

The Measurement of Social Networks: A Comparison of Alter-Centered and Relationship-Centered Survey Designs

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Abstract

Utilizing two surveys administered to a classroom of college students, this study explores differences in social network measures based on survey instrument design. By administering both a relationship-centered survey and an alter-centered survey, we analyze differences in range, mean numbers of relationships, network centralization, and network density. Nonparametric tests are also used to discern patterns of similarity and difference. We find that measurement differences are often negligible when asking about extremely close relationships like friendship. However, differences often appear when studying “weak tie” types of relationships such as recognition of classmate names or acquaintances.

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Introduction

Many important methodological issues have been raised for social network researchers to consider (e.g., Marsden, 1990). In part, a significant amount of research in this area has been devoted to testing survey questions for response effects. Survey researchers have explored the impact of question phrasing, question ordering, and survey design layout on individual response. As a result of this research, a series of recommendations have been developed to help ensure that researchers are able to elicit responses while reducing non-response and measurement error (Braverman and Slater, 1997; Dillman, 2000). Unfortunately for social network researchers, most of this literature is aimed at researchers who have little interest in examining social network structures. The survey methodology literature tends to follow standard neo-classical economic assumptions that treat individuals as independent, atomistic units, and does not focus attention on the methodological challenges associated with measuring relational variables. As such, this literature does not present a coherent set of guidelines for the collection of social network data. Nevertheless, the structure of a survey may very well influence the quality of network data collected.

Fortunately, a number of studies exploring the impact of questionnaire construction and item writing on the quality of social network data collected have recently emerged. Marin (2004) considered the issue of name-generation versus questions about all alters, and found network-level measures differed substantially. Fu (2005) studied daily contacts in personal networks by utilizing two methods: a diary approach and a single-item survey. Kosovsek and Ferligoj (2005) examine differences in response by multiple methods – whether validity and reliability are affected by type of survey (phone vs. in-person) and by question (by alter vs. by question). Following a similar pattern, Coromina and Coenders (2006) checked layout and design of web surveys, including by question/by alter, graphics vs. text, and varying response labels, to assess network data quality.

Adding to this growing body of literature, our research uses social network data obtained from students in a college classroom to determine if differences arise among several network characteristics when we ask respondents about relationships using an *alter-centered* or a *relationship-centered* structured questionnaire. It is our aim in this research to further frame the discussion of survey design effects on the collection of social network data.

Collecting Network Data

As the popularity of collecting social network data with survey techniques has grown, attention has started to focus on assessing the networks' quality of measurement. Of interest to this study is the source and method of collecting information on social ties. Network researchers must make a number of decisions regarding how to measure the relationships between actors. Network researchers wishing to use survey instruments to collect data immediately face two key decisions. First, does the researcher provide the respondent with a list or roster of actors or allow the respondent to use free recall? Second, does the researcher allow a fixed maximum number of alters or an open-ended number of choices for respondents to make when identifying alters (Wasserman and Faust, 1995, p. 46)?

The primary difficulty in utilizing the roster format remains the potentially challenging task of creating an exhaustive list of all of the actors in a social network. For some research settings, a complete roster can be constructed and applied with relative ease, especially when the number of actors is limited. For instance, researchers can often obtain lists for students in a class from an enrollment roster, union participants as specified by dues-paying members, or membership lists for other bounded or relatively stable groups. In such cases, a respondent can be presented with an entire list of people in the network and then the researcher can ask the respondent to identify with whom the respondent shares a particular relationship. However, there are times when rosters are not readily available. In some settings, there are too many actors in the system to create a comprehensive list, while in other

situations exhaustive rosters are simply unknown. When the researcher cannot construct a complete roster of actors, the respondent can be asked to list those persons with whom the respondent had a particular relationship. For instance, respondents would be asked to “identify all friends.” This name-generator approach is likely to work well with questions about relationships that are salient and accessible to the respondent.

Another critical decision that network researchers face involves the number of actors the respondents are allowed to identify on the survey. This issue becomes very important if using the name-generator or free-recall approach. Often, time and space limitations prevent respondents from generating a complete list of actors with whom a particular relationship is shared. Instead, respondents are asked to name only a small number of people with whom they have a particular relationship. For example, respondents might be asked to identify “your three best friends” or “the five people with whom you discuss important matters.” Alternatively, respondents might be provided with an initial question without an upper limit on responses, but subsequent follow-up questions might ask information about only the first n people the respondent mentioned. This, too, can be problematic. As Holland and Leinhardt (1973) have suggested, by limiting the number of choices a respondent can make, an inherent selection bias may be present and therefore introducing measurement error.

Many of the design issues discussed above were taken into consideration with the first effort to collect representative social network data from the United States population in the 1985 General Social Survey (GSS). Prior to implementation of the GSS social network module, Burt (1984) conducted an extensive review of the amount of time it would take respondents to answer a series of 15 network-related questions, the number of alters a respondent would be asked to name, and the types of relationships about which respondents would be questioned. On the basis of this study, the social network module in the GSS used a

name-generator approach to identify alters, limited responses to five alters, and was estimated to take approximately eleven minutes to administer.

In this process, Burt also questions how information about relationships between pairs of alters should be gathered. Burt distinguishes between a “short-form” and a “long-form” questionnaire:

The short-form variation frames items in terms of a specific kind of relationship. The respondent is asked to identify people between whom the specified relation exists. Are any of these people married to one another? Who among these people dislike one another? (Burt, 1984, p.320).

In contrast, “The long-form instrument, frames items in terms of a specific pair of alters. The respondent is asked to describe the relationship between a specific pair of people” (Burt 1984, p. 321). Thus, in the short-form instrument, the respondent focuses on the relationship and must recall the names of all individuals meeting the condition of the specified relationship. The instrument typically cycles through a number of different types of relationships. The long-form instrument begins with two actors, and asks the respondent to recall the types of relationships shared by these two actors. Then, the respondent must consider the relationships in terms of all other pairs of alters.

In discussing the strengths and weaknesses of each approach, Burt acknowledges possible differences in completion time, reliability, and bias in choosing one form over another. He suggests that the long-form requires more time to administer and would be more likely to tire the respondent, as they assess all possible combinations of actors.

Burt also claims that measures of social network density would be upwardly biased with the long-form because the respondent is asked about the relationship between two specific actors. As Burt puts it, “Given a set of people named as intimates, cognitive balance implies a

bias toward perceiving some kind of relation between each pair of intimates” (1984, p. 321). On the other hand, the short-form items require respondents “to evaluate relations for their relative strength, identifying the strongest and weakest” (1984, p. 321). Burt concludes that the differences between short and long forms will result in the short form items producing “greater variability in the structure of interpersonal environments” (1984, p. 322) because the evaluation of the relative strength of the relationship (long-form) will be more stable than the evaluation of the boundaries between relationships (short-form). While Burt empirically tested other aspects of this module, differences between the short and long-form responses were not explored. Instead the short-form was selected for the GSS, primarily because this form takes less time for respondents to complete.

Burt acknowledges the possibility of measurement error that may occur due to differences in how the survey is created and administered. These differences should be of concern in measuring social relationships and evaluating results. If the character and quality of social network data varies by the type of survey instrument used, questions arise about the usefulness of survey approaches, collecting future network data, and the conclusions of prior studies relying on network data collected with such survey techniques. In the following sections, we report on one such effort to explore survey design effects in the collection of social network data.

Data and Methods

The social networks that will be used in this analysis come from one classroom of college students enrolled in a sociology course. Focusing on students as actors in a network allows us to use a roster format for the collection of network data because all members of the group (the students officially enrolled in the class) are known from enrollment records. The classroom had 42 enrolled students. While attendance in the class was quite high, not all students enrolled in the class at the start of the semester were

present in the classroom when the surveys were administered. Students not completing the survey were not included as respondents nor were these students counted as alters if named.

The students enrolled in the class do not constitute a random selection from the population of all students. Nevertheless, the composition of students in this class parallels that observed in other offerings of this course. Students in this classroom were homogenous with respect to major, race, and age. No “high-profile” students were enrolled in the class (e.g., male varsity athletes, student government leaders, or other students who might be expected to have larger social networks). While samples drawn from different populations may exhibit different network structures, we have no reason to suspect that our participants would react uniquely to differences in question format.

To assess the possibility of different responses based on question wording, two surveys were constructed, each asking about relationships in different ways. Appendix A provides examples of the layout for each survey. The first survey, the *alter-centered survey*, generates network data by providing respondents with a series of questions about each of his or her classmates and the particular relationships that he or she has with each of these individuals. In the alter-centered survey, the respondent is first given the name of a classmate (alter) and then provided with a list of all of the possible types of relationships that the respondent could have with that classmate. For example, the respondent is given the name “John Smith,” followed by a list of possible relationships (recognize his/her name, acquaintance, friend, etc.). The survey continues through a list of each member of the class with each of the possible relationships available for checking.

The second survey, the *relationship-centered survey*, asks respondents a series of questions about the types of relationships the actor has with others in the classroom. First, the respondent is provided with the statement

that defines a specific type of relationship. For instance, “I recognize the following person(s) by name...”. This phrase is followed by an alphabetized list of all students in the class. Respondents are asked to check all students whom she or he “recognizes by name”. The survey continues asking questions in this manner, first identifying a relationship (acquaintance, friend, etc.) and then asking the respondent to mark those classmates that he or she considers having that type of relationship.

The alter-centered instrument resembles Burt’s long-form in that respondents must first consider pairs of actors (i.e., the respondent and alter) and then provide information on the relationship. The relationship-centered survey parallels Burt’s short-form because respondents are asked to consider a specific type of relationship and then must identify respondent-alter pairs that meet the conditions of the relationship. We expect the alter-centered instrument to be more likely to tire respondents as they shift from one classmate to the next, identifying all relationships that apply, until the entire roster of students is exhausted. As a respondent tires, he or she might not check all relationships that apply for each classmate. Instead, in an effort to complete the survey in an efficient manner, or perhaps because boredom sets in as the respondent considers every student in the class, respondents might resort to checking only the most salient relationships for each respondent. Therefore, a measure of a network characteristic like network degree will likely be underreported in the alter-centered survey. However, we might find, similar to Burt’s long form, inflated measures of social network density because the actors are the focus of the survey. The relationship-centered survey will likely produce more variability in the network structure as respondents may have more difficulty distinguishing the boundary of a specific relationship (e.g. acquaintance) when evaluating on a person-to-person basis. That is, difficulty may arise when a respondent must decide whether Actor 1 truly deserves acquaintance status when compared to the acquaintance shared by, say, Actor 2 and Actor 3.

Both survey forms were administered to the same students in the classroom. The alter-centered survey was administered on a Friday and the relationship-centered survey was administered the following Monday. The analyses within the same classroom allow us to see what differences may be revealed by the same people taking two different versions of the survey. This reduces variation in scores that might result due to differences in individuals. However, the possibility of testing effects exists for a within group design. That is, subjects may remember taking the first survey and retain information to use on the second survey.

Measures

Using the two surveys, we compare the measures of a number of network characteristics. One of the most basic network properties is degree. The degree of an actor or node is the measure of how many other nodes (or alters) the actor is directly connected to, represented as $d(n_i)$ or the degree of node i . The degree of node i can range from zero (a node has no relationship with any other actor in the network) to $n-1$ (a node has a relationship with every actor in the network with reciprocal ties excepted). This measure provides information about how “connected” nodes are within the network. A group or network-level measure of degree (mean degree) can be developed by summing the degrees of all nodes in the network and dividing by the size of the network (Wasserman and Faust, 1994, p. 100, equation 4.1).

In the first set of analyses, we compare mean degree and other descriptive group-level statistics as measured by the two types of surveys for three salient types of relations that connect students: name recognition, acquaintances, and friends. In the second set of analyses, we compare two additional group-level network properties, density and centrality, for these same three ties: name recognition, acquaintance and friendship relations.

Density is the ratio of the actual number of relationships between people observed in the network and the total number of relationships that are possible

within the network. Following Wasserman and Faust (1994, p. 101), if a network of size g contains L relationships, the density of the network is defined as:

$$\Delta = \frac{L}{g(g-1)},$$

when $L=0$ there are no relationships between any actors in the network and density equals a minimum of zero. When all nodes are connected to all other actors, $L=g(g-1)$ and density equals a maximum of one.

Various measures of network centrality exist in the literature. Our measure of centralization corresponds to “actor closeness centrality,” a measure reflecting the closeness (or distance) of all actors in the network to each of the other nodes (Wasserman and Faust 2004, pp. 184-186). We use a standardized measure of actor closeness centrality, ranging from 0 (an isolated node) to 1 (an actor is adjacent to all other actors in the system). As Wasserman and Faust explain, this measure is based on Sabidussi’s index (1966) of actor closeness, “the inverse sum of the distances from actor i to all the other actors” (1994, p. 184). In mathematical form, the measure is specified as:

$$C_C(n_i) = \left[\sum_{j=1}^g d(n_i, n_j) \right]^{-1} (g-1),$$

where $d(n_i, n_j)$ indicates the smallest number of lines linking nodes n_i and n_j (the geodesic distance). This distance function is summed over all network actors, g , and the closeness centrality measure is calculated by taking the reciprocal of this sum. The standardized actor closeness centrality measure is multiplied by the size of the network minus unity, $(g-1)$, in order to allow for an accurate comparison across networks of varying size.

Finally, we conduct nonparametric tests for differences in a variety of network characteristics across surveys. We use non-parametric tests because the assumption of normality is not met for the network measures we consider. And, while t-tests and other statistical tests based on the arithmetic mean are subject to influence by possible outliers, our non-parametric tests are not. In particular, we conduct a median test to assess whether two or more samples are drawn from populations with the same median.

Results

Respondents were asked about seventeen different relationships they had with other members of the class. In this analysis, we focus on three of the most often cited relationship ties: recognizing the name of other classmates, considering a classmate an acquaintance, and considering a classmate a friend. The degree, density and network centralization of actors is then considered within each of these relationship types across the two surveys administered. All social network measures were calculated using UCINET 6 Social Network Analysis Software (Borgatti, Everett, & Freeman, 2002).

Table 1 presents the results for the group mean degree, standard deviation, median degree, and minimum and maximum values of degree observed. For two of the three relationships observed within the classroom, the relationship-centered survey produces more alters named by respondents as compared to the alter-centered survey. (The third relationship – recognize name – resulted in the same mean value.) In other words, respondents failed to identify some of the existing relationships that were measured in the alter-centered survey. These results provide support for the idea that respondents became tired or perhaps identified only the most salient relationships when responding to the alter-centered survey.

Table 1. Degree Measures

Relationship	Classroom	Mean	S.D.	Median	Minimum	Maximum	N
Recognize Name	Alter-Centered	6.90	8.22	4.5	0	38	42
	Relationship-Centered	6.90	3.62	6	1	18	42
Acquaintance	Alter-Centered	2.10	1.78	2	0	9	42
	Relationship-Centered	3.40	3.15	3	0	21	42
Friend	Alter-Centered	1.57	1.02	2	0	3	42
	Relationship-Centered	2.14	1.24	2	0	4	42

This finding is further supported by considering the total number of relationships identified by respondents in each survey. Table 2 shows that the relationship-centered survey produced an average of 18.33 relationships identified by each respondent, while the alter-

centered survey resulted in only 15.26 relationships. Thus, when the same respondents are asked about relationships with classmates using two different survey instruments, the relationship-centered survey identified more relationships than the alter-centered survey.

Table 2. Total Number of Relationships Recognized

Classroom	Mean # of Relationships	S.D.	Median	Min	Max
Alter-Centered	15.26	9.78	12	1	46
Relationship-Centered	18.33	8.92	17	5	49

Table 3 provides another look at these relationships by providing the network density and centralization measures. Here, too, we find for the three major relationships (recognize name, acquaintance, friend), network density is higher in the relationship-centered survey (recognize name density = 0.1678, acquaintance density = 0.0830, friend density = 0.0523) compared to the alter-centered survey (recognize name density = 0.0523, acquaintance density = 0.0511, friend density = 0.0383). While these reported differences are small, this pattern of

within classroom difference for density holds when looking at even less salient relationships, such as the identification of homework partners or shared organizational membership. Similarly, we find that the relationship-centered survey produces higher measures of centralization for both name recognition (0.010 compared to 0.001) and acquaintance (0.012 compared to 0.005). This would seem to indicate that, as reported above, the relationship-centered instrument produces networks with higher levels of connectedness between actors in this system.

Table 3: Centralization and Density Measures

Relationship	Classroom	Density	S.D. of Personal Network Densities	Network Centralization	N
Recognize Name	Alter-Centered	0.0523	0.2226	0.001	42
	Relationship-Centered	0.1678	0.3737	0.010	42
Acquaintance	Alter-Centered	0.0511	0.2202	0.005	42
	Relationship-Centered	0.0830	0.2259	0.012	42
Friend	Alter-Centered	0.0383	0.1920	0.001	42
	Relationship-Centered	0.0523	0.2226	0.001	42

Non-parametric Tests

We also test for significant differences between the survey instruments with tests for variations in the median across classrooms and across relationships. We find no statistical difference in median degree for the relationship of “recognize name.” However, we do find a significant difference in the median when respondents are asked to identify acquaintances ($p < 0.05$) or friends ($p < 0.05$). This implies that these two classrooms are not from populations with the same medians, although they are in fact the same students. These findings suggest that differences in the structure of the survey instruments produce differences in the respondents’ network structures.

Discussion

The results presented above leave us with evidence that differences occur between alter-centered and relationship-centered question formatting. Clear differences emerge when we examine the broadest relationship-type – recognizing a classmate by name. Here, the

range and standard deviation of alters named is much greater when the alter-centered survey is used. Similar differences are observed with the network centralization measure; the alter-centered survey once again yields significantly higher estimates than its relationship-centered counterpart. These findings substantiate Burt’s (1984) intuition regarding the reliability of respondents’ choices due to the focus on one individual classmate at a time.

Contrary to Burt’s (1984) hypothesis, however, upwardly biased estimates of network density do not appear when using the alter-centered form of the questionnaire. In fact, the results indicate the opposite – although the difference is not statistically significant. This finding is consistent not just with the recognition of name relationship; similar conclusions are reached when considering acquaintance and friendship ties.

Network degree and centralization are more stable when evaluating the acquaintance and friendship ties. Here, unlike the relationship

involving the recognition of a classmate's name, variation is greatly reduced. When we look at the differences between surveys, it appears as though the relationship-centered survey produces greater recognition of acquaintances and friends. However, the range in degree minimum and maximum, along with the standard deviations, are reduced considerably. The same is true with the network centralization measure.

These results lead us to conclude that meaningful differences in measurement are not apparent when we ask about extremely close relationships like friendship ties. In this case, we suggest Burt's (1984) consideration of time is most important. Results of this study did find that respondents completed the relationship-centered survey more quickly (3.91 minutes) than they completed the alter-centered survey (4.67 minutes). This is similar to what Burt found with the short-form versus long-form of the GSS module.

However, when we ask respondents about people they know less well, researchers would do well to consider the type of survey instrument used to elicit response. Clearly, greater connections, as measured by network density and centralization, were acknowledged when the

relationship-centered survey was used to elicit recognition of other classmates by name. In a world where weak ties are acknowledged to be of great importance for many outcomes (Granovetter 1973), accurate measurement of these weak ties must be obtained.

Certainly, this examination is only a beginning. Additional research about how social network researchers should best measure relationships must be pursued. Explorations of other populations of actors and relationships would be beneficial. Further, future studies should consider different modes of administration. A test of the differences explored in this study using web-based surveys may yield very interesting results – especially among young college-aged respondents who are familiar with this technology. Utilizing a split-half study in these types of large groups, either by web or paper survey, may provide further evidence that confirms the results found in this study. Additionally, looking at other network measures, such as individual measures of centrality, reciprocal ties between actors, and even clique structure, may help to further clarify differences that emerge based on instrumentation.

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Appendix A. Alter-centered and Relationship-Centered Surveys

Alter-Centered Survey	Relationship-Centered Survey
<p>Student 1:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Recognize his/her name <input type="checkbox"/> Acquaintance <input type="checkbox"/> Friend <input type="checkbox"/> Significant Other <p><input type="checkbox"/> Classmate (outside of this course)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Homework/study partner <input type="checkbox"/> Co-worker <input type="checkbox"/> Neighbor <input type="checkbox"/> Roommate <p><input type="checkbox"/> Attend similar social events</p> <p><input type="checkbox"/> Belong to the same organization (check all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Greek Fraternity/Sorority <input type="checkbox"/> Intramural Sports Team <input type="checkbox"/> Religious Organization <input type="checkbox"/> Residence Hall Association <input type="checkbox"/> Other _____ <p>Other relationship _____</p>	<p>Student 3:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Recognize his/her name <input type="checkbox"/> Acquaintance <input type="checkbox"/> Friend <input type="checkbox"/> Significant Other <p><input type="checkbox"/> Classmate (outside of this course)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Homework/study partner <input type="checkbox"/> Co-worker <input type="checkbox"/> Neighbor <input type="checkbox"/> Roommate <p><input type="checkbox"/> Attend similar social events</p> <p><input type="checkbox"/> Belong to the same organization (check all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Greek Fraternity/Sorority <input type="checkbox"/> Intramural Sports Team <input type="checkbox"/> Religious Organization <input type="checkbox"/> Residence Hall Association <input type="checkbox"/> Other _____ <p>Other relationship _____</p>
<p>Student 2:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Recognize his/her name <input type="checkbox"/> Acquaintance <input type="checkbox"/> Friend <input type="checkbox"/> Significant Other <p><input type="checkbox"/> Classmate (outside of this course)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Homework/study partner <input type="checkbox"/> Co-worker <input type="checkbox"/> Neighbor <input type="checkbox"/> Roommate <p><input type="checkbox"/> Attend similar social events</p> <p><input type="checkbox"/> Belong to the same organization (check all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Greek Fraternity/Sorority <input type="checkbox"/> Intramural Sports Team <input type="checkbox"/> Religious Organization <input type="checkbox"/> Residence Hall Association <input type="checkbox"/> Other _____ <p>Other relationship _____</p>	<p>Student 4:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Recognize his/her name <input type="checkbox"/> Acquaintance <input type="checkbox"/> Friend <input type="checkbox"/> Significant Other <p><input type="checkbox"/> Classmate (outside of this course)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Homework/study partner <input type="checkbox"/> Co-worker <input type="checkbox"/> Neighbor <input type="checkbox"/> Roommate <p><input type="checkbox"/> Attend similar social events</p> <p><input type="checkbox"/> Belong to the same organization (check all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Greek Fraternity/Sorority <input type="checkbox"/> Intramural Sports Team <input type="checkbox"/> Religious Organization <input type="checkbox"/> Residence Hall Association <input type="checkbox"/> Other _____ <p>Other relationship _____</p>
<p>1. I recognize the following person(s) by name.</p>	
<p><input type="checkbox"/> Student 1</p> <p><input type="checkbox"/> Student 2</p> <p><input type="checkbox"/> Student 3</p> <p><input type="checkbox"/> Student 4</p> <p><input type="checkbox"/> Student 5</p> <p><input type="checkbox"/> Student 6</p> <p><input type="checkbox"/> Student 7</p> <p><input type="checkbox"/> Student 8</p> <p><input type="checkbox"/> Student 9</p> <p><input type="checkbox"/> Student 10</p> <p><input type="checkbox"/> Student 11</p> <p><input type="checkbox"/> Student 12</p> <p><input type="checkbox"/> Student 13</p> <p><input type="checkbox"/> Student 14</p> <p><input type="checkbox"/> Student 15</p> <p><input type="checkbox"/> Student 16</p> <p><input type="checkbox"/> Student 17</p> <p><input type="checkbox"/> Student 18</p>	<p><input type="checkbox"/> Student 19</p> <p><input type="checkbox"/> Student 20</p> <p><input type="checkbox"/> Student 21</p> <p><input type="checkbox"/> Student 22</p> <p><input type="checkbox"/> Student 23</p> <p><input type="checkbox"/> Student 24</p> <p><input type="checkbox"/> Student 25</p> <p><input type="checkbox"/> Student 26</p> <p><input type="checkbox"/> Student 27</p> <p><input type="checkbox"/> Student 28</p> <p><input type="checkbox"/> Student 29</p> <p><input type="checkbox"/> Student 30</p> <p><input type="checkbox"/> Student 31</p> <p><input type="checkbox"/> Student 32</p> <p><input type="checkbox"/> Student 33</p> <p><input type="checkbox"/> Student 34</p> <p><input type="checkbox"/> Student 35</p> <p><input type="checkbox"/> Student 36</p>
<p>2. I consider the following person(s) to be an acquaintance.</p>	
<p><input type="checkbox"/> Student 1</p> <p><input type="checkbox"/> Student 2</p> <p><input type="checkbox"/> Student 3</p> <p><input type="checkbox"/> Student 4</p> <p><input type="checkbox"/> Student 5</p> <p><input type="checkbox"/> Student 6</p> <p><input type="checkbox"/> Student 7</p> <p><input type="checkbox"/> Student 8</p> <p><input type="checkbox"/> Student 9</p> <p><input type="checkbox"/> Student 10</p> <p><input type="checkbox"/> Student 11</p> <p><input type="checkbox"/> Student 12</p> <p><input type="checkbox"/> Student 13</p> <p><input type="checkbox"/> Student 14</p> <p><input type="checkbox"/> Student 15</p> <p><input type="checkbox"/> Student 16</p> <p><input type="checkbox"/> Student 17</p> <p><input type="checkbox"/> Student 18</p>	<p><input type="checkbox"/> Student 19</p> <p><input type="checkbox"/> Student 20</p> <p><input type="checkbox"/> Student 21</p> <p><input type="checkbox"/> Student 22</p> <p><input type="checkbox"/> Student 23</p> <p><input type="checkbox"/> Student 24</p> <p><input type="checkbox"/> Student 25</p> <p><input type="checkbox"/> Student 26</p> <p><input type="checkbox"/> Student 27</p> <p><input type="checkbox"/> Student 28</p> <p><input type="checkbox"/> Student 29</p> <p><input type="checkbox"/> Student 30</p> <p><input type="checkbox"/> Student 31</p> <p><input type="checkbox"/> Student 32</p> <p><input type="checkbox"/> Student 33</p> <p><input type="checkbox"/> Student 34</p> <p><input type="checkbox"/> Student 35</p> <p><input type="checkbox"/> Student 36</p>
<p><input type="checkbox"/> Student 37</p> <p><input type="checkbox"/> Student 38</p> <p><input type="checkbox"/> Student 39</p> <p><input type="checkbox"/> Student 40</p> <p><input type="checkbox"/> Student 41</p> <p><input type="checkbox"/> Student 42</p> <p><input type="checkbox"/> Student 43</p> <p><input type="checkbox"/> Student 44</p> <p><input type="checkbox"/> Student 45</p> <p><input type="checkbox"/> Student 46</p> <p><input type="checkbox"/> Student 47</p> <p><input type="checkbox"/> Student 48</p> <p><input type="checkbox"/> Student 49</p> <p><input type="checkbox"/> Student 50</p> <p><input type="checkbox"/> Student 51</p> <p><input type="checkbox"/> Student 52</p> <p><input type="checkbox"/> Student 53</p> <p><input type="checkbox"/> Student 54</p>	<p><input type="checkbox"/> Student 37</p> <p><input type="checkbox"/> Student 38</p> <p><input type="checkbox"/> Student 39</p> <p><input type="checkbox"/> Student 40</p> <p><input type="checkbox"/> Student 41</p> <p><input type="checkbox"/> Student 42</p> <p><input type="checkbox"/> Student 43</p> <p><input type="checkbox"/> Student 44</p> <p><input type="checkbox"/> Student 45</p> <p><input type="checkbox"/> Student 46</p> <p><input type="checkbox"/> Student 47</p> <p><input type="checkbox"/> Student 48</p> <p><input type="checkbox"/> Student 49</p> <p><input type="checkbox"/> Student 50</p> <p><input type="checkbox"/> Student 51</p> <p><input type="checkbox"/> Student 52</p> <p><input type="checkbox"/> Student 53</p> <p><input type="checkbox"/> Student 54</p>