HHS Public Access

Author manuscript

*Soc Sci Med*. Author manuscript; available in PMC 2021 February 01.

Published in final edited form as:

*Soc Sci Med*. 2020 February ; 246: 112714. doi:10.1016/j.socscimed.2019.112714.

# Personal networks and associations with psychological distress among young and older adults

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## 1. INTRODUCTION

For decades, consistent evidence has supported a link between social networks and physical health (Berkman, 1984; Berkman et al., 2000; Moore and Kawachi, 2017). Relatively fewer studies have examined associations between social networks – specifically, the resources structured within the network – and mental health (Almedom, 2005; Kawachi and Berkman, 2001). Yet, the mechanisms through which personal networks are linked with physical well-being (Ellwardt et al., 2015; Legh-Jones and Moore, 2012), including instrumental and emotional support (Ertel et al., 2009), are similarly important for mental health outcomes (Kawachi and Berkman, 2001; Thoits, 2011). Further, while some studies find positive relationships between social embeddedness and mental health, others focusing specifically on networks indicate that social relationships may also worsen psychological well-being, particularly among older adults (Birditt et al., 2016; Rook, 2014, 2015; Seeman, 2001). These findings underscore the need for further examination of associations between social relationships and psychological distress using network-oriented approaches. At present, this body of work remains inconclusive as to which types of social ties and under what circumstances networks affect mental well-being.

Many of the standard studies have focused on the elderly. A comparative advantage of the UC Berkeley Social Network Study (UCNets) database is its attention to cohorts in different stages of life. This is important because the kind of social relationship an ego will experience as supportive or burdensome may vary by age. For example, a young adult may view parents as a source of financial and instrumental support, whereas for older adults, parents may represent a caregiving responsibility (Rossi and Rossi 1990). Net of other factors, a younger person may have a different set of criteria for evaluating network sufficiency than would an older person (Qualter et al. 2015), in turn affecting how network support is associated with psychological distress. Accordingly, in this study we explicitly

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consider the ego's life course position as a subsequent factor in the relationship between network support and psychological distress and indeed find that patterns are distinct.

In this study, we examine what it is about a personal network that may have positive or deleterious effects on psychological well-being, beginning with an examination of the direct relationship between characteristics of the network (e.g., size, structure, closeness of alters, exchange role, and multiplexity) and psychological distress. This approach is justified by the reasonable expectation from the literature that networks are, in net, beneficial on a day-to-day basis and not only in times of unusual stress. Then, given previous literature on social support and stress-buffering, we consider how exchange roles—sources of support or burden—within the ego's network buffer external stressors. Briefly, we find that distinct types of network exchange roles are directly associated with psychological distress among older adults, and largely that these exchange roles do not buffer deleterious effects of negative life events on psychological stress, with one notable exception.

## 2. BACKGROUND

### 2.1. Personal Network Characteristics

Drawing from the work of Berkman and Glass (2000; p.145) and their conceptual model for the effects of social networks on health, we consider the following elements as characterizing a personal (i.e., egocentric) network: network size, or the number of ties (alters); the closeness of these alters to the ego; and the substantive content of the network, such as the number of social companions, confidants, practical helpers, or even demanding alters. We also consider multiplexity as a structural aspect of network tie, which is the ability of an alter to fill more than one role in the relationship with the ego (e.g., friend and co-workers), and more than one role in terms of supportive behaviors (confidant and helper).

Personal network size, consistency, and tie strength are associated with mental health outcomes broadly construed. For example, larger networks have been associated with lower risk of depression (Noteboom et al., 2016). Additionally, populations with depression and other psychological conditions have smaller, less multiplex networks, on average, than those without (Hatzenbuehler et al., 2014; Houtjes et al., 2014; Segal and Holschuh, 2002). Conversely, multiplexity of ties within the network, an indicator of tie strength or overlap of relationships within the network, may influence the spread of negative mental health through contagious attitudes and behaviors (Scatà et al., 2018). In contrast, relatively fewer studies examine personal network characteristics in association with *psychological distress*, despite their noted importance for mental health (Rook and Charles, 2017). Some evidence points to a modest inverse relationship between overall network size and psychological distress (Flórez et al., 2016) and that interactions among close ties evoke more positive and less negative memories, compared to interactions with acquaintances (Charles and Piazza, 2007), indicating the importance of close ties for psychological affect and well-being. Conversely, other studies show psychological distress is often transmitted from alters to egos in close relationships, including among kin and spouses (Behler et al., 2019; Woods-Giscombé et al., 2015). These results underscore the dual role of close ties for psychological well-being.

In addition to close relationships, personal network characteristics also encompass the presence of weak ties, often measured in egocentric networks via social participation. While strong ties provide social support and the intimacy with which to discuss particularly intimate or stressful matters, weak ties often serve as bridges to outside resources not readily available or known within the core network (Ferlander, 2007; Granovetter, 1973). Weak ties are particularly useful in seeking support and other mental health services (Naslund et al., 2016; Pitkin Derose and Varda, 2009; Viladrich, 2007; Wright and Rains, 2013). Less is known about how weak ties and social participation are directly associated with psychological distress.

Finally, the Berkman and Glass model underscores the importance of the specific functional role, or exchange type, of network ties—what is received from or provided to alters. Which of these roles are important for mental well-being is not yet well understood. Having a confidant or advisor, someone to speak with about personal matters, has been associated with better mental health, particularly among people experiencing stressful life events (Bookwala et al., 2014; Yoon et al., 2018). Yet other research suggests that social companionship may be more important. Social companionship is typically mutually beneficial, focused on pleasurable experiences—such as going out to a show or dinner—and not indebting, which can exacerbate feelings of distress or obligation (Buunk and Verhoeven, 1991; Rook, 1987). Further, network support that can be evoked specifically at times of urgent need--or simply the belief that such help is available— promotes mental well-being (Hogan and Eggebeen, 1995). Finally, *providing* support *to others* has been shown important for physical health outcomes (Brown et al., 2003, 2005), but it is unclear how providing support to others, or, for that matter, having to deal with particularly burdensome relationships, is associated with mental health. This study is unique in its ability to examine whether and how several types of network supports or burdens affect mental health.

### 2.2. Stress-Buffering Framework

Besides seeming to be beneficial on their own, social relationships are considered productive of psychological well-being because they can be relied upon and mobilized during times of stress (Cohen and Wills, 1985; Kawachi and Berkman, 2001). Social relationships fill various needs in a stressful situation, including companionship, advice, help, and confiding. However, networks that include stressful relationships, such as when there is a burdensome alter, may exacerbate psychological distress (Rook, 2014, 2015) by undermining ego's self-esteem and self-efficacy with obstructive behavior such as criticism and passive aggressive sabotage (Mayberry et al., 2015). The trigger for whether a social tie will buffer or exacerbate a stressful situation may depend on the nature of the proffered support, such that companionship may be buffering whereas helping has more potential for exacerbation. To test this framework, we examine the extent to which specific support and demand roles buffer the effect of four negative life events on psychological distress.

### 2.3. Distress and Personal Networks Across the Life Span

Young adults report more distress than older adults do (McIntosh, 2017). But, in addition, there is reason to suspect that how older and younger adults' networks affect mental health

also differs (Wrzus et al., 2013). Younger and older adults have different expectations of how social ties should exist and be active within their personal networks (Child and Lawton, 2017; Qualter et al., 2015). Unlike older adults, younger adults tend to rely on their 'families of orientation' for a good deal of instrumental and emotional support (Kronebusch and Schlesinger, 1994; Rossi and Rossi, 1990) and are less likely to be embedded in 'families of procreation,' especially considering that the average age at marriage is now over 28-years old (Vespa, 2017). Older adults rely more on their spouses for social and instrumental support. Younger people are less likely to be active in religious organizations (Fischer, 2011), which are well known for providing social support (Sherkat and Ellison, 1999). Despite these life cycle differences, previous studies have predominantly examined network characteristics' association with mental health among older adults (Cornwell and Waite, 2009; Li and Zhang, 2015; Rafnsson et al., 2015) or vulnerable populations, such as those recovering from mental illness (Perry and Pescosolido, 2015). Few studies have compared the relationships between personal networks and psychological distress among a general; sample of both young and middle-aged adults (Wrzus et al., 2013), despite evidence pointing to more stress reported by younger adults (House and Robbins, 1983; McIntosh, 2017). The current study addresses this lacuna.

### 2.4 Current Study

Building upon previous work (Kawachi and Berkman, 2001), in the current study we aim to examine both the main and bufferring effects of personal network characteristics on psychological distress in two distinct phases of the life course: young adults and late middle-age adults. Following Cohen and Wills' classic approach (1985), our first aim is to examine how characteristics of the personal network are directly associated with psychological distress (i.e., main effects). These characteristics include both structural aspects of the network, including size, multiplexity, and presence of weak ties through formal and informal participation, as well as functional aspects of the network, including the number of ties named to specific exchange roles (i.e., social companions, confidants, etc.). Our second aim is to explore whether these specific exchange roles act as a stress buffer in the presence of four negative life events (i.e., buffering effects). From these two aims we pose three research questions: 1) what characteristics of the network structure (e.g., close ties, social participation, multiplexity) and network exchange types (e.g., confidants, emergency helpers) are directly associated with psychological distress? 2) To what extent do specific forms of network exchange (e.g., support or burden) moderate the effect of negative life events on psychological distress? And, 3) how do these results differ across two distinct phases of the life course?

## 3. METHOD

### 3.1 Study Design and Sample

The current study utilizes cross-sectional data from the first wave of the UCNets study, a panel study on personal networks, significant life events, and health examining two age cohorts of San Francisco Bay Area residents. In 2015, late middle-age adults (aged 50-70) were recruited for the survey via stratified random address-based sampling in six counties in the Bay Area. Just under half of young adults (aged 21-30) were also recruited via

addressed-based sampling, which was then supplemented with a small referral (snowball) sample ($n$=32) and a larger Facebook advertisement which drew the remaining half of young adults for the study. Preliminary analyses suggest there are relatively few differences in network characteristics across recruitment methods among the younger sample (Lawton and Wilson, 2018). Among those recruited through stratified random (address-based) sampling or by referral, participants were randomly assigned to complete the UCNets survey online or with face-to-face interviews in their home or other quiet setting (café, park, etc.). Participants recruited via Facebook were automatically directed to an online survey, which was nearly identical to the face-to-face survey instrument.

## 3.2 Measures

### 3.2.1 Dependent variables.—

*Psychological distress* was measured using the previously validated six-item short form Kessler Scale (Kessler et al., 2002). Items asked participants about the frequency with which they experienced feeling nervous, hopeless, worthless, and so forth, in the past 30 days. Response options ranged from 0 = “none of the time” to 4 = “all of the time”. Cronbach’s α for the six items was 0.80. Factor analysis at an eigenvector of 1 confirmed all six items loaded onto a single dimension in the current sample, so a summary score was calculated across the six items for a total range of 0-24. The K6 variable was treated as a count outcome as has been shown to be more appropriate than using as a continuous scale (McIntosh, 2017).

### 3.2.2 Network characteristics.—

Nine “name generators” in the survey elicit the names of the alters in respondents’ within the network across numerous roles (i.e., spouse, housemate, etc.) and exchange types (i.e., confidant, emergency helper, etc.). Following these nine name generators, name interpreters were also used to identify further information about the alters, including how they are related to or know the ego and closeness to the ego.

The ego’s embeddedness within the network was assessed using three separate indices. First, the *number of close ties:* how many of the alters whom they named did they later describe as “feel[ing] close to.” We logged the raw number to test for curvilinear relationships between close ties and distress. Second is average network multiplexity, measured in two ways. *Average role multiplexity* is the number of distinctive roles (e.g., sister, friend, neighbor) a particular alter occupies, averaged across all the alters listed by ego. *Average exchange multiplexity* is the number of exchange types (e.g., social activity partner and confidant and emergency helper) a particular alter is listed as providing, averaged across all alters listed by ego. Neither role multiplexity nor exchange multiplexity were correlated with the number of ties named to each role, indicating multiplexity is independent of more basic characteristics of the network structure, including size.

The type of network support (i.e., exchange) was measured by summing the number of alters named to each of six substantive name-generator questions: social companions (people with whom they, for example, went out to dinner with), confidants (people with whom they shared important personal information), advisors (people from whom they sought advice), emergency helpers (people who could be called upon to help if the ego needed considerable help, such as being sick for weeks), people who received help *from* ego, and people who the

ego reported as being particularly “difficult or demanding.” While the number of ties named to each type of exchange was not exhaustive, and in most instances limited to six alters, we used the natural log to transform these count predictors to test for non-linear relationships between exchange type and distress.

The presence of weak ties within the network was measured in terms of group participation. *Formal participation* was assessed by asking participations if they were involved in a series of formal organizations, such as a religious organization, service club, etc. If participants responded ‘yes’ to any formal organization type, these responses were collapsed into a single, dichotomous indicator of formal participation. To assess *informal participation*, participants were asked a single question about whether they were involved in any type of informal group, such as a book club or card-playing group. Responses were coded as ‘yes’ or ‘no’.

**3.2.3 Negative events.—**Respondents reported about significant events they may have experienced within the previous “year or so.” Here we focus on four negative and particularly stressful experiences: financial difficulties (“trouble paying bills”); difficult problems either at work or, for students, in school; a “major break” in a relationship with a friend or relative; and any major health shock, such as a diagnosis of illness, a hospitalization, or becoming disabled. The two questions about difficulties at work or school were combined into a single indicator (only 10 respondents indicated difficulties in both domains), and all four measures were dichotomous (yes/no).

**3.2.4 Demographic characteristics and weighting.—**Participants also reported information about their gender (male or female), race/ethnicity (categorized here as white, black, Latino, Asian, or other), relationship status (married, partnered, or otherwise single), employment status (employed full/part time or other, which included unemployed, retired, student), and household composition (number of adults in the household besides a spouse or partner). The sampled population skews toward women and those with more education. As such, post-stratification sample weights with a 95% trim were calculated to approximate the age, gender, race/ethnicity, marital status, and educational composition of the corresponding age-specific population of the greater Bay Area. Weighted descriptive statistics – average psychological distress score, network characteristics, negative events, and demographic composition of the sample separately by age cohort – can be found in Table 1.

**3.2.5 Analytic approach.—**We used weighted Poisson regression models to examine main effects and buffering effects between network characteristics and psychological distress for each cohort (Table 2 for 21-30 year olds; Table 3 for 50-70 year olds). Model 1 examines our first research question: the main effect relationship between personal network characteristics and psychological distress. Model 2 adds in and examines the effect of four negative events on distress. In Model 3, we examine the buffering hypothesis, our second research question, which is tested by examining the potential for network exchange characteristics (i.e., social companions, advisors) to moderate associations between negative events and psychological distress. Abbreviated tables are shown, with only one significant interaction among older adults and no significant interactions among younger adults. Each

age cohort is examined separately, including a post-hoc sensitivity analysis in order to answer our third research question.

We used multiple imputation with chained equations to impute cases with missing predictor variables (n=79) for a final sample of size of n=485 young adults (21- to 30-years old) and n=673 late middle-age adults (50- to 70-years old). All analyses were performed in Stata 16, and each regression model controls for demographic variables, described previously, as well as recruitment method (stratified, referral, or Facebook) and survey mode (web versus face-to-face).

## 4. RESULTS

Descriptive statistics of the weighted sample are provided in Table 1. On average, young adults reported greater psychological distress ($M$=7.82, $SD$=6.14) than did older adults ($M$=5.19, $SD$=4.98; $p$<0.01). Young adults reported a relatively similar number of close ties as did late middle-age adults, but higher levels of role and exchange multiplexity, which indicate members in the network who fill multiple roles (i.e., cousin, friend, neighbor) and serve in multiple types of exchange (i.e., social companion, confidant, difficult). Young adults reported less participation in formal organizations than the older cohort (53.4% vs 71.7%; $p$<0.001), but there was no significant difference in informal organization participation between the two age groups (60.0% vs 54.9%).

Compared to the older cohort, approximately one-third and significantly more of young adults reported financial difficulties, problems at work or school, or a major break in a platonic relationship. Approximately one-third of the 50-70 year old cohort reported a major health shock, which did not differ statistically from the quarter of young adults who also reported a major health shock. In both cohorts, approximately half of the weighted sample was female, and less than half had a Bachelor degree or higher level of education.

### 4.1 Main Effect Relationships between Personal Network Characteristics, Negative Life Events, and Psychological Distress

To examine the main effect of personal network characteristics on psychological, Tables 2 (young cohort) and 3 (older cohort) provide weighted Poisson regression estimates, reported as incident rate ratios (IRRs), of network characteristics and negative events associated with psychological distress for each cohort. Model 1 examines the role of personal network characteristics. Model 2 adds in four negative events. No direct relationships between network characteristics and distress were observed among young adults. However, three of the four negative events were positively associated with distress, particularly problems at work or school (IRR= 1.31, 95% $CI$: 1.17, 1.46, $p$<0.001; Table 2, Model 2). Among 50-70 year old adults, greater numbers of social companions (IRR= 0.83, 95% $CI$: 0.73, 0.94, $p$<0.01) and emergency helpers (IRR= 0.76, 95% $CI$: 0.65, 0.89, p<0.01) are directly associated with lower psychological distress, while greater numbers of difficult and demanding ties (IRR= 1.25, 95% $CI$: 1.12, 1.40, p<0.001), as well as advisors (IRR= 1.22, 95% $CI$: 1.06, 1.40, $p$<0.01) are directly associated with higher psychological distress (Table 3, Model 1). Additionally, all four negative events were significantly associated with higher

rates of psychological distress, and in particular, reporting a major health shock (IRR= 1.32, 95% *CI*: 1.17, 1.48, $p<0.001$; Table 3, Model 2) among older adults.

### 4.2 Buffering Effect Relationships between Personal Network Characteristics, Negative Life Events, and Psychological Distress

To examine the stress-buffering hypothesis, exchange types were interacted with the most salient negative event(s) for each cohort (problems at work or school among the younger cohort, and financial difficulties and health shocks among the older cohort) and tested separately in a series of models (not shown). Figure 1 (Table 3, Model 3) depicts the only significant interaction found. Among the older cohort, the number of difficult or demanding ties significantly interacted with financial difficulties (IRR= 0.77, 95% *CI*: 0.61, 0.97, $p<0.05$; Table 3, Model 3), such that in the absence of financial difficulties, greater numbers of difficult and demanding ties are associated with greater psychological distress, while there does not appear to be an association between difficult and demanding ties and psychological distress in the presence of financial difficulties (Figure 1).

### 4.5 Sensitivity Analyses

Post-hoc analyses were conducted to formally test for differences in the observed associations across the two age cohorts. Interactions between age group and network characteristics revealed that while there were significant cohort differences for relationships between distress and each of close ties, social companions, and emergency helpers, there were no significant differences in relationships between distress and advisors, or difficult and demanding ties by age cohort.

## 5. DISCUSSION

Given recent evidence to suggest social relationships have both positive and deleterious effects on mental health, the current study examines main and buffering pathways linking personal network characteristics with psychological distress. By focusing on specific network characteristics, including various sources of support and burden, and examining two distinct stages of the life course, in our study, we aimed to shed additional light on these relationships. First, the lack of significant direct or buffering associations between network characteristics and psychological distress among young adults is particularly striking. Prior research indicates other processes unique to young adults, including self-esteem and mastery building, may be more important for mental well-being during this time period, and that while social relationships may have an effect on such development, social support itself does not appear to directly, or indirectly, affect psychological distress (Bovier et al., 2004). Another explanation may have to deal with the nature of relationships among younger adults. Preliminary results in the UCNets panel data indicate younger adults' social networks contain a lot of churn. That is, while the *number* of social companions remains almost constant over time, the individuals named to those roles, and thus the context of those relationships, are often very different over time.Subsequently, the reason young adult network ties do not seem to alleviate stress may be because a large proportion of the network is too new to be a source of support. While we examined certain aspects of that churn here, including the number of ties the respondent considers close and measures of network

embeddedness (i.e., multiplexity), future research that examines relationship characteristics over time, including relationship duration, may provide more insight into the role of networks on mental well-being among both young and older adults.

Among older adults, the findings were more complex. First, unlike with the younger adults, there was evidence for a direct association between network characteristics and mental health among older adults. The findings suggest social companionship and alters who can provide help during an emergency are the most salient and beneficial forms of support for lower psychological distress. The findings corroborate previous hypotheses around the importance of social companionship rather than other forms of social support for mental health (Buunk and Verhoeven, 1991; Rook, 1987) and are similar to work which has focused on the importance of perceived support (Bolger and Amarel, 2007; Uchino, 2009), rather than actual support received. Individuals who perceive that they are unable to return a favor are less likely to ask for and receive help when needed, likely due to feelings of indebtedness (Greenberg and Shapiro, 1971). As such, social companionship may serve as a form of support with mutual enjoyment and limited obligation, and may be best positioned to positively influence mental health.

Additionally, our findings indicate certain support ties may be mobilized in response to psychological distress. The positive association between number of advisors and distress among older adults likely reflects a bi-directional, or reciprocal relationship between networks and mental health. Substantial evidence indicates social networks are activated, or mobilized, during times of strain or stress (Hurlbert et al., 2000; Perry and Pescosolido, 2015). The seminal review on support type in association with mental health by Kessler and McLeod (1985) revealed that emotional support and the ability to mobilize broad-based support if needed were the most salient predictors of mental distress in association with life stressors. It is conceivable then that folks experiencing higher levels of psychological distress, perhaps due to some external stressor, would have turned to more alters as advisers. Additionally, people who have recently experienced psychological distress may be better able to recall those who gave or were asked for advice, and as such can name greater numbers of people to this role.

There was some evidence to indicate social ties named as difficult and demanding were associated with greater psychological distress among the older sample, though sensitivity analyses did not find statistically significant differences by age cohort. This finding supports previous studies which suggest certain network members may have negative effects on health, including mental well-being (Rook, 2014, 2015). The literature offers the explanation that well-intentioned members of the network may be overbearing or intrusive. However, the direction of this relationship is also unclear. Demanding friends or family members may exacerbate psychological distress, while conversely, people who are experiencing stress unrelated to their network may be more likely to perceive some of their relationships as particularly burdensome during that time.

We found limited evidence to indicate personal network characteristics moderated the relationship between external stressors and psychological distress, which is inconsistent with prior research. According to the buffering hypothesis, we would expect to see supportive

roles minimize the effect of stressors on psychological distress, and burdensome relationships exacerbate the effect. However, there was no evidence of moderating effects among the younger cohort. Additionally, the test of buffering among the older adults resulted in a different (and rather quizzical) pattern: among older adults, higher numbers of difficult and demanding ties in the absence of financial difficulties were associated with higher distress, but were not associated with distress in the presence of financial difficulties. One potential explanation is that the same people who are named as difficult and demanding – close kin who are typically female relatives and aging parents (Offer and Fischer, 2018)— are also the ones most available and obligated to provide financial support. A second explanation may be that burdensome ties are salient for distress only when other aspects of ones' life seem relatively stable. That is, in the presence of negative events, burdensome ties pale in comparison.

To rephrase the findings in terms of the three research questions posed earlier: First, rather than structural characteristics of personal network (e.g., size, multiplexity), specific types of network support and burden were directly associated with psychological distress, and in particular, among late-middle age adults. Second, contrary to previous studies, we found limited support for the buffering hypothesis. However, our findings do suggest the association between networks and mental health should be considered within the context of negative life events. Specifically, the negative effect of demanding ties on distress was tempered by the presence of financial difficulties. And third, associations between personal networks and psychological distress differed across two distinct phases of the life course. While network support and burden were associated with psychological distress among the older cohort, there were no significant relationships between personal networks and distress among young adults.

### 5.1 Limitations

The findings should be discussed in light of certain limitations. First, network homophily presents a challenge inherent to all research on personal networks and individual outcomes. Network homophily refers to the interdependence of outcomes among connected individuals due to larger processes around selection into and social influence within social networks (McPherson et al., 2001; Schaefer et al., 2011). This factor may be particularly relevant for psychological outcomes, including depression, in which individual outcomes are highly correlated with friends and neighbors (Rosenquist et al., 2011). The current study has no information about the psychological well-being of ties within the network. Thus, for example, it becomes difficult to disentangle greater involvement with ties who provide support and resources which may lower distress from greater involvement with ties who are also experiencing psychological distress themselves, which has been linked with increased distress among egos (Woods-Giscombé et al., 2015). As such, it is difficult to discern whether relationships between network characteristics are being masked, or whether these relationships are truly absent, as was observed among the younger cohort. Additionally, there is evidence to indicate individuals with depression withdraw from certain social interactions with friends, which ultimately shapes and limits their personal network (Schaefer et al., 2011). It is not yet well understood whether and how psychological distress may define or restrict personal networks.

Second, the cross-sectional data used cannot determine the direction of the associations between network characteristics, negative life events, and psychological distress. It is a well-known phenomenon that individuals may reach out to their network members during times of need (Hurlbert et al., 2000; Perry and Pescosolido, 2015, 2010), which is a possible explanation for the association between increasing numbers of advisors and higher psychological distress. Studies using longitudinal data are required to examine causal effects and test for more robust associations between negative events, aspects of social support, and mental health. Finally, the UCNets data are both a convenience and probability sample, and are representative of the San Francisco Bay Area, a relatively wealthy, highly educated population. Therefore, the sample does not have adequate numbers to investigate the specifics of low income and/or minority communities, nor are the findings generalizable to broader populations.

## 6. CONCLUSIONS

This study revisits and extends upon the social network and mental health literature by examining main and buffering effects between personal network characteristics and psychological distress among two adult cohorts. A particular strength of the current study was the examination of specific forms of support and resources available within the network in association with psychological distress, which allowed us to see, for example, the unique contribution of having members within the network who serve as confidants, versus those who serve in an advisory role, and additionally, the role of difficult and demanding network members on psychological distress.

The findings have several implications for current recommendations and future research. While previous studies call for broadly increasing network size and support for improved mental health among older adults (Cornwell and Waite, 2009; Rafnsson et al., 2015), the current findings indicate the psychological well-being of late middle-age adults may benefit most from specific types of relationships, including social companions and ties that can be called upon in an emergency. As adults age, they engage in active ‘pruning’ of their social network, largely to focus on particularly meaningful relationships (English and Carstensen, 2014; Stoeckel and Litwin, 2016), which may make it difficult to follow recommendations to increase the overall network size and diversity. Instead, focusing on the continued maintenance of specific types of relationships, including social companionship, and local ties who can provide support in an emergency, may be a more obtainable goal. Subsequently, it should be noted that both of these types of support roles (social companions and emergency helpers) are inherently required to be geographically local ties. Future studies should examine the importance of distance of network ties in association with psychological distress, especially as older adults exit the workforce and move to retirement communities, and younger adults enter the workforce and move to economic opportunities.

Future research should also seek to examine longitudinal data and network selection effects (discussed in the limitations section), which may have masked potential findings among the younger cohort. Additionally, some scholars posit that buffering theory needs to be further elucidated within network research, such that family ties, in particular, can serve as both support and as a stressor (Garris and Weber, 2018). Further distinguishing exchange types by

familial versus non-familial network ties (Fiori et al., 2006) and considering the effect of increasingly diverse family structures (Grzywacz and Ganong, 2009) are important future areas of research, allowing us to better understand the ways in which network characteristics can be targeted for mental health promotion among both young and older adults (Kawachi and Berkman, 2001).

In conclusion, a broader and richer understanding of the mechanisms linking network exchange roles with mental health (e.g., geographic distance, absence of obligation), and one that distinguishes between family and non-family alters for young and older adults, is a potentially fruitful area of future research. These mechanisms may be especially important when considering broader sociodemographic trends, including continued reliance on parents among young and emerging adults, and longer life expectancies leading to aging adults caring for elderly parents, all of which have implications for personal networks and the types of support they provide or demand. Younger adults, who are experiencing high levels of anxiety and difficulty in launching adult careers in the service economy, may be particularly at risk for poor mental health outcomes, of which personal networks may be unable to combat. These larger sociodemographic trends invite inquiries into the relationship between mental health, personal networks, and the role of support systems throughout the life course.

## Acknowledgments

The authors wish to acknowledge the following funding sources: NIA R01 AG041955, PI: Claude Fischer and NIA K99 AG059950, PI: Stephanie Child.

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## Research Highlights

- Social networks are important for health, including mental well-being.
- Networks have both direct and indirect effects on distress via social support.
- Social companionship and emergency help matter most for older adults.
- Demanding social ties are associated with psychological distress among older adults.
- No support for any associations between networks and distress among young adults.

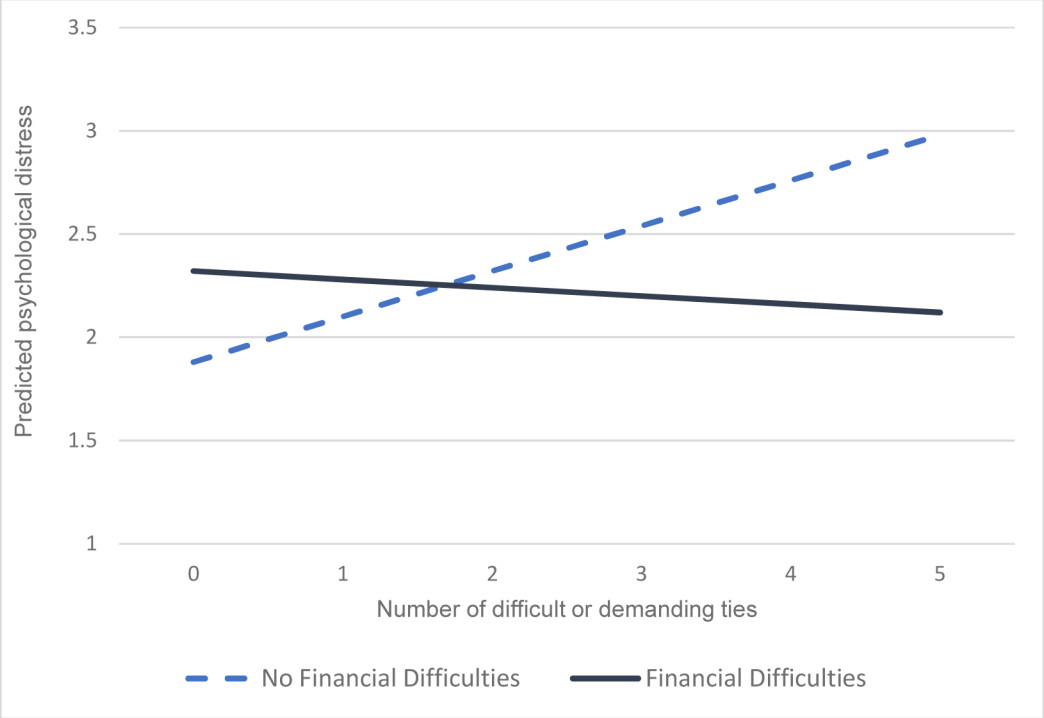


**Fig. 1.**

Interaction of difficult/demanding ties and financial difficulties on predicted psychological distress among older adults (50- to 70-years old).

**Table 1.**

Weighted sample characteristics of Wave I UCNets participants by age cohort.

| Variable | 21- to 30-years old (*n*=485) Mean (*SD*) or % | 50- to 70-years old (*n*=673) Mean (*SD*) or % |
|---|---|---|
| Psychological Distress[a] (range: 0-24) ** | 7.82 (6.14) | 5.19 (4.98) |
| Network Characteristics | | |
| Number of Close Ties | 4.37 (4.54) | 4.58 (4.31) |
| Role Multiplexity * | 1.42 (0.59) | 1.33 (0.48) |
| Exchange Multiplexity ** | 2.72 (1.10) | 2.44 (0.78) |
| Formal Participation *** | 53.4 | 71.7 |
| Informal Participation | 60.0 | 54.9 |
| Type of Exchange (*Number of…)* | | |
| Social Companions | 5.33 (3.52) | 5.47 (3.89) |
| Confidants | 2.90 (2.62) | 2.86 (2.49) |
| Advisors ** | 2.85 (1.79) | 2.47 (1.73) |
| Emergency Helpers | 3.00 (1.70) | 2.85 (1.70) |
| People who receive help | 4.00 (1.65) | 3.78 (1.86) |
| Difficult/Demanding * | 1.44 (1.33) | 1.22 (1.27) |
| Negative Life Events | | |
| Financial Difficulties *** | 30.8 | 18.2 |
| Problems at Work/School *** | 31.2 | 11.8 |
| Major Break in Relationship *** | 32.6 | 19.6 |
| Health Shock | 25.6 | 33.0 |
| Female | 51.3 | 52.7 |
| Race/Ethnicity *** | | |
| White | 39.5 | 57.5 |
| Black | 9.0 | 9.6 |
| Latino | 22.1 | 12.3 |
| Asian | 28.5 | 20.2 |
| Other | 0.9 | 0.4 |
| Educational Attainment | | |
| Less than Bachelor's | 56.4 | 53.5 |
| Bachelor's Degree | 30.2 | 26.5 |
| More than Bachelor's | 13.4 | 20.0 |
| Income *** | | |
| <$15,000 | 40.1 | 18.4 |
| $15,000-$34,999 | 25.1 | 20.3 |
| $35,000-$59,999 | 15.2 | 16.2 |

| Variable | 21- to 30-years old (*n*=485) Mean (*SD*) or % | 50- to 70-years old (*n*=673) Mean (*SD*) or % |
|---|---|---|
| ≥$60,000 | 19.6 | 45.1 |
| Employment Status * | | |
| Employed Full- or Part-time | 66.2 | 48.5 |
| Unemployed/Retired/Student | 33.8 | 51.5 |

T-test for difference between age groups:

* p<0.05,

** p<0.01,

*** p<0.001

Note:

[a] Higher scores indicate greater psychological distress

**Table 2.**

Weighted Poisson estimates predicting psychological distress among young adult (21-30 years old) participants of the UCNets Study ($n$=485, Wave I).

| Variable | Model 1 IRR (95% *CI*) | Model 2 IRR (95% *CI*) |
|---|---|---|
| **Network Characteristics** | | |
| Number of close ties (*log #*) | 0.93 (0.81, 1.07) | 0.95 (0.83, 1.07) |
| Role multiplexity | 0.94 (0.79, 1.11) | 0.91 (0.78, 1.06) |
| Exchange multiplexity | 1.01 (0.92, 1.10) | 1.01 (0.93, 1.09) |
| Formal participation | 0.88 (0.77, 1.01) | 0.91 (0.80, 1.03) |
| Informal participation | 1.03 (0.91, 1.17) | 1.03 (0.92, 1.15) |
| Type of exchange (*log #* of…) | | |
| Social companions | 0.93 (0.77, 1.12) | 0.98 (0.82, 1.18) |
| Confidants | 1.13 (0.98, 1.03) | 1.11 (0.99, 1.24) |
| Advisors | 0.94 (0.82, 1.08) | 0.93 (0.83, 1.04) |
| Emergency helpers | 1.16 (0.97, 1.40) | 1.13 (0.94, 1.35) |
| Receives help | 0.90 (0.73, 1.09) | 0.87 (0.74, 1.03) |
| Difficult/demanding | 1.12 (0.98, 1.28) | 1.05 (0.93, 1.19) |
| **Negative life events** | | |
| Financial difficulties | | 1.20 (1.06, 1.37)** |
| Problem at work/school | | 1.31 (1.17, 1.46)*** |
| Break in relationship | | 1.17 (1.03, 1.32)* |
| Health shock | | 1.14 (1.00, 1.28) |

* $p<0.05$,

** $p<0.01$,

*** $p<0.001$

Higher scores indicate greater psychological distress.

All models are weighted and control for ego's gender, race/ethnicity, educational attainment, relationship status, employment status, income, and household composition, as well as recruitment and survey mode.

IRR= Incident Rate Ratio; CI= Confidence Interval

**Table 3.**

Weighted Poisson estimates predicting psychological distress among older adult (50- to 70-years old) participants of the UCNets Study ($n$=673, Wave I).

| Variable | Model 1 IRR (95% *CI*) | Model 2 IRR (95% *CI*) | Model 3 IRR (95% *CI*) |
|---|---|---|---|
| **Network Characteristics** | | | |
| Number of close ties (*log #*) | 0.89 (0.76, 1.03) | 0.90 (0.79, 1.05) | 0.90 (0.79, 1.04) |
| Role Multiplexity | 0.99 (0.84, 1.17) | 0.96 (0.81, 1.13) | 0.97 (0.82, 1.14) |
| Exchange Multiplexity | 1.04 (0.96, 1.12) | 1.03 (0.95, 1.12) | 1.04 (0.96, 1.12) |
| Formal participation | 0.88 (0.76, 1.02) | 0.88 (0.77, 1.00) | 0.88 (0.78, 1.00) |
| Informal participation | 1.00 (0.88, 1.13) | 0.97 (0.87, 1.09) | 0.97 (0.87, 1.09) |
| Type of Exchange (*log #* of…) | | | |
| Social companions | 0.83 (0.73, | 0.84 (0.74, | 0.85 (0.76, 0.95)** |
| Confidants | 0.97 (0.85, 1.11) | 0.95 (0.84, 1.08) | 0.95 (0.83, 1.07) |
| Advisors | 1.22 (1.06, | 1.20 (1.06, | 1.18 (1.04, 1.34)** |
| Emergency helpers | 0.76 (0.65, | 0.81 (0.70, | 0.81 (0.70, 0.94)** |
| Receives Help | 0.96 (0.83, 1.10) | 0.96 (0.84, 1.11) | 0.97 (0.83, 1.14) |
| Difficult/Demanding | 1.25 (1.12, | 1.17 (1.04, | 1.25 (1.10, 1.41)*** |
| **Negative Life Events** | | | |
| Financial difficulties | | 1.28 (1.11, | 1.55 (1.27, 1.90)*** |
| Problem at work/school | | 1.15 (0.96, 1.37) | 1.12 (0.94, 1.32) |
| Break in relationship | | 1.21 (1.04, | 1.20 (1.03, 1.39)* |
| Health shock | | 1.32 (1.17, | 1.31 (1.17, 1.48)*** |
| **Interaction** | | | |
| Financial difficulties × difficult/demanding (*log*) | | | 0.77 (0.61, 0.97)* |

* $p$<0.05,

** $p$<0.01,

*** $p$<0.001

Higher scores indicate greater psychological distress.

All models are weighted and control for ego's gender, race/ethnicity, educational attainment, relationship status, employment status, income, and household composition, as well as recruitment and survey mode.

IRR= Incident Rate Ratio; CI= Confidence Interval