Weak Ties and Contact Initiation in Everyday Life:
Exploring Contextual Variations from Contact Diaries

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Abstract

This study examines how the significance of weak ties varies by contact initiation and purposes of contact in everyday life. Based on data from 55 contact diaries, we analyze the extent to which diary keepers judge each of 102,825 specific contacts as beneficial after they occur, by how well they knew the target person beforehand. Our hypothesis testing and bootstrap resampling show that when a diary keeper initiates a contact, weak ties result in more gains. In contrast, when the other party starts the contact, it is strong rather than weak ties that turn out to be more beneficial to the diary keeper. Such effects vary by other contextual factors, however, particularly the purposes of contacts.

Keywords: weak ties; everyday life; contact diary; ego-centered networks.

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Abstract

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1. Introduction

The "strength of weak ties" argument claims that people may receive crucial information or critical help by means of sporadic contacts with "someone only marginally included in the current network" or "individuals whose very existence they have forgotten" (Granovetter, 1973, pp.1371-1372). Extant literature has given inconsistent support to this line of arguments. Some studies have demonstrated that weak ties do bring about unexpected significant gains (Bashi, 2007; Granovetter, 1973, 1983). Other empirical evidence, however, has suggested that stronger ties result in better social outcomes, not only in terms of affective support, but also in instrumental gains (Massey et al., 1994; Wegener, 1991). Still others have argued that some seemingly weak ties can actually be decomposed into links of strong ties (e.g., father's close friend). The positive outcomes of such weak ties thus may result from the cumulative effects of a series of strong ties, particularly when looking for a job (Bian, 1997).

Such inconsistent research findings reveal difficulties in testing the "weak ties hypothesis" in empirical research. Although Granovetter (1973) elaborated his arguments about weak ties based on qualitative interview data, other studies have examined the argument in various contexts. Indeed, the strength of weak ties may manifest in many social facts. Among these, the literature has focused mostly on macro-level or instrumental events, such as the diffusion of influence and information (e.g., the small-world phenomenon), opportunities for mobility (including job searches), community organization, and social cohesion (Granovetter, 1973, 1983; Harvey, 2008; Liu and Duff, 1972; Milgram, 1967). In comparison, micro-level or affective outcomes have received little attention and systematic examination.

Extending the recent literature that identifies the need to study personal situations of social networks in daily life (Andersen and Rossteutscher, 2007; Tindall and Cormier, 2008), we aim to revisit the weak ties arugment with a research design that helps shed new light on conventional network studies. First, we focus on social interactions in everyday life, rather than specific events that are mostly instrumental. Second, we break down interpersonal relations or ties into contacts, which allows us to examine whether and how the strength of weak ties functions under different circumstances. Third, we differentiate such circumstantial effects by identifying who initiates the contact, a factor key to understanding human motivations and behaviors.

While examining the relationship between tie strength and contact initiation, we take into account another key contextual factor, purposes of social interactions. We argue that weak ties in everyday life may be beneficial, particularly when one initiates a contact. Such effects, however, largely depend on the circumstances under which a contact takes place. Weak ties are slightly more beneficial when an individual initiates contacts for instrumental purposes, whereas strong ties bring about positive outcomes when the other party initiates such instrumental contacts. As for affective contexts, especially leisure and social activities, strong ties should remain more beneficial regardless of who initiates the contacts.

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We draw data from 55 three-month contact diaries that recorded interpersonal interactions in everyday life. The large number of contacts and the attributes attached to each contact entry enable us to model different effects of contacts under various circumstances. As the format of the dataset is uncommon, combining some characteristics of both imbalanced and longitudinal data, our model draws aid from resampling methods to ensure that the sampling distribution follows the Gaussian distribution; most of all, we assume that the variable of the differences among those who kept the dairies obeys a fixed distribution, thus allowing heteroscedasticity among these diary keepers.

2. How Significant Are Weak Ties in Everyday Life?

Weak ties appear to be less helpful than strong ties in real life. As early studies suggested, information is often transmitted through strong ties or circulated among people who share similar attributes (Palmore, 1967; Rogers and Bhowmik, 1970). As important as such strong and homophilous ties are in major events, however, they may be limited in offering other benefits. Transmission through strong ties, for example, tends to end or saturate early because messages re-circulate among those who already possess the same information. In other words, by transmitting redundant and overlapping information, homophilous communication poses a structural constraint on diffusion (Liu and Duff, 1972).

In contrast, the information transmitted through weak ties or unfamiliar people often leads to non-redundant social circles and brings about different returns that can be at least as significant as the transmissions among strong ties. On many occasions, particularly during job searches or people searches, weak ties can serve as a crucial vehicle that helps reach the goal more effectively. As Granovetter (1973, p.1372, note 17) recalled, "when [he] asked respondents whether a friend had told them about their current job, they said, 'Not a friend, an acquaintance'."

Seminal studies have focused on how weak ties turn out to be effective for social mobility, job searches, or idea diffusion (Granovetter, 1973, 1983; Milgram, 1967). Other well-known studies have emphasized the potential for social resources and social capital embedded in weak ties or structural holes in networks, which lead to non-redundant ties and bridges that help advance individuals in the job market (Burt, 1992, 2001; Lin, 2001a,b). More recent empirical inquiries have further elaborated how job information is transmitted or leaked through acquaintances or other weak ties (Forse, 2004; Harvey, 2008; McDonald et al., 2009). Although studies of strong ties are spread over various events, as well as the more general life domain, research on weak ties seems to be more constrained within certain areas. As a result, findings based on such empirical inquiries may not be easily generalized to everyday life.

To complement preexisting studies on weak ties, researchers need to extend their examinations to more life domains. For example, what do contacts with weak ties mean to individuals in everyday life? Under what circumstances in daily life can such ties bring about unexpected outcomes? Although it is

relatively easy to see the contribution of weak ties in major events, how likely is it that actors detect the tangible rewards that weak ties have brought about from ordinary interactions? In other words, do weak ties also play important roles during small events and trivial incidents? Many weak ties may indeed be "forgotten" and only become significant at certain critical moments. When such weak ties are dormant or seemingly "insignificant," what do people perceive about their contacts with these ties in their everyday experiences?

Most of these questions remain unanswered or even unexplored, thus limiting the extent to which the strength of weak ties hypothesis can be applied. As Granovetter (1973, p.1372) noted, chance meetings or mutual friends serve to reactivate such weak ties, which, in turn, provide crucial information. As recent studies have revealed, active social networking in everyday life helps expand citizens' connections with weak ties and participate more often in social life as effectively as joining formal organizations. Not only does such routine and all-encompassing networking help individuals obtain useful information, but it also enables citizens to polish their civic skills and to adopt specific political preferences (Denters et al., 2007; Andersen and Rossteutscher, 2007; Iglič and Fábregas, 2007; Walzer, 1989). Thus, it would be interesting to explore the extent to which weak ties may also matter in everyday social interactions, and how such effects of tie strength differ across various situations.

3. Contact as the Unit of Analysis

3.1. Relations as Aggregated Contacts

Using a contact as the unit of analysis adds another level to the analysis of social networks, thus opening up more opportunities for examining the strength of weak ties in everyday life. Data about weak ties have been more difficult to collect than those about strong ties. Like most other empirical studies about social interactions, social network research has focused more on strong ties, not just for conceptual significance but also for convenience in data collection and construction. As Granovetter (1973, p.1366) observed, many commonly used research instruments do not measure the importance of weak ties. Even though researchers recognize the significance of examining weak ties in everyday life, they still face the challenge of collecting reliable data for rigorous tests.

Researchers have designed network generators to help reconstruct network data. Most such generators, however, produce more information about strong ties within one's immediate social circles. The name generator, for example, sharply limits how many network members a respondent is allowed to list, thus generating friends and family members who often maintain close ties or frequent contacts (Burt, 1984; Marsden, 1990, 2003). In contrast, both the position generator and the resource generator tend to reach larger networks and thus help identify more targets in a network's outer layers (Lin and Dumin, 1986; Lin et al., 2001; van der Gaag and Snijders, 2005; van der Gaag et al., 2008). When more than one network member fits in a category, however, most survey respondents are still inclined to list the closest ties among these candidates, thus limiting our knowledge about weak ties (Fu, 2008).

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In addition, unaided recalls from survey respondents can be less reliable and highly selective, which also leads to a bias toward strong ties (de Sola Pool and Kochen, 1978, pp.19-21). To overcome the limitations of such instruments, it is imperative to collect network data that cover factual and exclusive ties. One of the few instruments that aims for such a goal is the *contact diary*, which tracks and records all the contacts that a diary keeper has had during a specific period of time.

Like a time-use diary that helps build a proxy for the investment individuals make in their social roles (Stalker, 2008, p.291), the contact diary helps produce baseline data from everyday life, which enables network researchers to reconstruct actual and comprehensive personal networks (Fu, 2005, 2007; Gurevitch, 1961; Lonkila, 1999). Not only does such a baseline data set allow researchers to study personal networks at both tie and network levels, but it also greatly facilitates their examination of the intricacies of social networking, contact by contact.

Understanding the basics of networking at the contact level represents a bottom-up approach similar to the "day reconstruction method" (Kahneman et al., 2004a,b), which explores how people perceive different events in their daily lives through either time-budget measurement or experience sampling. Both of these methods rely on actual events or encounters in everyday life, thus allowing researchers to investigate the "smallest-tightest" unit of social interactions in detail (Lofland, 1976, pp.27-28). Because interpersonal relations and social actions are built upon aggregated contacts, a lack of information about contacts would essentially limit our understanding of how a tie or network forms, sustains, and transforms. With such a bottom-up approach, therefore, researchers are able to distinguish and study situational factors contact by contact, within the same ties or relationships.

3.2. Contact Initiation

As Homans (1974, pp.313-315) deliberated in his classic arguments, social exchanges often implicitly regulate who is supposed to initiate an interpersonal contact, particularly when the actors' statuses are unequal. As a social norm in many societies, who initiates a contact carries important implications for behavioral outcomes. To extend this crucial line of inquiries about contact situations, we further examine the strength of weak ties by contact initiation.

When an individual contacts someone in his or her personal network for special needs, the action may be intuitive or the outcome of careful calculation and deliberation, upon which the actor believes the action to be more likely to lead to success. Not all interpersonal contacts take place at actors' will. People with strong ties may "meet voluntarily and in several contexts," while contacts among weaker ties are often less voluntary and more specialized (Wellman and Tindall, 1993, p.70). Still, under certain circumstances people avoid having contacts as much as they can. Although such "avoidance relationships" play a role in minimizing negative impacts from unsolicited encounters (Goffman, 1967, p.15), "initiation of contact" often helps distinguish major circumstances in social interactions.

Many individuals indeed "manipulate" their networks to achieve specific goals, either through a friend's friends or other indirectly tied persons, two common types of weak ties. After all, weak ties are important "not only in ego's manipulation of networks, but also in that they are channels through which ideas, influences, information socially distant from ego may reach them" (Granovetter, 1973, pp.1370-1371).

Whether for instrumental or affective needs, everyday life is full of goal-oriented social interactions. To maximize the likelihood of success in social interactions, people often reach beyond their immediate social circles for better-suited targets. Therefore, self-initiated contacts are expected to bring about more significant outcomes in the first place, whereas contacts initiated by others may be less significant. Even though people often initiate contact to get help, under certain circumstances, individuals also take the initiative to offer assistance, for example, when close friends or kin members are desperately in need (Wellman and Tindall, 1993).

The aforementioned presumptions leave us with two sets of questions to explore. First, to what extent do contacts with weakly tied others give an individual more significant gains than those with strong ties in everyday life? Second, how do such outcomes of contacts vary by contextual factors, such as contact initiation and the purposes of contacts? More specifically, when one takes the initiative to contact others, does the effect of tie strength differ from that of contacts initiated by others? If the weak ties argument holds, we would expect, in general, that contacts with weak ties in everyday life result in more significant gains. According to the principle of social exchange and interactions, such gains should be particularly significant when one initiates the contacts. Interpersonal contacts in everyday life vary by contents and purposes, however, which also affect the outcome of contacts. To take this factor into account, we further examine the relationship between tie strength and contact initiation along with another major contextual factor – whether a contact is for instrumental, affective, or other purposes.

4. Data and Measures

4.1. Participants and Key Variables

Data were drawn from 55 contract diaries collected in Taiwan. In early 2004, 21 respondents from a random sample (who completed a follow-up interview after a nationwide probability survey) volunteered to participate in our diary study; another 34 volunteers were recruited from survey fieldwork supervisors' personal networks. Of the 55 informants who kept diaries for three consecutive months by recording all one-on-one interpersonal contacts (including anyone with whom they chatted, talked, or discussed matters, whether they personally knew the target person or not),[1] 23 were males and 32 were females. The

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[1]The instruction in each contact diary reads, "Please record the following information for *every* contact that you have made today, including all kinds of one-on-one contacts such as

informants' median age was 36 (ranging from 21 to 61); about 75% were married and 34.5% had a college education. They worked in various occupations and industries spreading mainly across the service sector, although 13 were not in the job market. About 73% lived in the northern part of Taiwan, the only factor significantly over-represented in the sample. In sum, the informants are not representative of any particular populations, but their diversified backgrounds provide variations for multivariate analyses.

These 55 three-month diaries yielded a total of 104,361 contacts, thus providing comprehensive information about individuals' daily interpersonal contacts. Each contact contained 28 variables, which covered contact situations, demographic and socioeconomic background of the contacted person, and the relationship between the diary keeper (Ego) and each contacted person (Alter) at the time of contact.

Among these variables, four are central to this study: familiarity between each pair of Ego and Alter, benefit from contact, contact initiation, and purposes of contact (Table 1). A fifth variable, kin (family and relatives) versus non-kin, distinguishes major types of relations and serves to screen out cases that are too skewed to be analyzed properly.

(Table 1 about here)

Familiarity (the first variable) resembles "closeness," which has been regarded as reflecting "the emotional intimacy of a relationship," probably the best indicator of tie strength (Campbell and Lee, 1991; Granovetter, 1983; Marsden and Campbell, 1984; Mitchell, 1987). Instead of using "preferring to do something with," "spending time together," "frequency of contact," or "type of relationships" (Granovetter, 1973, pp.1371-1376, 1983, p.205; Harvey, 2008), we asked the diary keeper to judge "how well did you know the person before this specific contact?" This variable measures the strength of ties and serves to differentiate weak from strong ties.

For practical purposes in conducting our statistical analyses, we divide the original ordinal categories into either strong ties or weak ties. First, we pool (4) "know very well" (46.9%) and (3) "know somewhat well" (22.5%) into "strong ties," and (2) "not very well" (11.3%) and (1) "not at all well" (19.3%) into "weak ties." In alternative analyses, we consider only "know very well" as "strong ties," and compare the findings with other dichotomous measures. To minimize possible biases from outliers, we exclude those cases where the diary keeper made only one contact with either strong or weak ties.

The second variable, benefit from contact, measures the extent to which Ego regarded each specific contact as beneficial after it occurred. "Benefit" refers to how much Ego gained from the contact or how important Ego felt about each contact, thus reflecting the subjective evaluation of contact. We also pool the original four ordinal categories into two: about 55.7% of all contacts are recoded

saying hello, chatting, talking, meeting, or sending or receiving a message, that occurred face-to-face, over the phone, on the Internet, or by other means of communication."

as "beneficial," including (4) "very beneficial" and (3) "somewhat beneficial" to Ego, and 44.3% are recoded as "not beneficial," including (2) "not very beneficial" and (1) "not at all beneficial."

The third variable helps identify who initiated the contact, which lets us examine the strength of weak ties under different contact situations. Of all contacts, about 40.3% were initiated by Ego, 28.5% by Alter, and 31.2% by both parties, casual encounters, or introduced by others.

The fourth variable distinguishes between "instrumental" and "affective" contacts. Instrumental contacts refer to those made for work (24.2%) or for business (13.1%), and affective contacts are either for leisure (7.4%) or social reasons (13.1%). The variable allows us to examine how the effect of tie strength varies by the purposes of contacts. Other contacts involved with purposes that were not clearly identifiable, such as daily routine (31.2%), multiple purposes (4.6%), and others (6.4%).

4.2. Comparing Familiarity with Other Indicators of Tie Strength

To reassure that the subjective evaluation of familiarity corresponds well with other possible measures of tie strength, we cross-examine the association between the degree of familiarity and two sets of similar variables. The first set is the frequencies of contact between Ego and Alter, both by face-to-face and by phone.[2] The second set refers to years of acquaintanceship between Ego and Alter, in five ordinal categories, from (1) "less than a year" to (5) "more than 20 years".

Despite rare occasions when Ego has many contacts with a particular unfamiliar alter, the results of both Chi-square test (including likelihood ratios for a better approximation when the number of observations is large) and Linear Trend test (for ordinal variables) of independence show that the degree of familiarity is positively associated with the three alternative measures. All the test results are significant at the 0.000 level (See Table 2). Our results are consistent with those from earlier studies of interpersonal contacts, particularly Wellman and Tindall's (1993) findings in Canada, which showed that those with strong ties talked to each other on the telephone much more often than those with weak ties. Even though these "objective" alternative measures may not reflect voluntary relationship and the actual strength of ties, such positive and strong associations help justify using the degree of familiarity as a measure of tie strength.

<center>(Table 2 about here)</center>

As with other measures of tie strength, familiarity may carry complex implications. On the one hand, frequent contact may not necessarily foster friendship,

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[2]Another measure, the frequency of mail or email contact, is excluded from the analysis because its distribution is too skewed (about 82.3% of such contacts are with someone Ego has never contacted, with a skewness coefficient of 2.86.)

and familiarity may even breed contempt, particularly among unsolicited primary relations. On the other hand, familiarity may engender trust in everyday life (Small, 2009, p.249). In sum, our measure of tie strength provides an alternative that somehow captures both objective and subjective evaluations of a tie.[3]

We use this intuitive evaluation of familiarity to define tie strength for two further, practical reasons. First, Ego might contact the same Alter by more than one means (e.g., face-to-face and phone) on the same day, yet record each means of contact in the diary log as a separate and independent entry. Second, research participants recorded the contact diary for only three months, which was a short time compared with the actual length of acquaintanceship.

5. Benefit from Contacts with Weak Ties

Having defined our measure of tie strength, we explore our data set by examining whether strong or weak ties bring about more beneficial results to Ego. Figure 1 shows the correlation between the probabilities of Ego's beneficial contacts obtained from strong ties and weak ties. The intercept and slope of the regression line shown in Figure 1 are 0.224 and 0.623, respectively. The R^2 value is 0.519, showing a strong and positive correlation between the beneficial results Ego obtained from the contacts with both strong and weak ties. The positive parameter of the intercept suggests that when the probability of beneficial results obtained from contacts with strong ties is relatively low, the probability of such results with weak ties is higher. Thus, at first glance, it appears that individual differences rather than the strength of ties may decide to what extent Ego is able to gain from such contacts in everyday life.

(Figure 1 about here)

Our data set contains a large number of heterogeneous entities that comprise a complex structure requiring careful examination and screening to prevent potential biases, such as those related with Simpson's paradox. We first break down all contacts by types of relationships (that is, kin versus non-kin ties). The number of contacts with weakly tied kin members turns out very small (only 404, or 1.7%, of 22,787 kin conacts are with weakly-tied family and relatives.) In contrast, 31,073, or 38.8%, of 80,038 contacts with non-kin alters are rated as contacts with weak ties. It could be true that our informants had indeed very

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[3]A direct translation of the term "closeness" in Chinese would have carried strong implications for emotional attachment in Taiwanese society, which would be further contaminated by the gender issue (e.g., it would be too sensitive for many to admit "very close" cross-gender relations). As a result, we used the Chinese term "shou" in the diaries, which indicated the degree of familiarity in relationships literally. In practice, however, when a diary keeper judged that "we know each other very well," it often referred to a significant relation, regardless how close they might feel to each other. In addition, when a previously familiar relationship deteriorated, most actors would contact each other less often, the tie strength would weaken, and the diary keepers would downgrade the relationship on the scale of familiarity.

limited contact with unfamiliar family and relatives. Alternatively, residents in Taiwan may almost always treat extended family members as strong ties, unlike those in many Western societies, which suggests that the significance of kin may vary from culture to culture. To avoid any biases that such an uneven distribution (or distinctive social norms) may cause, thus, we focus more on contacts with non-kin ties.

Because the effects of tie strength may be confounded by factors embedded in routine daily contacts (such as when familiy or coworkers have contact with each other without specific purposes), we also try to limit our analysis to non-routine contacts in the next step. With detailed information about such contact situations, then, we are able to distinguish and compare how weak ties may bring about positive outcomes between Ego-initiated and Alter-initiated contacts under various circumstances. As descriptive statistics show in Table 3, while 58.8% of all Ego-initiated contacts with strong ties turn out to be beneficial, 62.3% of that with weak ties benefit Ego. The Alter-initiated contacts with weak ties, however, tend to be less beneficial to Ego. Non-routine contacts are more beneficial overall, but the link between benefit and tie strength differs by contact initiation.

<center>(Table 3 about here)</center>

In order to untangle these potential contextual variations, we introduce in the following section a method that helps clarify whether strong or weak ties result in more fruitful returns. We tailor our methodology to the format of our data set, as conventional methods might be unfitting for our purpose. Since we have broken down relationships into contacts, the unit of analysis becomes contact rather than individual or interpersonal tie.

6. Testing the Strength of Weak Ties by Contact Initiation

To test whether the contacts with strong or weak ties bring about more beneficial results to Ego, we run a series of significance tests for the differences between two types of contacts. The variable on which our test statistics are based is the probability for Ego to benefit from a contact. To model this variable of probability, we make the following assumptions. (1) For every Ego, the total number of alters available for making a contact is fixed. (2) All of the contacts can be classified into K different types. (3) For each contact of the same type between an identical pair of Ego and Alter, the probability for Ego to benefit is constant. (4) For any two contacts made t days apart by the same Ego, the interdependence between the two contacts decreases to near zero as t becomes very large.

In Assumption (1) we denote the number of alters by A_i for Ego i. The first three assumptions serve to ensure the constancy of the underlying probability structures. The last assumption aims to guarantee that the outcomes of all contacts made by the same Ego will not be too strongly correlated with one another, so that certain parameters of interest can be consistently estimated. To

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simplify notation, the type-k contact made by Ego i with Alter j is abbreviated as contact (i, j, k). Let $\mu_{i,k}$ denote the probability for a type-k contact made by Ego i being beneficial, and $\mu_{i,j,k}$ the probability for contact (i, j, k) being beneficial. From the assumptions above, it follows that for Ego i

$$\mu_{i,k} = \sum_{j=1}^{A_i} w_{j,k}^i \mu_{i,j,k} \ \ with \ \ k = 1, 2, ..., K, \tag{2}$$

where $w_{j,k}^i$ denotes the proportion of contact (i, j, k)'s in the population of contacts made by Ego i to all alters.

To classify the contacts into the types that are particularly relevant to our analysis, we use five indicator functions defined in accordance with the five variables introduced in Section 4.1. An indicator function or a product of some of the five indicator functions specifies the type to which a contact belongs. Then, a natural estimate for $\mu_{i,k}$ is the ratio of the number of Ego i's beneficial type-k contacts to the number of Ego i's all type-k contacts. Under Assumptions (3) and (4) and some mild regularity conditions, the estimate can be shown to be consistent if every Ego had made many contacts in a long period of time.

Next, for Ego i we denote the probability of beneficial results obtained from the contacts with strong ties by S_i and that obtained from the contacts with weak ties by W_i. In reference to the formulation of model (2), K is 2, that is, strong-tie or weak-tie contact; and for Ego i, $\mu_{i,k}$ here is S_i or W_i. For all i define

$$D_i = S_i - W_i$$

$\{D_i, 1 < i < 55\}$ is regarded as an unobserved sample from a distribution $D(\theta, v^2)$, with mean θ and variance v^2. In other words, each Ego is independently assigned a prior value D_i sampled from the fixed $D(\theta, v^2)$, which represents the distribution of the differences between an ego's gains S_i obtained from the contacts with strong ties and the gains W_i from weak ties. Our goal is to test whether the expected θ of the distribution is null or not, or formally,

$$H_0 : \theta = 0 \ \ vs \ \ H_1 : \theta \neq 0.$$

Let $\hat{S}_i = \frac{I_i^S}{M_i^S}$ denote the empirical probability of beneficial returns brought by the contacts with strong ties; here M_i^S is the total number of contacts with strong ties obtained by Ego i and I_i^S is the number of contacts that result in beneficial returns. Analogously, we define $\hat{W}_i$ as $\hat{W}_i = \frac{I_i^W}{M_i^W}$ for the probability of beneficial results obtained through the contacts with weak ties.

We then define

$$\hat{D}_i = \hat{S}_i - \hat{W}_i = D_i + \varepsilon_i,$$

where $\varepsilon_i = \hat{D}_i - D_i$ stands for the approximation error for Ego i. We assume that ε_i's are independent and have zero-expectation and finite-variance, but do not necessarily have the same distribution. Note that under $H_0, E\hat{D}_i = 0$.

The test statistic we use is

$$Z_n = \frac{\sum_{i=1}^{n} \hat{D}_i}{\sigma \sqrt{n}}$$

where n is the total number of Egos. Denote the variance of $\hat{D}_i$ by σ_i^2 (under the null hypothesis) and assume

$$\lim_{n \to \infty} \frac{\sigma_1^2 + \sigma_2^2 + ... + \sigma_n^2}{n} = \sigma^2 < \infty, \tag{3}$$

which essentially says that σ_i^2's center closely around a fixed average σ^2. Then, by equation (3) and Lyapunov's central limit theorem (see Resnick, 1999, pp.319-321), Z_n converges to a normal distribution $N(0, \sigma^2)$ as n tends to infinity.

It follows from equation (3) that the sample variance $\sum_{i=1}^{n} \frac{\hat{D}_i^2}{n}$ serves as a consistent estimate of the limiting variance σ^2, and we will later use the sample variance for inference. By taking into account the heteroscedasticity among ε_i's, we also employ the bootstrap resampling method (Efron, 1982), with 500 bootstrap samples for each test, to estimate σ^2.

That is, for each Ego, we first calculate the difference between the probabilities of beneficial returns obtained through the contacts with strong ties and weak ties. Then we draw 55 random samples with replacement of such a difference $\hat{D}_i$ and repeat this process 500 times. The bootstrap resampling method enables us to generate bootstrap replications $\hat{D}_i^*$, and then use these replications to decide the critical values for our test.

As stated earlier, we are interested in understanding human motivation and behavior by examining contact initiation in everyday life. So we select contacts initiated by Ego and those initiated by Alter from our database and categorize them into two sub-groups, to draw comparisons with those contacts in which neither Ego nor Alter initiated the interaction. We have also mentioned that very few family members and relatives are considered as weak ties. So within each sub-group of contact initiation, we further compare between those contacts including and excluding kin members. From within each sub-group, we compute the probabilities of benefits obtained through contacts with strong ties and those with weak ties for each Ego, and we then test the difference between the two with the bootstrap resampling method. The results from bootstrap replications appear in Figure 2.

(Figure 2 about here)

The values of Ego-initiated contacts are by and large negative, indicating that weak ties appear to be more beneficial than strong ties. In contrast, the values of Alter-initiated contacts are generally positive, showing that strong ties tend to be more beneficial when Ego is contacted by Alter. The results could vary slightly each time because of the nature of the bootstrap resampling method. None of the results, however, has altered the acceptance or rejection of our null hypothesis, since the p-values remain consistent each time.

As our method reflects an absolute difference between beneficial contacts obtained through strong and weak ties, we also adopt the Wilcoxon signed ranks test to detect the relative difference between the two. The results of both our model and the Wilcoxon signed ranks test are shown in Table 4.

(Table 4 about here)

As shown in Figure 2, the probabilities of obtaining beneficial returns through contacts with strong and weak ties clearly differ by contact initiation. Although Ego-initiated contacts tend to benefit more from weak ties, Alter-initiated contacts are more beneficial to Ego when the Ego-Alter ties are strong. In other words, when Ego takes the initiative to contact another person, unfamiliar acquaintances tend to be more helpful; whereas when the other party initiates a one-on-one contact, it is those with whom Ego is more familiar that are potentially more helpful.

Such differences are statistically significant, as Table 4 shows. The first two rows (all contacts) of our model indicate that, without taking contact initiation into account, the differences between the gains obtained through strong and weak ties are not significant. This finding is consistent with the result revealed in Figure 1, even though the negative Z-scores suggest that weak ties may bring about slightly more fruitful outcomes.

When we test the effect of weak ties by contact initiation, however, the results clearly vary. For all Ego-initiated contacts, the negative Z-scores ($P = 0.005$ for all contacts) indicate that weak ties result in more positive gains than strong ties.[4] Such differences remain significant ($P = 0.000$) after we exclude kin members that may cause biases because of the skewed distribution on the strength of tie, and also by counting only non-routine non-kin contacts ($P = 0.007$, thus ruling out contacts such as sending messages or chatting for no particular reason).

In contrast, when Alter initiates a contact, it is strong rather than weak ties that yield more rewarding results for Ego ($P = 0.023$, Table 4). Such an effect of tie strength remains significant after excluding routine contacts as well

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[4]As our model defines the difference between strong and weak ties as $S_i - W_i$, negative Z-scores suggest that the probabilities of beneficial contacts obtained through weak ties are larger than those obtained through strong ties. As we are interested in testing which type of tie is more beneficial, we mainly look at one-sided tests.

as contacts with family and relatives ($P = 0.028$). As confirmed by the same results from Wilcoxon signed ranks test, we can assume that the effects of tie strength vary by contact initiation in both absolute and relative terms.

Such variations by contact initiation change after we further take into account the purposes of contact, however. If Ego contacts Alter for instrumental purposes (for work and business), weak ties remain slightly more beneficial, but the difference is only marginal ($P = 0.080$). When Ego-initiated contacts are affective (for leisure and social purposes), in contrast, strong ties turn out to benefit Ego more ($P = 0.007$). As for Alter-initiated contacts, the effect of tie strength has little to do with instrumental actions ($P = 0.166$), while strong ties are also highly beneficial to Ego among affective interactions ($P = 0.002$). In other words, weak ties may be beneficial only when Ego contacts someone for instrumental reasons, and such benefits are marginal. When contacts are for leisure or social purposes, strong ties bring about more beneficial outcomes, regardless whether Ego or Alter starts the contact.

As with other measures and operational definitions, the significance of tie strength may differ by varying the categorization of measurements. For example, when we run the same analysis using only "know very well" as "strong ties" (the measure of "weak ties" remains the same), the results change slightly. The weak tie effects among Ego-initiated instrumental contacts further diminish ($Z = -0.232, P = 0.409$) but the strong tie effects among Alter-initiated instrumental contacts become significant ($Z = 1.955, P = 0.025$). Thus, compared to those "not very well" or "not at all well" known, the really strong ties turn out to be very helpful when they contact Ego, not just for affective but also for instrumental purposes.

7. Discussions and Conclusions

The findings shed new light on how the effects of weak ties in everyday life vary under different circumstances. Two such circumstances, contact initiation and purpose of contact, prove distinctive and critical: When Ego contacts someone, the returns on the contact will be greater if the target is unfamiliar. This effect remains noticeable when we exclude all contacts with family and relatives, as well as routine contacts. When someone else contacts Ego instead, Ego tends to benefit more from strong ties than weak ties. Such relationships between contact initiation and tie strength, however, are further contingent upon the purpose of contact. The benefits of weak ties are positive but marginal among Ego-initiated instrumental contacts. When Alter initiates such instrumental contacts, in contrast, it is those who are very well known that yield most beneficial results to Ego. Furthermore, strong ties are apparently more rewarding in bringing about affective returns, whether Ego or Alter initiates a contact.

The differences in returns between Ego-initiated and Alter-initiated contacts, as well as between instrumental and affective contacts, suggest that researchers should pay more attention to such contact situations as initiation and purpose of interactions, which represent circumstantial forces that help explain the intricacies of reciprocity and exchange in social interactions. The findings also call

for interpretations based on behavior motivation or purposive social actions. For example, when Ego desperately needs specific help or critical information through personal assistance, his or her unfamiliar acquaintances are less likely to know about such needs, nor would they offer help by contacting Ego. Thus, Ego would need to take the initiative and go ask weak ties for help. For such calculated actions with specific purposes in mind, Ego-initiated contacts with weak ties ought to be more fruitful. Because our contact diaries asked informants to record contacts with anyone, however, an instrumental contact with unknown professional (e.g., when going to the doctor) may turn out to be very beneficial. Future studies may need to take such potential biases into consideration. In contrast, strong ties would be more likely to learn about Ego's needs, and thus reach out and give Ego a hand. As illustrated in earlier studies (Wellman and Tindall, 1993), those strongly tied others often make an effort to offer not only emotional support but also instrumental assistance when they know their close friends are in urgent need. In that regard, the contacts that strong ties initiate normally become more beneficial to Ego.

The study of weak ties has been overwhelmingly limited to specific life events or social phenomena. Our research based on contact diaries complements such a tendency by exploring the strength of weak ties in everyday life. Whether for affective or instrumental needs, everyday life is full of goal-oriented social interactions. To maximize the likelihood of success in social actions, people often reach beyond their immediate social circles to ask better-suited targets for help. Therefore, Ego-initiated contacts are expected to bring about more significant outcomes. By taking into account the interaction between contact initiation and the purpose of contact, our analyses help reveal contextual variations in the extent to which social outcomes vary by tie strength in everyday life.

Our approach allows us to examine such contact situations, as well as tie characteristics, contact by contact for 3 months. For example, assumption (3) given in Section 6 allows the strength of ties to vary over time. The probability remains unchanged as long as the contact is of the same type and involves the identical pair of Ego and Alter. More extensive and longitudinal data at contact, tie, and individual levels, over a longer time span, would facilitate further analyses of dynamic social networks. In particular, it would be more feasible to identify how tie strength between Ego and Alter changes over time if some of the contact diaries could be replicated a few years apart. As Ego's benefits from contacts with Alter may fluctuate from time to time, it would be intriguing to further examine to what extent the changing tie strength with Alter plays a role in inducing the benefits. Alternatively, a tie could also strengthen or weaken as a result of gaining or losing from a series of contacts with Alter.

Conceptually, daily lives are mostly so eventless that it is hard to imagine why and how routine contacts with weakly tied acquaintances could bring about any fruitful outcomes. As recent studies have also explored how weak ties are linked to creativity, as well as how structural holes lead to new ideas in the business world (Baer, 2010; Burt, 2004), future studies also should explore other contexts in everyday life where the strength of weak ties has been hidden.

References

Andersen, J. G., Rossteutscher, S., 2007. Small-scale democracy: citizen power in the domains of everyday life. In: van Deth, J. W., Montero, J. R., Westholm, A. (Eds.), Citizenship and Involvement in European Democracies: A Comparative Analysis. Routledge, London, pp.221-254.

Baer, M., 2010. The strength-of-weak-eies perspective on creativity: a comprehensive examination and extension. Journal of Applied Psychology 95, 592-601.

Bian, Y., 1997. Bringing strong ties back in: indirect connection, bridges, and job search in China. American Sociological Review 62, 366-385.

Bashi, V. F., 2007. Survival of the Knitted: Immigrant Social Networks in a Stratified World. Stanford University Press, Stanford, CA.

Burt, R. S., 1984. Network items and the general social survey. Social Networks 6, 293-339.

Burt, R. S., 1992. Structural Holes. Cambridge University Press, Cambridge.

Burt, R. S., 2001. Structural holes versus network closure as social capital. In: Lin, N., Cook, K. Burt, R. S. (Eds.), Social Capital: Theory and Research. Aldine de Gruyter, New York, pp.31-56.

Burt, R. S., 2004. Structural holes and good ideas. American Journal of Sociology 110, 349-99.

Campbell, K. E., Lee, B. A., 1991. Name generators in surveys of personal networks. Social Networks 13, 203-221.

de Sola Pool, I., Kochen, M., 1978. Contacts and influence. Social Networks 1, 5-51.

Denters, B., Gabriel, O., Torcal, M., 2007. Norms of good citizenship. In: van Deth, J. W., Montero, J. R., Westholm, A. (Eds.), Citizenship and Involvement in European Democracies: A Comparative Analysis. Routledge, London, pp.88-108.

Efron, B., 1982. The Jackknife, the Bootstrap, and Other Resampling Plans. Society for Industrial and Applied Mathematics, Philadelphia.

Forse, M., 2004. Role and rise of social capital. In: Flap, H. D., Völker, B. (Eds.), Creation and Returns of Social Capital: A New Research Program. Routledge, London, pp.254-275.

Fu, Y.-C., 2005. Measuring personal networks with daily contacts: a single-item survey question and the contact diary. Social Networks 27, 169-186.

Fu, Y.-C., 2007. Contact diaries: building archives of actual and comprehensive personal networks. Field Methods 19, 194-217.

Fu, Y.-C., 2008. Position generator and actual networks in everyday life: an evaluation with contact diary. In: Lin, N., Erickson, B. H. (Eds.), Social Capital: An International Research Program. Oxford University Press, Oxford, pp.49-64.

Goffman, E., 1967. Interaction Ritual: Essays on Face-to-Face Behavior. Aldine Pub. Co., Chicago.

Granovetter, M. S., 1973. The strength of weak ties. American Journal of Sociology 78, 1360-1380.

Granovetter, M. S., 1983. The Strength of Weak Ties: A Network Theory Revisited. Sociological Theory 1, 201-233.

Gurevitch, M., 1961. The Social Structure of Acquaintanceship Networks. Unpublished Ph.D. Dissertation. MIT.

Harvey, W. S., 2008. Strong or weak ties? British and Indian expatriate scientists finding jobs in Boston. Global Networks 8, 453-473.

Homans, G. C., 1974. Social Behavior: Its Elementary Forms. Revised Edition. Harcourt Brace Jovanovich, Inc., New York.

Iglič, H., Fábregas, J. F., 2007. Social networks. In: van Deth, J. W., Montero, J. R., Westholm, A. (Eds.), Citizenship and Involvement in European Democracies: A Comparative Analysis. Routledge, London, pp.188-218.

Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., Stone, A. A., 2004a. A survey method for characterizing daily life experience: the day reconstruction method. Science 306, 1776-1780.

Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., Stone, A. A., 2004b. Toward national well-being accounts. American Economic Review 94, 429-434.

Lin, N., 2001a. Social Capital: A Theory of Social Structure and Action. Cambridge University Press, Cambridge.

Lin, N., 2001b. Building a network theory of social capital. In: Lin, N., Cook, K., Burt, R. S. (Eds.), Social Capital: Theory and Research. Aldine de Gruyter, New York, pp.3-29.

Lin, N., Dumin, M., 1986. Access to occupations through social ties. Social Networks 8, 365-385.

Lin, N., Fu, Y.-C., Hsung, R.-M., 2001. The position generator: measurement techniques for investigations of social capital. In: Lin, N., Cook, K., Burt, R. S. (Eds.), Social Capital: Theory and Research. Aldine de Gruyter, New York, pp.57-82.

Liu, W., Duff, R. W., 1972. The strength in weak ties. Public Opinion Quarterly 36, 361-366.

Lofland, J., 1976. Do Social Life: Qualitative Study of Human Interaction in Natural Settings. John Wiley & Sons, New York.

Lonkila, M., 1999. Social Networks in Post-Soviet Russia: Continuity and Change in the Everyday Life of St. Petersburg Teachers. Kikimora Publications, Helsinki.

McDonald, S., Lin, N., Ao, D., 2009. Networks of opportunity: gender, race and unsolicited job leads. Social Problems 56, 385-402.

Marsden, P. V., 1990. Network data and measurement. Annual Review of Sociology 16, 435-463.

Marsden, P. V., 2003. Interviewer effects in measuring network size using a single name generator. Social Networks 25, 1-16.

Marsden, P. V., Campbell, K. E., 1984. Measuring tie strength. Social Forces 63, 482-501.

Massey, D. S., Goldring, L., Durand, J., 1994. Continuities in transnational migration: an analysis of nineteen Mexican communities. American Journal of Sociology 99, 1492-1533.

Milgram, S., 1967. The small-world problem. Psychology Today 1, 62-67.

Mitchell, J. C., 1987. The components of strong ties among homeless women. Social Networks 9, 37-47.

Palmore, J. A., 1967. The Chicago snowball: a study of the flow and diffusion of family planning information. In: Bogue, D. J. (Ed.), Sociological Contributions to Family Planning Research. Community and Family Study Center, University of Chicago, Chicago. pp.272-363.

Resnick, S. I., 1999. A Probability Path. Birkhäuser, Boston.

Rogers, E. M., Bhowmik, D. K., 1970. Homophily-heterophily-relational concepts for communication research. Public Opinion Quarterly 34, 523-538.

Small, M. L., 2009. Unanticipated Gains: Origins of Network Inequality in Everyday Life. Oxford University Press, Oxford.

Stalker, G. J., 2008. Measuring diversity in daily social contact: the contribution of social context, work and leisure on the opportunity for engagement. Social Indicator Research 86, 275-295.

Tindall, D. B., Cormier, J. J., 2008. Gender, network capital, social capital, and political capital: the consequences of personal network diversity for environmentalists in British Columbia. In: Lin, N., Erickson, B. H. (Eds.), Social Capital: An International Research Program. Oxford University Press, Oxford, pp.282-307.

van der Gaag, M., Snijders, T. A. B., 2005. The resource generator: social capital quantification with concrete items. Social Networks 27, 1-29.

van der Gaag, M., Snijders, T. A. B., Flap, H., 2008. Position generator measures and their relationship to other social capital measures. In: Lin, N., Erickson, B. H. (Eds.), Social Capital: An International Research Program. Oxford University Press, Oxford, pp.27-48.

Walzer, M., 1989. Citizenship. In: Ball, T., Farr, J., Hanson, R. L. (Eds.), Political Innovation and Conceptual Change. Cambridge University Press, Cambridge, pp.211-219.

Wegener, B., 1991. Job mobility and social ties: social resources, prior job, and status attainment. American Sociological Review 56, 60-71.

Wellman, B., Tindall, D. B., 1993. How telephone networks connect social networks. Progress in Communication Sciences 12, 63-93.

Table 1

Table 1
Summary of Variables

A. Ties with the Contacted Person				
	Mean	**S.D.**	**Min**	**Max**
Familiarity (how well do you know the person?)				
(1) not at all well (2) not very well (3) somewhat well (4) very well				
	2.97	1.16	1	4
Frequencies of contact				
(1) never (2) seldom (3) sometimes (4) often				
face-to-face	3.01	1.11	1	4
phone	2.13	1.07	1	4
mail/email	1.24	0.59	1	4
Length of acquaintanceship				
(0) unknown (1) < 1 year (2) 1-4 years (3) 5-19 years (4) 20+ years				
	1.99	1.29	0	4
B. Contact Situations				
Benefit from contact				
(1) not at all (2) not very (3) somewhat (4) very beneficial				
	2.58	0.95	1	4
Initiation				
by ego	0.403	0.491	0	1
by alter	0.285	0.452	0	1
others	0.312	0.463	0	1
Purposes				
Instrumental (work & business)	0.373	0.484	0	1
Affective (leisure & social)	0.205	0.404	0	1
Neither (routine, multiple, others)	0.422	0.494	0	1

Table 2

Table 2
Crosstabs of Familiarity and Other Measures of Tie Strength, with Results of χ^2 and Linear Trend Tests

face-to-face contact	how well do you know the person?				
	not at all	not well	sw. well	very well	Total
never	15,893 (96.6)	403 (2.5)	97 (0.6)	54 (0.3)	16,447 (100.0)
seldom	2,268 (17.3)	4,210 (32.1)	3,492 (26.6)	3,142 (24.0)	13,112 (100.0)
sometimes	1,165 (4.4)	3,417 (12.9)	9,976 (37.7)	11,896 (45.0)	26,454 (100.0)
often	531 (1.1)	3,574 (7.6)	9,598 (20.5)	33,128 (70.8)	46,831 (100.0)
Total	19,857 (19.3)	11,604 (11.3)	23,163 (22.5)	48,220 (46.9)	102,844 (100.0)
Results of χ^2 Test	value=89,988.7, DF=9, likelihood ratio=80,377.4 ($P = .000$)				
Results of Linear Trend Test	value=56,905.5 ($P = .000$)				

phone contact	how well do you know the person?				
	not at all	not well	sw. well	very well	Total
never	18,956 (48.3)	6,404 (16.4)	7,545 (19.3)	6,263 (16.0)	39,168 (100.0)
seldom	698 (2.8)	3,619 (14.5)	8,243 (33.0)	12,459 (49.7)	25,019 (100.0)
sometimes	174 (0.7)	1,239 (5.1)	6,398 (26.1)	16,684 (68.1)	24,495 (100.0)
often	29 (0.2)	266 (1.9)	852 (6.2)	12,687 (91.7)	13,834 (100.0)
Total	19,857 (19.4)	11,528 (11.3)	23,038 (22.5)	48,093 (46.8)	102,516 (100.0)
Results of χ^2 Test	value=50,130.9, DF=9, likelihood ratio=55,453.2 ($P = .000$)				
Results of Linear Trend Test	value=38,519.5 ($P = .000$)				

duration of acquaintanceship	how well do you know the person?				
	not at all	not well	sw.well	very well	Total
0	16,650 (96.7)	492 (2.9)	51 (0.3)	13 (0.1)	17,206 (100.0)
< 1 year	1,949 (10.6)	6,084 (33.0)	6,662 (36.0)	3,755 (20.4)	18,450 (100.0)
1-4 years	804 (2.9)	3,548 (13.0)	10,665 (39.0)	12,364 (45.1)	27,381 (100.0)
5-19 years	277 (1.1)	1,354 (5.2)	4,952 (19.2)	19,255 (74.5)	25,838 (100.0)
> 20 years	177 (1.3)	143 (1.0)	839 (6.0)	12,836 (91.7)	13,995 (100.0)
Total	19,857 (19.3)	11,621 (11.3)	23,169 (22.5)	48,223 (46.9)	102,870 (100.0)
Results of χ^2 Test	value=107,235.9, DF=12, likelihood ratio=97,061.8 ($P = .000$)				
Results of Linear Trend Test	value=58,657.8 ($P = .000$)				

Note: Percentages are in parentheses.

Table 3

Table 3

Types of Contacts by Tie Strength and Contact Initiation

		Strong Ties	**Weak Ties**
Ego	All contacts	26,869 (15,797, 58.8%)	14,761 (9,195, 62.3%)
	Non-routine contacts	15,941 (10,601, 66.5%)	13,678 (8,804, 64.4%)
Alter	All contacts	21,326 (11,757, 55.1%)	7,448 (3,592, 48.2%)
	Non-routine contacts	14,767 (8,905, 60.3%)	6,603 (3,363, 50.9%)

Note: The number in each parenthesis is the number of beneficial contacts followed by its proportion.

Table 4

Table 4

Results of Statistical Test for Beneficial Returns Obtained from Contacts with
Strong and Weak Ties

Contact Initiation	Ties & Contexts	Our Model		Wilcoxon Test	
		Z	P-value	Z	P-value
All Contacts	Kin & nonkin	-0.488	0.313(0.626)	0.461	0.325(0.650)
	Nonkin	-1.455	0.073(0.146)	-0.310	0.381(0.762)
	Non-routine nonkin	-1.354	0.088(0.176)	-0.427	0.335(0.669)
	Instrumental	-1.080	0.141(0.282)	-0.865	0.194(0.387)
	Affective	3.718	0.000***(0.000***)	3.715	0.000***(0.000***)
Ego-Initiated	Kin & nonkin	-2.598	0.005**(0.010**)	-1.860	0.032*(0.063)
	Nonkin	-3.261	0.000***(0.001**)	-2.681	0.003**(0.007**)
	Non-routine nonkin	-2.444	0.007**(0.014*)	-1.692	0.046*(0.091)
	Instrumental	-1.402	0.080(0.160)	-0.615	0.270(0.538)
	Affective	2.479	0.007**(0.013*)	1.603	0.055(0.109)
Alter-Initiated	Kin & nonkin	1.997	0.023*(0.046*)	2.145	0.016*(0.032*)
	Nonkin	1.679	0.047*(0.093)	1.877	0.030*(0.061)
	Non-routine nonkin	1.910	0.028*(0.056)	2.086	0.019*(0.037*)
	Instrumental	0.971	0.166(0.332)	0.728	0.234(0.467)
	Affective	2.941	0.002**(0.003**)	3.023	0.002**(0.003**)

Note: $^*p < .05;^{**}p < .01;^{***}p < .001$.
Numbers in parentheses are 2-tailed p-values.

Figure Captions:
Fig. 1. Probability of Beneficial Contacts from Strong Ties and Weak Ties
Fig. 2. Bootstrap Distributions for Probability of Beneficial Contacts from
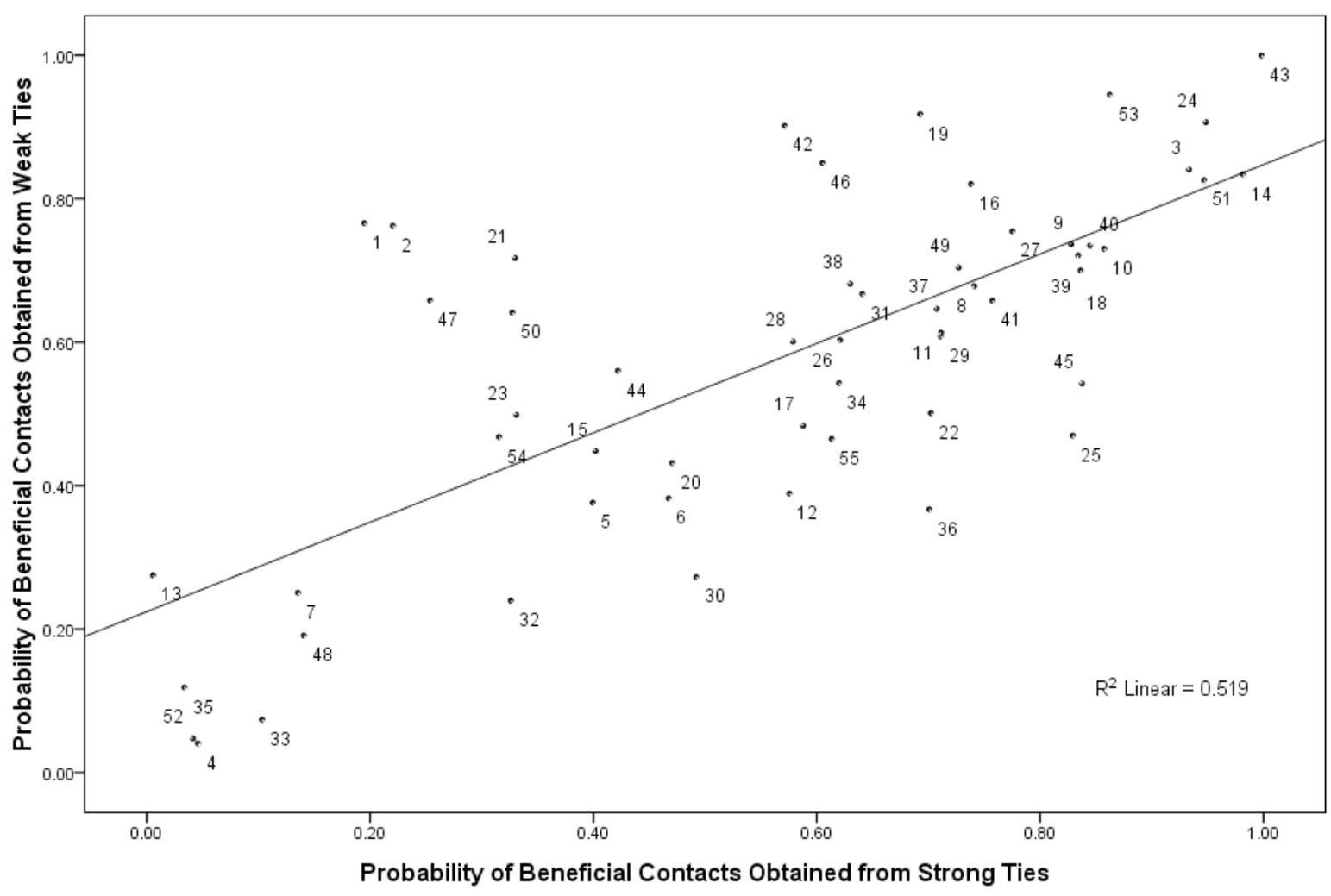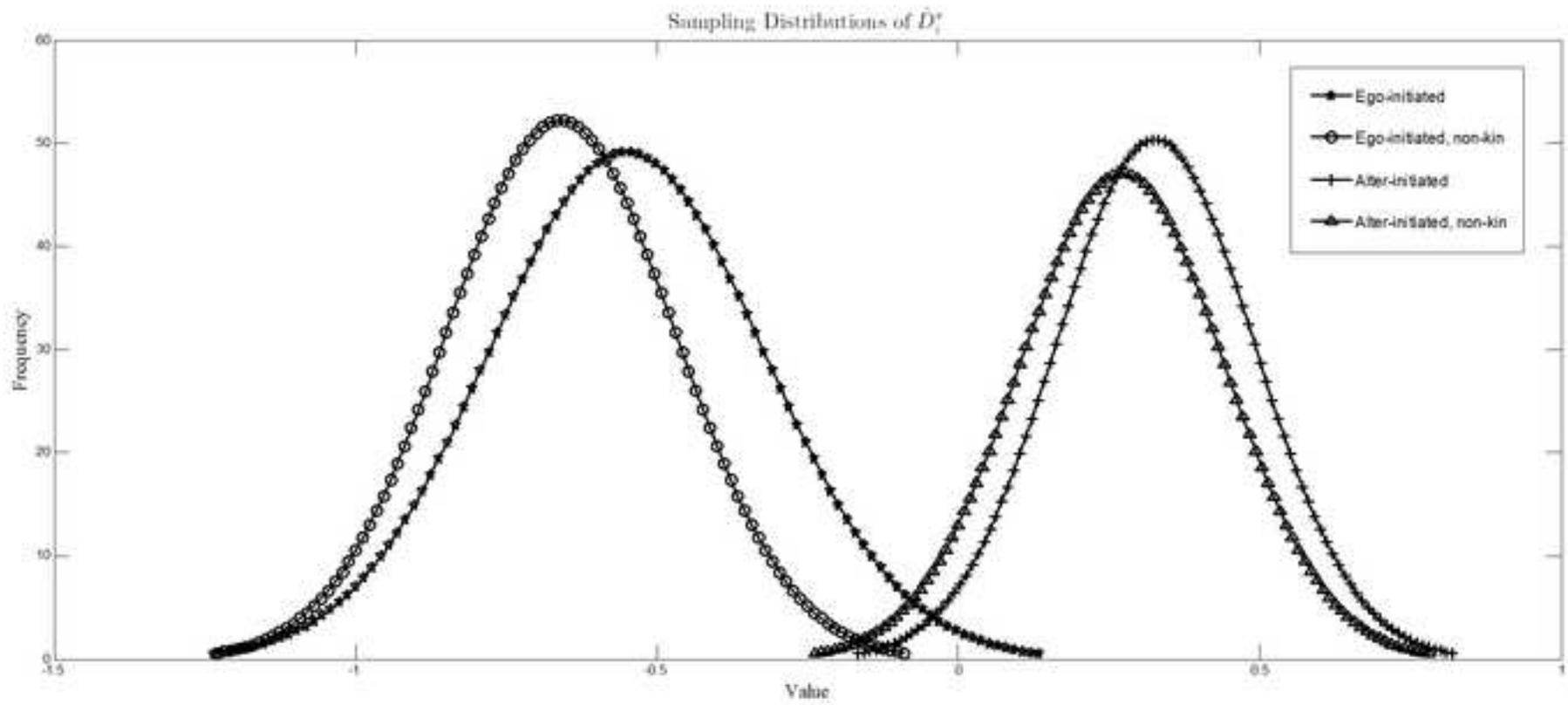Strong Ties and Weak Ties

Figure 1

Sampling Distributions of $\hat{D}_i^r$