you know well and a second person you know well approaches. Both of your friends know each other well, share one another's interests, and the three of you continue the discussion collectively. The more often this pattern occurs in your informal social relations, the more likely that you and your associates all have similar interests, share similar values, and are available to one another for social support when needed. Thus, the more likely you are to be pleased with your overall situation and the less likely you are to feel stressed. At the other extreme, suppose that you are in the same discussion except that the third person who approaches is a complete stranger to your initial discussion partner. You stop your discussion, introduce your friends to one another, and look for some topic of mutual interest to the three of you. Collective exchange is missing and the cost of managing independent relationships is introduced. The more often this pattern occurs in your informal social relations, the greater your responsibility for defining and

---

[2]Accounts linking well-being to social density are myriad, proliferating within each discipline, but some exemplary references are discussions of first-order zones and quasi-groups in anthropology (e.g., Mayer 1966; Boissevain 1974), discussions of interpersonal fields in social psychology and social psychiatry (e.g., Lewin 1936; Sullivan 1940), and classical sociological accounts of primary groups more generally as in Durkheim's Suicide, Toennies' Community and Society, and Cooley's Social Organization. Hughes and Gove (1981, pp. 49-56) provide a succinct literature review focusing, as seems proper from the results to be presented here, on the impact of being a social isolate.

maintaining your interpersonal network -- a responsibility detracting from the network's ability to support well-being. In sum, across people in a heterogeneous population, happiness and well-being are expected to increase with the number of people in a network (network size) and increase with the strength of relations between people in the network (network density).

The positive effect of network size is well documented in empirical research beginning with social volume and family size in Durkheim's *Suicide* and continuing through the recent explosion of papers on social support (e.g., see Gottlieb 1981; Cohen and Syme 1985; Kessler et al. 1985; Litwak 1985; Lin et al. 1986, for review). An influential example of this research is the Human Population Laboratory mortality study. A large sample of adults of widely varying ages was drawn in 1965 from Alameda County (just east of San Francisco). The subsequent mortality of respondents was recorded in a follow-up survey nine years later. Social contact items were included in the initial survey; marital status, church membership, membership in other groups, and items asking for the number of friends and relatives close to the respondent and the aggregate frequency of contact with friends and relatives. Responses were aggregated into a four category "social network index" distinguishing respondents with the fewest contacts from respondents with the most. With controls for related factors such as age, sex, socioeconomic status, and health at the time of the initial interview, respondents with few social contacts were systematically more likely to die in the follow-up period than respondents with extensive contacts (see Berkman and Syme 1979, p. 190, for an illustrative graph of the network size effect). In other words, merely being involved in social relations had a positive effect on well-being, even to the extent of affecting mortality.

In contrast to the wealth of results on network size, little empirical research has directly addressed the effect of network density on expressions of well-being. Wellman (1981) and Hall and Wellman (1985) cogently argue the need and value of giving more explicit attention to the structure of an individual's network as it provides social support. As recently as a few years ago, Kadushin (1982, p. 147) was able to state that his analysis was; "...the first substantial empirical demonstration that there is indeed a negative relation between density and mental disorder; or, conversely, high density is associated with mental health." Studying a sample of men in Brooklyn, Westchester County, and Bridgeport "between the ages of 24 and 37 who were eligible to

serve in the Vietnam War," Kadushin found a significant association between stress and density. The stronger the relations among up to nine of a respondent's close associates, the lower his score on a stress scale composed of items indicating respondent anger, anxiety, frustration, worry and so on. Studying a much more heterogeneous sample of persons drawn from areas around San Francisco and Sacramento, Fischer (1982, pp. 149ff) also found a significant association between stress and density after other factors, especially income, are held constant. Fischer measured stress with a "psychological mood" scale composed of items similar to Kadushin's (cf., Kadushin 1982, pp. 157-158, Fischer 1982, p. 336) and measured density by the degree to which up to five of a respondent's core associates all knew one another well (cf., Kadushin 1982, p. 156, Fischer 1982, pp. 144-145, 344). Holding constant respondent differences in related factors such as age, mobility, marital status, household size, and so on, the extent to which a respondent felt "pleased" with his or her overall situation increased significantly with increasing density -- especially in families with below average incomes (Fischer 1982, pp. 393-394).[3]

THE GENERAL SOCIAL SURVEY NETWORK DATA

This research can be expanded in two significant ways with the network data obtained in the 1985 General Social Survey (GSS). First, the scope of the research findings can be expanded from local and/or specialty populations to the national population. The GSS sample represents "English-speaking persons 18 years of age or over, living in non-institutional arrangements within the continental United States." Each of the 1,534 GSS respondents was asked; "Looking back over the last six months, who are the people with whom you discussed matters important to you?" Diverse data were then obtained on relations with and among the first five people named. Burt (1984) provides a detailed discussion of the network data and various issues taken into account by the GSS Board of Overseers in their deliberations over the network items.

---

[3]Fischer reports an interesting interaction between density and household income; density is positively associated with well-being for low income respondents but has a negative effect on well-being for high income respondents (e.g., Fischer 1982, p. 151). I have not addressed this point in the text because it is not needed to describe network effects in the GSS data. Regressing happiness over density, family income and an interaction term between density and high versus low family income (dichotomized at the mean category of family income) yields a strong positive density effect across all respondents (2.16 t-test, $p = .015$, cf. Eq. 1 in Table 1) and a negligible difference in the density effect for high and low income families (-1.07 t-test, $p = .287$). Similarly negligible slope adjustments are obtained if separate network size and stranger effects are estimated.

Marsden (1986) and Burt (1986) describe basic features of the data and the network data are available on microcomputer diskette (see acknowledgment note).

Second, the form of the association with expressions of happiness can be studied more carefully. The network data available in the GSS make it possible to separate the effects of network size and density. What is more novel is the ability to study effects at the upper and lower extremes of density because the GSS network data identify both especially close relations and total strangers. Respondents were asked to indicate which pairs of their discussion partners were especially close to one another. These data can be used to assess the familiar positive effects of being able to discuss important matters with a close circle of people close to one another. Respondents were also asked to indicate which of their discussion partners were total strangers to one another. These data can be used to assess the negative effects of having to sustain independent relationships with otherwise unconnected people in order to discuss important matters.

Of course, subject to severe time constraint, the GSS network data are limited, providing no more than a narrow window on the interpersonal environment. They stand in stark contrast to the rich network data obtained in some local and regional surveys. Nevertheless, they are sufficient to detect a significant link between happiness and density.

BASIC RESULTS

The principal indicator in the GSS of overall respondent well-being is a three category happiness item; "Taken all together, how would you say things are these days -- would you say that you are very happy, pretty happy, or not too happy?" In 1985, most respondents claimed to be pretty happy (60%). Half as many were very happy (29%), and some were not too happy (11%). Similar proportions occur across the nine GSSs between 1972 and 1982 (53%, 34%, and 13% respectively, Davis 1984, p. 319).

These are extremely crude distinctions among respondents, much less precise than those studied by Kadushin and Fischer (see Veenhoven 1984, pp. 64-114, for a thorough review of happiness indicators). However, significant effects detected with these crude distinctions should be even stronger in studies with more precise measures of well-being. In keeping with the GSS mandate from the National Science Foundation, I am using the GSS happiness variable

less to calibrate network effects on respondent well-being than to find out whether or not there are network effects worth pursuing with more precise measures of well-being. Further, even these crude distinctions are strongly associated with certain domestic and economic differences among respondents (see Davis 1984, for an analysis of happiness correlates in the nine General Social Surveys between 1972 and 1982). Finally, the GSS happiness variable often appears as an important component in more precise measures of respondent well-being (e.g., Fischer 1982, p. 310, item 116).

---- Table 1 About Here ----

Overall, happiness is significantly associated with network size and density. Summary results are presented in Table 1. The first column of the table presents the results of regressing happiness over the usual measure of network density -- summed strength of relations among discussion partners divided by the number of relations. The tendency for happiness to increase with mean relation strength is significant. An effect this strong would be expected in only .02 of repeated General Social Surveys of the American population if happiness were independent of density (one-tail test).

The results of estimating separate size and density effects are reported in the remaining columns of Table 1. The happiness variable is regressed over three variables; the number of discussion partners on whom network data were obtained, the number of "especially close" pairs of discussion partners, and the number of "total stranger" pairs of discussion partners. Happiness should increase with network size, increase with the number of especially close relations in the network and decrease with the number of strangers.[4]

Size and close relations are used to predict happiness in the second and third columns of Table 1. Size alone has a significant positive effect on happiness, but happiness is less determined by network size than the number of especially close relations between discussion partners. Of course, number of

---

[4]Note that the specification of additive effects in table 1 is different from the usual definition of density as an interaction variable created by dividing number of relations by a function of network size. No interaction terms are specified in table 1 because size and number of stranger (or especially close) relations do not have an interaction effect on happiness above and beyond their direct additive effects on happiness. If the standard density variable (second row of table) is added to Eq. (5) in table 1, for example, there is no change in the pattern of effects obtained. Strong effects exist from network size (.037 regression coefficient with a 2.42 t-test) and number of stranger relations (-.036 with a 2.86 t-test), a negligible effect exists from number of especially close relations (.011 with a 1.07 t-test), and the effect of density as an interaction between network size and number of close relations is negligible (-.058 with a 0.94 t-test). Similarly, nothing is added by including the standard density variable in Eqs. (1) or (3) of table 1 (respective t-tests of -0.03 and -0.49).

close relations increases with network size so the positive effect of especially close relations includes a size effect.

Stronger results are obtained by focusing on strangers. The fourth column of Table 1 shows that happiness increases significantly with network size and decreases significantly with the pairs of discussion partners who were total strangers to one another (the t-tests of 3.82 and -3.32 are significant beyond a .001 level of confidence). The fifth column shows that the positive effect of especially close relations is more precisely an effect created by discussion partners not being strangers to one another. The direct positive effect of especially close relations is negligible with network size and strangers held constant (0.71 t-test, p = .24). In contrast, the effects of network size and strangers are strong (respective t-tests of 2.27, p = .012, and -2.70, p = .003).[5]

---- Figure 1 About Here ----

In sum, happiness increases with network size and declines with the prevalence of strangers in the network. These effects are illustrated in Figure 1.[6] Overall, the proportion of respondents claiming to be "very happy" increases with the number of people named as discussion partners. Among the respondents with no discussion partners, 24% were very happy. This percentage increases with network size to 30% of the respondents with five or more discussion partners -- 37% if the discussion partners were especially close or at least acquainted with one another. At each level of network size, respondents

---

[5]Respondents with small networks are sometimes deleted from density analyses because density is zero by definition. For example, Fischer (1982, p. 145) reports density effects only for respondents naming three or more close associates. If I delete GSS respondents naming fewer than three discussion partners (lowering the sample size from 1,527 to 932), I replicate Fischer's finding that density has no zero-order association with happiness: Happiness = .149 + .109 Density, (1.65 t-test), and this conclusion is repeated for the density of especially close relations between discussion partners (number of observed "especially close" relations divided by number possible): Happiness = .173 + .071 Especially Close Density, (1.21 t-test), but the negative effect of strangers among a respondent's discussion partners is still evident even as a zero-order effect (number of observed "total stranger" relations divided by number possible): Happiness = .250 - .109 Stranger Density, (3.21 t-test). This calls attention to the importance of strangers in the density effect on happiness and does not recommend eliminating small networks from analysis.

[6]Although network size is truncated and the number of stranger relations is reduced to a binary variable for illustrative purposes in Figure 1, the results in Table 1 are replicated by the limited network data presented in the graph. The hypothesis that happiness (very, pretty, not too) is independent of both size (2, 3, 4, 5 or more) and strangers (none versus one or more) is unacceptable (26.78 likelihood ratio chi-square, 14 df, p = .02). Happiness is not independent of network size with strangers held constant (20.70 chi-square, 12 df, p = .05) nor is it independent of strangers with size held constant (19.07 chi-square, 8 df, p = .02). In contrast, the density of especially close relations (none versus one or more) has no direct association with happiness. The data are adequately described by a loglinear model in which three category happiness is independent of especially close relations when network size is held constant (4.70 chi-square, 8 df, p = .79).

with no strangers among their discussion partners (white bars) were happier than those with networks containing one or more strangers (dark bars). In fact, respondents with large networks (five or more discussion partners) containing one or more strangers were about as happy as social isolates, the respondents who had no one with whom they discussed important matters. Respondents with two discussion partners who were strangers to one another were actually less happy than the social isolates.

OTHER FACTORS

Given evidence of a significant association between happiness and density, I wish to determine how robust the detected network effects are after other factors associated with happiness are held constant. Focusing on the information most relevant to this question, significance tests are presented in table 2 for some of the most familiar happiness correlates.

The network effects survive these controls. Two points are demonstrated with Table 2. First, the network size and stranger effects remain strong after respondent differences in socioeconomic status, age, sex, race, and domestic situation are held constant. The positive effect of having many discussion partners (row one of the table) is slightly less than the negative effect of having many strangers among the discussion partners (row two), however, both effects are very strong, typically about three times the size of their standard errors.

Second, holding network size and density constant does not eliminate the correlates of happiness reported by Davis (1984) in his extensive analysis of the General Social Surveys between 1972 and 1982, surveys in which network data were not available (cf. Veenhoven's 1984, pp. 376-379, review of research on happiness correlates). The 149 black respondents were significant less happy than the remaining 1,378 respondents. Happiness increases with socioeconomic status as indicated by occupational prestige, education being a more important factor than dollars of annual income. Occupational prestige is not used with income and education to predict happiness because prestige scores were originally determined from income and education data. The variables are sufficiently correlated to eliminate unique effects from any one of them if all three are included in the same equation.[7] The strongest association in Table 2

[7] A further socioeconomic consideration is work status. At a given level of income and education, GSS respondents could have been working full time, working part time, employed but legitimately out of work

is the tendency for married people to have been happier than the unmarried (cf., Davis 1984, p. 330, 333, for the same finding across the earlier General Social Surveys).[8]

---- Table 2 About Here ----

The domestic situation merits closer study. Not only does marital status have the strongest effect on happiness, it is network data of a limited kind. The socioeconomic status and attribute variables in Table 2 describe qualities of an individual respondent. The domestic situation variables indicate the volume and nature of relations in the respondent's household and so offer some indication of the interpersonal environment in which the respondent could have discussed important matters.

---- Figures 2 and 3 About Here ----

The distribution of happiness across kinds of domestic situations is presented in Figure 2, illustrating significant variation across the domestic situations (10.86 F-test with 8 and 1,494 df, $p < .001$). It is apparent, and not too surprising, to see that household size affects happiness differently for respondents in different marital statuses. The happiest domestic situation contained a married respondent living with only one other person. As noted

---

(e.g., illness, vacation, strike), unemployed, retired, in school, keeping house, or something else. Of these conditions, two are significantly associated with happiness. The 39 respondents legitimately out of work were significantly unhappy and the 45 unemployed respondents were significantly unhappy. Being out of work falls into the general class of life event variables used to describe well-being as a response to happy and depressing events. The interaction between such variables and network structure is an important research question, a question being answered by studies such as Nan Lin's mental health surveys with colleagues in the Albany area (e.g., Lin et al. 1986, especially pp. 77-81), but the GSS is not designed to provide life event data for such an analysis and the 1985 GSS in particular did not contain the GSS items on death and divorce among the respondent's relatives. Nevertheless, proceeding with the data at hand, I used a dummy variable contrasting these 84 out of work respondents with the remaining 1,443 respondents to study level and slope adjustments to the network effects. Happiness increases significantly with network size and decreases significantly with strangers regardless of work status, but the network effects do operate at a significantly lower average level of happiness for the respondents out of work.

[8]Race, marital status and improving financial situation are the principal correlates of happiness that emerge from Davis's (1984) analysis. As can be seen in Table 2, the race and marital status effects are evident in the 1985 GSS. Improving financial situation also continues to be strongly associated with happiness. Respondents were asked to pick one of three financial change categories: "During the last few years, has your financial situation been getting better, worse, or has it stayed the same?" Happy respondents tended to say that their financial situation was getting better (70.80 chi-square, 4 df, $p < .001$). I have not included this variable in Table 2 because it is less a determinant of happiness than an additional indicator of happiness. Nevertheless, holding this variable constant does not eliminate the effects of network size and strangers. An analysis of happiness variance across size, strangers, and financial changes reveals the strong positive effect of network size (3.05 t-test, $p = .001$, cf. first row of Table 2), the strong negative effect of strangers (3.29 t-test, $p < .001$, cf. second row of Table 2), and a strong association with having an optimistic *financial outlook* (28.28 F-test with 2 and 1,522 df, $p < .001$).

elsewhere (e.g., Glenn and Weaver 1979; Davis 1982), expanding the household to include any additional people had a significant negative impact on the married respondent's happiness (-3.24 t-test, $p < .001$).[9] Even widows living alone were only slightly less happy than married respondents in households of three or more, the principal difference being the greater tendency for widows to select the "not too happy" response category.[10] The greatest unhappiness occurred in the households of respondents who had divorced or separated from a spouse.[11] There is no association for these people between happiness and household size (-0.59 t-test, $p = .55$). Whether living alone, living with one other person, or living with two or more other people, divorced respondents and separated respondents were the most likely to select the "not too happy" response category. Finally, respondents who had never been married benefited from living with others. Happiness tends to increase with household size (1.30 t-test, $p = .195$) -- a tendency distinguishable principally because of the nonpositive household size effects for other marital statuses.

Discussion networks varied across domestic situations at the same time that happiness varied. This is illustrated in Figure 3. Network size is by and large the same across the nine domestic situations -- except for the small networks of widows living alone -- but network structure and composition varied significantly by domestic situation.[12] As might be expected, the use of kin as discussion partners varied across domestic situations. Significant

---

[9]In fact, happiness is significantly lower in every other domestic situation except never married respondents living with two or more other people. Regressing happiness over respondent education, being out of work, race, number of discussion partners, strangers (see Table 2), and eight dummy variables distinguishing the domestic situations in Figure 2 from married respondents living with just one companion shows significant declines in happiness among; married respondents living with two or more other people (-3.54 t-test, $p = .001$), widows living alone (-2.95 t-test, $p = .003$), divorced or separated respondents living alone (-5.95 t-test, $p < .001$) with one companion (-4.69 t-test, $p < .001$) or with two or more other people (-6.00 t-test, $p < .001$), and never married respondents living alone (-3.90 t-test, $p < .001$) or living with one companion (-2.95 t-test, $p = .003$).

[10]Not all widows lived alone, but so few lived with others that it is impossible to study their domestic situation with any reliability. Sixteen lived with one other person and 10 lived with two or more other people. These 26 respondents are deleted from the analysis of domestic situations.

[11]Related to this are the seven married respondents who lived alone and are not presented in Figure 2. They were very unhappy; none claimed to be very happy and three said that they were not too happy. These respondents were few in number and obviously not enjoying the benefits of being married. Rather than treat them as formally separated from their spouses I have deleted them from the analysis.

[12]There are significant differences in average network size across the nine domestic situations in Figure 3 (7.69 F-test with 8 and 1,489 df, $p \leq .001$) principally created by the small networks of widows living alone (-6.97 t-test, $p < .001$). Network size does not differ significantly across the other eight domestic situations (1.82 F-test with 7 and 1,357 df, $p = .08$).

differences exist in the average number of kin cited as discussion partners (9.98 F-test with 8 and 1,489 df, $p < .001$) and the average proportion of discussion partners who were kin (7.69 F-test, $p < .001$). The availability of a spouse meant that married respondents named significantly more kin as discussion partners (white bars in Figure 3). Proportionately, about every other discussion partner named by a married respondent was a relative (61% if living with one companion, 56% if living with two or more other people). Widows too turned to kin for about half of their discussion partners (51%). In other domestic situations, respondents were more likely to discuss important matters with nonkin (striped bars in Figure 3). Regardless of household size, respondents who were divorced, separated, or never married named significantly more nonkin discussion partners and a higher proportion of their discussion partners were nonkin.[13] This shift to nonkin increased the likelihood of some discussion partners being strangers (dark bars in Figure 3). Across the nine domestic situations in Figure 3, significant differences exist in the average number of pairs of discussion partners who were total strangers (5.25 F-test with 8 and 1,489 df, $p < .001$) and the average proportion of discussion partners who were total strangers (5.86 F-test, $p < .001$). Strangers were significantly more likely to be found in the networks of respondents who were divorced, separated, or never married, especially if the respondent lived alone.[14] The respondents

---

[13]Regressing number of nonkin discussion partners over six dummy variables distinguishing the domestic situations of these respondents yields a constant of 1.17 nonkin named by married and widowed respondents and upward adjustments for divorced or separated respondents (t-tests of 4.37 for those living alone, 3.00 for those living with one companion and 3.12 for those living with two or more people) and for respondents never married (t-tests of 6.15 for those living alone, 5.34 for those living with one companion and 4.16 for those living with two or more people). Similar results are obtained with proportion of nonkin named. The regression constant of 43% nonkin named by married and widowed respondents has to be adjusted upward for divorced and separated respondents (t-tests of 5.73, 4.79, and 4.44 respectively for those living alone, with one companion, or with two or more people) and for respondents never married (t-tests of 6.72, 4.55, and 3.12 respectively for those living alone, with one companion, or with two or more people).

[14]Regressing number of total strangers in a network over dummy variables distinguishing married and widowed respondents yields a constant of about one pair of strangers on average in the network of a respondent who was divorced, separated, or never married ($b = 1.16$) and significant downward adjustments for widows (-4.17 t-test, $p < .001$) and married respondents (t-tests of -3.28 for those living with one companion and -4.85 for those living with two or more people). Predicting the percentage of discussion partner pairs who were total strangers yields a constant of 19.4% in the networks of divorced, separated or never married respondents and significant downward adjustments for widows (-5.27 t-test, $p < .001$) and married respondents (t-tests of -3.82 for those living with one companion and -4.06 for those living with two or more people). Although household size is a negligible consideration in this comparison, the networks in which strangers were most likely are the networks of respondents who lived alone. Across all nine domestic situations in Figure 3, a 4.81 t-test describes the increased proportion of strangers in the networks of divorced or separated respondents who lived alone and 3.61 t-test for the never married who lived alone. Strangers

living alone are worth noting in light of Hughes and Gove's (1981, pp. 62ff) demonstration that living alone is not directly linked to well-being. Among the divorced, separated, and never married respondents in Figure 3, those living alone were neither less likely to turn to nonkin nor less likely to include strangers among their discussion partners than similar respondents living with two or more people. Further, they were no less involved in discussion relations than any respondents, married or unmarried, who did not live alone.

Given systematic variation in respondent happiness and networks across domestic situations, it is tempting to infer that network effects on happiness vary across domestic situations. In fact, the positive effect of network size and the negative effect of strangers are stable across domestic situations.

The results in Table 3 describe an analysis of covariance in which happiness is predicted by three classes of variables; (a) network size and number of pairs of strangers as in Tables 1 and 2, (b) dummy variables adjusting happiness for each of the nine domestic situations in Figures 2 and 3, and (c) interaction terms adjusting the slope of network effects within each domestic situation. The first two rows of Table 3 show that the network size and stranger effects described in Tables 1 and 2 remain strong within and across the domestic situations. The size effect is about three times its standard error and the stranger effect is about two and a half times its standard error. The third row of the table shows that the average level of happiness within each domestic situation varied significantly across domestic situations regardless of network size and strangers ($p < .001$). Finally, adjustments within domestic situations to the overall positive effect of network size are negligible (1.29 F-test, $p = .243$) and adjustments to the overall negative effect of strangers are negligible (0.77 F-test, $p = .626$). In sum, the significant variation in happiness across domestic situations is described by an adjustment for the level of happiness within each situation rather than an adjustment to the magnitude of network effects within each situation. The composition of respondent networks did vary across domestic situations as illustrated in Figure 3, but the effects of network size and strangers did not.

---- Table 3 About Here ----

---

were next most likely to have appeared in the networks of divorced or separated respondents living with two or more other people (2.75 t-test).

CONCLUSIONS

I draw three conclusions; conclusions about whether or not the network matters, how it matters, and how much it matters.

First, there is a significant, robust connection between the informal discussion network surrounding a person and his or her expressions of well-being. The connection can been seen in a simple graph of happiness by network structure such as figure 1. The connection is unchanged after holding constant respondent differences in socioeconomic status, age, sex, race, and domestic situation -- factors often correlated with expressions of happiness. There are significant associations between the control variables and the level of happiness; in particular, blacks tend to be less happy and married people tended to be more happy. However, these adjustments affect the level of happiness expressed. They do not affect the significance of the covariation between network structure and happiness. This is an important but not altogether surprising extension to the national population of findings available from research in more narrowly defined populations. What is surprising is that the network effects are sufficiently strong to be detected with network data limited to the five most important discussion partners and as crude an indicator of well-being as the three category GSS happiness item.

Second, turning to the question of how the network matters, the aggregate network effect is the sum of distinct size and stranger effects. The size effect refers to a significant, and relatively continuous, tendency for happiness to increase with the number of people available for discussing important matters. This tendency generates t-tests ranging from 2.6 to 3.5 with various relevant respondent differences held constant. The stranger effect refers to a significant tendency for happiness to decrease with a lack of contact between the people with whom important matters are discussed. The negative effect of one's important discussion partners being strangers to one another generates t-tests ranging from -2.4 to -3.4 with network size and other respondent differences held constant. In the light of current studies emphasizing the positive effects of strong relations, it is especially interesting to note that the network's effect is driven less by especially close relations than by strangers. It is the negative impact of strangers rather than the positive impact of close relations that determines expressions of happiness. These results have three implications for future research on the connection between density and well-being: (a) Proper estimation of network effects requires

measures of both the size and structure of networks in studies of well-being. (b) Such data are readily available even in national probability surveys as evidenced by the size and stranger effects detected with the GSS network data. (c) Network effects on well-being will be clearer when measures are built from the structure of absent relations (strangers) in a network rather than the structure of strong relations.

I hasten to add a third conclusion regarding the extent to which the network matters -- the effects are very small in magnitude. Judging from the multiple correlations in table 1, only 1.2% of the variation in happiness can be attributed to variation in the network variables. This result is annoying, but even it emphasizes the importance of network variables for studying well-being. Consider how much variation in the GSS happiness indicator is described by any of the familiar alternatives to network variables. Extending the network variables to include all factors in table 2 -- occupational prestige, income, education, age, sex, race, marital status, and household size -- only increases the explained variance to 4.8%. The significant, robust effects of the network variables in the context of such small proportions of explained response variance suggest that the effects are attenuated by random error in the criterion variable. These results call for more detailed analysis of transitions between the three GSS happiness response categories, and more generally, finer distinctions between levels of respondent well-being. Beyond measurement error in the criterion variable, consider the kind of explanation provided by alternatives to the network variables. Happiness is more strongly associated with domestic situation than it is with either network size or strangers. However, the nine domestic situations distinguished in figures 2 and 3 are actually kinds of network structures among people living with the respondent. In particular, the critical variable of being married merely indicates that a particular kind of person was available when the respondent wished to discuss an important matter. The few married persons not living with their spouses were among the most miserable of respondents. An almost certain route to strengthening the network measures to predict well-being lies in studying how happiness varies with the position of a spouse or other domestic partner in the respondent's network.

REFERENCES

Berkman, Lisa F. and S. Leonard Syme. 1979. "Social networks, host resistance, and mortality: a nine-year follow-up study of Alameda County residents," *American Journal of Epidemiology* 109:186-204.

Boissevain, Jeremy. 1974. *Friends of Friends*. New York: St. Martin's Press.

Burt, Ronald S. 1984. "Network items and the General Social Survey," *Social Networks* 6:293-339.

Burt, Ronald S. 1986. "A note on sociometric order in the General Social Survey network data," *Social Networks* 8:149-174.

Burt, Ronald S. and Miguel G. Guilarte. 1986. "A note on scaling the General Social Survey network item response categories," *Social Networks* 8:In Press.

Cohen, Sheldon, and S. Leonard Syme, eds. 1985. *Social Support and Health.* New York: Academic Press.

Davis, James A. 1984. "New money, an old man/lady and 'two's company': subjective welfare in the NORC General Social Surveys, 1972-1982," *Social Indicators Research* 15:319-350.

Davis, James. A., and Tom W. Smith. 1985. *General Social Surveys, 1972-1985.* [machine readable data file] Principal Investigator, James A. Davis; Senior Study Director, Tom W. Smith. NORC ed. Chicago: National Opinion Research Center, producer, 1985; Storrs, CT: Roper Public Opinion Research Center, University of Connecticut, distributor.

Fischer, Claude S. 1982. *To Dwell Among Friends.* Chicago: University of Chicago Press.

Glenn, Norval D., and Charles N. Weaver. 1979. "A note on family situation and global happiness," *Social Forces* 57:960-967.

Gottlieb, Benjamin H., ed. 1981. *Social Networks and Social Support.* Beverly Hills: Sage Publications.

Hall, Alan, and Barry Wellman. 1985. "Social networks and social support," Pp. 23-41 in *Social Support and Health*, edited by Sheldon Cohen and S. Leonard Syme. New York: Academic Press.

Hughes, Michael, and Walter R. Gove. 1981. "Living alone, social integration, and mental health," *American Journal of Sociology* 82:48-74.

Litwak, Eugene. 1985. *Helping the Elderly.* New York: Guilford Press.

Kadushin, Charles. 1982. "Social density and mental health," Pp. 147-158 in *Social Structure and Network Analysis*, edited by Peter V. Marsden and Nan Lin. Beverly Hills: Sage Publications.

Kessler, Ronald C., Richard H. Price and Camille B. Wortman. 1985. "Social factors in psychopathology," *Annual Review of Psychology* 36:531-572.

Lewin, Kurt. 1936. *Principles of Topological Psychology*, translated by Fritz Heider and Grace M. Heider. New York: McGraw-Hill.

Lin, Nan, Alfred Dean and Walter Ensel, eds. 1986. *Social Support, Life Events, and Depression.* New York: Academic Press.

Marsden, Peter V. 1986. "Core discussion networks of Americans," *American Sociological Review* 51:In Press.

Mayer, Adrian C. 1966. "The significance of quasi-groups in the study of complex societies," Pp. 97-122 in *The Social Anthropology of Complex Societies*, edited by Michael Banton. London: Tavistock Publications.

Rossi, Peter H. 1966. "Research strategies in measuring peer group influence," Pp. 190-214 in *College Peer Groups*, edited by Theodore M. Newcomb and Everett K. Wilson. Chicago: Aldine.

Sullivan, Harry Stack. (1940) 1953. *Conceptions of Modern Psychiatry.* New York: W. W. Norton.

Veenhoven, Ruut. 1984. *Conditions of Happiness.* Boston: D. Reidel.

Wellman, Barry. 1981. "Applying network analysis to the study of support," Pp. 171-200 in *Social Networks and Social Support*, edited by Benjamin H. Gottlieb. Beverly Hills: Sage Publications.

TABLE 1

Network Size and Density Effects

Terms in Regression Equation	Eq. (1)	Eq. (2)	Eq. (3)	Eq. (4)	Eq. (5)
Multiple Correlation (probability R = 0)	.053 ~ .04	.064 ~ .01	.083 ~ .01	.106 < .001	.108 < .001
Constant	.138	.102	.117	.080	.088
Mean Strength of Relations in Network	.091 (2.08)	.	.	.	.
Network Size	.	.024 (2.50)	.009 (0.76)	.042 (3.83)	.034 (2.27)
Number of Especially Close Relations	.	.	.017 (2.06)	.	.007 (0.71)
Number of Stranger Relations	.	.	.	-.036 (-3.33)	-.032 (-2.70)

NOTE -- Results are based on the 1,527 respondents answering the happiness and network items (of 1,534 GSS respondents in total). Ordinary least squares estimates of unstandardized regression coefficients are presented with t-tests in parentheses. Happiness ranges from "not too happy" (-1), to "pretty happy" (0), to "very happy" (1). Alternative metrics, dummy variables and loglinear models yield very similar results. Relations have been scaled as described in Burt and Guillarte (1986) in order to compute the mean strength of relations among discussion partners; 1 for an "especially close" relation, 0 for a "total stranger" relation, and .2 for an acquaintance relation (discussion partners who are neither especially close nor strangers). The mean, the usual measure of network density, is then is the sum of relations among a respondent's discussion partners divided by the number of relations (i.e., divided by N(N-1)/2 for N discussion partners). The other three predictors in the table are the number of discussion partners on whom network data were obtained (size ranging from 0 to 5), the number of pairs of "especially close" discussion partners (ranging from 0 to 10), and the number of pairs of discussion partners who were "total strangers" (also ranging from 0 to 10).

TABLE 2

Network Size and Stranger Effects with Other Factors Held Constant

Terms in Regression Equation	Eq. (1)	Eq. (2)	Eq. (3)	Eq. (4)	Eq. (5)
Multiple Correlation	.130	.121	.143	.200	.218
Network Size	3.39 (.001)	2.86 (.002)	3.50 (.001)	3.33 (.001)	2.78 (.003)
Number of Stranger Relations	-3.59 (.001)	-3.60 (.001)	-3.21 (.001)	-2.70 (.003)	-2.76 (.003)
Socioeconomic Status:					
Occupational Prestige	2.98 (.001)	.	.	.	1.72 (.043)
Income	.	0.47 (.318)	.	.	.
Education	.	1.93 (.027)	.	.	.
Background Attributes:					
Age	.	.	0.50 (.624)	.	-0.06 (.949)
Sex	.	.	-0.39 (.697)	.	0.56 (.577)
Race	.	.	-3.65 (.001)	.	-2.71 (.007)
Domestic Situation:					
Married	.	.	.	6.41 (.001)	5.49 (.001)
Household Size	.	.	.	-1.51 (.126)	-1.00 (.315)

NOTE -- Results are based on the 1,527 respondents answering the happiness and network items (of 1,534 respondents in total). The t-tests for ordinary least squares regression estimates with listwise deletion are presented with the probability of no effect in parentheses. Probabilities for the network and socioeconomic status effects are based on one-tail tests and .001 refers to an effect significant at or beyond the .001 level of confidence. The happiness and network variables are defined in Table 1. Occupational prestige is measured with Hodge-Siegel-Rossi scores. Income is the sixteen category GSS respondent annual income variable ranging from under 1,000 dollars to 50,000 dollars or more. Education is an eight category variable combining years of education with the highest degree obtained (primary school, junior high school, high school without graduating, high school graduate, some college, associate degree, college graduate, graduate or professional degree). Age is measured in years and sex is a dummy variable distinguishing males (0) from females (1). The major association between race and happiness is the negative association for blacks so race is a dummy variable distinguishing blacks (1) from others (0). Domestic situation is operationalized by distinguishing married from unmarried respondents (respectively 1 and 0 on the

TABLE 3

Network Size and Stranger Effects within and across Domestic Situations

Terms in Regression Equation	Eq. (1)	Eq. (2)	Eq. (3)
Multiple Correlation	.250	.263	.258
Network Size	3.26 (.001)	2.84 (.002)	3.20 (.001)
Number of Stranger Relations	-2.42 (.008)	-2.76 (.003)	-2.46 (.007)
Adjustments for Mean Happiness within Each Domestic Situation	9.85 (.001)	4.88 (.001)	7.88 (.001)
Adjustments for Network Size Effects within Each Domestic Situation	.	1.29 (.243)	.
Adjustments for Stranger Density Effects within Each Domestic Situation	.	.	0.77 (.626)

NOTE -- Results are based on the 1,494 respondents (of 1,534 in total) answering the happiness and network items and living in one of the nine domestic situations distinguished in Figures 2 and 3. The t-tests for ordinary least squares estimates of network size and stranger effects are presented from an analysis of covariance model distinguishing the nine domestic situations. One-tail probabilities of no effect are given in parentheses (cf. the network effects in Table 2). F-tests are presented for the eight independent level adjustments and eight independent slope adjustments within the nine domestic situations. The F-tests are distributed with (8,1475) degrees of freedom in the models estimating level and slope adjustments, (8,1483) degrees of freedom in the model estimating only level adjustments. The probability of no effect from the adjustments is given in parentheses. Throughout, .001 refers to an effect significant at or beyond the .001 level of confidence.

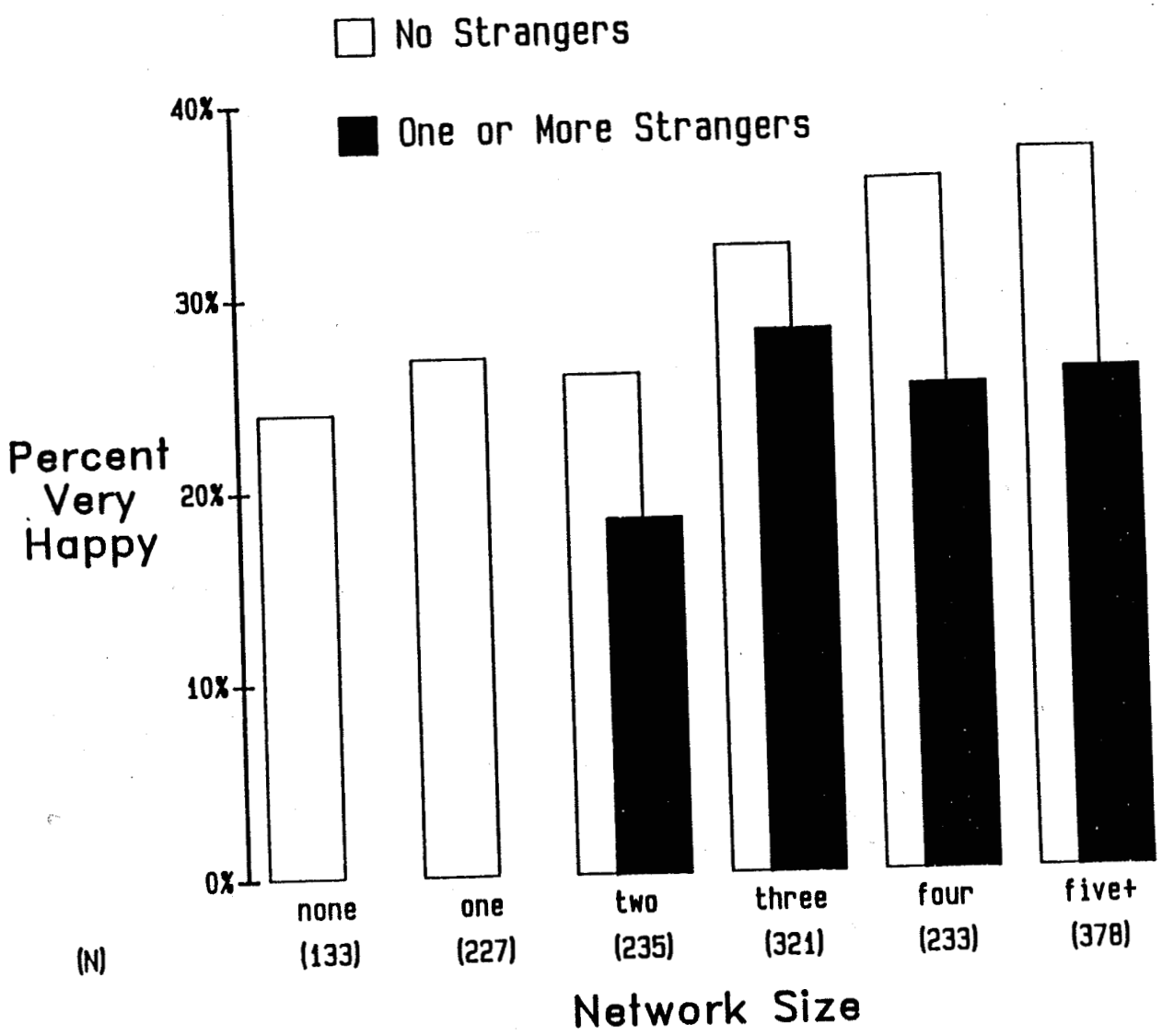

Figure 1. Happiness by Network Size and Strangers.

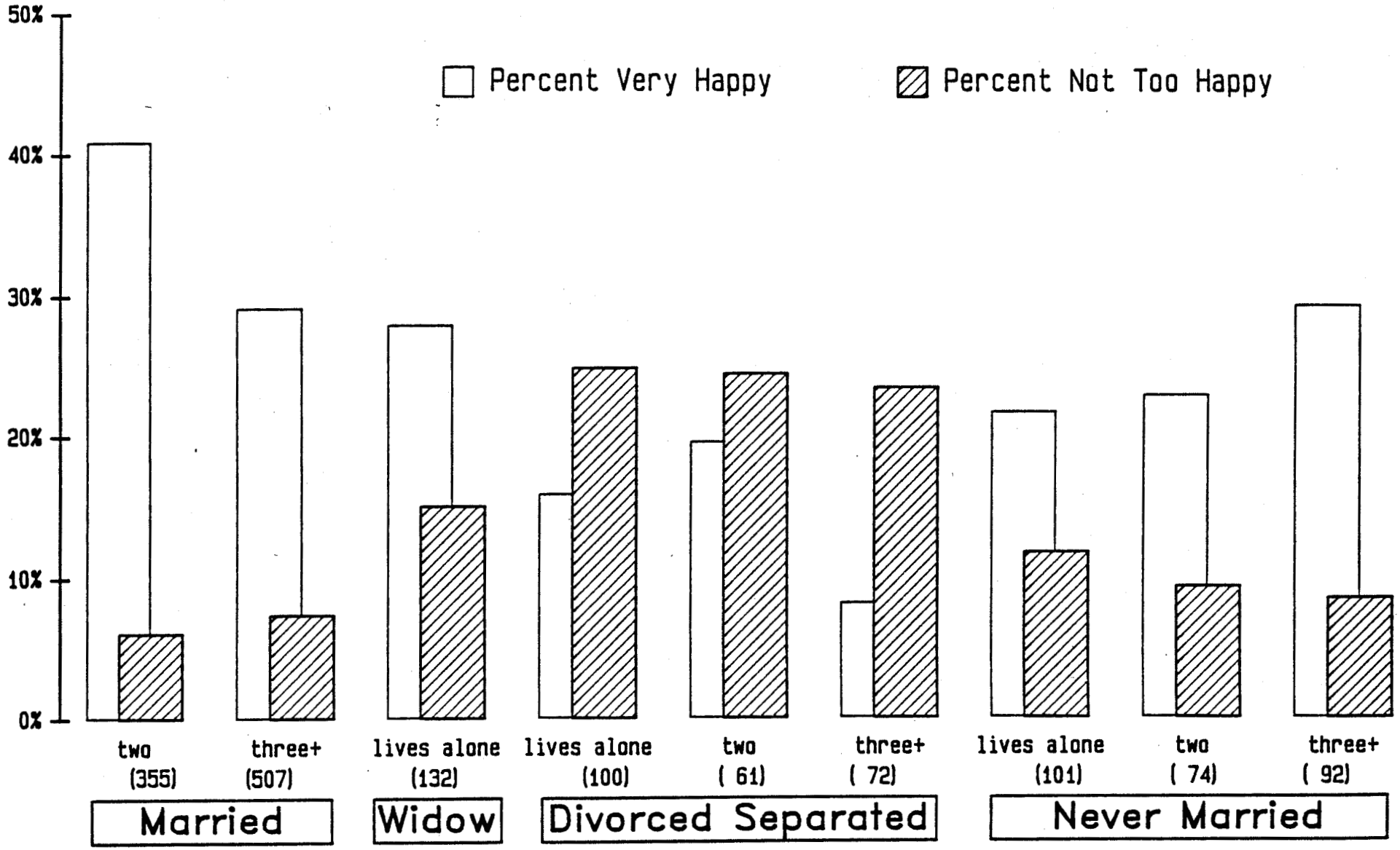

Figure 2. Happiness by Marital Status and Household Size.

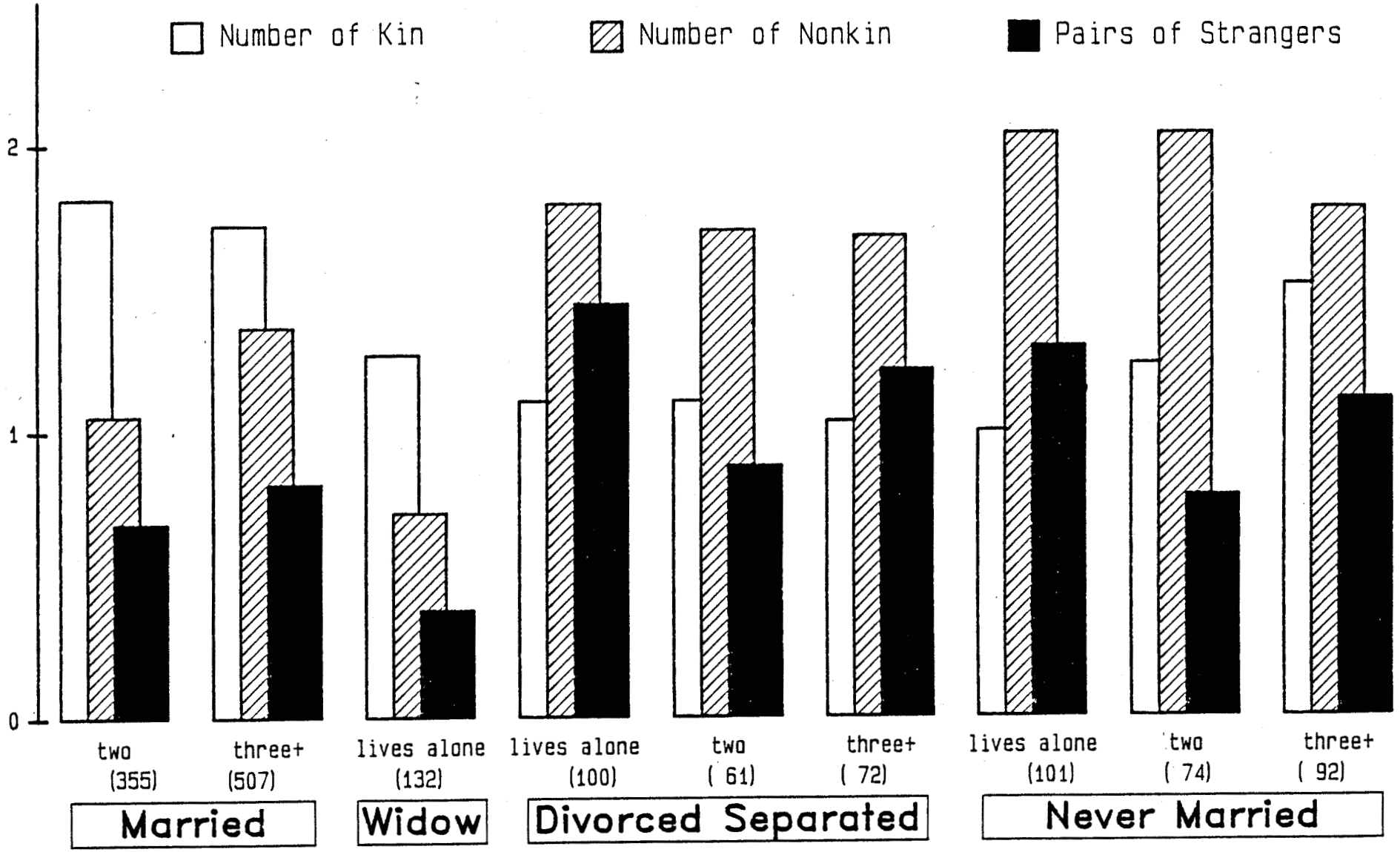

Figure 3. Discussion Network by Marital Status and Household Size.