

Social networks formed through mobile phone text-message and their effects on psychological well-being: Focusing on social capital approached from micro-, dyad-, and meso-levels

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Widespread diffusion of the Internet around the world has affected the quantity and quality of interpersonal communication. The presence of the Internet contributes to developing new relationships in cyberspace, and strengthens existing real life relationships. Technological advances in recent years have increased access to the Internet, in terms of both convenience and affordability. Along with personal computers, mobile/cell phones have become popular devices for Internet access eliminating the physical constraints regarding when and where access can be attained. At current, Asia leads the world in providing Internet connection services via mobile phones. For instance, in Japan, text-message communications have become more popular than the more traditional computer-mediated communication, especially amongst young people, owing to its widespread usage, mobility, and low cost.

The main purpose of this dissertation was to investigate the manner in which text-message communication affects people's social networks and their psychological well-being. Much of the previous work regarding this matter has been examined through computer mediated communication. For example, Kraut and his colleagues (1998, 2001) revealed that personal computer-mediated communication increased loneliness for introverts, while on the other hand, it decreased loneliness, and increased the number of cyber-acquaintances for extroverts. Lack of nonverbal cues, a sense of connectedness, and physical proximity have been discussed as important explanations for the effects of the computer-mediated social networks on loneliness. Those who are already effective in using social resources are likely to reap the most benefits from personal computer-mediated communication. Though these effects can be conceived to be true for text-message communication as well, few studies have yet to attempt to examine the psychological effects of this emergent means of communication.

Lin (1999) defines social capital as embedded resources captured from social networks, which generate collaborative behavior within a group so as to enrich the individual's life. This dissertation provides a broad overview of social capital in text-message communication, proposing an original model which attempts to explain the mechanism behind the effects of social networks based on this communication, on the individual's psychological well-being. The proposed model shown in Figure 1 depicts the underlying sociological and psychological

frameworks, which extends Lin's (1999) sociological perspective of social capital. The text-message social network is integrated as a mediator in the process in which collective assets and the individual's position in the social structure affect psychological well-being. The new model also incorporates Levin and Stokes' (1986) psychological perspectives, the social network mediation model and the cognitive bias model, which explain the links amongst individual disposition, social networks and well-being. The social network mediation model claims that individual disposition affects well-being through mediation by social network variables, whereas the cognitive bias model asserts that individual disposition directly affects well-being by way of cognitive processes. Social capital for psychological well-being should also be analyzed at three different levels: individual-based (micro-level social capital: elaborated by structural equation modeling etc.), interpersonal-based (dyad-level social capital: pair-wise analysis), and structural-based (meso-level social capital: social network analysis).

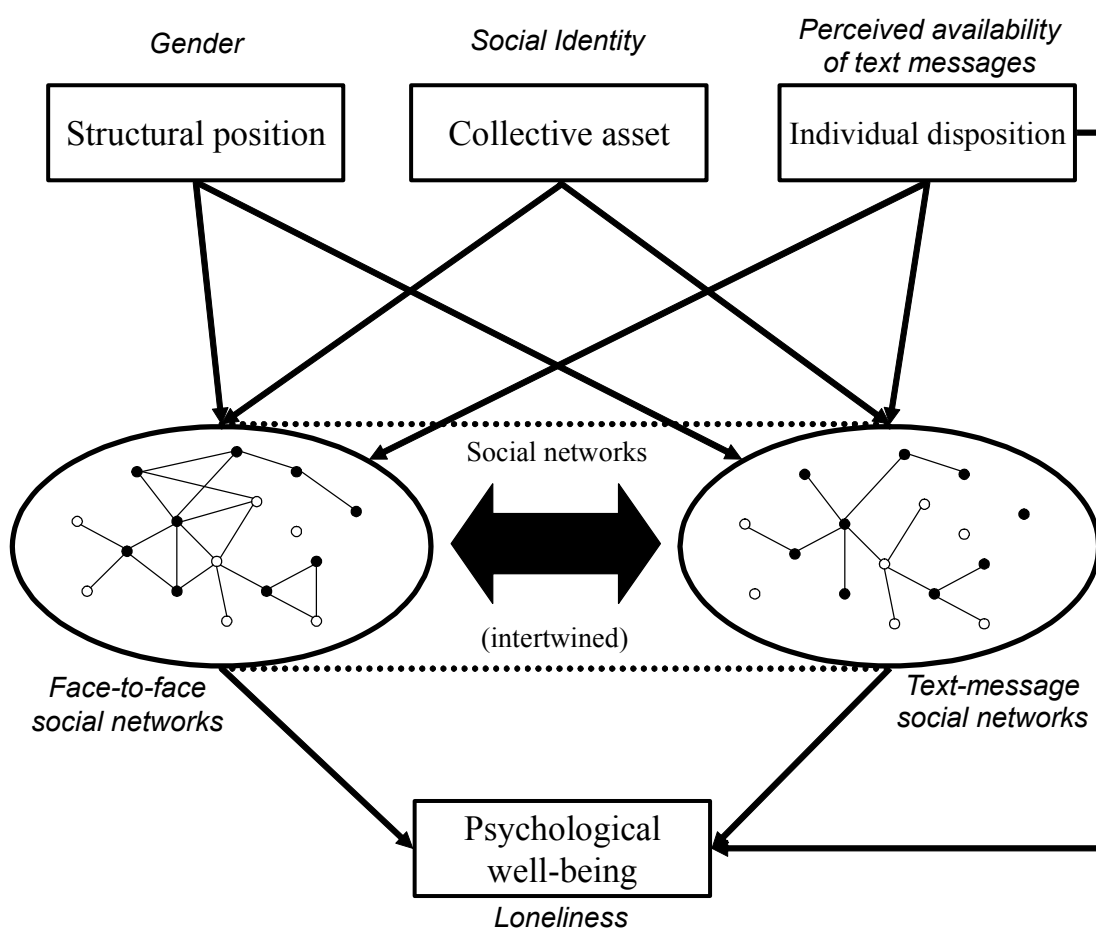


Figure 1
 A conceptual model of social capital in text-message:
 the impact of pre-condition and social networks on well-being

As can be seen from the above, the proposed model of social capital in text-messaging contains three blocks of variables in causal sequences. The first block represents the pre-conditions of social networks; each individual's position in the social structure, collective assets, and individual disposition. The second block describes face-to-face and text-message social networks intertwined with each other. The third block addresses a state of psychological well-being affected by both preconditions and social networks. In this model, social networks are assumed to be dyad- and meso-level outcomes of action. If social networks improve psychological well-being, such relationships are deemed as social capital, increasing interpersonal pleasure and sense of connectedness. The model advances the theory of the effect of text-message social networks on psychological well-being.

How does text-message affect loneliness?

Based on the analysis for micro-level social capital, Study 1 focused on the availability and impact of text-message social network on first year undergraduates during their transition to college. Longitudinal effects of text-message communication amongst physically proximal friends (the college social network) were compared with that of physically distant friends (the pre-college social network) on loneliness. A total of 83 first year college students in central Japan completed measures of loneliness and their college and pre-college social network variables (size, frequency, and importance of face-to-face and text-message social networks) at the beginning and end of their first semester. The functional usefulness of text messages was assessed at the beginning of the semester, and structural equation modeling showed that it had a positive effect on the change in frequency of sending text messages to college friends. Furthermore, increases in the importance of both pre-college and college friendship, and in the frequency of sending text messages to college friends, contributed to a decrease in loneliness. Greater importance felt toward the text message to pre-college friends, however, was associated with an increase in loneliness. That is, a correct understanding of the effectiveness of text messages has an indirect effect of increasing social capital. Text-message communication with proximal college friends strengthens social capital, while that with distant pre-college friends, with whom they hardly get a chance to meet in person, decreases social capital. These results suggest that undergraduates use text messages with proximal friends in addition to face-to-face communication so that they may satisfy their need for physical proximity.

Strength of the dyadic text-message communication.

Study 2 addressed the importance of text-message dyadic relationships as compared to face-to-face dyadic relationships, by controlling the strength of text message ties. A longitudinal interaction process was examined between face-to-face and text-message relationships amongst

university classmates with whom physical proximity allows ready access to face-to-face interactions. A total of 70 first year undergraduates at a university in Japan were asked to evaluate the degree to which they perceived in-group membership (collective assets) in their cliques, and to choose up to five classmates whom they merely have greeting interactions (weak ties) or with whom they had discussed personal matters (strong ties) via face-to-face or text messages. Questionnaires were administered four times in sequence during their school year. The p_2 model was used to analyze binary dyadic data within the network (van Duijn, Snijders, & Zilstra, 2004). Existing face-to-face and text-message relationships for weak and strong ties at Time 1 and Time 2 were good predictors of subsequent face-to-face and text-message dyadic relationships. At Time 3, for weak ties, the existing text-message relationship did not predict the subsequent face-to-face relationship, while the existing face-to-face relationship was related to the subsequent text-message relationship. For strong ties, however, the existing text-message relationship at Time 3 affected the subsequent face-to-face relationship, whereas the existing face-to-face relationship did not influence future text-message relationship. Group membership did not predict any relationship formation.

Structural characteristics of the text-message social network.

From a structural perspective regarding social capital in text-message communication, Study 3 applied Matsuda's (2000) selective interpersonal relationship theory in order to compare the developmental processes of face-to-face versus text-message social network structure. This particular theory claims that mobile phones increase the frequency of communication, and hence, allot opportunities for expanding interpersonal relationships, although young people are likely to communicate only to close friends via mobile phones. This study also concentrated on sex differences regarding one's position within the social structure. Questionnaires were administered to 64 male and 68 female first year undergraduates twice during their first semester. Participants reported on up to ten classmates with whom they had seen in person or exchanged text messages at least once during the past two weeks, and evaluated each relationship. The intimacy level of friends whom were communicated via both face-to-face and text messages was rated higher than for those only via face-to-face. Social network analysis revealed that a greater part of text-message social networks amongst participants consisted of dyadic relationships, and that its growth was slower than face-to-face networks. These findings suggest that the text-message social network assumed segmentation of structure, and hence, patterns of interpersonal relationships for text-message social networks corresponded to what was predicted by selective interpersonal relationship theory. Meanwhile, females tended to expand their face-to-face and text-message social networks more than males, in agreement with expected sex differences in network characteristics.

Conclusion.

The three surveys in this dissertation provide strong converging evidence for the proposed model of social capital in text-message communication from a broader perspective. The findings of micro-level social capital have revealed that text-message communication with physically proximate friends lead to significant improvement of psychological well-being. The dyadic text-message relationship becomes a fundamental web of interpersonal relationships amongst young people, which contributes not only just to supplement, but also to transform close face-to-face relationships. The analysis of social network structure found that the text-message social network constitutes intimate friends who play a crucial role in increasing social capital. Respondent sex, and perceived availability of text messages also had indirect effects on social capital. Thus, text-message communication may be more beneficial to well-being than personal computer-mediated communication to the extent that its social networks can be readily accessed. Future research should attempt to discern the manner in which text-message communication affects people's well-being with the best designs possible, by elaborating the mechanisms by which text-message social network has its impact on the face-to-face social network and psychological well-being.