

Social Capital and Health: Civic Engagement, Community Size, and Recall of Health Messages

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In the past decade, public health researchers have begun to explore the relation between social capital and health outcomes,¹⁻¹⁰ and the topic has engendered much debate and controversy on the meaning of social capital.^{3,11-16} Social capital is an oft-contested concept whose definition is fluid and the measurement of which varies across studies.¹⁻¹⁶ This research and debate was stimulated by a resurgence of interest in the link between social capital, "the ways in which we connect with friends and neighbors and strangers,"^{17(p27)} and the declining levels of civic engagement among the American public observed by Putnam and described by his "Bowling Alone" hypothesis.¹⁷⁻¹⁹ Social capital is usually understood to embody several dimensions, including norms of reciprocity, interpersonal trust, solidarity, and cooperation, that seem to depend on social networks and civic engagement.^{3-6,14,17,20,21} Several studies have documented the protective effects of social capital, showing it to reduce stressful conditions, risky behaviors, mortality, and psychological distress and to improve self-rated health.^{3-8,12,22}

Before this recent surge of interest by public health researchers, social capital, often studied in the context of community integration (the patterns and processes that bind different components of the community together), was an important area of study in the fields of communication and sociology. This previous work in sociology and communication identified social capital as a dimension of community integration that is a product of people's ties to their communities' institutions and social networks.²³ Communication has long been identified as playing a vital role in integrating people into their communities by helping to support and maintain their community ties and to promote interpersonal trust.^{23,24} Studies specifically looking for an association between community integration and media use find consistent and

Objectives. We explored the effects of community integration and pluralism on recall of cardiovascular disease health information messages.

Methods. With 1980-1983 data from the Minnesota Heart Health Program, we examined whether ties to community groups were associated with recall of health messages, and whether this relation was modified by size and degree of differentiation of the community.

Results. A higher level of civic engagement through ties to community groups was associated with better recall of health messages. Ties to community groups independently contributed to better message recall even after control for gender, education, and other variables. The moderating role of community size was non-significant but intriguing.

Conclusions. Community group membership could increase exposure to health messages, providing a critical pathway for social capital to influence health promotion and, thus, public health outcomes. (*Am J Public Health*. 2006;96:1456-1461. doi:10.2105/AJPH.2003.029793)

broad evidence for such an association.²⁵⁻³¹ For example, newspaper readership is associated with community involvement and engagement such as membership in volunteer groups, churches, and similar organizations.^{25,27-30,32} In at least 1 study, subscription to cable television was related to community group membership.²⁵

A little-explored factor with potentially important influence on the association between community integration and media use is *community pluralism*. Pluralism is characterized by community size and degree of structural differentiation and essentially is a measure of general heterogeneity, with more pluralistic communities usually being larger and more differentiated. Community size and degree of community differentiation influence interactions among people and groups, though the precise nature of these interactions needs further investigation. Some of these interactions are potential determinants of social capital. In general, more pluralistic communities are characterized by greater diversity in both impersonal and interpersonal networks of information. The degree of community pluralism modifies the relation between community integration and media use.^{32,33} In more pluralistic

communities, people are more likely to rely on nonpersonal (vs interpersonal) channels of communication such as mass media, compared with residents of less pluralistic communities, who rely more on interpersonal channels. What is less clear is how social capital is influenced by community pluralism, given that social capital is a product of individual-level interaction with networks and organizations in the community and that pluralistic communities are likely to contain more networks and organizations than are less pluralistic communities.

Although the relation between community ties and media use is well documented,²³ the role of community integration in affecting exposure to messages from the media and other sources is less clear. Specifically, we were interested in whether the findings associating media use with community integration and its consequences (such as social capital) be extended to recall of specific content from the information environment. We were especially interested in the recall of cardiovascular disease (CVD) health messages. Thus, the focus of our study went beyond examining media use to refining our understanding of how people who differ in degree of involvement in their communities

differ in health message recall, particularly recall of messages regarding CVD. Greater integration in the form of community ties may have "primed" study respondents to attend to information about community events in general, to act as sources of information themselves, and to function as contacts in interpersonal networks.^{34,35} In addition, membership in organizations may render messages in the environment more salient through more frequent interpersonal discussions that may even reinforce these messages.³⁶ Moreover, interpersonal contacts within an association could help frame health messages and provide background learning that may enhance reception and retention of health messages.³⁷⁻³⁹ We specifically wondered whether community pluralism modifies the interaction between community ties and CVD message recall.

On the basis of a close analysis of the public health and media studies literature, and to explore the relations between community integration (community group ties), message and media exposure and the possible effects of community pluralism (community size and character), we formed 3 research questions. (1) Does degree of community integration or civic engagement influence people's recall of CVD health messages? We hypothesized that a greater number of ties would be related to a greater number of CVD health messages. (2) Is the relation between community integration and message recall moderated by community pluralism? We hypothesized that a greater degree of pluralism would be positively related to message recall, possibly because of the greater diversity of interpersonal networks and media and other information sources in pluralistic communities. (3) Does the nature of the organizations to which one belongs and the depth of one's involvement matter? That is, is being an active or nonactive member in community groups with specialized health information activities positively associated with recall of specific heart disease prevention messages? We hypothesized that even nonactive members of groups providing health information would recall a greater number of specific messages than would active members of groups that did not provide CVD information.

METHODS

Data Source and Collection

Data for this study came from the Minnesota Heart Health Program, a thirteen-year-long (1980-1993) research and demonstration project aimed at reducing CVD in three matched pairs of northern Midwest communities. The pairs were selected for diversity of size and community character: small cities (<50 000 population), independent regional cities (about 100 000 population), and large suburban sections of large cities (1980 metropolitan statistical area rank 13).⁴¹

Study design involved successive cross-sectional surveys to measure community-level changes over time in CVD risk factors and cohort surveys to measure change over time in CVD risk factors in the sample. A full description of the study design and analysis of primary outcomes is available from Jacobs et al.⁴⁰ and from Luepker et al.⁴¹ The intervention and program implementation were fully described by Mittelmarm et al.⁴² Briefly, 3 of the communities received 5 years of an intervention targeting risk factors for CVD and promoting individual-level strategies to prevent CVD. The intervention was conducted through several channels, including mass media such as television and community newspapers and media such as community groups, schools, and distribution of literature through direct mail and community health fairs among other places.⁴²

Because we did not want the interventions to influence our research questions we used only the baseline cross-sectional data gathered from the six communities before intervention and program implementation. Baseline data were collected from 2 968 subjects over 3 years, from 1980 through 1983. Surveys were conducted with a 2-stage cluster sampling design in each community. Census blocks were randomly selected in each city and adjacent groups of 5 households were randomized within census blocks. Within each household, an age-eligible adult aged 25-74 years was randomly selected for the survey, which was conducted by a trained interviewer in the respondent's home. Questions were devoted to respondents' community ties, recall of CVD-related health messages, and relevant demographic information.

Measures

The dependent variables were the overall number of messages, specific and nonspecific, about CVD recalled (e.g., risk factors, preventive actions) and the number of specific messages about CVD recalled by a respondent. Specific messages contained more details but were not necessarily more scientifically accurate. The number of messages recalled by respondents was measured using the message discrimination method,⁴³⁻⁴⁵ which involves eliciting the messages a respondent can recall or "discriminate" from different information sources for a given topic. Respondents were asked to recall "What specifically have you read, seen or heard about heart attack and stroke during the past few months from any of these sources?" It was followed with a question where they have "read, seen, or heard" about the message. This pair of questions was asked a maximum of 4 times or until a respondent's recall was exhausted. Because the interviewers could record up to 4 messages, respondents could recall up to 16 messages using this method; however, 80% exhausted their recall by the end of 3 cycles. Because interviews were conducted in person, respondents were provided with a list of possible communication sources: mass media such as radio, television, and newspapers, interpersonal channels such as family and friends, doctors and nurses, and co-workers, and other sources such as brochures and pamphlets.

Open-ended responses were coded independently according to a pretested coding scheme with high internal reliability (Cohen $\kappa=0.72$, $SE=0.02$). The variable overall messages recalled included all codable responses to the question and all information sources. Messages were further classified by trained coders as specific or nonspecific on the basis of level of detail provided in the answer, according to an elaborate coding scheme. For example, if a respondent answered, "cut down on fat," it was coded as a nonspecific message. On the other hand, if a respondent answered, "eat leaner cuts of meat to reduce fat," it was coded as a specific message.

Predictor variables included number of community ties (our measure of community integration) and size and character of community (our measure of community pluralism). Number of community group memberships was

determined by asking respondents to indicate their participation in 17 different categories of community groups, institutions, and organizations. These groups ranged from fraternal or volunteer associations, service clubs, and ethnic groups to political, professional, occupational, or church organizations. Number of reported memberships was summed and categorized into the group memberships variable for analysis (no groups, 1–2 groups, ≥ 3 groups).

Community ties were also assessed by examining membership in specialized groups such as the American Heart Association and the American Cancer Society—organizations for which providing CVD information was a core part of their mission. Respondents were allowed to interpret each question as they chose. For each membership reported, respondents were asked to indicate whether they were active participants (yes/no) and whether the group provided regular information or recommendations about health (yes/no). These responses were combined to separate respondents into four groups forming the specialized group membership variable: those reporting no memberships in a group that provided health information; those reporting active membership in groups that did not provide health information; those reporting membership in any group that provided health information (whether or not they reported being active participants); and those reporting membership and active participation in groups that provided health information.

Community pluralism was defined by size of the community and was measured according to population size and the other structural characteristics of the 3 pairs of communities, such as distance to metropolitan areas, percentage of people employed in agriculture, percentage employed in manufacturing, and number of media outlets. Community size has proved to be a valuable proxy for pluralism; previous work has shown that size of community is positively associated with number of media channels and diversity of community groups.⁴⁶ Large community size also provides a larger variety of information sources on a range of topics, including health.⁴⁸ In addition, size is related to more frequent interpersonal interactions among members of the community, enhancing the probability of learning.³⁹ The urban character of the communities (i.e.,

whether they are small cities vs independent regional cities vs suburbs of a large city) may also influence the availability of various media as well as frequency of interpersonal discussions among community members. It is possible that metropolitan suburbs may enjoy greater media diversity compared with regional cities, but interpersonal networks may not be as diverse in those areas.

A detailed description of the community pairs and their characteristics is available from Luepker et al.⁴¹ The paired communities were similar, especially in population characteristics (e.g., age, gender, educational level), type of economy (e.g., agriculture vs manufacturing), provision of social services, and availability of media systems. Because we used baseline data collected before the introduction of any intervention, we were able to use both intervention and reference communities for our analysis.

Data Analysis

To test the hypothesis that community group ties and community size and character are related to CVD message recall, we analyzed the differences in adjusted means of overall messages and specific messages recalled using analyses of covariance. To test the hypothesis that group membership predicts CVD message recall, we ran a multiple regression with overall number of messages recalled and number of specific messages recalled as the dependent variables. Community group membership was a categorical variable with three levels based on number of groups: none (no membership), 1–2 (moderate integration), and ≥ 3 (high integration). These analyses were adjusted for respondent's community size, age, gender, and years of education.

To test the hypothesis that community pluralism moderated the relation between community ties and message recall, we added an interaction term, group membership \times community size, to the model. These analyses were adjusted for age, gender, and years of education. Finally, to test whether ties to specialized groups predicted more recall of specific messages, we ran a multiple regression with all independent variables and with specific messages recalled as a dependent variable, with adjustment for age, gender, and years of education.

TABLE 1—Community Group Ties and Number of Cardiovascular Disease Messages Recalled, Specific and Overall

No. Group Memberships	Average No. Specific Messages Recalled ^b	Average No. Messages Recalled Overall ^a
None	1.63	2.24
1–2 groups	2.07	2.82
≥ 3 groups	2.48	3.38

Note. Numbers of messages were means adjusted for respondent community size, gender, age, and years of education.

^aModel included group membership ($F=39.01$, $df=2$, $P\leq .001$), community size ($F=2.36$, $df=2$, $n.s.$), gender ($F=56.16$, $df=1$, $P\leq .001$), education ($F=114.52$, $df=1$, $P\leq .001$), and age ($F=3.56$, $df=1$). The model was significant at $P\leq .01$.

^bThe ANCOVA model for the equation included group membership ($F=31.62$, $df=2$, $P\leq .001$) and the covariates, community size ($F=5.83$, $df=2$, $P\leq .01$), gender ($F=33.01$, $df=1$, $P\leq .001$), education ($F=76.71$, $df=1$, $P\leq .001$) and age ($F=7.67$, $df=1$, $P\leq .01$). The model was significant at $P\leq .01$.

RESULTS

The analysis included 2 968 respondents across the six communities. The average age of the sample was 45.1 years. Slightly more than one half (52.7%) of the sample was female and more than one quarter (27.2%) of respondents had sixteen or more years of education.

Our first research question was whether community group ties (measured as number of group memberships) had an effect on CVD health information message recall. We hypothesized that citizens more engaged with their communities through group membership would recall greater numbers of both specific and nonspecific messages (i.e., specific messages and overall messages) about CVD risk factors and prevention compared with their less-engaged counterparts.

Table 1 shows average number of messages recalled (specific and overall), stratified by group membership level. The relation between number of group memberships (grouped into levels) and number of messages recalled was positive and linear, with an estimated partial correlation of 0.16. The analysis of covariance (ANCOVA) models for both overall messages and specific messages

TABLE 2—Community Size and Character, Community Group Ties, and Number of Cardiovascular Disease Messages Recalled

No. Group Memberships	Community Size and Character		
	Small Cities	Independent Regional Cities	Metropolitan Suburbs
No. messages recalled overall^a			
None	1.97	2.35	2.39
1-2 groups	2.81	2.95	2.74
≥ 3 groups	3.28	3.52	3.34
No. specific messages recalled^b			
None	1.44	1.69	1.74
1-2 groups	1.99	2.25	1.97
≥ 3 groups	2.31	2.67	2.44

Note. Numbers of messages were means adjusted for gender, age, years of education, group membership, population, and group membership \times community size.

^aThe ANCOVA model included community ties ($F = 76.71$, $df = 2$, $P \leq .001$), community size ($F = 2.51$, $df = 2$) and the interaction of community size by ties ($F = 0.74$, $df = 4$) and the covariates; gender ($F = 56.36$, $df = 1$, $P \leq .001$), education ($F = 112.56$, $df = 1$, $P \leq .001$) and age ($F = 3.53$, $df = 1$). The overall ANCOVA model was not significant.

^bThe ANCOVA model included community ties ($F = 31.31$, $df = 2$, $P \leq .001$), community size ($F = 4.69$, $df = 2$, $P \leq .01$) and the interaction of community size by ties ($F = 0.67$, $df = 4$) and the covariates; gender ($F = 33.45$, $df = 1$, $P \leq .001$), education ($F = 75.80$, $df = 1$, $P \leq .001$) and age ($F = 7.58$, $df = 1$, $P \leq .01$). The overall ANCOVA model was not significant.

recalled were significant at $P < .01$ after adjustment for population, gender, age, and years of education. We found that respondents with more community group ties recalled more nonspecific and more specific messages about CVD. This confirms our original hypothesis that greater community integration would be associated with better nonspecific and specific message recall. However, the amount of variance explained by the overall model is less than 2%, though group membership does contribute substantially to this variance.

We had also hypothesized that the effect of community size on the association between community group ties and message recall is variable—that is, that the association is stronger in more pluralistic communities because of their greater availability and diversity of ties. We tested this hypothesis with an ANCOVA model that included average overall CVD messages recalled, stratified by group membership level and community size and character and adjusted for gender, age, and years of education (Table 2). The model did not support the hypothesis of an effect of community size on either overall or specific CVD message recall. Both community group ties and community size were significant determinants of message recall, but the interaction term for community ties and community size was not significant.

Women and more educated respondents recalled more messages, regardless of community size or community group ties.

Our next question asked whether ties to specialized community groups, institutions, and organizations facilitate exposure to specialized health information. Our third hypothesis proposed a positive association between membership in such groups and the specificity of health messages recalled. We divided respondents into four categories on the basis of membership or nonmembership in groups that provided health information to their members (specialized group membership variable). Results of our analysis appear in Table 3.

ANCOVA analysis of the average number of specific messages recalled supported the hypothesis of an association between specialized group ties and specificity of message recall ($P < .01$). The least-active respondents recalled the smallest number of specific messages. Respondents who were active members of groups that did not provide health information recalled fewer specific messages than respondents who were nonactive members of groups that did disseminate health information. Finally, active members of groups that did provide health information recalled the greatest number of specific messages. The specialized group membership variable remained

TABLE 3—Specialized Group Membership and Recall of Specific Cardiovascular Disease Messages

Specialized Group Membership	Average No. Specific Messages Recalled
No active memberships and no memberships in groups that provide health information	1.71
Active membership but not in groups that provide health information	2.04
Nonactive membership in groups that provide health information	2.13
Active membership in groups that provide health information	2.38

Note. The ANCOVA model included specialized group membership ($F = 19.23$, $df = 3$, $P \leq .001$) and the covariates; gender ($F = 29.80$, $df = 1$, $P \leq .001$), years of education ($F = 101.36$, $df = 3$, $P \leq .01$) and age ($F = 7.58$, $df = 1$, $P \leq .01$). The overall ANCOVA model was significant at $P \leq .01$.

significant ($P \leq .001$) even after control for gender, years of education, and age. Women, more educated respondents, and older respondents recalled a greater number of specific messages than did less-educated respondents, men, and younger respondents.

DISCUSSION

The concept of social capital, despite its wide appeal among researchers, has generated controversy about the very meaning of "social capital" as well as about acceptable ways of measuring it. Although we have not addressed the controversy itself, we tried to explore the meaning of social capital in the context of the dissemination of health information. We were interested in how community groups, which, according to the theory of social capital, should generate social capital, might be related to the recall of health messages. We hypothesized that greater community integration via such groups is related to higher recall of messages and that community pluralism may moderate this association. We also hypothesized that individuals with ties to

organizations that presented health information would have higher message recall than all other categories of individuals.

We found that individuals' greater integration into their communities (measured as their number of community group memberships) was associated with recall of both non-specific and specific information about CVD prevention. Community integration was not only associated with general exposure to media, as found in the literature we have cited, but also was associated with quality of exposure, leading to recall of more detailed CVD health information. We also found that more active members of organizations, especially those organizations that provided health information, recalled more messages than others. However, community pluralism did not modify the relation between community ties and message recall. Community pluralism and community ties contributed independently to the number of messages recalled but the interaction term, group membership \times community size, did not.

Our analyses offer promising directions for further exploration and implications for potential interventions. First, our results offer an explanation for the well-documented finding of a positive association between social capital and health status. Social capital is a product of social networks and interaction among those networks. Membership in the networks could "prime" individuals to be aware of particular topics present in the environment and, thus, result in recall of more health messages. Although it is well known⁴⁸ that women and the more-educated know more about health than do men and the less-educated, our findings suggest that community group ties are independently associated with message recall, which is a matter of significance for health interventions.

This finding leads to a second implication regarding how to target health messages to social isolates in small communities. Respondents in small communities who did not belong to any groups recalled the fewest messages in our study. If community organizations prime their members to certain messages or serve as sources of information, holding few community group ties and residing in an information-poor environment may result in a sort of double-dose of media isolation. This doubled

impediment to media exposure may be a major source of gaps in health knowledge and other structurally-based disparities in material resources and health that have been observed and documented by many researchers.^{39,49}

There were some limitations to our study. First, the relation between community ties and CVD message recall in these six communities may not be generalizable to other communities or other measures of social capital or other disease realms. Second, although our analyses focused on community ties and social capital, other factors we did not examine, such as community conflict, message publicity, saturation coverage, and personal relevance among others, may also influence recall. Third, our data were collected more than twenty years ago. Social capital may not act on message recall in the same way today, given the changed media landscape and purportedly declining levels of social capital. Fourth, because of the large sample size, our analyses were likely to show statistical significance even if the models explain little variance.

Our hypotheses regarding the relation between community integration and health message recall as a potential link between social capital and health outcomes were largely borne out by our data. What remains unanswered is how the associations we have found would hold up in a dramatically changed media environment. Given the increasing complexity of the information environment, with the advent of cable and satellite television, the Internet, and other specialized media, has the relation between social capital and health changed, and will it change further? Additionally, much of the discussion about the social capital generated from social networks involved networks in geographical proximity to each other. The emergence of the Internet has strengthened ties among members of "communities without propinquity"⁵⁰ or "virtual communities." Previous work has suggested that ties to such geographically-dispersed communities may be related to local public-affairs knowledge.⁵¹ It is reasonable to ask if the current relation between community integration, social capital, and health outcomes will hold for such virtual communities. We speculate that our findings should be even more applicable today than when our data were collected. The emergence of the Internet

as yet another tool for communication is likely to contribute to interpersonal discussions and interactions that may heighten attention to messages in the environment that could lead to better learning about health. ■

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Contributors

K. Viswanath conceptualized the study and analyses and wrote and reviewed the article. W. Randolph Steele contributed to the conceptualization of the model, the review of the literature, and the writing. J.R. Finnegan Jr participated in writing and conceptualized the study with K. Viswanath.

Human Participant Protection

Because ours were secondary analyses, no approval was required. Protocol approval was obtained before the original data collection.

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