Teachers Supporting Teachers: A Social Network Perspective on Collegial Stress Support and Emotional Wellbeing among Elementary and Middle School Educators

Chelsea A. Kaihoi

Jessika H. Bottiani

Catherine P. Bradshaw

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Abstract

School mental health practitioners and researchers are increasingly concerned about educator job-related stress and its implications for teacher burnout, teaching efficacy, turnover, and student outcomes. Educators' collegial networks in their schools are natural resources for stress support, yet little is known about the extent to which educators seek support from their colleagues in managing their stress and whether these relationships promote their emotional wellbeing. Utilizing peer nomination and self-report data from 370 educators in 17 elementary and middle schools, we found patterns in whom educators nominated as a source of stress support. Specifically, educators more often nominated colleagues who worked in the same role, grade, and/or subject, and those similar in age and who had similar or more experience. Furthermore, men and educators of color more often nominated same-gender and same-race colleagues, respectively, whereas these trends were not observed for women or White educators. However, the prevalence of these characteristics among colleagues nominated as a source of stress support was not often significantly associated with educators' stress and burnout. Rather, educators' level of burnout was positively related to the burnout among those in their stress support networks. In addition, educators' stress and burnout were positively related to the stress and burnout of their colleagues with whom they spent the most time. These findings highlight how educators' perceptions of stress and burnout may be shared within their collegial networks and have implications for a role for colleagues in teacher stress-reduction and wellbeing-focused interventions.

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Teaching is a high stress profession (Johnson et al., 2005; Stansfeld et al., 2011), which can lead to burnout over time (Montgomery & Rupp, 2005), with consequences for staff turnover in schools (Ryan et al., 2017), teacher performance (Bottiani et al., 2019; Kidger et al., 2016a), and student outcomes (Herman et al., 2018). Collegial support among educators is a naturally occurring resource in schools, with potential to buffer the high levels of stress and burnout experienced by educators (Bottiani et al., 2019; Griffith et al., 1999; Kinman et al., 2011; O'Brennan et al., 2017). Research utilizing a social network perspective has elucidated an important role for collegial relationships – and networks of relationships – among educators to improve educator practice (Atkins et al., 2008; Neal et al., 2011). Some work has uncovered the differential influence of relationships within instrumental (i.e., professional content-focused) versus expressive (emotion-focused) support networks on job satisfaction and turnover (Porter et al., 2019). However, few studies have examined expressive relationships among educators through a social network lens to understand their associations with educators' emotional wellbeing. As such, little is known about how educators turn to their colleagues for support in managing their stress, and whether certain aspects of relationships support educator emotional wellbeing.

The present study sought to elucidate patterns in educators' expressive relationships, with a particular focus on support for managing teaching-related stress. Leveraging survey data from 370 educators working in 17 elementary and middle schools, we explored patterned variation in educators' stress support networks. We were also interested in the potential association between educators' network characteristics and their emotional wellbeing (i.e., stress and burnout). This line of research may inform efforts to support educator wellbeing through interventions (Jennings et al., 2019a) and foster healthy organizational functioning (Jennings et al., 2019b; Shernoff et al., 2011).

Collegial Support for Managing Teaching-Related Stress

High levels of stress among educators may be due to the varied tasks and roles required by the job

(McCallum et al., 2017; Punch & Tuetteman, 1996; Shernoff et al., 2011); one notable stressor is the emotional labor associated with addressing social, emotional, and behavioral challenges among students (Kinman et al., 2011; Montgomery & Rupp, 2005). Over time, engaging in this emotional labor can lead to burnout (Wróbel, 2013), with the element of emotional exhaustion – a sense of feeling drained – being particularly salient for educators and an oft-cited reason for leaving the profession (Huberman, 1993). Educators' approaches to coping play an important role in preventing burnout (Montgomery & Rupp, 2005; Pithers & Soden, 1998). Obtaining collegial support is one such approach that can mitigate work-related stress (Halbesleben, 2006).

Much research has focused on the "buffering hypothesis", which posits that interpersonal relationships and social support function as protective factors against stress (Cohen & Willis, 1985). Generally speaking, this body of work suggests social support lowers both work-related stress and burnout (Ganster et al., 1986), including the possibility that social support may weaken the relationship between stress and burnout (e.g., Etzion, 1984). Among educators specifically, a general sense of collegial support is associated with reduced teacher stress and burnout (Bottiani et al., 2019; Kinman et al., 2011; Punch & Tuetteman, 1996; Russell et al., 1987), even after taking into account personal coping strategies (e.g., disengagement; Griffith et al., 1999).

Prior research yielded these insights on collegial support through traditional methods, like surveying teachers' general sense of affiliation with their colleagues . In contrast, a social network perspective – which considers individuals in an organization as well as connections (or "ties") between individuals – provides a means to conceptualize patterns and correlates of collegial relationships in organizations. Researchers have increasingly used social network analysis (SNA) to understand how collegial relationships and network characteristics provide instrumental (i.e., professional content-focused) support to educators – facilitating information sharing, professional development, and innovation in educators' practice. The present study adopted a similar approach, but with a focus on expressive (i.e., emotional) support networks – more specifically, support network for managing stress –

to further elucidate how specific collegial relationships among educators form and function (or not) to support their emotional wellbeing. This work therefore builds upon not only a growing body of work focused on teachers' social networks, but also applies this lens to teachers' social lives to the well-established body of work demonstrating social support's buffering effect for work-related stress and burnout.

Patterns in Stress Support Relationships among Educators and Links to Wellbeing

Prior work demonstrates that instrumental ties among educators have predictable structures based on organizational structure and proximity, demographic homophily (i.e., similarity), and relative experience in an educator role (e.g., Spillane et al., 2012). These same factors may play a role in shaping educators' stress support ties as well but, in this respect, such ties are not well understood, particularly with regard to whether they influence teacher emotional wellbeing.

Organizational Proximity

Prior research suggests that organizational proximity – such as working in the same role or department, or teaching the same grade – shapes the flow of instrumental supports through social interaction among educators, based on being in similar staff roles and teaching the same grade-levels and subjects. For example, "spillover" of professional development occurred within departments (Rienties & Kinchin, 2014) and diffusion of educational reforms occurred within grade-level groups (Daly et al., 2010). Organizational proximity may play a similar role in fostering stress support among colleagues, perhaps in part due to frequent interaction. Indeed, in qualitative work, educators described leveraging the just-in-time availability of nearby colleagues to express feelings and receive comfort in times of distress, keeping them from having to stifle those feelings (Kidger et al., 2016b). More generally, a feeling of wanting to speak with a colleague, but being unable to, has been shown to be a risk factor for prevalent depressive symptoms among educators (Kidger et al., 2016a). As such, on the one hand, organizationally proximal colleagues who provide stress support may be helpful for educator wellbeing. On the other hand, some educators ascribed value to speaking with colleagues outside of usual working groups, which

alleviated pressure to exhibit professionalism (e.g., “exude calm”; Kidger et al., 2016b, p. 9). Such pressures have represented their own form of emotional labor, thereby contributing to burnout (Grandey et al., 2012). Thus, it is unclear whether educators tend to seek out and experience benefits related to expressive support (e.g., stress support) from proximal colleagues, as they seem to for instrumental support (e.g., support with lesson development).

Demographic Homophily

Although formal organizational structures influence interactions among educators, the formation of social relationships within schools also occurs informally, outside of organizational structures (Castro et al., 2010; Spillane et al., 2012). Specifically, research from multiple domains has supported the principle of demographic homophily in social networks – colloquially understood as the notion “birds of a feather fly together” (McPherson et al., 2001). In particular, social network research frequently has demonstrated homophily by race and ethnicity (DiPrete et al., 2011; McPherson et al., 2001), as well as gender and age (McPherson et al., 2001), including in instrumental relationships and friendships among educators (Moolenaar et al., 2012). However, little research has focused on demographic homophily in relationships providing emotional support. Given the different needs and experiences of educators from various backgrounds, it is important to understand educators’ sources of stress support in reference to their background.

Race and gender. Given the predominance of White female educators in the teaching profession in the US (Hussar et al., 2020), educators of color and men tend to hold social positions in a numerical minority in schools. This limits their access to same-race or same-gender colleagues, a circumstance which may lead to feelings of social isolation (Bristol, 2020). As greater commonality in experiences may lead to more effective support than between demographically dissimilar persons (Suitor et al., 1995), having access to stress support from colleagues who experience similar social positionality or have similar cultural backgrounds may be particularly important for men and educators of color. Some research has shed light in this area; for example, racial homophily in friendships has been observed for African

American individuals within organizations, but associations with wellbeing were not investigated in this work (Mollica et al., 2003). Similarly, gender differences exist between forms of collegial support and educator stress (e.g., Punch & Tuetteman, 1996), but such work has not been approached from a social network perspective.

Age. The wide range of age groups represented within a school grants educators opportunities to form relationships with colleagues inside and outside their generation. Geeraerts and colleagues (2018) found that older and younger educators alike tended to form relationships with colleagues of various ages, but what was gained from these relationships differed based on relative age (e.g., learning innovative methods from younger colleagues and practical knowledge from older colleagues). However, there is limited research examining age homophily in educators' stress support networks and whether age homophily relates to emotional wellbeing.

Relative Experience in Education

Employees in a variety of work-settings, including schools, tend to seek out instrumental support from co-workers or supervisors who they perceive as more experienced or credentialed than themselves (e.g., Frank et al, 2008; Nadler et al., 2003; Spillane et al, 2012). It is not entirely clear, however, that educators must similarly lean heavily on senior colleagues for expressive forms of support. Instead, in line with theories of homophily, educators may feel most comfortable being open with others with similar levels of experience, and who therefore share certain challenges or stressors. Furthermore, formation of supportive relationships for new teachers in particular appears to be largely an ad-hoc process, where novice educators seek out and establish their own, informal support (Castro et al., 2010). Whether educators tend to seek out support based on relative experience or not, qualitative work suggests support from senior colleagues is important for early career educators' adjustment, including for managing stress (Howard & Johnson, 2004). As such, stress support from more-experienced colleagues may represent an important resource for early career educators' emotional wellbeing, when risk of burnout and attrition are relatively high (Buchanan et al., 2013; Ewing & Manuel, 2005). Given the lack of a formalized process

and limited research in this area, we know little regarding stress support among educators as a function of relative experience.

Stress and Burnout as a Shared Experience within Educators' Networks

As demonstrated by SNA research, instrumental networks may support educators' professional outcomes through information sharing. For example, influential educators (i.e., "key opinion leaders") have been leveraged in interventions to increase uptake and implementation of evidence-based practices (e.g., Atkins et al., 2008). Other studies have linked characteristics of collegial networks with constructs such as collective trust (e.g., Moolenaar et al., 2010). We were only able to locate one study that examined such shared experiences of emotional outcomes from an SNA perspective; Kim and colleagues (2017) focused on early career educators' burnout in the context of levels of burnout among colleagues. They found individual educators' burnout levels to be uniquely related to average levels of burnout in their school and among those identified as close colleagues. This observation is consistent with a so-called "contagion effect," whereby ones' stress and burnout may be affected by those around them, and also highlights the possibility that relationships with close colleagues operate not only as a resource, but also as a burden (Kim et al., 2017). With so few studies investigating this possibility, the current study also aimed to examine stress and burnout as shared experiences in educators' networks and, further, delineated between two types of close colleagues – those sought out for stress support versus those with whom educators spent most of their time.

Present Study

The present study sought to address the following research aims to determine from whom educators seek support for managing stress (Aim 1), and explore whether characteristics of stress support networks are associated with educator emotional stress and burnout (Aims 2 and 3). We examined these aims by considering educators' ego-centric social networks, which is comprised of colleagues who have the potential to be nominated as a source of stress support. In social network terminology, the nominating teacher would be called an "ego", whereas nominated colleagues would be considered "alters" (see Figure

1). In Aim 1, we examined whether the likelihood of educators nominating a colleague as a source of stress support was related to their organizational proximity, demographic homophily, and relative experience. We expected organizational proximity (i.e., having the same role, teaching the same grade or subject) and demographic homophily (i.e., same gender, same race, and similar age) between pairs of educators to increase the likelihood of a stress support tie (i.e., one teacher nominating another as a source of stress support; McPherson et al., 2001). Differences in support seeking were anticipated based on educator characteristics, with gender homophily among stress support ties expected to be more pronounced for men than women, and racial homophily among stress support ties more pronounced for educators of color than White educators (Mollica et al., 2003). We expected colleagues with similar or more experience than the responding educator to be more often nominated than those with less experience than the responding educator (Spillane et al., 2012).

In Aim 2, we examined educators' levels of stress and burnout as a function of prevalence of organizationally proximal, demographically similar, and more- or similarly-experienced colleagues among those nominated as a source of stress support (i.e., their stress support network). We expected lower levels of educator stress and burnout when men and educators of color had a higher prevalence of same-gender and same-race ties, respectively, in their stress support networks (Howard & Johnson, 2004; Kidger et al., 2016a, 2016b; Suitor et al., 1995) and when early career educators had a higher prevalence of ties with educators who had more experience than themselves in their stress support networks (Castro et al., 2010; Howard & Johnson, 2004). Finally, in Aim 3 we considered educators own stress and burnout as a function of average levels of stress and burnout among two types of educators' networks: their stress support network and those with whom they spent most of their time (i.e., their "most-time network"). The peer nomination process used allowed for these networks to be distinct or overlapping, based entirely on colleagues an educator chose to nominate (see Figure 1). We expected a shared experience of wellbeing among educators to be indicated, with stress and burnout in personal networks being positively related to educator stress and burnout (Kim et al., 2017). Further, we anticipated such

associations might be stronger in most-time networks, as compared to stress support networks.

Method

Recruitment and Procedure

Data for the present study were secondary from a small-scale evaluation of a teacher professional development and coaching intervention focused on culturally responsive behavior management. Two cohorts of schools were independently recruited from a single school district in a large metropolitan area in the Mid-Atlantic region of the United States (see Authors et al., 2018). Principals of schools in the school district attended recruitment meetings; those willing to participate signed commitment letters. Data for the present study were collected in the spring of 2015 from 17 schools – 8 elementary schools and 9 middle schools. At this time point only, the survey included peer nomination questions querying relationships (i.e., ties) among colleagues. All educators (i.e., teachers and school staff) in each school were invited to respond to the self-report survey, which was administered online on a secure website, regardless of individuals' participation in the larger evaluation study. Paper versions of the survey were available for respondents who preferred not to complete the survey online. Those who completed the survey were compensated with a $15 gift card. The researchers' Institutional Review Boards approved collection and analysis of these data.

Participants

Three hundred seventy educators responded to the spring 2015 self-report survey, representing an average of 36% of educators per school and 54% of those participating in the evaluation. A majority of educators (85%) were classroom teachers; 6% were teacher assistants, ESOL/resource teachers, or paraprofessionals; 3% were student services staff (e.g., school psychologists and counselors); and another 6% were in other roles. Just under one third (30%) were considered early career educators, meaning they had been in their current role for three years or less. The majority of respondents was female (87%), White (81%), and worked in middle schools (62%). See Table 1 for more information on responding educators' demographic characteristics.

Table 2 provides information on dyads pairing all respondents (n = 370; in SNA terminology, "egos") with their colleagues (i.e., the egos' potential "alters") in their respective schools. Across all schools were a total of 1,008 educators (i.e., potential nominees), regardless of whether they themselves responded to the survey. In total, across the 17 schools, there were 22,862 combinations ("dyads") of egos and potential alters. In elementary schools, 39% of dyads taught the same grade and 63% taught the same subject, whereas in middle schools these percentages were 58% and 21%, respectively. Consistent with educator-level demographics, for women, 86% of their colleagues were same-gender, whereas for men, only 17% of their colleagues were same-gender. Similarly, among White respondents, 80% of their colleagues were same race, whereas for educators of color only 9% of their colleagues were same race. Of the 1,008 colleagues across all schools, 660 were nominated as either a source of stress support or as someone with whom a respondent spent the most time; in other words, the 370 egos identified 660 alters as part of either their stress support network or most-time network.

Measures

Demographics

Both egos and alters self-reported information on their own demographic characteristics, including race/ethnicity (White, Black, Hispanic/Latino, Asian/Pacific Islander, Native American), gender (male or female), age (20-30 years, 31-40 years, 41-50 years, 51-60 years, or 61+ years), school role (e.g., general education teacher, school counselor, special education teacher), years of experience in their current role (1st year, 1-3 years, 4-8 years, 9+ years), subject(s) taught, and grade level(s) taught. Because these data were collected within the context of a larger study, we were able to obtain information on demographic characteristics of many educators who did not themselves report on their own ego-centric network but responded to other surveys at other points in time.

Peer Nominations for Social Network Ties

For peer nomination questions, respondents were given the following prompt:

> "*We are trying to learn more about who teachers go to for help and support regarding challenges they may encounter at school. Please select among the teachers listed within your school and*

> *rank up to 3 people that you are the most likely to seek out for help in each of the following areas…*"

The primary area of interest in the present study was, *"support for managing the stress of being a teacher"* (i.e., their ties within their stress support network). In a separate prompt, educators were also asked, "*Who do you spend the most time with at school?*" The latter nomination category was considered to be another indicator of a close collegial relationship, but not necessarily a supportive relationship. For each question, respondents selected up to three colleagues from a list of the names of all other educators in the school. Educators were allowed, but not required, to nominate different colleagues for each type of relationship (i.e., "tie"). Thus, *stress support ties* and *most-time ties* were distinct, but could overlap. On average, egos identified 2.4 alters as stress support ties, and most egos (70%) identified three alters as stress support ties. Similarly, on average, egos identified 2.4 alters as most-time ties and most (73%) identified three alters as most-time ties. Ties were also directed: a tie from Teacher A to Teacher B was distinct from a tie from Teacher B to Teacher A. Figure 1 provides a simplified example representation of a single teachers' ego-centric network.

Stress and Burnout

Respondents reported on several aspects of occupational wellbeing, including stress and burnout. Stress was measured with five items from an exposure to job stress scale (e.g., "*I regularly experience physical symptoms associated with stress*"; based on the National Institute for Occupational Safety and Health [1999] measure of work stress; also see Hurrell, & McLaney, 1988; α = .82 in the present sample). Burnout was measured with four items from the Maslach Burnout Scale focused on emotional exhaustion (e.g., "*I feel like I'm at the end of my rope"*; Maslach et al., 1996; α = .92 in the present sample).

School characteristics

Publicly available data from the state department of education provided information used for school-level covariates. These included total enrollment, percent of students receiving free and reduced priced meals (FARMS), and percent student enrollment who were White. As a school's FARMS rate has

been previously validated as an indicator of low household income (Ensminger et al., 2000), this variable was used as a proxy for the average student socioeconomic status in the school. Grades taught in elementary schools were Kindergarten through fifth grade, whereas grades taught in middle schools were sixth through eighth grade.

Sociometric Data Preparation

Initial data management and preparation was conducted in R version 4.0.3 (R Foundation for Statistical Computing, 2020). The sna package (Butts, 2020) enabled the manipulation of these data at the school-level as social networks (e.g., visualization of networks) when examining and vetting data.

Aim 1 – Dyad-level Data Preparation

Dyad-level data were generated in support of Aim 1, with each dyad defined as pairing one responding educator (an "ego") with one of each of their colleagues (a potential "alter"). Variables indicating organizational proximity were generated as three dummy variables (0 = No; 1 = Yes) for whether the ego and each colleague (1) had the same role in the school, (2) taught the same grade, and/or (3) taught the same subject. For educators teaching multiple grades, egos and each of their colleagues were considered to teach the same grade if both reported the same grade among the multiple grades they taught; the same was true for educators teaching multiple subjects. Demographic homophily variables included three dummy variables (0 = No; 1 = Yes) for whether both educators reported the (1) same gender, (2) same race, and/or (3) same age grouping (see age groups above). Relative years of experience was defined by dummy variables indicating whether a potential alter reported a lower category of experience, the same category of experience, or a higher category of experience than did the ego (see experience groupings above). Further, *stress support ties* were defined as existing (0 = No, 1 = Yes) when an ego nominated a colleague as a source of stress support (i.e., stress support alter). Similarly, *most time ties* were defined as existing (0 = No, 1 = Yes) when an ego nominated a colleague as one with whom they spent the most time (i.e., most time alter).

Aims 2 and 3 – Respondent-level Data Preparation

Respondents' networks were characterized by aggregating characteristics of alters in each egos' networks. In order to examine prevalence of each characteristic among alters in stress support networks (i.e., in Aim 2), we calculated the proportion of each respondent's stress support alters that had that particular characteristic. For example, if all of an ego's stress support alters taught the same subject as they did, then 100% of the stress support network was considered to be same-subject. Examining these characteristics as proportions among social ties for which such information is known is in line with standard practices for social network analysis focused on individual-level, or "ego-centric" networks (e.g., McCarty, Killworth, & Rennell, 2007). To examine shared stress and burnout between egos and alters in their networks (i.e., Aim 3), average stress and burnout was calculated among respondents' stress support alters and separately among respondents' most time alters.

Characteristics of egos' nomination networks (for both Aim 2 and 3) were calculated based on information available among their alters. For example, if an ego nominated three colleagues as stress support alters, but gender was known for only two of these, then the percentage of this ego's stress support alters considered to be same gender were based on those two ties. The same was true of average levels of stress and burnout among alters in personal networks; this average was based on the subset of alters for whom stress and burnout self-reports were available.

Missing Data

Table 2 presents information regarding the extent of missing data at the dyad-level. There was no missing data for peer nomination and demographic variables for survey respondents; however, all of the respondents' colleagues (including those nominated as alters) did not necessarily answer the survey, and therefore there was considerable missing data to contend with at the dyad level (50-57% of dyads had missing demographic data for the alter). For some educators who did not provide data (11% of the 1,080 educators in schools and 17% of those without survey data specifically), we were able to ascertain gender and race based on their responses at other data collection time points. These rates of missingness may be relatively high for sociometric studies, but missing data are more concerning to obtaining reliable

sociometric data in studies focused on reputational nominations, rather than the relational nominations (Marks et al., 2013), the latter of which is the focus of this study. Nevertheless, we ran tests for bias in missingness in order to bolster confidence in our data and analyses.

In order to examine whether extent of missing data among alters was biased, we investigated associations between extent of missingness in network variables with the values of the composite variables themselves. For instance, proportion of an ego's alters who were missing gender was regressed on all variables included in Aim 2 models (including proportion of the ego's same gender ties, as well as all other independent and dependent variables). Among 14 network characteristic variables relevant to Aim 2, there was a significant association between missingness and only one variable – proportion of alters missing gender, which was positively related to proportion of same gender alters. However, this may be attributable to the proportion representing an aggregate of up to three binary variables and having a lopsided distribution (i.e., due to the prevalence of female educators in the sample). Among the network variables relevant to Aim 3, missingness was not significantly related to the characteristics themselves once all variables in the models were considered. Thus, we had sufficient evidence to suggest that these variables were missing at random (MAR) and proceeded with confidence that the use of partial information to characterize respondents' personal networks was valid. We also presumed the tests for bias in partial missingness provide reasonable evidence that missingness from *all* of a respondent's alters (which was true 12-21% of respondents, depending on characteristic) were MAR, an assumption which cannot be directly tested. We addressed missingness from alters in dyad-level data in Aim 1, as well as full-missingness among alters in respondent-level data in Aims 2 and 3, utilizing full information maximum likelihood (FIML; see Enders, 2010).

Analytic Plan

Data analyses were carried out in Mplus version 7.3 (Muthen & Muthen, 1998-2014). In all analyses, school-level clustering was accounted for using the Huber-White adjustment and full information maximum likelihood was invoked by modeling the variances of all independent variables.

Specifically, for Aim 1, we used a logistic regression model, utilizing dyad-level data, to estimate the odds of an ego nominating a colleague as a stress support alter. Using logistic distributions combined with FIML required the use of the robust maximum likelihood estimator and monte carlo integration. The model estimated odds of nomination as a function of the dummy variables indicating *organizational proximity*, *demographic homophily*, and *relative experience* between egos and their potential alters, all as previously described. Relative experience had three categories (i.e., alter had lower category of experience, the same category of experience, or a higher category of experience than did the ego); in all models, we utilized dummy codes for each category and utilized the alter having less experience than the ego as the reference group. To examine relevant differential effects, the model included interactions between same gender alter and male ego (0 = female, 1 = male) and same race alter by ego educator of color (0 = ego White, 1 = ego was an educator of color). Covariates included ego characteristics (gender, race, and experience) and school network size (i.e., number of educators in the school). A variable accounting for potential alters' "popularity" (i.e., proportion of nominations at a school, excluding the ego's nomination) was included as a covariate. Additionally, an interaction between same grade and school type (0 = middle school; 1 = elementary school) and same subject with school type were included. These interactions accounted for differences observed in proportions of same grade and same subject colleagues between elementary and middle-grade educators (Table 2), but were not of substantive interest.

For Aim 2 we utilized respondent-level data, and examined egos' levels of stress and burnout, which were separately regressed in two models on the variables indicating proportions of educators' stress support networks which satisfied characteristics examined in Aim 1 (i.e., organizational proximity, demographic homophily, and relative experience). As in Aim 1, the model estimated differential effects of same gender alter by ego gender (male versus female educator), same race alter by ego racial minority group (educators of color versus White teacher), and all relative experience variables by early career status (versus not-early career). We included the following covariates: number of alters nominated by the

ego, gender, racial minority status, early career status, percentage of the student body who received free or reduced priced meals (FARMS), the percent White, and the school level (elementary versus middle school). Finally, for Aim 3, respondents' stress and burnout were regressed on average levels of stress (for stress models) and burnout (for burnout models) in respondents' personal stress support and most-time networks. Covariates were the same as used for Aim 2.

Results

Aim 1: Examining Sources of Educators' Stress Support

Table 3 provides parameter estimates and significance for the logistic regression model predicting odds of an ego nominating a colleague as source of stress support as a function of organizational proximity, demographic homophily, and relative experience. For each predictor variable, an unstandardized regression coefficient and an odds ratio (OR; i.e., exponentiated coefficient) are provided. All three variables under organizational proximity uniquely predicted odds of nomination. Same role and same grade increased odds of nomination by 92% (B = 0.65. p < .001) and 87% (B = 0.63, p < .001), respectively, and there were no significant differences between elementary and middle school teachers in same grade effects. There were no significant differences between these two school types for same grade effects. Teaching the same subject increased the odds of nomination for middle school teachers by a factor of more than three (B = 1.13, OR = 3.09, p < .001). The significant differential effect (Elementary X Same Subject) suggested the same-subject effect for elementary teachers was 38% as large as that for middle school teachers (B = -0.97, OR = 0.38, p < .05). A follow-on model parameter test in Mplus suggested same subject was not a significant predictor of stress support tie nomination among elementary teachers (p = .70).

Same gender was not significantly related to odds of nomination for female educators, but the differential same-gender effect between male and female educators was significant (B = 0.63, OR = 1.87, p < .05). A follow-on model parameter test suggested a significant same gender effect for male educators, with male educators about twice as likely to nominate another male colleague than they were a female

colleague. Similarly, same race was not related to odds of nomination for White educators, but the differential same race effect between educators of color and White educators was significant (B = 0.70, OR = 2.02, $p < .05$). A follow-on model parameter test indicated a significant same-race effect, whereby educators of color were more than twice as likely to nominate a same-race colleague than they were a colleague with a different race. In addition, educators were more likely to nominate colleagues with similar (B = 0.27, OR = 1.31, $p <.001$) or more experience (B = 0.20, OR = 1.22, $p <.05$) than colleagues with less experience than themselves.

Aim 2: Stress and Burnout Regress on Stress Support Network Characteristics

Table 4 provides parameter estimates and significance for regression models predicting egos' self-reported stress and burnout as a function of personal stress support network characteristics. These parameters are standardized, representing change in outcomes in standard deviations as a function of standard deviation change in the independent variable. Percentage of alters in the same role in stress support networks was positively related to levels of both stress (β = 0.17, $p <.001$) and burnout (β = 0.18, $p < .01$). The non-significant interaction terms involving proximity variables suggested this association was similar between elementary and middle school educators.

Demographic homophily in stress support networks was not significantly related to egos' stress, nor were effects significantly different based on ego gender or race. For burnout, percentage of same-gender alters in stress support networks was negatively related to burnout for female teachers (β = -0.13, $p <.05$). While the differential same gender effect between male and female egos was not significant for burnout, a follow-on model parameter test suggested the same gender effect was not significant for male teachers. Percentage of alters in stress support networks with more experience than the ego was positively related to stress among egos who were not early-career educators (β = 0.18, $p < .05$); the differential association between early and non-early career egos for more experience among stress support alters was only marginally significant for stress (β = -0.39, $p = .07$). A follow-on model parameter test suggested proportion of alters in stress support networks with more experience than the ego was

significantly and negatively related to stress for egos who were early career educators. A similar trend was observed for burnout: more experienced alters in stress support networks was positively, but only marginally, related to stress (β = 0.12, p = .06) but differences between non-early educators and early career educators was significant (β = -0.31, p <.05). A follow-on model parameter test suggested proportion of alters in stress support networks with more experienced than the ego was marginally and negatively related to burnout for egos who were early career educators.

Aim 3: Stress and Burnout Regressed on Average Network Stress and Burnout

Table 5 provides parameter estimates and significance for regression models predicting ego' self-reported stress and burnout as a function of the average stress and burnout, respectively, of alters in their stress support networks and most-time networks. These parameters are standardized, representing change in outcomes in standard deviations as a function of a one standard deviation change in the independent variable. Covariate-related parameters are not shown as these were largely identical to those appearing in Table 4. We found that levels of average stress among alters in most time networks was positively related to ego stress (β = 0.14, p <.05). Levels of average burnout among alters in stress support network were positively related to ego burnout (β = 0.13, p <.05). Similarly, levels of average burnout among alters in most time networks was positively related to ego burnout (β = 0.26, p <.001).

Discussion

This study leveraged peer nomination data to examine educators' sources of stress support among their colleagues, patterns in stress support relationships among educators and links to their wellbeing, and stress and burnout as a shared experience within collegial networks with the goal of better understanding educators' collegial support networks for managing stress. We found that educators were more likely to report seeking support for managing stress from organizationally proximal colleagues. We also found that some educators were more likely to seek out stress support from colleagues based on gender and race. Specifically, men were more likely to seek men, and educators of color were more likely to seek a same-race colleague. Educators tended to nominate those who were in the same age category (relative to their

tendency to nominate those in a different age category from themselves) and those who were in the same or higher category of experience in their roles (relative to their tendency to nominate those with a lower category of experience than themselves). Organizational proximity of being in the same role was associated with higher stress and burnout; demographic homophily by gender was associated with lower burnout for women. In addition, higher prevalence of more experienced colleagues in early career educators' stress support networks was associated with less burnout. Finally, we found that higher average levels of stress and burnout in educators' networks corresponded with their own higher levels of stress and burnout. We examined this in two different types of networks – those they seek for help with managing stress and those they named as colleagues with whom they spend the most time. Burnout was higher for educators when burnout was higher in their stress support networks and both burnout and stress were higher when stress and burnout were higher in their "most-time" networks. Taken together, these findings elucidate the types of relationships educators naturally leverage to manage stress, while highlighting stress and burnout in one's stress support and most-time networks as a social context factor with implications for educators' emotional wellbeing. Below we consider these and some other findings in greater detail, along with some limitations and implications of the results.

Organizational Proximity

As hypothesized, stress support ties were much more likely among organizationally proximal colleagues. Specifically, having the same role increased odds of nomination by over 75%, while teaching the same grade or subject each more than doubled odds of nomination. These patterns differed in a logical way between elementary and middle-grade educators; specifically, teaching the same subject was not a significant predictor specifically for elementary educators, but was for middle-grade educators. This is likely because most educators at the elementary level teach multiple subjects, and therefore commonality in subject(s) taught is less likely to be a meaningful distinguishing factor among their colleagues in the same way it is for middle school teachers, who more often specialize in teaching a particular subject. These observations resonate with the observations in qualitative literature that educators tend to lean on

immediately available, nearby colleagues for "just in time" support (Kidger et al., 2016b). They may also be an indication that educators are generally comfortable expressing emotional challenges with colleagues, underscoring the potential educators have as natural caretakers to each other at school.

Interestingly, despite educators often seeking support from colleagues who taught the same grade or subject as stress support ties, these characteristics among educators' stress support networks were unrelated to participants' levels of stress or burnout. Instead, among organizational proximity variables, only prevalence of colleagues in the same role in stress support networks was related to both stress and burnout. Specifically, more stress support ties from colleagues in the same role was related to *higher* levels of stress and burnout. This finding is inconsistent with our hypothesis that organizationally proximal or similar colleagues might represent a resource in supporting educator wellbeing. As the vast majority of respondents in this study were general education teachers, having more stress support from colleagues in a different role indicated receiving support from non-general education teachers. In this particular sample, according to available data on the non-general education roles of stress support alters, roles included special education teachers, special course teachers, school counselors, and "other" roles (e.g., administrative roles). However, role information was missing for many alters (half of all ties, as shown in Table 2). Alter non-participation in the survey was more likely when alters were in non-general education and non-teaching roles (i.e., school counselors and administrators), because they were not eligible for recruitment in the larger study. Thus, participating teachers' indication of receiving more support from colleagues in a non-general education role very likely means they sought support from administrators or school counselors (i.e., colleagues who may have been better positioned or uniquely skilled to provide effective support).

Demographic Homophily and Relative Experience

The findings from this study provided support for gender homophily in stress support ties for male educators, such that male educators were more likely to seek out other men as collegial supports for stress management (c.f., Moolenaar et al., 2012). However, greater gender homophily among female

educators' stress support networks was associated only with lower burnout (not stress). Since this finding did not hold for men, one interpretation of these results is that woman-to-woman relationships are more effectively supportive than man-to-man relationships. Indeed, some research has found that emotional support differed depending on gender combinations, with more active understanding expressed when a woman was listening to another woman, as compared to other gender combinations (Leaper et al., 1995). Further, other research has found that social support buffers against the long-term effects of stress (Cohen & Wills, 1985), which helps to explain why this study found gender homophily in stress support was only significantly related to burnout (i.e., a long-term of effect of stress). That we observed these associations between gender homophily among female educators' stress support networks specifically with burnout, and did not for stress, is consistent with effects social support has in buffering against the long-term effects of stress (Cohen & Wills, 1985).

Consistent with prior literature on demographic homophily, this study confirmed that, for educators of color, stress support ties were more likely among same race colleagues (DiPrete et al., 2011). However, extent of racial or ethnic homophily in stress support networks was not significantly associated with lower stress or burnout, regardless of the educator's race or ethnicity. Although it may be valid to conclude from this that same-race ties among educators of color are unrelated to lower stress or burnout, sample constraints may have limited our power to detect these effects for educators of color. Specifically, only 19% of the sample were educators of color, and among them, only 9% of their colleagues were same-race (Table 2). Thus, while same-race colleagues made up a disproportionate share (15%, on average) of stress support networks for educators of color, this restricted range may have still reduced power to detect effects. This is particularly troubling, given the predominately White female teacher workforce; as such, educators of color may lack access to same-race colleagues, which may in turn contribute to social isolation for Black male educators in particular (Bristol, 2020). Yet, this reality of teachers of color having relatively few same-race colleagues also presents methodological limitations, in that it is possible that another sample of schools with a higher proportion of educators of color and men

might have yielded detectable effects.

We detected both age homophily and experience homophily in this sample (c.f., Geeraerts et al., 2018), such that educators were more likely to report seeking stress management support from colleagues of a similar age (i.e., in the same age category as themselves, as compared to those in a different age category) and similar experience (i.e., in the same experience category as themselves, as compared to those in a lower experience category). However, as with racial homophily, we did not find an association between age or experience homophily in stress support networks with stress or burnout. Rather, a higher share of educators with more experience in their role in educators' stress support network related to lower levels of burnout, a finding we observed for early career educators only. This speaks to the notion that it is similarity in task-relevant experience that makes homophily a helpful characteristic of social connection, and not simply the "same-ness" itself (Suitor et al., 2000; Suitor & Pillemer, 2000). For educators in particular, our results suggest being similar in age and experience may attract educators to one another for stress support. However, the effectiveness of such support may be limited compared to that provided by more experienced colleagues, at least for early career teachers.

Stress and Burnout as a Shared Experience in Educators' Social Networks

The study findings were consistent with the notion that educators' stress and burnout is associated with the degree of stress and burnout among close colleagues (Kim et al., 2017). We were able to consider such patterns distinctly among two types of networks of close colleagues: those providing stress support versus those with whom an educator spends the most time. Results differed slightly between these networks: only average burnout in stress support networks was related to educators' burnout, whereas both of educators' stress and burnout was positively related with average levels of these outcomes in their most-time networks. Emotional exhaustion may have served as a barrier to effectiveness of the support provided by stress support ties, thereby reduced the buffering effect of support from those colleagues against burnout (Cohen & Wills, 1985). Lack of such associations for the stress outcome in stress support networks could indicate that interactions with colleagues focused on eliciting emotional support might not

necessarily be frequent enough for "contagion" to occur. This is in contrast with *both* stress and burnout being shared between educators and those with whom they spent the most time, consistent with the notion of "contagion effect" in which spending a lot of time with other stressed or burnt-out colleagues leads to higher stress and burnout (as described by Kim et al., 2017). It is also important to consider that close colleagues likely share certain working conditions and exposure to stressors, and such exposures may be more closely shared with colleagues that one spends much time with (as compared to those who are sought out for stress support). In other words, a common source of stress is an alternative explanation, as opposed to the transmission or "contagion" explanation, for shared stress and burnout. In either case, results resonate with perspectives on emotional wellbeing which go beyond individual-level stress and coping to consider group- or community-level emotional wellbeing (McCallum et al., 2017; McLaughlin, 2008).

Limitations

There are some limitations of this study that are important to consider when interpreting the findings. As the data utilized were cross-sectional, we cannot form causal conclusions or confirm directionality. We were missing a high percentage of data from respondents' colleagues regarding their own characteristics (e.g., demographics, stress), which in sociometric studies is considered problematic (Marks et al., 2013). Relatedly, restriction of nominations to three colleagues for each sociometric question is not best practice, as some educators may have otherwise nominated more than three colleagues as part of their social networks. However, these methodological concerns may be most relevant in situations when network-level characteristics are of interest (e.g., when the focus is on individuals' reputation in their social network; see Cillessen & Marks, 2017). In the present study, we were less interested in obtaining reliable measures of reputation, but rather, focused on identifying connections among educators and the colleagues (more akin to friendship studies; Marks et al., 2013). Nonetheless, we rigorously explored missingness and established the data were missing at random to the extent possible (see Missing Data section for full description). The categorical age groupings used to

identify the relative age of teachers' colleagues were coarse, such that colleagues age 30 and 39, for example, would be considered in the same age range, whereas those who were 29 and 31 would not. This imprecision in age warrants care in the interpretation of findings pertaining to relative age, as colleagues identified as "same age" could potentially be significantly older or younger than a reporting teacher, but within the same decade of life. Finally, the interpretation of stress support (i.e., *"support for managing the stress of being a teacher"*) could vary widely among respondents, and we did not query respondents further to understand what types of support were important to them. Thus, the nature of stress support sought out from respondents' colleagues is not fully explicated here.

Implications and Future Directions

Being one of the first studies to examine expressive support – more specifically, stress support – among educators from an SNA perspective, this study represents a significant step toward better understanding educators' relationships with their colleagues, and how those relationships may be related to their emotional wellbeing. This is an important area of exploration, given interventions involving interactions among educators (e.g., peer mentoring) have been identified as a promising approach to improve educator satisfaction and retention (see Brill & McCartney, 2008). Knowing how social support ties naturally occur – whether educators tend to seek out support from particular "types" of colleagues – is likely to be useful in such interventions. Further, exploring differential effects of demographic homophily for men and educators of color in particular provides insights into factors which may be of relevance for their retention, a concern among practitioners and policymakers given their under-representation in the profession (Bristol, 2019; Hussar et al., 2020; McGrath & Van Bergen, 2017). The finding that educators may find expressing emotional difficulties more comfortable among those who are demographically similar, especially among those in under-represented groups, is therefore another point worth considering in the context of interventions focused on teacher emotional health. An important extension of this work would be exploring in more detail the form of stress support sought out from colleagues (e.g., stress originating from interactions with students versus scheduling versus conflicts with colleagues); such

insights would be important for identifying stressors for which teachers could use more stress support.

Findings based on the present study regarding characteristics of ties associated with lower (or higher) levels of stress and burnout may also inform whether certain peer matches or coaching relationships may hold greater promise for supporting educators' mental health. Design of interventions and supports may therefore also benefit from considering emotional wellbeing as a shared experience among groups of close colleagues, as opposed to solely an individual-level concern. In this study, the use of multiple nomination questions allowed a finer-grained examination of such potential "contagion effects" or common sources of stress among different networks of close colleagues than has been done in previous work. Shared experiences of stress and burnout appeared to be stronger among those with whom educators spent more time – perhaps their more proximal colleagues – than it did among those specifically sought out for stress support. Future work is needed to explore whether and how "contagion effects" may operate in schools and among educators, particularly to distinguish them from common sources of stress. For instance, empathy – or an ability to share, intuit and respond to another's emotions – is a desirable characteristic among educators in their role as natural caretakers (Swan & Riley, 2015), but may increase their emotional labor (Wróbel, 2013), or predispose them to "catching" others' emotions (Hatfield et al., 2011). As such, empathy and other relational constructs in educators deserve more attention, including in terms of how they may affect collegial relationships. It may also be important to understand, as an alternative explanation for shared experiences of stress and burnout, whether and how educators' exposure to stressors may be more or less concentrated in certain sub-communities in schools. Future studies may also consider whether being an educator who is highly-sought out for stress support by their colleagues is itself a risk for stress or burnout. Such insight could be used to implement more targeted strategies for groups of educators facing risks to their wellbeing.

Conclusion

Supporting educator emotional wellbeing is increasingly recognized as a priority among school and district leaders, as well as policymakers. The highly social environment of schools and the value of

social support for preventing burnout against stress suggest relationships among educators could be an important resource to be leveraged in interventions. Such findings are particularly timely, given the high levels of teacher stress and burden that have been expressed as educators aim to return to business as usual following the COVID-19 pandemic (Baker et al., 2021). This study elucidates predictable patterns among those relationships, but also suggests that factors relating to the likelihood of educators leaning on each other do not necessarily lead to more effectively supportive relationships. Instead, emotional wellbeing among close colleagues may deserve more attention as an influential aspect of relationships affecting educators' wellbeing, including in the context of intervention.

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Table 1

Respondent Characteristics (n = 370)

	#	%
School Type		
Elementary Teachers	142	38%
Middle Teachers	228	62%
Gender		
Female	323	87%
Male	47	13%
Race		
White	298	81%
Black	42	11%
Other (Non-White, Non-Black)	30	8%
Experience		
First Year	26	7%
1-3 years	84	23%
4-8 years	89	24%
9+ years	171	46%
Number of Alters Nominated as Respondent's Stress Support Ties		
0 Alters	33	9%
1 Alter	49	13%
2 Alters	29	8%
3 Alters	259	70%
Number of Alters Nominated as Respondent's Most-Time Ties		
0 Alters	38	10%
1 Alter	39	11%
2 Alters	22	6%
3 Alters	271	73%

Table 2

Educator Dyad Characteristics (i = 22,862 directed edges/dyads)

		% missing data	*i*	#	%
Proximity	**Same Role**	**50%**	**11,529**	**5,406**	**47%**
	Elementary Schools		3,310	1,389	42%
	Middle Schools		8,219	4,017	49%
	Same Grade	**54%**	**10,533**	**5,537**	**53%**
	Elementary Schools		3,064	1,195	39%
	Middle Schools		7,469	4,342	58%
	Same Subject	**57%**	**9,902**	**3,311**	**33%**
	Elementary Schools		2,965	1,865	63%
	Middle Schools		6,937	1,446	21%
Homophily	**Same Gender**	**50%**	**11,529**	**8,729**	**76%**
	Female Respondents		9,862	8,444	86%
	Male Respondents		1,667	285	17%
	Same Race	**50%**	**11,517**	**7,656**	**67%**
	White Respondents		9,274	7,462	80%
	Respondent Educator of Color		2,243	194	9%
	Similar Age	**50%**	**11,517**	**2,953**	**26%**
Experience	**Relative Experience**	**56%**	**10,084**		
	Nominee is Less Experienced			3,215	32%
	Similar Experience			3,614	36%
	Nominee is More Experienced			3,255	32%

Table 3

Logistic Regression Estimates Predicting Odds of Stress Support Tie Nominations (i = 22,862)

		Aim 1 Model			
		Log-Odds			OR
		B	(SE)		
Odds of Stress Support Tie Nomination on					
Proximity	Same Role	0.65	(0.18)	***	1.92
	Same Grade	0.63	(0.14)	***	1.87
	Same Subject	1.13	(0.27)	***	3.09
	Elem X Same Grade	0.28	(0.24)		1.32
	Elem X Same Subject	-0.97	(0.40)	*	0.38
Homophily	Same Gender	0.04	(0.12)		1.04
	Same Race	0.17	(0.13)		1.18
	Similar Age	0.32	(0.07)	***	1.37
	Male X Same Gender	0.63	(0.26)	*	1.87
	Educator of Color X Same Race	0.70	(0.29)	*	2.02
Experience	Similar Experience	0.27	(0.09)	**	1.31
	Nominee More Experienced	0.20	(0.08)	*	1.22
Controls	Nominee Indegree	8.25	(0.85)	***	3839
	Network size/10	-0.09	(0.05)	+	0.91
	Elem School	0.31	(0.33)		1.36
	Sender is Male	-0.16	(0.12)		0.85
	Sender is White	-0.01	(0.12)		0.99
Nomination Threshold		4.53	(0.40)	***	

Notes: OR = Odds Ratio; Elem = Elementary School Teacher. Nominee indegree calculated as proportion of possible nominations minus sender's nomination. Though the race variable used as moderator of same-race effects was binary (0 = White, 1 = Educator of Color), the same race variable is based on match on a five-category race variable. School-level clustering addressed using robust standard errors (Huber White adjustment)

*** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .10$

Table 4

Stress and Burnout Regressed on Source of Teachers' Stress Support Ties

		Stress		Burnout	
		β (SE)		β (SE)	
Outcome ON					
Proximity	%Noms Same Grade	0.04 (0.07)		0.05 (0.08)	
	%Noms Same Subj	0.00 (0.05)		0.04 (0.08)	
	%Noms Same Role	0.17 (0.04)	***	0.18 (0.06)	**
	Elem X %Noms Same Grade	-0.05 (0.07)		-0.08 (0.09)	
	Elem X %Noms Same Subj	0.05 (0.07)		0.05 (0.11)	
	Elem X %Noms Same Role	0.04 (0.09)		-0.01 (0.09)	
Homophily	%Noms Same Gender	-0.10 (0.09)		-0.13 (0.07)	*
	%Noms Same Race	-0.07 (0.07)		-0.03 (0.07)	
	%Noms Similar Age	-0.01 (0.05)		-0.02 (0.06)	
	Male X Same Gender	-0.01 (0.09)		0.07 (0.10)	
	Educator of Color X Same Race	0.03 (0.03)		0.05 (0.06)	
Experience	%Noms More Experience	0.18 (0.09)	*	0.12 (0.07)	+
	%Noms Similar Experience	-0.07 (0.06)		-0.09 (0.08)	
	Early Career X More Experience	-0.39 (0.21)	+	-0.31 (0.15)	*
	Early Career X Similar Experience	0.04 (0.11)		0.04 (0.08)	
Covariates	Number of Stress Nominations	0.05 (0.09)		0.09 (0.09)	
	Educator is Male	-0.03 (0.06)		-0.09 (0.07)	
	Educator of Color	-0.14 (0.07)	*	-0.08 (0.06)	
	Early Career	0.20 (0.22)		0.15 (0.15)	
	School Percent FARMS	-0.06 (0.08)		-0.05 (0.08)	
	School Percent White	-0.01 (0.09)		-0.03 (0.09)	
	Elementary School	0.11 (0.09)		0.11 (0.09)	
Unstandardized Intercept		2.41 (0.40)	***	2.55 (0.48)	***
R^2		11% (0.00)		8% (0.00)	

Notes: %Noms = Percent of Stress Support Nominations; Subj = Subject; Elem = Elementary School Teacher; FARMS = Free and reduced meals. Though the race variable used as moderator of same-race effects was binary (0 = White, 1 = Educator of Color), the same race variable is based on match on a five category race variable. School-level clustering addressed using robust standard errors (Huber White adjustment). *** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .1$

Table 5

Stress and Burnout Regressed on Average Stress and Burnout of Ego-centric Networks

	Stress				Burnout			
	Stress Support Network Model		Most Time Network Model		Stress Support Network Model		Most Time Network Model	
	Est	(SE)	Est	(SE)	Est	(SE)	Est	(SE)
Outcome ON								
Average Network Stress	0.03	(0.06)	0.14	(0.07) *				
Average Network Burnout					0.13	(0.06) *	0.26	(0.06) ***
Unstandardized Intercept	2.30	(0.40) ***	2.00	(0.39) ***	2.31	(0.44) ***	1.80	(0.33) ***
R^2	3%		4%		3%		7%	

Notes: Covariates included in models are the same as the controls listed in Table 4. Parameter estimates and significance levels for these controls largely mirrored those presented in Table 4. *** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .10$

Figure 1

Example ego-centric social network with colleagues