

Brokers at Risk: Gender Differences in the Effects of Structural Position on Social Stress and Life Satisfaction

Inga Carboni

College of William and Mary

Rich Gilman

Cincinnati Children's Hospital Medical Center,
Cincinnati, Ohio, and University of Cincinnati
Medical School

Within social networks, many benefits tend to accrue to brokers (i.e., individuals who connect with otherwise unconnected individuals). However, few studies have examined the potentially negative psychological consequences to individuals occupying this network position. Drawing upon role theory, we hypothesize that brokers, especially female brokers, may be particularly vulnerable to higher levels of social stress and lower levels of life satisfaction. Data on social relationships were collected from 733 senior high school students at two different high schools. Results supported our hypotheses, revealing that brokerage was positively associated with social stress and negatively associated with life satisfaction, but only for adolescent women. The theoretical and practical implications of these findings conclude the paper.

Keywords: social networks, brokerage, social stress, subjective well-being

Brokerage has been explored as a property of whole networks and of individuals (e.g., Burt, 2005). On the network level, research has shown that brokers, that is, those who connect otherwise unconnected individuals, are critically important when social systems are seeking to build cohesion (Putnam, 2000), integrate disparate social groups (Blau & Schwartz, 1997), or leverage the advantages of a diverse membership (Reagans, Zuckerman, & McEvily, 2004). Since unconnected people tend to belong to different social groups, brokers can become bridges between groups, creating opportunities for collaboration, information-sharing, and positive intergroup relations. In light of their influential position, brokers have been suggested as the focal point in efforts to target reductions in gang involvement (Fleisher, 2005), aggression

(Neal, 2007), and substance abuse (Pearson et al., 2006).

On the individual level, however, brokerage may be costly. Situated as they are between different social groups, brokers may face conflicting sets of preferences (Podolny & Baron, 1997), different languages or perspectives (Carlile & Rebentisch, 2003), unclear role expectations (Dekker, Stokman, & Franses, 2000), and multiple demands on their time and energy (Burt, 2002). Managing these tensions may pose a number of challenges to brokers, placing them at risk for a variety of negative outcomes (Perrewé et al., 2004).

Compounding the issue is the role of gender. As will be described shortly, differences in the structure and composition of men's and women's social networks have been demonstrated in several studies, with a variety of outcomes associated with each gender group (Bearman & Moody, 2004; Ibarra, 1992). Nevertheless, no study has examined the effects of gender on brokerage with respect to self-reported social and mental-health indicators. In this study, we examine the differential effects of brokerage on two key social and psychological constructs, perceived social stress and well-being, among adolescent men and women in two large social networks.

This article was published Online First June 11, 2012.

Inga Carboni, Mason School of Business, College of William and Mary; Rich Gilman, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio, and University of Cincinnati Medical School.

Correspondence concerning this article should be addressed to Inga Carboni, Mason School of Business, College of William and Mary, Miller Hall, 101 Ukrop Way, Williamsburg, VA 21385. E-mail: inga.carboni@mason.wm.edu

Brokerage and Psychological Health: A Brief Overview

By virtue of their position, brokers play an important role in integrating systems and building communal social capital in at least four ways. First, as a function of their connective position, brokers can facilitate coordination between groups in response to threats to the entire system (Granovetter, 1973). Second, brokers who have positive relationships with members of different groups are also likely to have insights into the norms and perspectives of those groups (Carlile & Reberntsch, 2003), making them well-positioned to serve as ambassadors or mediators between groups that might otherwise develop negative (or more negative) relationships. Third, brokers are in a position to transmit information about group norms between individuals from different groups (Podolny & Baron, 1997) without the associated emotional flooding that can occur during direct cross-group interactions, thereby reducing intergroup anxiety and making cross-group friendship formation more likely (Pettigrew & Tropp, 2008). Finally, brokers may have multiple group identities, allowing them to form cross-cutting circles that can serve as mechanisms for reducing ingroup/outgroup barriers and associated intergroup conflict (Blau & Schwartz, 1997).

Nevertheless, in spite of the benefits to the overall system, brokers themselves may experience increased stress as a function of having and maintaining relationships with people from disconnected social groups (Dekker, Stokman & Franses, 2004; Krackhardt, 1999). Role theory has been a lens with which to investigate individuals who occupy a certain status or position (Merton, 1968) in relationships, and is a salient framework when examining brokers. According to role theory, relationship partners communicate their expectations for the focal individual with more or less felt pressure (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964). Psychological stress arises as individuals deplete their coping resources by investing significant energy in considering, addressing, and attempting to resolve unclear or conflicting role expectations (Dekker et al., 2004; Hobfoll, 1989). It has been shown that individuals who are embedded in a tightly connected social group tend to experi-

ence fewer stress reactions, perhaps as a result of clear and consistent expectations for behavior (Haines, Beggs, & Hurlbert, 2002; Kadushin, 1982).

Conversely, brokers may frequently face ambiguous or even conflicting social expectations, depending on the specific individual or group with whom they are interacting (Podolny & Baron, 1997). For example, a broker who interacts with friends who value and expect behavior related to academic success, such as spending social time in the library, may experience stress when interacting with other friends with dissimilar values and different expectations, such as spending time together at the mall. Given the primacy of social relationships in everyday life (Baumeister & Leary, 1995; Kawachi & Berkman, 2001; McGrath, Brennan, Dolan, & Barnett, 2009), determining and enacting expected social behaviors may be particularly stressful for brokers, particularly in cases when they are situated between people who are located in different parts of the larger social structure (Kahn et al., 1964).

Findings have also shown that subjective well-being may be affected by the composition of social networks (Kawachi & Berkman, 2001; McGrath et al., 2009). Within this multidimensional construct is global life satisfaction, defined as a cognitive appraisal of one's life quality without reference to a specific domain (Diener, Scollon, Oishi, Dzokoto, & Suh, 2009). Although there is evidence to suggest that life satisfaction is positively associated with aspects of social networks, especially social integration (e.g., Kawachi & Berkman, 2001), research in this area has generally focused on the number, valence, and (occasionally) strength of social relationships, rather than on the structure of relationships. A burgeoning line of research has examined how life satisfaction is related to the quality of social relationships both among adults (Powdthavee, 2008) and adolescents (Gilman & Huebner, 2006). Clearly, some elements inherent in the broker position (e.g., being socially integrated) would foster a sense of belonging, which in turn may promote global satisfaction (Berkman & Glass, 2000; Kawachi & Berkman, 2001). Nevertheless, those who occupy brokerage positions often must navigate a variety of different social expectations across the social network, making them less likely to feel fully integrated into the

network (Mcfarland & Pals, 2005). As a result, brokerage may not generate the positive psychological states associated with global satisfaction.

Brokerage and Gender

Studies examining the role of gender in social groups have shown that women are more likely to place a higher value on emotional connections (Ryan, La Guardia, Solky-Butzel, Chirkov, & Kim, 2005), experience themselves more relationally (Cyranowski, Frank, Young, & Shear, 2000), focus more on relationships than rules (Gilligan, 1982), be more attuned to the needs of others, and feel responsible for meeting those needs (Miller, 1976). As a result of the greater emphasis they place on social relationships, women may be more distressed than men when faced with incongruent role expectations (e.g., Bearman & Moody, 2004).

Psychological health may also differ according to the gender of the broker because of social role expectations regarding control, dependence, and gender. Specifically, given their location within the network, brokers have attractive and legitimate alternative sources of need fulfillment (Thibaut & Kelley, 1969) because they do not depend upon any one individual in their social networks for the fulfillment of their social needs. Even when brokers are unaware that they occupy a brokerage position, they tend to negotiate better “deals” than nonbrokers (Cook & Emerson, 1978). The ability to negotiate advantageous deals is one of the benefits of brokerage (Simmel, 1950), and is one reason why some people persist in occupying such powerful positions. Yet, compared to men, women are less likely to occupy brokerage positions, and when they do, are less likely than men to benefit from them (Burt, 1992). Gender-role-expectation theory suggests that, although the control benefits and relative independence associated with a broker’s position are congruent with gender role expectations for men, they are not congruent with gender role expectations for women (Eagly, 1987). In response to this incongruity, women may face negative evaluations and increased pressure to conform to gender role expectations (Eagly, 1987; Rudman & Glick, 2001). Thus, although no study has directly examined the associations between brokerage, gender, and mental health, women who

assume the brokerage position, either by conscious volition or by virtue of a specific activity (Schaefer, Simpkins, Vest, & Price, 2011), may be at risk for backlash or social disapproval (Rudman & Glick, 2001).

For all of these reasons, we expect that women who are brokers, in comparison to their male counterparts, may report higher levels of social distress and lower well-being (i.e., life satisfaction).

Purpose of Study

Our findings extend research in the network literature by examining the psychological health of adolescent men and women in brokerage positions within friendship networks. We chose to test our hypotheses among older adolescents (i.e., high school seniors) because we wanted to examine large, stable networks among a population that was not influenced by instrumental concerns (e.g., career advancement). We chose the last year of high school, given that social networks by then have been fairly established, and the number of adolescents newly arriving into the system is minimal. The following hypotheses will be tested:

Hypothesis 1: Brokerage will be positively associated with social stress and negatively associated with life satisfaction.

Hypothesis 2: Brokers who are women will be more likely than brokers who are men to report higher levels of social stress and lower levels of life satisfaction.

Method

Participants and Procedure

Data were collected from seniors at two schools located in the Lexington, Kentucky region. Site 1 was located in a suburban setting (2009 estimated census population = 21,589), and Site 2 was located in an urban setting (2009 estimated census population = 296,545). All data were gathered approximately 6 weeks prior to graduation. The enrollment and stability of adolescents in each school was quite stable; over 95% of students who entered the school as freshman graduated as seniors. Table 1 reports the demographic breakdown of each sample. Of the 482 students in Site 1, 363 completed the

Table 1
Breakdown of Sample Characteristics Across Sites

Variable	Site 1	Site 2
Sex		
Male	170	185
Female	193	185
Race/ethnicity		
White/European American	316	239
Black/African American	21	68
Hispanic/Latino	10	11
Asian American	6	26
Other	6	18
Dual affiliation	5	8
Socioeconomic status (lunch status)		
Regular lunch	289	284
Free/reduced	74	86
Disability status		
Learning disability	8	15
Physical disability	6	2
Emotional disability	5	5
Other disability	4	3

survey (75% response rate); of the 466 students at Site 2, 370 completed the survey (79% response rate). The response rate is in keeping with other studies examining school-based social networks (e.g., Kobus & Henry, 2010). Percentage of responders that were 18 or older at Site 1 was 60% (mean age = 17.63 years; $SD = 0.59$) and at Site 2 was 71% (mean age = 17.77 years, $SD = 0.54$). Passive parent consent was approved by the school principal, the school district, and the second author's institutional review board. Data were collected via an online survey as part of a larger study on social networks and outcomes for youth.

Measures

Social stress. The Behavioral Assessment Scale for Children-2 (BASC-2: Reynolds & Kamphaus, 2004) is a 186-item self-report that measures well-being as well as negative indicators of mental health. One specific subtest of the BASC-2 is relevant for this study: *social stress* (10 items, e.g., "I feel out of place around people" and "People say bad things to me."). All items are rated on a 4-point scale (ranging from *never to almost always*) or in a true/false format. The BASC-2 is one of the most frequently administered rating scales in school and clinic settings, and demonstrates solid support for its construct validity. The internal consistency of the scale was 0.88 in this study.

Global life satisfaction. The Life Satisfaction Scale for Students (MSLSS: Huebner, 1994) is a self-report scale that measures overall satisfaction without reference to any specific life domain. Individuals respond to seven items on a 6-point rating scale (1 = *strongly disagree*, 6 = *strongly agree*). Studies of this scale consistently reveal solid evidence of construct validity (Gilman & Huebner, 2003), as well as convergent and discriminant validity (e.g., Rice, Ashby, & Gilman, 2011). The internal consistency of the scale in this study was 0.86.

Social network data. The study used a roster method, which is a reliable and established method for collecting social-network data (Marsden, 1990). Individuals were presented with a list of all the high school seniors at their school, listed alphabetically, and were asked to select between three and seven individuals with whom they felt "at least somewhat close." This range was chosen given previous findings that four to five friends constitutes the average number of friends endorsed by adolescents (Steglich, Snijders, & West, 2006). Close friends were defined as "people with whom you spend lots of time doing different activities and whom you can count on when you need help." To account for individual bias in defining close relationships, participants were also instructed: "If you don't have any close friends among seniors in your class, please select the names of three people you feel at least somewhat close to."

An abundance of literature has shown that self-reported negative interactions are a consistent and independent correlate of negative psychological outcomes (e.g., House, Landis, & Umberson, 1988; Lincoln, 2008), including lower levels of life satisfaction (Gilman & Huebner, 2006). To rule out the effects of negative relationships on psychological outcomes, each respondent also selected up to three names of individuals with whom they had experienced "conflict, tension, or with whom they just didn't get along." Although single-item measures can be problematic in some studies, they can effectively capture network relationships without undue burden on respondents, especially when they refer to behaviors that endure over a period of time (Marsden, 1990).

For each participant within each school, a symmetrical positive tie matrix was created in which cell X_{ij} was coded as 1 if both Respon-

dent *i* and Respondent *j* reported being at least “somewhat close” to the other. We included only “strong” ties, that is, those with mutually close endorsement, because we believe that they are most likely to provoke role-related tensions. Our inclusion of strong ties also minimized potential bias in the accuracy of perceived closeness between raters. At Site 1, a 363 by 363 matrix was created. At Site 2, a 370 by 370 matrix was created.

Measuring Network Variables

We analyzed the network of each school independently and then, given that the networks were of similar size, we combined the variables into one database.¹ Network data were created using UCINET 6.311 for Windows (Borgatti, Everett, & Freeman, 2002).

We distinguished between two types of brokerage—indirect and direct—in our analyses. *Indirect brokerage* takes into account an individual’s position in the larger social network by referring to the extent to which the person, referred to as *ego*, is indirectly connected to people who are otherwise unconnected. *Direct brokerage*, on the other hand, refers to the extent to which an ego has direct relationships with individuals who are not connected to each other. Thus, indirect brokerage tends to capture brokerage between different parts of the larger social network, whereas direct brokerage captures brokerage within an ego’s set of direct relationships. Given our interest in understanding the psychological correlates of occupying a position that connects disparate parts of the network, our primary variable of interest was indirect brokerage.

Indirect brokerage was measured as “betweenness” centrality, which captures how often ego lies on the shortest path between all possible pairs of people in a network (Freeman, 1979). Given that the distribution of scores exhibited both skewness (Site 1 = 2.16; Site 2 = 2.66) and kurtosis (Site 1 = 4.78; Site 2 = 9.88), the variable was transformed by taking the square root.

Direct brokerage is a measure of an ego’s personal network density. To calculate, we counted the number of transitive triads that included the respondent (i.e., $A \leftrightarrow B$, $A \leftrightarrow C$, and $B \leftrightarrow C$) and divided this by the number of potentially transitive triads that included the

respondent (i.e., $A \leftrightarrow B$ and $A \leftrightarrow C$) (Holland & Leinhardt, 1970). In calculating this variable, we only included individuals who had at least two friends (224 of 363 at Site 1; 252 of 370 at Site 2). Given that the distribution of scores exhibited a modest amount of skewness (Site 1 = 1.59; Site 2 = 1.40) and kurtosis (Site 1 = 1.23; Site 2 = 0.98), the variable was transformed by taking the square root. This variable was computed so that higher values indicated higher levels of direct brokerage.

Positive network size was measured by degree centrality, which is equal to the number of people to whom the individual is directly connected. Irrespective of brokerage position, the number of a person’s positive affective relationships has been associated with increased well-being (House et al., 1988). In addition, the more people to whom a person is connected, the more opportunities that person has to be a broker. To control for these effects, positive network size was added as a control variable. Since the two positive affective networks were of nearly equal size to ease interpretation, degree centrality was not normalized.

As with positive network ties, a negative tie matrix was created for each site, in which cell X_{ij} was coded as 1 if Respondent *i* reported *j* as being someone with whom s/he didn’t “get along.” At Site 1, a 363 by 363 matrix was created. At Site 2, a 370 by 370 matrix was created. We assumed that negative relationships affect stress and satisfaction whether or not the relationship is reciprocated, and so we symmetrized the matrix such that a tie was said to exist if either *i* or *j* indicated that a tie existed.² *Negative network size* corresponds to positive network size and captures the number of negative ties connected to an individual. Given that the distribution of scores exhibited both skew-

¹ All analyses were also run separately by school. At both sites, brokerage was negatively associated with life satisfaction but only for adolescent women. However, the association between social stress and indirect brokerage was not significant at Site 1. Although the overall equation was significant for adolescent women (but not for adolescent men), the coefficient for indirect brokerage was not. We think that this is likely to be the result of demographic differences between the two schools. Site 1 is less ethnically diverse than Site 2; Site 2 includes gangs and colors are flashed. It may be that occupying a position between unconnected groups has stronger and more serious implications for mental health at Site 2 than it does at Site 1.

² All analyses were also run with only outgoing or incoming negative relationship nominations. Results were unchanged.

ness (Site 1 = 3.25; Site 2 = 3.12) and kurtosis (Site 1 = 11.84; Site 2 = 10.25), the variable was transformed by taking the square root.

Results

Descriptives

Descriptive statistics and correlations among study variables for individuals who completed network surveys are reported in Table 2 and Table 3. Correlations with and between social stress and satisfaction were consistent with what has been reported elsewhere among older adolescents (Suldo, Thalij, & Ferron, 2011). Associations between most network variables were significant but not large, suggesting that each variable assessed a different (but not orthogonal) aspect of network composition. However, consistent with previous studies (e.g., Oh & Kilduff, 2008), the correlation between positive network size and indirect brokerage was quite elevated (r 's = 0.78 and 0.76 at Sites 1 and 2, respectively), raising concerns about multicollinearity. Multicollinearity statistics showed that the variance inflation factor for all variables was below 2.5, all of which were well below the recommend level of 10 (Belsley, Kuh, & Welch, 1980). All condition indices (CI) were below 21. Normally, only CI values above 30 are cause for concern, and those between 10 and 30 are considered instances of moderate multicollinearity (Belsley et al., 1980). Given these checks, we do not believe that multicollinearity was a cause for concern in our data, increasing confidence in the robustness of our results.

Association Between Brokerage Position and Levels of Stress/Global Life Satisfaction

Hierarchical ordinary least-squares (OLS) regression analyses were used to test our hypotheses. In the first step of the OLS models, we entered only the control variables (i.e., site, sex, disability status, socioeconomic status [SES], ethnicity, positive network size, negative network size, and direct brokerage). In successive steps, we entered the effects of the research variables corresponding to our a priori hypotheses. The initial and final regression steps for each outcome are reported in Table 4.

Results revealed that negative network size was a significant and positive predictor of social stress ($\beta = 0.18, p < .001$). Socioeconomic status was a negative predictor of life satisfaction (with adolescents of lower SES status reporting lower levels). Conversely, positive network size was a significant and positive predictor of life satisfaction. As shown in the final steps of the regression models for each outcome variable (i.e., Model 2 and Model 4), the inclusion of the indirect brokerage variable yielded a significant change in R^2 . Indirect (but not direct) brokerage significantly and positively predicted social stress ($\beta = 0.19, p < .01$) and negatively predicted life satisfaction ($\beta = -0.27, p < .001$).³ The final models explained 6% and 8% of the variance, respectively, providing support for Hypothesis 1, which predicted a positive association between brokerage and social stress and a negative association between brokerage and life satisfaction.

Brokerage Position and Gender Differences

To assess for possible gender differences in the pattern of covariates, social stress (see Table 5) and life satisfaction (see Table 6) were examined separately for adolescent men and women. All analyses are based on 267 women and 209 men. Model 1 and Model 3 represent the initial regression step for each gender, which entered the regression constant, demographic variables, positive and negative network size, and direct brokerage. Indirect brokerage was entered at the second step for each gender (Model 2 and Model 4). As can be seen in the final models, significant prediction values were found between social stress and indirect brokerage for women only, thus supporting Hypothesis 2a. The overall model for women was significant ($p < .01$) and explained 10% of the variance. Control-

³ The changes to the direct brokerage variable suggest that it shares variance with the indirect brokerage variable, which is not surprising given that they both capture the extent to which a person's friends are disconnected. We tested for suppression by first entering indirect brokerage and then direct brokerage into a model. In all instances, the indirect brokerage variable retained its significance with or without the inclusion of direct brokerage and did not change sign. For this reason, we do not believe that suppression explains our findings regarding the primary variable of interest, indirect brokerage.

Table 2
Descriptive Statistics by Site

	Site 1			Site 2		
	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
1. Sex ^a	.50	.50	374	.47	.50	382
2. Disability ^b	.07	.25	374	.05	.23	382
3. SES ^c	.23	.42	374	.21	.41	382
4. Ethnicity ^d	.64	.48	374	.87	.34	382
5. Positive network size	2.42	1.60	370	2.07	1.45	363
6. Negative network size	1.46	.81	370	1.40	.80	363
7. Direct brokerage	.36	.35	252	.27	.36	224
8. Indirect brokerage	20.10	21.97	370	19.48	22.46	363
9. Social stress	.66	.50	372	.66	.58	381
10. Satisfaction	4.64	.87	373	4.67	.93	382

^a Female = 0, male = 1. ^b No disability = 0, disability = 1. ^c Does not participate in free-lunch program = 0, participates in free lunch program = 1. ^d Not Anglo/Caucasian = 0, Anglo/Caucasian = 1.

ling for site, disability status, SES, ethnicity, positive network size, negative network size, and direct brokerage, indirect brokerage significantly and positively predicted social stress for women ($\beta = 0.24, p < .01$). The unexpected negative relationship between direct brokerage and social stress for women ($\beta = -0.18, p < .05$) can be explained by the variance shared by the two brokerage terms.

Similarly, when gender analyses were run separately for global life satisfaction, significant prediction values were noted with indirect (but not direct) brokerage among women only (see Models 2 and 4, Table 6). The prediction between indirect brokerage and (low) global satisfaction was significant and moderate ($\beta = -.33, p < .001$). The overall model including indirect brokerage was sig-

nificant at $p < .001$ and explained 13% of the variance. Thus, we found full support for Hypothesis 2.

Discussion and Conclusions

In general, our findings supported both of our hypotheses, indicating that brokers—and more specifically, women—pay significant psychological costs for their position in the social structure, in that they experience increased social stress and decreased life satisfaction. Our findings extend research on outcomes associated with positions within social networks in several ways.

First, the present research contributes to a growing literature base on the role of social network structure on mental-health outcomes

Table 3
Correlation Matrices by Site (Site 1 Below Diagonal, Site 2 Above)

	1	2	3	4	5	6	7	8	9	10
1. Sex ^a		.055	.047	.013	-.138**	-.032	-.079	-.159**	.028	.025
2. Disability ^b	.026		.131*	-.047	-.165	-.002	-.003	-.143**	.109*	-.182***
3. SES ^c	-.034	-.066		-.464***	-.085	-.056	.052	-.078	-.020	-.074
4. Ethnicity ^d	.039	-.042	-.188***		.128*	.134*	-.151*	.146***	.027	.058
5. Positive network size	-.104*	-.028	-.156***	.098		-.105*	.165**	.762***	-.017	-.013
6. Negative network size	-.085	.095	-.033	.059	.010		.014	-.046	.159**	.039
7. Direct brokerage	-.056	.004	-.067	.025	.106	.016		-.266***	.056	-.079
8. Indirect brokerage	-.029	-.033	-.139**	.072	.782***	.025	-.391***		.064	-.108*
9. Social stress	.036	.108*	.163**	.008	-.033	.062	-.011	.026		-.521***
10. Satisfaction	-.071	-.166**	-.203***	.068	.071	-.042	.148*	-.041	-.583***	

^a Female = 0, male = 1. ^b No disability = 0, disability = 1. ^c Does not participate in free-lunch program = 0, participates in free lunch program = 1. ^d Not Anglo/Caucasian = 0, Anglo/Caucasian = 1.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
Results of Regression Analyses Predicting Social Stress and Satisfaction (N = 476)

Variable	Social stress						Satisfaction					
	Model 1			Model 2			Model 3			Model 4		
	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
Constant	.50	.09		.46	.09		4.67	.16		4.76	.16	
Site ^a	.00	.05	.00	.02	.05	.02	-.05	.08	-.03	-.09	.08	-.05
Sex ^b	.08	.05	.08	.08	.05	.08	-.07	.08	-.04	-.07	.08	-.04
Disability ^c	.10	.11	.04	.11	.11	.05	-.17	.19	-.04	-.21	.18	-.05
SES ^d	.06	.06	.05	.06	.06	.05	-.29	.11	-.13**	-.29	.11	-.13**
Ethnicity ^e	.01	.06	.01	.01	.06	.01	.15	.11	.07	.15	.10	.07
Positive network size	.01	.02	.04	-.03	.02	-.07	.01	.03	.01	.11	.04	.15***
Negative network size	.23	.06	.18***	.21	.06	.16***	-.19	.10	-.09	-.13	.10	-.06
Direct brokerage	-.04	.07	.02	-.17	.08	-.11*	-.03	.12	-.01	.28	.14	.10*
Indirect brokerage				.01	.00	.19**				-.01	.00	-.27***
R ²	.04*			.06**			.04**			.08***		
F for change in R ²				8.73**						17.22***		

^a Site 1 = 0, Site 2 = 1. ^b Female = 0, male = 1. ^c No disability = 0, disability = 1. ^d does not participate in free lunch program = 0, participates in free lunch program = 1. ^e Not Anglo/Caucasian = 0, Anglo/Caucasian = 1.
* p < .05. ** p < .01. *** p < .001.

(e.g., Bearman & Moody, 2004; Fowler & Christakis, 2008; Kalish et al., 2009). To the best of our knowledge, this is one of only a handful of studies to look beyond purely dyadic relationships to explore the impact of position in the larger social structure on mental health (e.g., Fowler & Christakis, 2008). Although previous theorizing on mental-health outcomes associated with social relationships assumes that dyadic relationships occur within the context of a

larger network of relationships, very little research has explored this proposition, which has largely been due to methodological and statistical limitations (cf. Wölfer, Bull, & Scheithauer, 2011). It is difficult to collect and analyze network data using traditional experimental or survey methods, especially when the focus of interest is on capturing reciprocated (i.e., self- and other-reported) positive relationships, as it was in this study. Our findings, based

Table 5
Results of Regression Analyses Predicting Social Stress, Split by Gender

Variable	Women (N = 267)						Men (N = 209)					
	Model 1			Model 2			Model 3			Model 4		
	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
Constant	.38	.12		.34	.12		.69	.13		.66	.14	
Site ^a	.10	.06	.10	.10	.06	.10	-.10	.07	-.10	-.07	.08	-.07
Disability ^b	.27	.15	.11	.28	.14	.12	-.03	.16	-.01	-.02	.16	-.01
SES ^c	.18	.09	.14*	.17	.09	.13*	-.01	.09	-.01	-.01	.09	-.01
Ethnicity ^d	.08	.08	.07	.08	.08	.07	-.03	.09	-.02	-.03	.09	-.02
Positive network size	.01	.02	.02	-.04	.03	-.11	.02	.03	.04	-.01	.04	-.03
Negative network size	.20	.07	.18**	.17	.07	.15*	.27	.11	.17*	.28	.11	.17*
Direct brokerage	-.11	.09	-.08	-.27	.11	-.18*	.04	.11	.03	.04	.13	.02
Indirect brokerage				.01	.00	.24**				.00	.00	.12
R ²	.07**			.10**			.04			.05		
F for change in R ²				7.30**						1.35		

^a Site 1 = 0, Site 2 = 1. ^b No disability = 0, disability = 1. ^c Does not participate in free lunch program = 0, participates in free lunch program = 1. ^d Not Anglo/Caucasian = 0, Anglo/Caucasian = 1.
* p < .05. ** p < .01. *** p < .001.

Table 6
Results of Regression Analyses Predicting Satisfaction, Split by Gender

Variable	Women (N = 267)						Men (N = 209)					
	Model 1			Model 2			Model 3			Model 4		
	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
Constant	4.84	.21		4.93	.21		4.44	.23		4.49	.23	
Site ^a	-.26	.11	-.15*	-.26	.11	-.15*	.20	.12	.11	.16	.13	.09
Disability ^b	-.51	.26	-.12*	-.54	.25	-.13*	.12	.27	.03	.10	.27	.03
SES ^c	-.39	.15	-.17*	-.38	.15	-.16*	-.28	.16	-.13	-.28	.16	-.13
Ethnicity ^d	.03	.15	.01	.04	.15	.02	.22	.15	.11	.22	.15	.11
Positive network size	.02	.04	.03	.15	.05	.21**	-.01	.05	-.01	.05	.07	.06
Negative network size	-.21	.12	-.11	-.12	.12	-.06	-.05	.19	-.02	-.05	.19	-.02
Direct brokerage	-.10	.16	-.04	.29	.19	.11	.09	.19	.03	.22	.22	.08
Indirect brokerage				.01	.00	-.33***				-.01	.00	-.13
R ²	.08**			.13***			.05			.06		
F for change in R ²				15.08***						1.60		

^a Site 1 = 0, Site 2 = 1. ^b No disability = 0, disability = 1. ^c Does not participate in free lunch program = 0, participates in free lunch program = 1. ^d Not Anglo/Caucasian = 0, Anglo/Caucasian = 1.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

on a large sample size with a high consent rate, underscores the critical importance of including a larger network perspective on relationships. Even after controlling for the number of positive and negative relationships held by an individual, a significant amount of variance in mental-health outcomes (at least for adolescent women) was explained by understanding the extent to which individuals connected other individuals to each other in the larger network. In addition, only adolescent women experienced a significantly positive association between number of positive relationships and life satisfaction, providing support for the notion that women place a greater value and find more satisfaction in their affective relationships than do men.

Second, to the best of our knowledge, this is also the first study that has not only explored the impact of position in a network of positive affective relationships on mental health, but has also included negative affective relationships in a network. Our results indicate that the number of negative but not positive ties within a person's network increases social stress but does not influence subjective well-being (as measured by life satisfaction), supporting the contention that negative relationships have a stronger impact on psychological distress than do supportive relationships (Lincoln, 2008). Lincoln and colleagues (Lincoln, Chatters, & Taylor, 2005) hypothesized that such relationships

can act both directly as a source of stress and also indirectly by threatening self-esteem and perceived self-efficacy. Our findings underscore the need to consider both positive and negative relationships when assessing the mental health of individuals.

Finally, our findings suggest a further examination of theories regarding differences in outcomes associated with men and women's professional relationship structures. Within networks of professional affective relationships, there are enormous performance benefits associated with brokerage at the individual level, such that brokers tend to advance faster, earn more, and outperform nonbrokers (for a review, see Burt, 2005). Nevertheless, studies (e.g., Burt, 1992) have also shown that women are less likely to occupy brokerage positions, and when they do, are less likely than men to benefit from them. Previously, these differences have been explained a function of women's need to signal their competency by developing strong interconnected networks (Burt, 1992; Ibarra, 1992). Our research suggests that these gender differences may also be influenced by the effects of structural position on psychological well-being. We have argued that women may be more distressed than men by conflicting role expectations because of the higher value they tend to place on social relationships. In addition, demonstrating gender-incongruent character-

istics (i.e., by being both a woman and occupying a structural position associated with control and relative independence) may induce social processes that affect psychological well-being. In addition to replicating our study in a professional setting, future research should explore the relationship between the affective networks of adolescents and professionals. For example, it may be that having experienced (or observed) an association between structural position and social (dis)approval as an adolescent affects the likelihood of adopting that position as an adult, whether or not it might be professionally advantageous to do so.

Overall, our research suggests that there may be tensions between individual and the collective benefits of network position (cf. Ibarra, Kilduff & Tsai, 2005). At the collective level, connections between individuals and subgroups are usually thought to benefit the entire network (Putnam, 2000). A preponderance of bridging relationships in a social network has been associated with positive health effects, such as the adoption of healthy norms and behaviors (Kawachi, Kennedy, & Glass, 1999). Thus, when brokerage is associated with positive individual-level benefits, the outcomes for individuals and networks are congruent (Ibarra et al., 2005). Our study suggests that brokerage, especially for women, may lead to a lack of network congruence that can undermine the well-being of the individual. This apparent social dilemma between individual and collective outcomes implies that systems may need to find ways to acknowledge and protect valuable brokers from negative psychological outcomes. Understanding these tradeoffs may also explain why some systems seeking to integrate a diverse membership fail to do so, whereas others may achieve social integration, but only at some cost to some individuals.

Given the value of brokers to the collective (e.g., Putnam, 2000), our findings also suggest that efforts to integrate systems may need to focus on brokers, particularly those who are women. Schools represent a logical organization in which to initiate and monitor these intervention efforts. Recent research demonstrating that students who belong to multiple friendship groups tend to be more socially skilled than students who belong to fewer friendship groups (Wölfer et al., 2011), sug-

gesting that interventions may need to focus on building coping strategies rather than on social skills. Processes to help brokers (particularly adolescent women) manage their position successfully, or at the very least to develop personal coping strategies when tensions arise, should be the first step in larger efforts to reduce conflict and integrate diverse populations in schools (Gilman, Schonfeld, & Carboni, 2009).

As with many social network studies, our cross-sectional data preclude making definitive causal statements. We have argued that the likely direction of causality is from structure to psychological outcomes. Our argument finds support in numerous reviews of research on the link between social ties and mental health (e.g., House et al., 1988; Kawachi & Berkman, 2001), which have generally concluded that social ties have a “predictive, arguably causal, association with health” (House et al., 1988, p. 544). However, there is no doubt that some of the relationship is reinforcing (cf. Kalish & Robbins, 2006). Longitudinal studies may provide more unambiguous support for our claims. Another limitation is that the ties we studied were all relatively strong ties. It may be that brokerage among strong ties affects well-being more than brokerage among weak ties. Neuroticism, for example, has been argued to be both a cause and an effect of direct brokerage among strong but not weak ties (Kalish & Robbins, 2006).

In summary, brokerage has been highly touted as an advantage for both individuals and the systems in which they reside. Brokers have the potential to form bridges between members of unconnected groups. Understanding the potential psychological costs of brokerage is an important and necessary step if brokers are to serve as integrating agents, knitting together our diverse and sometimes fractious system.

References

- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497–529. doi:10.1037/0033-2909.117.3.497
- Bearman, P. S., & Moody, J. (2004). Suicide and friendships among American adolescents. *American Journal of Public Health*, *94*, 89–95. doi:10.2105/AJPH.94.1.89

- Belsley, D. A., Kuh, E., & Welsch, R. E. (1980). *Regression diagnostics: Identifying influential data and sources of collinearity*. New York, NY: Wiley.
- Berkman, L. F., & Glass, T. (2000). Social integration, social networks, social support, and health. In: Berkman L. F. & Kawachi I., (Eds.), *Social epidemiology* (pp. 137–173). Oxford, UK: Oxford University Press.
- Blau, P. M., & Schwartz, J. E. (1997). *Crosscutting social circles: Testing a macrostructural theory of intergroup relations*. New Brunswick, NJ: Transaction Publishers.
- Borgatti, S. P., Everett, M. G., & Freeman, L. C. (2002). *Ucinet for Windows: Software for social network analysis*. Harvard, MA: Analytic Technologies.
- Burt, R. S. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.
- Burt, R. S. (2002). Bridge decay. *Social Networks*, 24, 333–363. doi:10.1016/S0378-8733(02)00017-5
- Burt, R. S. (2005). *Brokerage and closure: An introduction to social capital*. Oxford, UK: Oxford University Press.
- Carlile, P. R., & Reberich, E. S. (2003). Into the black box: The knowledge transformation cycle. *Management Science*, 49, 1180–1195. doi:10.1287/mnsc.49.9.1180.16564
- Cook, K. S., & Emerson, R. M. (1978). Power, equity and commitment in exchange networks. *American Sociological Review*, 43, 721–739. doi:10.2307/2094546
- Cyranowski, J. M., Frank, E., Young, E., & Shear, M. K. (2000). Adolescent onset of the gender difference in lifetime rates of major depression: A theoretical model. *Archives of General Psychiatry*, 57, 21–27. doi:10.1001/archpsyc.57.1.21
- Dekker, D., Stokman, F., & Franses, P. H. (2000). *Broker positions in task-specific knowledge networks: Effects on perceived performance and role stressors in an account management system* (ERIM Report Series No. ERS-2000-37-MKT). Rotterdam, the Netherlands: Erasmus Research Institute of Management, Erasmus Universiteit.
- Dekker, D. J., Stokman, F. N., & Franses, P. H. (2004). *Effectiveness of brokering within account management organizations* (Reference No. RRM-2004-04-MKT). Nijmegen, the Netherlands: University of Nijmegen, Nijmegen School of Management.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125, 276–302. doi:10.1037/0033-2909.125.2.276
- Eagly, A. H. (1987). *Sex differences in social behavior: A social-role interpretation*. Hillsdale, NJ: Erlbaum.
- Fleisher, M. S. (2005). Fieldwork research and social network analysis: Different methods creating complementary perspectives. *Journal of Contemporary Criminal Justice*, 21, 120–134. doi:10.1177/1043986204273436
- Fowler, J. H., & Christakis, N. A. (2008). Dynamic spread of happiness in a large social network: Longitudinal analysis over 20 years in the Framingham Heart Study. *British Medical Journal*, 337, a2338–a2346. doi:10.1136/bmj.a2338
- Freeman, L. (1979). Centrality in social networks conceptual clarification. *Social Networks*, 1, 215–239. doi:10.1016/0378-8733(78)90021-7
- Gilligan, C. (1982). *In a different voice: Psychological theory and women's development*. Cambridge, MA: Harvard University Press. doi:10.1521/seppq.18.2.192.21858
- Gilman, R., & Huebner, E. S. (2006). Characteristics of adolescents who report very high life satisfaction. *Journal of Youth and Adolescence*, 35, 293–301. doi:10.1007/s10964-006-9036-7
- Gilman, R., & Huebner, S. (2003). A review of life satisfaction research with children and adolescents. *School Psychology Quarterly*, 18, 192–205.
- Gilman, R., Schonfeld, D., & Carboni, I. (2009). Using social network analysis as a lens to examine ostracized youth. In M. Kerns (Ed.), *Bullying, rejection, and peer victimization: A social cognitive neuroscience perspective* (pp. 345–363). New York, NY: Springer.
- Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology*, 78, 1360–1380. doi:10.1086/225469
- Haines, V. A., Beggs, J. J., & Hurlbert, J. S. (2002). Exploring the structural contexts of the support process: Social networks, social statuses, social support, and psychological distress. In Judith A. Levy & Bernice A. Pescosolido (Eds.), *Advances in medical sociology* (pp. 269–292). Bingley, UK: Emerald Group.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44, 513–524. doi:10.1037/0003-066X.44.3.513
- Holland, P. W., & Leinhardt, S. (1970). A method for detecting structure in sociometric data. *American Journal of Sociology*, 76, 492–513. doi:10.1086/224954
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, 241, 540–545. doi:10.1126/science.3399889
- Huebner, E. S. (1994). Preliminary development and validation of a multidimensional life satisfaction scale for children. *Psychological Assessment*, 6, 149–158. doi:10.1037/1040-3590.6.2.149

- Ibarra, H. (1992). Homophily and differential returns: Sex differences in network structure and access in an advertising firm. *Administrative Science Quarterly*, 37, 422–447. doi:10.2307/2393451
- Ibarra, H., Kilduff, M., & Tsai, W. (2005). Zooming in and out: Connecting individuals and collectivities at the frontiers of organizational network research. *Organization Science*, 16, 359. doi:10.1287/orsc.1050.0129
- Kadushin, C. (1982). Social density and mental health. In P. V. Marsden & N. Lin (Eds.), *Social structure and network analysis* (pp. 147–158). London, UK: Sage.
- Kahn, R., Wolfe, D. M., Quinn, K. P., Snoek, J. D., & Rosenthal, R. A. (1964). *Organizational stress: Studies in role conflict and ambiguity*. New York, NY: Wiley.
- Kalish, Y., & Robins, G. (2006). The relationship between individual predispositions, structural holes and network closure. *Social Networks*, 28, 56–84. doi:10.1016/j.socnet.2005.04.004
- Kalish, Y., Robins, G., Pattison, P., Jackson, H., Judd, F., Murray, G., & Wearing, A. (2009). *Social networks and mental health: Relating current and lifetime psychiatric diagnosis to characteristics of social networks* (Working Paper 7/2009). Retrieved from: http://reanati.tau.ac.il/eng/_uploads/dbsattachedfiles/wp_7-2009_kalish.pdf
- Kawachi, I., & Berkman, L. F. (2001). Social ties and mental health. *Journal of Urban Health*, 78, 458–467. doi:10.1093/jurban/78.3.458
- Kawachi, I., Kennedy, B. P., & Glass, R. (1999). Social capital and self-rated health: A contextual analysis. *American Journal of Public Health*, 89, 1187–1193. doi:10.2105/AJPH.89.8.1187
- Kobus, K., & Henry, D. B. (2010). Interplay of network position and peer substance use in early adolescent cigarette, alcohol, and marijuana use. *The Journal of Early Adolescence*, 30, 225–245. doi:10.1177/0272431609333300
- Krackhardt, D. (1999). The ties that torture: Simmelian tie analysis in organizations. *Research in the Sociology of Organizations*, 16, 183–210.
- Lincoln, K. D. (2008). Personality, negative interactions, and mental health. *Social Service Review*, 82, 223–252. doi:10.1086/589462
- Lincoln, K. D., Chatters, L. M., & Taylor, R. J. (2005). Social support, traumatic events, and depressive symptoms among African Americans. *Journal of Marriage and Family*, 67, 754–766. doi:10.1111/j.1741-3737.2005.00167.x
- Marsden, P. V. (1990). Network data and measurement. *Annual Review of Sociology*, 16, 435–463. doi:10.1146/annurev.so.16.080190.002251
- Mcfarland, D., & Pals, H. (2005). Motives and contexts of identity change: A case for network effects. *Social Psychology Quarterly*, 68, 289–315. doi:10.1177/019027250506800401
- McGrath, B., Brennan, M. A., Dolan, P., & Barnett, R. (2009). Adolescent well-being and supporting contexts: A comparison of adolescents in Ireland and Florida. *Journal of Community & Applied Social Psychology*, 19, 299–320. doi:10.1002/casp.998
- Merton, R. K. (1968). *Social theory and social structure*. New York, NY: Free Press.
- Miller, J. B. (1976). *Toward a new psychology of women*. Boston, MA: Beacon Press.
- Neal, J. W. (2007). Why social networks matter: A structural approach to the study of relational aggression in middle childhood and adolescence. *Child & Youth Care Forum*, 36, 195–211. doi:10.1007/s10566-007-9042-2
- Oh, H., & Kilduff, M. (2008). The ripple effect of personality on social structure: Self-monitoring origins of network brokerage. *Journal of Applied Psychology*, 93, 1155–1164. doi:10.1037/0021-9010.93.5.1155
- Pearson, M., Sweeting, H., West, P., Young, R., Gordon, J., & Turner, K. (2006). Adolescent substance use in different social and peer contexts: A social network analysis. *Drugs: Education, Prevention and Policy*, 13, 519–536. doi:10.1080/09687630600828912
- Perrewé, P. L., Zellars, K. L., Ferris, G. R., Rossi, A. M., Kacmar, C. J., & Ralston, D. A. (2004). Neutralizing job stressors: Political skill as an antidote to the dysfunctional consequences of role conflict. *Academy of Management Journal*, 47, 141. doi:10.2307/20159566
- Pettigrew, T. F., & Tropp, L. R. (2008). How does intergroup contact reduce prejudice? Meta-analytic tests of three mediators. *European Journal of Social Psychology*, 38, 922–934. doi:10.1002/ejsp.504
- Podolny, J. M., & Baron, J. N. (1997). Resources and relationships: Social networks and mobility in the workplace. *American Sociological Review*, 62, 673. doi:10.2307/2657354
- Powdthavee, N. (2008). Putting a price tag on friends, relatives, and neighbours: Using surveys of life satisfaction to value social relationships. *The Journal of Socio-Economics*, 37, 1459–1480. doi:10.1016/j.socec.2007.04.004
- Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York, NY: Simon & Schuster.
- Reagans, R., Zuckerman, E., & McEvily, B. (2004). How to make the team: Social networks vs. demography as criteria for designing effective teams. *Administrative Science Quarterly*, 49, 101–133.
- Reynolds, C. R., & Kamphaus, R. W. (2004). *Manual for the Behavior Assessment System for Children* (2nd ed.). Circle Pines, MN: American Guidance Services.

- Rice, K. G., Ashby, J. S., & Gilman, R. (2011). Classifying adolescent perfectionists. *Psychological Assessment, 23*, 563–577. doi:10.1037/a0022482
- Rudman, L. A., & Glick, P. (2001). Prescriptive gender stereotypes and backlash toward agentic women. *Journal of Social Issues, 57*, 743–762. doi:10.1111/0022-4537.00239
- Ryan, R. M., La Guardia, J. G., Solky-Butzel, J., Chirkov, V., & Kim, Y. (2005). On the interpersonal regulation of emotions: Emotional reliance across gender, relationships, and cultures. *Personal Relationships, 12*, 145–163. doi:10.1111/j.1350-4126.2005.00106.x
- Schaefer, D. R., Simpkins, S. D., Vest, A. E., & Price, C. D. (2011). The contribution of extracurricular activities to adolescent friendships: New insights through social network analysis. *Developmental Psychology, 47*, 1141–1152. doi:10.1037/a0024091
- Simmel, G. (1950). *The sociology of George Simmel*. Glencoe, IL: Free Press.
- Steglich, C., Snijders, T. A. B., & West, P. (2006). Applying SIENA: An illustrative analysis of the coevolution of adolescents' friendship networks, taste in music, and alcohol consumption. *Methodology: European Journal of Research Methods for the Behavioral and Social Sciences, 2*, 48–56. doi:10.1027/1614-2241.2.1.48
- Suldo, S., Thalji, A., & Ferron, J. (2011). Longitudinal academic outcomes predicted by early adolescents' subjective well-being, psychopathology, and mental health status yielded from a dual factor model. *The Journal of Positive Psychology, 6*, 17–30. doi:10.1080/17439760.2010.536774
- Thibaut, J. W., & Kelley, H. H. (1959). *The social psychology of groups*. New York, NY: John Wiley & Sons.
- Wölfer, R., Bull, H. D., & Scheithauer, H. (2011). Social integration in youth: Insights from a social network perspective. *Group Dynamics: Theory, Research, and Practice* (Advance online publication). doi:10.1037/a0024665

Received September 10, 2011

Revision received March 2, 2012

Accepted April 4, 2012 ■