

# Why Would Social Networks Be Linked to Affect and Health Practices?

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**Objective:** To examine the relation among social integration (SI), affect, and smoking and alcohol consumption. **Design:** The authors administered social network and psychological questionnaires to 193 adults and then interviewed them on 14 consecutive evenings about their daily social interactions, affect, and smoking and alcohol consumption. **Main outcome measures:** The main outcome measures were positive and negative affect, smoking, and alcohol consumption. **Results:** Between-subjects analyses found that those with more diverse social networks (high in SI) interacted with more people and smoked and drank less. SI was not, however, associated with affect. In contrast, within-subject analyses found that the more people participants interacted with during a day, the greater their positive affect, drinking, and smoking on that day. However, this occurred primarily for persons low in SI. High-SI persons reported high positive affect irrespective of the number of people with whom they interacted, and their smoking and drinking behaviors were less influenced by number of interactants. **Conclusion:** SI may alter health because it affects responsiveness to the social influences of others.

social integration, smoking, alcohol consumption, positive affect, negative affect

(SI) refers to participation in a broad range of social relationships (Brissette, Cohen, & Seeman, 2000) and is rooted in Durkheim's (1897/1951; Thoits, 1983) seminal work indicating that suicide was most prevalent among those who were neither married nor had close ties with the community and church. There is no accepted or standard measure of integration, but most assess the number of recognized social positions (roles) or identities (e.g., points are assigned for being a spouse, father, friend, or church member). SI has attracted the attention of psychologists interested in the role of interpersonal relationships in health because of its reliable association with both psychological and physical well-being. More than a dozen prospective community-based studies have reported that socially integrated people live longer (see reviews by Berkman & Glass, 2000; Cohen, 1988, 2004; House, Landis, & Umberson, 1988; Uchino, 2004); other studies have found that greater integration predicts increased survival from heart attacks (see reviews by Berkman, 1995; Seeman, 1996), less risk for cancer recurrence (see reviews by Helgeson, Fritz, & Cohen, 1998), less upper respiratory illness (Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997), less depression and anxiety (see reviews by Cohen & Wills, 1985; Kawachi & Berkman, 2001), and less severe cognitive decline with aging (Bassuk, Glass, & Berkman, 1999).

Despite this sizable descriptive literature linking diverse social networks to morbidity and mortality, there have been virtually no analytic studies to test well-formulated hypotheses about why this occurs. In this study, we examined whether people with more diverse social networks differ on daily affect and rates of smoking and alcohol use, all of which are ultimately relevant for health status. We also tested several models of how SI might influence these outcomes. First, we examined traditional theories that suggest that SI operates by generating dispositional-like characteristics, including feelings of mastery, purpose, and positive affect (PA), that are thought to motivate better health behaviors and regulate affect (see reviews in Cohen, 1988; Thoits, 1983; Uchino, 2004). Second, we tested the proposal that SI is associated with better health because it is a marker of having social support for addressing life adversities (House et al., 1988; Uchino, 2004). In turn, this support is thought to provide protection from stress-triggered increases in smoking, drinking, and negative affect and decreases in PA. Third, we tested the possibility that the SI associations Berkmani7tney,wearedrvhenby socialicalw68(rat7tive)-3329owJTJ

also predicted that the diversity of their networks makes them less subject to social pressures by specific subgroups to drink or smoke. Moreover, because these individuals have a broad range of experiences interacting across social domains, they may be less dependent on alcohol and cigarettes to facilitate social interaction.

Finally, we investigated the role of a number of variables that might provide alternative spurious (third factor) explanations for associations among SI, health behaviors, and affective response. These include social dispositions that have evolved from the traditional personality literature, such as extraversion and agreeableness, as well as other variables representing our ability to form and maintain social networks, such as caring, communal orientation, and tendencies toward negative social interaction (Lakey & Cohen, 2000; Reis & Collins, 2000).

In the present study, we monitored participants' interactions, health-related behaviors, and affect for 14 consecutive days. We conducted between-subjects analyses to determine whether SI was associated with PA and negative affect (NA) and with smoking and alcohol consumption. We expected to find SI associated with more PA, less NA, and less smoking and alcohol consumption (Berkman & Breslow, 1983; Cohen & Wills, 1985; Uchino, 2004; Umberson, 1987). We also tested whether these relations can be explained by the mechanisms discussed earlier, including mastery, purpose, social support, or psychological stress. Finally, we asked whether SI moderates how people respond (affect, drinking, and smoking) in social situations. We also examined the possibility that any relationship we found might be attributable to SI merely acting as a proxy for the social personality characteristics and or for common measures of interpersonal relationships such as caring and communal orientation.

## Method

The participants were 95 men and 98 women ages 21 to 54 years (mean age = 37.3 years,  $SD = 8.8$ ) who responded to newspaper advertisements soliciting participants for studies of psychosocial risk factors for upper respiratory infections. There were 108 White, 72 African American, and 13 other racial/ethnic categories represented in the sample. The mean level of education was 13.76 years ( $SD = 2.21$ ), and median income was \$17,500, with a range of \$2,500 to \$162,500. The sample contained 28.5% full-time employees, 26.9% part-time employees, 22.3% unemployed persons, 15.3% other nonworking categories (e.g., housewife, retired), and 7.3% were other unidentified categories. Finally, 47.2% were smokers, and 65.8% drank at least one alcoholic drink during the 14 days of monitoring. Here, we report an analysis of baseline data obtained prior to any of the parent study-related interventions. All

rate how accurately various single-word traits (irritable, nervous, resentful, tense, depressed) describe how they typically are.

For all the scales, the appropriate items were reversed, and the scale scores were summed. The test-retest correlations were .81 for Extraversion and .64 for Agreeableness ( $p < .001$ ). The internal reliabilities were .71-.78 for Extraversion, .69-.79 for Agreeableness, .79 for Positive Relationships, .80 for the ISEL, .73 for Communal Orientation, .77 for Negative Interactions, .72 for Mastery, .73 for Life Engagement, .80 for Emotional Instability, .88 for Negative Affect, and .88 for Perceived Stress.



Participants were interviewed on the telephone for 14 consecutive evenings. Interviewers were blind to psychological questionnaires and the hypotheses of this study. Each evening, participants were asked whether they had participated with someone else in each of seven different broadly defined activity categories during the previous 24 hr. These included having a meal, drink or dessert, cup of coffee, etc.; leisure activities at home; leisure activities away from home; work around the house; family or personal errands; anything else with anyone, such as visiting, exercising, going to church; and spending at least 15 min with other(s) in any other activity. For each category they participated in, they were asked exactly what they did and with whom. They could list more than one activity for each category. We calculated the number of people with whom they interacted (within these activities) during each 24-hr period. Individuals were counted only once within any day.

The interviewers also queried how many cigarettes participants had smoked and alcoholic drinks they had consumed during the previous 24 hr. A bottle of beer, shot of whiskey, or glass of wine each counted as one drink. A sizable

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-.04, ES = .15,  $p < .05$ , for smoking). The effects of number of interaction partners on increased drinking and smoking were greater for people low in SI (drinking:  $\beta = .21$ , ES = .27,  $p < .001$ ; smoking:  $\beta = .20$ , ES = .25,  $p < .01$ ) than for people high in SI (drinking:  $\beta = .08$ , ES = .19,  $p < .01$ ; smoking:  $\beta = .07$ , ES = .14,  $p < .05$ ; see Figures 1 and 2).

• The effect of daily interaction partners on PA was moderated by SI (interaction was marginal:  $\beta = -.04$ , ES = .13,  $p = .08$ ). Specifically, those high in SI reported high levels of PA irrespective of the number of people with whom they interacted during the day ( $r = .58$ ); in contrast, those low in SI who interacted with few people during the day had low levels of PA, but as the number of people with whom they interacted increased, their PA increased ( $\beta = .19$ , ES = .19,  $p < .01$ ).

Because the interaction with the total PA scale was marginal, we examined each of the subscales separately to see whether the type of PA mattered. The interaction held up for vigor ( $\beta = -.02$ , ES =

Adding all of these variables as Level 2 covariates did not substantially influence the main effects of SI (Table 3), with the largest reduction (25%) in the association of SI and number of interaction partners. Similarly, adding these covariates and their interaction with SI did not reduce the ES of the SI  $\times$  Number of Interaction Partners interactions (Table 2).

, = 128,

= 1.98) and more distant ( $\beta = .09$ ,  $p < .05$ ; high SI distant  $\beta = 1.2$ ; low SI distant  $\beta = .86$ ) partners. However, the percentage of partners who were close was not correlated with SI ( $r = -.05$ ). As indicated in Table 2, all of the interactions between SI and number of partners reported earlier were nearly identical (no reductions in effect sizes) after controlling for individual differences in average percentage of partners who were close and the SI  $\times$  Percentage of Close Partners interaction.

We also conducted an analysis to determine whether changes in drinking and smoking may have been responsible for improvement in mood with increased numbers of interaction partners among participants with high SI. Controlling for daily drinking, daily smoking, and the interactive effects of SI and these variables resulted in minimal reductions in the ES for either concurrent daily vigor or well-being (Table 2).

SI was significantly correlated with communal orientation ( $r = .19$ ,  $p < .01$ ), negative interactions ( $r = .25$ ,  $p < .001$ ), and relationship caring and satisfaction ( $r = .28$ ,  $p < .001$ ), but it was not related to extraversion ( $r = .05$ ) or agreeableness ( $r = .13$ ).

that took these into account. (Only 43% of our participants used e-mail.) The score on the revised scale was correlated ( $r = .96$ ,  $p < .001$ ) with the original score. Moreover, analyses using the revised score resulted in virtually identical results.

### Discussion

As expected, the greater the SI score, the more people participants joined with in activities on the average day. Those high in SI interacted with more people in their family and close circle, as well

consumption on that day. These effects may be attributable to the role that alcohol and cigarettes play in facilitating social interactions (Mohr et al., 2001). It is also possible that more interactants increase participant participation in these behaviors through traditional means of social influence. Finally, persons low in SI might find interacting with others stressful and, therefore, use smoking and drinking as coping strategies (Shiffman & Wills, 1985), although the failure of smoking or drinking to mediate effects of interaction partners on PA suggests that, if this were the mechanism, it is not very effective.

Unique to this article was the proposal that SI might influence how people react to their social environment. In fact, it was primarily the low-SI people whose PA, smoking, and drinking increased with the number of people with whom they interacted. In contrast, PA, smoking, and alcohol consumption of those higher in SI were relatively independent of the number of interaction partners. This result is consistent with the argument that higher SI people are responsive to the ongoing normative constraints to live a healthy lifestyle that belonging to an integrated social network places on them. In contrast, the less integrated may be more susceptible to moment-by-moment social pressures that influence their smoking and drinking behaviors. Differences in SI are not associated with the proportion of interactants with whom they have close relationships, but it is possible that people lower in SI are more likely to interact with others who drink and smoke and, hence, more people may represent more negative social pressure.

It is interesting that when we broke PA into the three subscales, it was feelings such as full of pep, cheerful, and happy ("activated" PA) that were associated with more social interaction in those with low SI. Unactivated affects (e.g., ease and calm) were not. This suggests a somewhat different perspective than the generally held position that increased social interaction is associated with increases in "undifferentiated" PA.

Finally, drinking and smoking in the presence of others might be responsible for the association between more interactants and greater PA in persons with low SI. However, this turned out not to be the case. More interaction partners were associated with higher PA irrespective of drinking and smoking rates. Thus, it is something about the interaction itself that is associated with PA, not the drugs.

None of the effects we have reported could be explained by common interpersonal relationship measures (communal orientation, the ability to have caring and satisfying relationships, negative interactions) or by social personality measures (extraversion and agreeableness), suggesting a unique role of humans' network structure in how people react to others. Similarly, with the exception of the role of purpose in smoking, the psychological mediators tested here (mastery, social support, affect) did not play important roles in explaining the associations we found. Nevertheless, it is possible that SI associations with health behaviors are mediated by feelings of loneliness, a potential mediator that was not assessed here (Cacioppo & Hawkley, 2003). However, smoking and drinking were not mediated by more global measures of NA or perceived stress that are highly correlated with loneliness and are thought to mediate its effects on health (Pressman et al., 2005). Moreover, social isolation is often not strongly associated (sometimes not at all) with loneliness, nor is it considered a sufficient or necessary cause of loneliness (Peplau & Perlman, 1982; Pressman et al., 2005).

This study does have limitations. Because the analyses were concurrent, causal inferences are not possible. We cannot be sure of the extent to which the health behaviors and affect influenced number of interactants, or whether number of interactants influenced the health behaviors. It seems reasonable, however, that in the case of health behaviors, it was probably the number of people that triggered the behaviors rather than vice versa. In the case of PA, either direction seems quite plausible. It is also possible that unspecified third (spurious) factors were responsible for changes in both variables, although we did account for the potential spurious effects of the most obvious alternatives, including age, gender, race, and an array of social and psychological variables.

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