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Social contact frequency and all-cause mortality: A meta-analysis and meta-regression

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ABSTRACT

Social contact frequency is a well-defined and relatively objective measure of social relationships, which according to many studies is closely associated with health and longevity. However, no previous meta-analysis has isolated this measure; existing reviews instead aggregate social contact with other diverse measures of social support, leaving unexplored the unique contribution of social contact to mortality. Furthermore, no study has sufficiently explored the factors that may moderate the relationship between contact frequency and mortality. We conducted meta-analyses and meta-regressions to examine 187 all-cause mortality risk estimates from 91 publications, providing data on about 400,000 persons. The mean hazard ratio (HR) for mortality among those with lower levels of social contact frequency was 1.13 ($p < 0.05$) among multivariate-adjusted HRs. However, sub-group meta-analyses show that there is no significant relationship between contact and mortality for male individuals and that contact with family members does not have a significant effect. The moderate effect sizes and the lack of association for some subgroups suggest that mere social contact frequency may not be as beneficial to one's health as previously thought.

1. Introduction

Over the last three decades, a growing number of studies have documented the association between social relationships and various health and longevity outcomes. Social interactions with others have been linked to improved mental health (Dalgard et al., 1995; Dressler, 1985; Mathiesen et al., 1999); to lower susceptibility to cancer (Ell et al., 1992; Hibbard and Pope, 1993; Welin et al., 1992), infectious diseases (Cohen, 1991; Lee and Rotheram-Borus, 2001; Patterson et al., 1996) and cardiovascular diseases (Johnson and Hall, 1988; Lepore et al., 1993; Roy et al., 1998); and to lower overall and cause-specific mortality rates (Andre-Petersson et al., 2006; Berkman et al., 1992; Brummett et al., 2005; Hanson et al., 1989; Lyyra and Heikkinen, 2006; Zhang et al., 2007).

The literature offers three main explanations for why social relationships may have a positive association with health outcomes. First, some argue that relationships moderate the adverse health effects of stress and loneliness by enhancing emotional support, intimacy, attachment, and feelings of self-worth, self-competence and emotional well-being, as well as providing comfort in times of need (Barrera, 2000; Berkman et al., 2000; House, 2001; Uchino, 2006; Umberson et al., 2010; Umberson and Montez, 2010). Second, relationships can facilitate healthy behaviors, such as adherence to medical treatment regimes, exercise, keeping a healthy diet, and smoking cessation (Kaplan et al., 1994; Uchino, 2004, 2006; Uchino et al., 1996). This may occur through various cognitive mechanisms. For example, contacts may actively pressure individuals to regulate their behaviors, or they may provide individuals with cognitive information about more healthy practices that would then more indirectly increase the chances for behavioral change (Cohen, 2004; Lyyra and Heikkinen, 2006). Finally, relationships can also be associated with a greater availability of instrumental assistance and material help, which may be especially crucial for the elderly and those suffering from mobility limitations (Messeri et al., 1993; Thoits, 2011). These different forms of support may be crucial at varying stages of the life course (for example, information on health behaviors may be more important at younger ages, while instrumental physical assistance may be especially important at older ages).

In the present study we focus on one particular aspect of social relationships – *social contact frequency*, defined as the frequency of social interactions with others. Social contact frequency is a

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relatively objective measure, unlike subjective measures of social relationships such as *perceptions* of social support. Social contact frequency focuses on the quantity of interactions one has, rather than the individual's assessment of the support he or she receives from others. Both "subjective" and "objective" measures of social relationships have strengths and weaknesses. Objective measures fail to penetrate the deeper meaning of social relationships and the way these are perceived and experienced. For example, people may not always judge higher proximity or contact with others as positive, especially when they consider this contact stressful or overbearing. Indeed, studies on negative social exchange suggest that some relationships are perceived as a burden rather than a source of support and enjoyment. This may be true when the relationship is perceived as too demanding, insensitive and invasive, or when those with whom one is in contact suffer from serious problems of their own (Edwards et al., 2001; Ruehlman and Karoly, 1991).

While these drawbacks might suggest preferring subjective measures, such measures are not without their shortcomings. Perhaps most importantly, subjective assessments of support suffer from idiosyncrasy and differential perceptions. Research has found, for example, that subjective perceptions of social support may be influenced by one's personality, mood, or cultural upbringing (Lakey et al., 1996; Pierce et al., 1992; Procidano and Heller, 1983; Russell et al., 1997; Sarason et al., 1991; Shor and Simchai, 2009). Hence, one person's definition of "high" social support at a given time may not be shared by other people, or even by the same person at a different time. This renders comparisons between individuals less reliable. Furthermore, studies have found that "supportive" social ties can sometimes encourage risky and unhealthy behaviors such as cigarette smoking, drug use, and reckless driving (Burg and Seeman, 1994; Uchino, 2006; Wills and Yaeger, 2003).

The scope of the combined literatures on subjective and objective measures of social relationships precludes a detailed analysis of each within the same paper. We therefore chose to focus solely on social contact frequency in the present analysis, seeking to present depth rather than breadth. Social contact frequency is also a direct and relatively precise measure. Other frequently used variables, such as marital status or engagement in out-of-the-house activities, do not necessarily capture the actual frequency of social interactions. Social contact frequency, on the other hand, is arguably the most direct and therefore accurate measure for the frequency of such interactions.

Our study is important for two main reasons. First, while the majority of existing studies report a positive association between social contact frequency and longevity (e.g. Berkman et al., 1992; Berkman et al. 2004; Okamoto and Tanaka, 2004; Rozzini et al., 1991), a large portion of the studies we surveyed found no significant effect or a negative effect, in particular after controlling for various demographic and behavioral factors (Bagiella et al., 2005; Krause, 1997; Thong et al., 2007; Yeager et al., 2006). We thus wish to explore whether the association remains significant even when accounting for other important explanatory factors.

Second, according to many of the field's leading scholars (e.g. Uchino, 2009; Umberson et al., 2010), the most pressing task in studying the association of social relationships and health today is identifying and elucidating how relationships affect health and mortality. In other words, it is essential to continue exploring the mediating and moderating factors (the "black box") in this association. This process of understanding intervening mechanisms and the relative impact of each of these mechanisms on health outcomes is essential for designing effective interventions (Gottlieb, 2000; Seeman, 1996; Thoits, 1995, 2011). We therefore focus in the present study on the moderators of the social contact frequency-health association. Meta-analysis and meta-regression methods are especially useful for identifying social contact frequency moderators. For example, differences in cultural norms and quality of medical care may imply geographical heterogeneity in the social contact frequency-health association. As most studies typically focus on a single geographic locale, comparisons between studies may be better suited for the analysis of this type of heterogeneity. We use meta-analysis and meta-regression methods for the examination of this and other similar types of heterogeneity because they allow us to leverage recurring differences between the sampling frames already examined in a large range of existing studies. This analysis tactic allows for direct tests of multiple potential mediating and moderating factors.

A small number of meta-analytic reviews have already been conducted in the social relationship literature, but none of them has isolated social contact frequency. Of particular relevance in the context of the present study is the meta-analysis of Holt-Lunstad et al. (2010), who examined associations between mortality outcomes and various social relationship measures (looking predominantly at point estimates from models with the fewest statistical controls). While Holt-Lunstad and colleagues did not include a direct measure for social contact frequency in their analysis, they did report findings for similar measures: Social isolation (inversed) (OR, 1.40; 95% CI, 1.06–1.86), social networks (OR, 1.45; 95% CI, 1.32–1.59), and social integration (OR, 1.52; 95% CI, 1.36–1.69). While this analysis makes important contributions, the precise measurement of each of these three concepts remains somewhat vague and none of them directly captures social contact frequency. Furthermore, the analysis does not differentiate between unadjusted and better-controlled models and does not investigate the potential moderators of the social contact frequency–mortality relationship.

The present study thus offers an important addition to our understanding by examining the heterogeneity in the contact-mortality association stemming from differences in the identity of those with whom one has contact (family vs. friends vs. others) and the sex, age, health status, and geographic location of the individuals in the study. We outline below the theoretical relevance of these factors and the hypotheses associated with each.

Source of contact: The literature on social relationships often suggests that a relationship with family members and friends may have different consequences, both in terms of how this relationship is perceived (Crohan and Antonucci, 1989; Rook, 1987; Seeman and Berkman, 1988) and in terms of its mental-health and physiological-health outcomes (Gallant et al., 2007; Matt and Dean, 1993; Potts, 1997). This literature suggests that it is through one's close relationships that one receives the greatest quantity of emotional aid, small services, and companionship (Wellman and Wortley, 1990). In addition, the bulk of frequent contact (especially at older ages) often occurs with a relatively limited number of close individuals who are frequently family members (Wellman and Frank, 2001; Wellman and Wortley, 1990).

Some scholars have suggested that contact with friends may be especially important, as friendships tend to be highly reciprocal (Wenger, 1990) and provide greater emotional support (Lee and Ishii-Kuntz, 1987). According to Thoits (2011), in times of acute stress those who are very close to the individual (such as family members) may be too emotionally invested in the person's recovery or even at times experience the person's stressor themselves. Friends, on the other hand, typically share similar characteristics and values, and hence provide emotional and informational support more tailored to the specific problem at hand (Miller and Darlington, 2002). Other scholars, however, have argued that family members (especially siblings, children, and spouses; see Wellman and Wortley, 1989; Wellman and Wortley, 1990) are more important for providing instrumental support (e.g. financial aid), assisting with practical tasks and physical needs, and providing