Homophily and Quality of Online and Offline Social Relationships among Adolescents

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Abstract

Studies on online social relationships have focused on how Internet use is associated with sociability, but have not compared the quality of online with offline relationships. On the other hand, studies on adolescent friendship formation have used school samples disregarding the Internet as a new social context for it. We took a different approach, studying the relationship between the social context of acquaintance (school, neighborhood, and online) and the structure and quality of friendships among adolescents. We relied on the proximity-similarity hypothesis that homophily between friends results from organized social activities wherein individuals sharing demographic characteristics are more likely to associate with each other. Despite the clear theoretical distinction between proximity and similarity, most studies on similarity in adolescent friendships have rested on school samples in which the effect of these two factors cannot be distinguished. The present study investigated friends’ similarity and its effect on the strength of ties in dyads. In a representative sample of Israeli adolescents (n=980), similarities in age, gender, and place of residence were studied in respect of the social sphere in which each friend was met (neighborhood, school, and online communication). We found that when a friend was met at school the likelihood of homophily in age, gender, and place of residence was higher than when contact was made in the residential locality or online. Additionally, similarity in age and gender were not related to the strength of ties, but friends met in the same locality were usually closer than those living in another city. Friends met in the neighborhood and schools were usually closer than friends met online. However, social similarity mattered even for friends who were met online. The more similar an online friend was in residence and gender, the stronger was the social tie. The results imply that proximity and similarity still count, even with a global medium of communication such as the Internet where communication is based on shared interests.
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Attraction to friendship, its formation, and its quality in adolescents are topics that have received much sociological attention (Kandel, 1978; Hallinan, 1982; Crosnoe, 2000; Moody, 2001). Adolescence is a period in life characterized by rapid developmental changes, and as children enter their teenage years they interact less with their parents. Peer relationships expand and assume greater importance (Youniss & Smollar, 1996; Giordano, 2003). Peers act as emotional confidants, provide each other with advice and guidance, and serve as models of behavior and attitudes (Crosnoe, Cavanagh & Elder, 2003; Berndt, Miller & Park, 1990; Hartup & Stevens, 1997). Studies show a significant relationship between the quality of an individual’s friends and that individual well being (Hartup, 1996; Collins & Laursen, 1999). Adolescents who lack attachment to peers are more likely to report psychological distress and to harbor thoughts of suicide (Beraman & Moody, 2004; Hansell, 1985). Although parents continue to influence behaviors and decisions, the time that adolescents spend with their peers expands and they become their most important reference group (Hartup, 1996).

Sociological studies on adolescent friendship attraction, formation, and quality have mostly relied on the proximity-similarity hypothesis (Kandel, 1978; Shrum, Cheek & Hunter, 1988). According to this perspective, homophily in social relationships is a two-step process. It results from the combination of proximity, which provides opportunities for frequent and mutual exposure, and shared social status, which creates attraction among individuals who share the same social experience and context. Activities in which individuals participate in their daily life are socially structured, creating an array of opportunities that tend to bring individuals into frequent contact. Once individuals who share social status have met, social attraction and relationship formation will be more likely because social statuses are associated with sharing similar life experiences and similar needs for information, communication, activities, and social support (Suitor, Pillemer & Keeton, 1995). Studies on adolescents’ friendships have typically relied on data from school samples, disregarding other contexts of friendship formation (see, e.g., Hansell, 1985; Kandel, 1978; Schrum et al., 1988; Kubitschek, & Hallinan, 1998; Hamm, 2000; Hallinan & Kubitscheck, 1988 ). This approach has a number of serious
limitations. First, with the proximity-similarity hypothesis and using school samples only one cannot disentangle the effects of proximity from similarity (Aboud & Mendelson, 1996; Epstein, 1989). To ask respondents to name friends at school only (as most studies have done) is to ask for friends who are already in proximity and thus are similar; this omits from the study friends who are not in proximity, do not attend the same school, and might be less similar. Second, the fundamental argument of the proximity-similarity hypothesis is that the quality of friendships among similar friends is higher. Studies based on school samples cannot reach this conclusion because they have not compared the quality of friendship in different social contexts of friendship formation.

Furthermore, recent studies have shown that adolescents make new friends not only at the neighborhood and school but also online; sometimes the latter friendship moves to face-to-face meetings (Wolak, Mitchell & Finkelhor, 2003; Gross, Juvonen & Gable, 2002). There is some evidence that these relationships are able to become intimate and provide social support (Gross et al., 2002; McKenna, Green & Gleason, 2002; Joinson, 2001). But the data for most of these studies are from samples of Internet users only, and inferences about the quality of online compared with face-to-face relationships cannot be made.

The goal of the current study is to fill this gap in the literature. First, rather than studying a single context of friendship formation (school or online) we focus on various relevant contexts of friendship formation among adolescents. We compare the extent of similarity, and how it is related to the quality of social relationships that were created in the neighborhood, at school, and online. Second, in taking this approach we improve previous studies in that we avoid the confounding effect of proximity and that of similarity, thus being able to treat these two variables separately and to draw inferences about the extent of friendship similarity in different contexts. Finally, we fill a gap in the growing literature on computer-mediated communication and compare the quality of online and offline friendships.

**Literature Review:**

**Friendship homophily:**

Studies on the formation, development, maintenance, and dissolution of close social relationships have emphasized the importance of homophily (McPherson, Smith-
Lovin & Cook, 2002; Hartup & Stevens, 1997; Maccoby, 1998). The latter notion holds that “contact and friendship formation between similar individuals occurs at a higher rate than among dissimilar individuals” (McPherson et al., 2002). Homophily seems to be the result of a structure of opportunities for interaction emerging from the social structuring of activities in society. Feld (1981) uses the concept of foci of activity, defining it as “social, psychological, legal or physical objects around which joint activities are organized”. Foci can be formal (school) or informal (regular hangouts), large (neighborhood) or small (household), and these foci of activity systematically constrain choices of friends. According to this perspective, foci of activity place individuals in proximity. For example, they provide opportunities for frequent meetings, which make for individuals to reveal themselves to each other. According to Feld (1981), whatever the basis of their initial association with a focus, it may be difficult, costly, and time consuming not to associate with certain individuals who share the same foci. For all these reasons an individual’s association with particular foci of activity may have unintended social consequences for him/her. Specifically, people tend to choose their friends from the set of people who are available through these foci.

Homophily in social relationships is frequent because it provides important rewards. Similar individuals are likely to participate in enjoyable joint activities with others who have similar interests, and that way to receive validation of their attitudes and beliefs (Aboud & Mendelson, 1996). Participation in the same activities increases the frequency of social interaction and provides social support in a wide variety of aspects of social life. It is not surprising that similarity has been associated with stable and strong ties (Hallinan and Kubitschek, 1988). When dissimilarity exists at the beginning of relationships, or a mismatch occurs in ascribed social statuses, relationships tend to be unstable and are more likely to terminate as individuals move on to other relationships in which there is greater similarity (Hallinan and Kubitscheck, 1988).

**Proximity and homophily**

Among adolescents, proximity is important for friendship formation as it establishes the boundaries within which they choose friends. Each individual occupies several separate but overlapping social worlds, each is a potential sphere for friendship formation. A major location for meeting and making friends is school: there adolescents
spend a large part of their waking hours. Yet other settings might be important as well. Adolescents spend their free time in neighborhood hang-outs that they frequent after school. In shopping malls, video arcades, and movie theaters, usually located in the neighborhood or nearby, groups of adolescents hang out, getting to know others who might live in the same neighborhood or locality but do not attend the same school (Cotterell, 1996).

Furthermore, adolescents are a segment of the population whose Internet use has increased drastically in recent years; studies show that the use of the Internet by adolescents is mainly for social purposes (Lenhart, Rainie, & Oliver, 2001; Gross et al., 2002). Through the Internet adolescents communicate after school hours, and exchange gossip, information about homework, and social support. Online relationships are a new phenomenon but they have already become part of adolescent culture. A recent US survey confirmed the existence of these relationships and reported that 14% of US teenagers have formed close online friendships (Wolak et al., 2003). This facility might be one of the most appealing aspects of Internet use among young people, given that forming relationships is a developmental imperative of adolescence and adolescents are closely involved with the technology.

Despite these developments, much of the empirical evidence for the salience of friends’ homophily comes from studies based on school samples (for a review see Aboud & Mendelson, 1996; Epstein, 1989). These studies suffer from a number of limitations. The dominant hypothesis guiding the study of adolescent’s social relationships has been the proximity-similarity hypothesis, which states that proximity is a pre-condition of similarity (Feld, 1981). But when proximity is limited to the school only, measurement problems might arise. The research site may well affect adolescents’ reporting about their friends. When answering to the survey, adolescent’s may look around the room, and friends who are close in proximity may be named more often than others who are in other classes, or other schools, even if those adolescents are equally or more important friends (Foot, Chapman & Smith, 1980). As schools in Western society are age-graded, at least age homophily is clearly a result of the structure of the research setting. Thus, these studies have failed to disentangle the confounding effects of proximity and similarity, and might have overestimated the extent of homophily of adolescent friendships. In sum,
there is a need for studies that consider multiple settings of friendship formation to disentangle the confusion of proximity and similarity that is built-in in school samples.

**Strength of online and offline ties:**

Strength of ties is a concept (and a measure) most popular in network research to characterize the value of social relations (Wasserman & Faust, 1995: 140-141; 449). The strength of tie is a combination of emotional intensity, mutual confidence, time spent on the relationship, and reciprocal services granted (Granovetter, 1973; Marsden & Campbell, 1984). Because strong ties are typically transitive, they are common among small, cohesive groups, while weak ties are relatively more prominent in larger groups, often bridging two or more network clusters (Granovetter, 1973). Through both selection and influence processes, strong ties among adolescents lead to similarity in behavioral patterns (Kitts, 2003; Kirke, 2004). As offline adolescents’ peer group networks tend to be fairly transitive and cohesive, they incline to contain relatively many strong ties, leading also to group conformity. As adolescents’ ties nowadays are both online and offline, we deemed it interesting to examine to what extent and under what conditions strong relationship tend to take place.

The study of the quality of online relationships evinces contradictory views. The ‘Reduced Social Context Cues model’ (Kiesler, Seigel & McGuire, 1984; Kiessler & Sproul, 1986) argues that CMC is an inferior medium of communication than face-to-face communication because it reduces features normally present in the latter. Communication is textual, and does not provide non-verbal emotional clues or personal information about communication partners. The absence of these features has mainly negative effects, according to the model. These include deregulated or inhibited behavior, feelings of social anonymity, and reduced social influence on attitudes and decision making (Kiesler et al., 1984). According to this view, computer-mediated communication (CMC) is more appropriate for routine and purely cognitive tasks (such as exchanging information and task-related issues) whereas face-to-face communication and phone communication is more appropriate for tasks that require more social and emotional content to be exchanged in messages (Sproull & Kiessler, 1986; Rice & Love 1987).

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1 A tie is transitive to the degree to which actor \(i\) knows actor \(j\) and actor \(j\) knows actor \(k\), and this leads also to actor \(i\) knowing actor \(k\).
While there is evidence that face-to-face and phone communication are preferred among individuals (Cummings, Butler & Kraut, 2002) we are unaware of any studies that have compared not the way individuals communicate but the resulting quality of social relationships created online and face to face.

Others rejected this technological determinism and argue that there are some qualities of CMC that are conducive to greater intimacy, closeness, and strong ties (Spears and Lea, 1992; McKenna et al., 2002). Research on intimate relationships has shown that both self-disclosure and partner disclosure increase the experience of intimacy in interactions. Disclosing intimate information about oneself normally occurs only after liking and trust have been established between people. Individuals usually do not engage in self-disclosure until they are confident that they formed a dyadic boundary, ensuring that information disclosed by one is not leaked by the other to mutual acquaintances. Even so, the dyadic boundary may be violated and there are clear risks in disclosing personal information, such as the risk of ridicule or outright rejection by one’s friends or family. McKenna et al. (2002) argue that the relative anonymity of internet interactions reduces the risks of such disclosure, especially about intimate aspects of the self, because one can share one’s inner beliefs and emotional reactions with much less fear of disapproval and sanction. On the Internet, therefore, people often engage in greater self-disclosure with strangers because a stranger does not have access to a person’s social circle so the dyadic boundary cannot be violated.

A second reason for greater self-disclosure online is the lack of the usual “gating features” to the establishment of any close relationship. Features such as physical appearance, visible shyness, or social anxiety are gates that often prevent people who are less physically attractive or socially skilled from developing relationships to the stage at which disclosure of intimate information could begin.

In addition, the unique features of the Internet allow individuals easily to find others who share specialized interests. We tend to be more attracted to others who are similar to ourselves and share our opinions. Even in long-standing relationships, the more similar two people are the more compatible they are. However, it may be difficult to find others that share our interests in the local area, and when people get to know each other face to face it generally takes time to establish whether they have common qualities and
to what extent. But in a newsgroup joined by people who share its interests, members can move forward rapidly to find out what other key interests they might share.

The above points carry implications for relationship formation. Relationships will develop closeness and intimacy significantly faster over the Internet than relationships that begun offline, because of the greater ease of self-disclosure. Also, the relationships will be founded on a more substantive basis.

Furthermore, in the information society, with its emphasis on networked individualism, studies have started to show that information and communication technologies such as the Internet are being used not only to maintain friendships but to seek new friends as well, based on shared concerns, interests, hobbies, and social support. Therefore, any study of friendship attraction should start by examining adolescent friendships in multiple contexts. Adolescents using the Internet for communication may be able to overcome restrictions in physical space for the formation of social relationships. The Internet is a global technology, able to connect individuals all over the world. At this point we cannot be sure that physical closeness, a central, long recognized condition for the selection of friends, might be just one of the criteria but not the only one, as more and more adolescents and youth are meeting friends online. Moreover, by studying various contexts of friendship formation it becomes possible to consider the role of multiple proximities. Finally, because of the possibility of confounding the effects of proximity and of similarity, the examination of limited contexts of social interaction, and the exclusion of the Internet as a context of friendship formation, we need to re-evaluate the extent of similarity and its effect on the quality of the social ties created in different contexts.

Additional factors associated with homophily and strength of ties

Once proximity has exposed individuals in shared foci of activities, other factors are known to affect the extent of friends’ similarity. Gender, for example, is an important factor to consider. Studies have shown that in adolescence there is a “sex cleavage” in friendship relations, and the majority of male and female adolescents at high school are in same-sex rather than mixed sex groups (Cotterel, 1996; McNelles, & Connolly, 1999). Although segregation between gender groups decreases with the passing years at school, in particular from middle to high school, sex segregation is still high (Shrum et al., 1988).
From previous studies we can infer that the social worlds of children and adolescents are highly segregated along gender lines.

Another important consideration in the study of friends’ similarity is developmental factors. Similarities between friends are also found also in level of psychological development. Age can be considered a proxy for psychological development, and younger adolescents tend to become friends with others similar to them in age because they are undergoing the same developmental stage and therefore share interests in activities, values, and attitudes (Cotterell, 1996). However, findings on the extensive similarity in age during adolescent years may reflect the age-graded organization of schools and the practice of researchers of peer relationships to study these relationships at school. This might have produced an exaggerated picture of age similarities in adolescent friendship cliques (Cotterell, 1996; Epstein, 1989).

In sum, homophily in social relationships can be explained as originating from a combination of opportunity for mutual disclosure and shared life experiences. Activities in which individuals participate in their daily lives are socially structured, creating an array of opportunities that tend to bring similar people into frequent contact with each other. School, workplace, and neighborhood haunts are places where social activities are organized (learning, work and leisure). The social structuring of these activities tends to bring similar individuals into frequent contact, encouraging the development of social relationships among them. These different foci of activities are the structural constraints in which individual choices are made (Feld, 1981). Foci of activity, a measure of proximity, might differ in the extent that they bring similar individuals close to one other. Some social contexts are more homogeneous in terms of age, gender, and place of residence, such as the school. This critique is related to the assumption of school samples studies that friendships are created only at school. Friendships can be created in other social settings than school. Friends, even if attending school, have met in other social contexts and their friendships outside school have migrated there. Thus our knowledge of adolescents’ friendships may benefit also from consideration of the context of acquaintance, and how this context is related to the quality of social relationships.
Methods

This study aimed to examine the nature of online and offline relations among Israeli adolescents; it was part of the annual national youth survey conducted by the Minerva Center for Youth Studies at the University of Haifa. The data were collected between June and October 2001. The annual survey covers a representative sample of 1000 households in Israel. The sampling procedure begins with a random sample of 60 localities in Israel with a population of 2000 or more. Then, according to the size of the adolescent population in each settlement, neighborhoods are selected randomly. The number of neighborhoods in each settlement is determined by the juvenile population size (13-18 years old) in the locality. At least one neighborhood is randomly selected in settlements with a low proportion of adolescents, and more than one in the larger urban areas. In each neighborhood, 15 households are randomly selected. The selected neighborhoods represent all geographic areas of Israel, and also different sizes of settlements from big cities to small towns and villages. The survey includes items on social and demographic characteristics of the youth, socio-demographic characteristics of their closest friends, types of resources exchanged, and the extent of perceived closeness to each friend.

The survey asked each adolescent for the names of six close friends. The respondent provided information on each friend’s age, gender, and place of residence; and whether he/she met him/her for the first time at school or extracurricular activities, in the neighborhood, or online. The adolescent was also asked to indicate the length of time that he/she had known him/her, and the extent that the respondent felt closeness and trust, and would ask for help from each of the friends named.

The interviews were conducted face to face in the respondent’s house by trained interviewers. Certain items on the questionnaire measured the socio-demographic characteristics of the adolescent and of ego-networks (up to six friends). Here we focus on the extent of similarity in age, gender, and place of residence between the respondent and the first friend who was named.

Measures:

To measure friends’ similarity, three measures were created. Adolescents were asked for the place of residence of the first friend. Possible responses were: in the same
neighborhood, in the same city, in another city in Israel, in another country. We took a
conservative approach to the measurement of neighborhood and created a dummy
variable coding similarity in place of residence 1 when the first friend was reported to live
in the same neighborhood or the same city. When the friend was reported as living in
another city or another country the variable was coded 0.

Adolescents were asked the age (in years) of the first friend that they named.
Similarity in age was measured by taking the age of alter and subtracting it from the age
of ego. Then a dummy variable was calculated and was coded 1 when the ego was the
same age as, or one year younger or one year older than the alter. In other words, 1
indicated age similarity and 0 indicated age dissimilarity. The definition of age similarity
used in this study is consistent with previous studies that defined same age friendship
when youngsters are within 12 months of each other’s ages (Hartup, 1976).

Gender similarity was defined likewise. Adolescents were asked the gender of the
first friend they named. Then the gender of the ego and that of alter were compared and a
dummy variable measuring gender similarity was created. The variable was coded 1
when the gender of ego and of alter were the same and 0 when they were not.

Strength of ties was measured by a number of survey items. Referring to the first
friend named, respondents were asked to indicate how close they felt to the friend, how
important this friend was for them, how far they would ask this friend for help, and how
far they trusted this friend. Responses were on a 5-point Likert scale. The items were
subjected to a factor analysis using a varimax rotation. One factor was found and a scale
was built with reliability $\alpha=.811$.

The survey included a measure of the place where the first friend was met for the
first time. For each friend respondents were asked to indicate whether this friend was first
met on the Internet, at school, or in the neighborhood. From this question we computed a
measure distinguishing the setting in which the first friend was met. A series of 3 dummy
variables were created indicating the place in which the friend was met for the first time
and the relevant categories were in the neighborhood, at school (including extracurricular
activities) and online (through chat rooms, icq, or email use).

We also used a number of measures of Internet use. Adolescents were asked to
report the number of hours per day that they used the Internet. The variable was
introduced as a continuous measure. Second, adolescents were asked to indicate their most frequent activities when connected to the Internet. From their answers two measures were created. One indicated use for social purposes (playing games with friends online, chatting, participating in bulletin boards or forums), and the other indicated uses of the Internet for instrumental purposes (downloading software and computer games, listening to music or watching movie clips, learning the Internet as a future occupation).

In addition, in the multivariate analysis we controlled for each adolescent’s age, gender, and nationality (1=Jew) and for mother’s education as a crude proxy for the household’s socio-economic status. Self-esteem was a composite variable created out of ten items from a reduced Rosenberg’s self-esteem questionnaire. The variables resulted in a single dimension with internal reliability $\alpha=.798$.

**Sample Description:**

Of the 1000 adolescents contacted, 987 agreed to participate in the study. Respondents’ average age was 15.61 years (S.D. 1.71); girls and boys were equally represented (50% each group). In terms of religious denomination, 72.8% were Israeli Jews. In socioeconomic status, average father’s education was 12.41 years (S.D. 3.51) and average mother’s education was 12.37 years (S.D. 3.04). Regarding family status, 87.6% reported that their parents were married; 12.4% of parents were separated or divorced.

It was found that 36.3% of the adolescents reported having Internet access. Respondents were asked where the first friend was met: 59.5% first met the friend at school, 29.8% in the neighborhood, and 11.7% online. In our sample, the majority of the adolescents met their closest friend at school, but a significant percentage (40.5%) met their closest friend in other social settings such as the neighborhood and online. The descriptive analysis showed that for the whole sample 90.4% of the friends first named lived in the same neighborhood or city as the respondent, 83.7% were of the same gender as the respondent, and 83.2% were the same age as the respondent.

Adolescents reporting having online friends were on average younger than adolescents reporting not having online friends (15.11 years and 15.65 years; $p<.05$) but no significant differences were found in terms of gender and socio-economic status.

Findings:
We start the analysis presenting the extent of respondent’s similarity to the first friend. As regards to Internet access, differences between ego and alter in terms of place of residence are seen to be minor. The differences are more pronounced in respect of the place where alter was met for the first time. When alter was met face to face, a high percentage (93.3%) lived in the same neighborhood or city but when alter was first met online, only 73.5% lived in the same neighborhood or city as the ego.

[INSERT TABLE 1 ABOUT HERE]

According to Table 1, differences in the extent of gender similarity between adolescents who reported and who did not report Internet access are minor. More than 80% of the adolescents reported that the first friend they named was of the same gender regardless of Internet access. The picture changes when we compare the percentage of adolescents who reported a friend of the same gender according to the place where the friend was met. As expected, gender similarity was higher among adolescents who met in the neighborhood or school than among adolescents who met their friend online.

For the entire sample a high age similarity was found as 83.2% of the adolescents reported that their friends were on average similar to them in age. Regarding differences between adolescents with and without access to the Internet, a higher percent of adolescents without access reported having friends of similar age (84.5%) than adolescents with access (81%). But this difference was not statistically significant. Adolescents were asked where they met the friend for the first time: face to face (school, neighborhood) or online. For adolescents who reported meeting the friend in a face-to-face setting such as school or the neighborhood, age similarity was high. When the friend was met online, age similarity held for only 42.4% of the respondents. Differences were found to be statistically significant for all the groups.

From the descriptive results we may conclude that meeting friends online is apparently a source of decreased residence, gender, and age similarity between ego and alter.

Multivariate Analysis:

The descriptive results show that similarity in place of residence, gender, and age varies not in respect of Internet use per se but in respect of the place where the friend was met at the start. However, this variation might be associated with other factors. For
example, regarding gender, studies have shown that while similarity in this feature is characteristic of friends in adolescence, it decreases as adolescents grow older as a developmental process. In addition the extent of gender similarity between friends may reflect personality factors such as self-esteem. Adolescents with higher self-esteem may feel more confident to get involved in friendships of the opposite sex.

Regarding place of residence, although adolescents are restricted to place in their movements, as in Israel an adolescent can drive alone only above the age of seventeen and a half, having older friends can reduce this place restriction. For this reason we conducted a multivariate logistic regression analysis. The goal was to identify the factors associated with friends’ similarity in age, gender, and place of residence. Measures of daily Internet use and its purposes were introduced, as well as control variables. The results are presented in Table 2.

[INSERT TABLE 2 ABOUT HERE]

The results show that residential similarity with friends was associated with socio-economic status. The lower the mother’s education, the higher the place similarity between ego and alter. Apparently low-income individuals are more likely to develop friendships in the local area as they are more restricted in their spatial mobility than the middle and upper class. Supporting the descriptive findings, no relation was found between Internet use, frequency of use, and purposes of use and the likelihood that the alter was a resident of the same neighborhood or city as the ego. Different contexts in which the friend was met were compared: where the friend was met online the probability that he or she resided in the same location as the respondent proved lower than in the case where the friend was met at school. On the other hand, meeting the friend in the neighborhood did not have a different effect on residence similarity from meeting the friend at school. In other words, the findings show that making friends online decreased the similarity of ego and alter in terms of place of residence. As expected, the longer a friend was known the more likely he/she was to reside in the same city or neighborhood. One interesting finding is that similarity at least in residence seemed related to age, that is, as the adolescent grew up place similarity decreased.

The findings regarding friends’ gender similarity are in the same direction. Making friends with a member of the opposite sex is also related to age. Most of the
literature notes that as the adolescent grows older the social circle expands and includes more members of the other sex (Maccoby, 1998). The effect of mother’s education was not significant, indicating that family socio-economic status did not affect the extent of gender similarity to the first friend. Measures of Internet use were not found related to gender similarity. Note however that making friends online decreased the likelihood that ego and alter were of the same gender, thus increasing the gender heterogeneity of social networks. Interestingly, making a friend in the neighborhood also reduced the likelihood of gender similarity, indicating that meetings at school tend to increase not only the friends’ age similarity but also their gender similarity. Finally, the multivariate analysis regarding age similarity yielded similar results. Making friends online and in the neighborhood reduced the friends’ age similarity, and length of acquaintance increased it. Summing up the results so far, it was found that making friends outside school was a source of heterogeneity in friendship. Making friends in the neighborhood increased the likelihood of the friend being of the other sex and in a different age category. Making friends online increased the likelihood of dissimilarity in all the three parameters (place of residence, gender, age) compared with making friends in school.

[Figure 1]

To show the difference in the likelihood of friends’ similarity in place of residence, gender, and age according to the social context in which the friend was met, we present figure 1. In it we plotted the predicted probabilities of similarity according to the place where the friend was met. As shown in the graph, the likelihood of similarity decreases according to the context of acquaintance-making. The highest similarity is for meeting at school; it is lower for meeting in the neighborhood and lower still for meeting online. The drop in age similarity is steeper than in the other parameters.

As we already noted in the literature review, there is a theoretical argument that homophily in social ties is associated with strong ties. People of similar social status go through the same developmental stages, have more problems in common, and are more alike in their attitudes than people of different status. As they share similar interests, activities, and concerns, they are more likely to spend time together and to reach out to each other for social support and advice. Our next step was to explore how the place in which the friend was met and the friends’ similarity are related to the strength of ties.
Table 3 presents the results of an O.L.S. regression predicting the strength of ties from place similarity. In the first model, besides other factors, residential similarity was included as an additive variable. In the second model an interaction term of online friendship and residential similarity was introduced (need justification here).

[INSERT TABLE 3 ABOUT HERE]

The results for the additive model show that strength of ties is dependent on developmental characteristics. Older, female adolescents were more likely to report strong ties than younger, male adolescents. Ties seem to be weaker as a function of socio-economic status. Internet use and using it for instrumental purposes were related to strength of ties. As expected, place similarity strengthened ties among adolescents. But the context in which a friend was met matters as well. The results show that friends who met online had weaker ties that friends who met at school. Friends who met in the neighborhood had stronger ties than friends who met at school. In the second model an interactive term was introduced, and the result show that online friendships were likely to increase the strength of ties only for individuals living nearby. This finding indicates that despite the Internet being a global technology, its effect on strength of ties was higher when it was used as a local technology for communication.

[INSERT FIGURE 2 ABOUT HERE]

For a better understanding of the interactive effect we plotted the predicted strength-of-tie value on the place of residence. The graph shows that the strength of the ties for friends met in all three contexts increased when they lived in the same location. But the slope of the line for friends met online is steeper.

[INSERT TABLE 4 ABOUT HERE]

Table 4 shows the results for gender similarity on strength of ties. First an additive model is shown. Strength of ties seems to be a developmental process as it increases with age and is higher for boys than for girls. Interestingly, having siblings seems to rival having friends. The higher the number of siblings the lower the strength of ties. The place in which a friend was met counts as well. Friends met online and friends met at school are considered to have weaker ties than friends met in the neighborhood. In this table sex similarity does not have an additive effect. However, checking for interaction effects, we found such an interaction effect: when a friend was met online and
was of the same gender, the ties were stronger.

[INSERT GRAPH 3 ABOUT HERE]

To appreciate the extent of differences in strength of ties according to gender similarity we plotted the results in graph 3. While strength of ties increases both for friends met at school and in the neighborhood according to gender similarity, the increase was substantial when the friend was met online.

[INSERT TABLE 5 ABOUT HERE]

The last table displays the association of age similarity with the strength of social ties. According to the results age similarity had no effect on strength of ties. Meeting a friend online or at school decreased the strength of ties. The interactive model shows that while meeting a friend online generally decreased the strength of ties, the effect differed according to age similarity. Friends of the same age and who met online were close friends.

[INSERT GRAPH 4 ABOUT HERE]

Graph 4 shows the difference in the predicted strength of ties when considering age similarity and the place in which the friend was met. It is noteworthy that for friends who were met online age similarity increased substantially the quality of the friends’ relationship.

**Discussion:**

Attempting to overcome the limitations of previous research on adolescent friendship and the quality of online relationships, our purpose here was to investigate the determinants of friends’ homophily and the quality of social relationships among adolescents. Earlier studies on adolescents’ social ties relied heavily on school samples, thus confounding the effect of proximity and similarity. On the other hand, studies on online relationships mostly restricted themselves to investigating the quality of these relationships or evaluating the effect of the type of communication (verbal vs. textual) relationship satisfaction.

In this study we investigated the effects of proximity, operationalized by the social sphere in which a friend was met, on social similarity, and the effect of social similarity and proximity on the quality of social relationships.

The results clearly show that the diverse social contexts in which individuals
reveal themselves to each other are important. The highest degree of similarity in friends was found in schools. Apparently the age-graded segregation and the fact that schools are mainly dependent on local enrollment combine to create a high degree of friends’ similarity in age and place of residence. Friends who were met in the neighborhood were less similar and friends met online were the least similar to the respondents. The results indicate that the higher levels of homophily reported in previous studies, which were based on school samples alone, might overestimate the extent of friends’ homophily.

Furthermore, our results indicate that for adolescents, beyond current proximity, developmental factors operate that create persistence in social similarity to friends. Out of all the three indicators of similarity studied, namely place of residence, gender, and age, the last proved to have a negative relationship to the likelihood of similarity. In other words, beyond proximity, the older the adolescent the lower the likelihood of friendship similarity was. Another indication of the operation of a developmental process was the effect of length of acquaintance. The longer the time that a friend was known, the higher the likelihood of similarity. Keeping friends from the past, from childhood, seems to reinforce the effect of proximity in the development of social similarity in adolescence. Thus the past had an effect on the present state of friendship.

We explored further whether social similarity among adolescent friends is conducive to a higher quality of social relationships. We found that proximity still counted, and similarity in place of residence was positively related to the quality of social relationships. But in adolescence, it appears that other qualities such as age and gender similarity do not exert an independent effect on strength of ties.

Current theories of computer-mediated communication are divided on the quality of online social relationships. On the one hand, technological determinists have argued that the nature of the medium, which is heavily textual, hence supposedly lacks any ability to convey non-verbal emotional expressions, is conducive to the formation and maintenance of weak ties only. By contrast, others have argued that the anonymity of the Internet facilitates strong ties. Our study supports the conditional effect. The sphere in which a friend was met modified the association between social similarity and relationship quality. Our findings qualify these theoretical approaches, and again it seems that place does matter. Online friends were strong friends, but only when similarity was
present. When friends who met online resided in the same locality or were of the same sex, relationship quality was high. We also found here that in general friendship quality when friends were met online is considered to be lower than when the friend was met offline. Nevertheless, similarity increased online relationship quality.

Developmental factors proved important here as well. As adolescents grow older the role of peers becomes more and more salient and the quality of their friendships is considered higher than for younger adolescents. Furthermore, length of acquaintance is important as well; the longer a friend has been known, the higher the quality of the relationship. Our study further revealed the “imprint”, namely the reinforcing effect that childhood might have on the similarity of social relationships in adolescence. The longer the time that has elapsed since the friend was met, the more likely was the friend to be both similar to the adolescent and considered as a close friend. In other words, the past reinforces the present and even determines it.

In conclusion, the current study contributes to the understanding of the effect of proximity on friendship formation and relationship quality. Unlike previous studies, this one used an unbiased, representative national sample, in which individual and structural parameters were estimated. The proximity-similarity hypothesis argues that socially structured contexts places individuals close together, so that they reveal themselves to one another and are thus likely to associate; this hypothesis found support in our study. Social homophily was higher between adolescents and friends to whom they were exposed at school or in the neighborhood, and less so with friends to whom they were exposed online. As to the quality of social relationships, we found that similarity matters, paradoxically, in particular for individuals who met friends online. Friends who were met online, resided in the same community, and were of the same sex, proved to be the closest, in contrast to friends who were met online but were not similar in these aspects.

Categorical approaches to ICT give binary answers through an ideologically or empirically biased approach. Instead of focusing on these, future studies on social homophily and relationship quality should consider following the present study. They would concentrate on the conditional effects of structured foci of social activities, social attributes, and technological features of contemporary communication.
Table 1. Extent of Friendship Similarity According to Internet access and Context of Acquaintanceship

<table>
<thead>
<tr>
<th></th>
<th>Whole Sample</th>
<th>No Internet access</th>
<th>Internet access</th>
<th>Met friend at school</th>
<th>Met friend in the neighborhood</th>
<th>Met friend online</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion living same neighborhood or city</td>
<td>90.4%</td>
<td>93.8%</td>
<td>89.8%</td>
<td>94.2%</td>
<td>92.3%</td>
<td>73.5%</td>
</tr>
<tr>
<td>Proportion same sex</td>
<td>83.7%</td>
<td>83.1%</td>
<td>84.6%</td>
<td>94.2%</td>
<td>92.3%</td>
<td>73.5%</td>
</tr>
<tr>
<td>Proportion Same Age</td>
<td>83.2%</td>
<td>84.5% (432)</td>
<td>81.0% (264)</td>
<td>89.5%</td>
<td>80.4%</td>
<td>42.4%</td>
</tr>
</tbody>
</table>
Table 2. Logistic regression predicting similarity in age, gender, and place of residence

<table>
<thead>
<tr>
<th></th>
<th>Place similarity</th>
<th>Gender Similarity</th>
<th>Age Similarity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>-339 (.088)</td>
<td>.713*</td>
<td>.839*</td>
</tr>
<tr>
<td>Gender (1=male)</td>
<td>.073 (.277)</td>
<td>1.076</td>
<td>.209</td>
</tr>
<tr>
<td>Mother’s education</td>
<td>-.125 (.045)</td>
<td>.883*</td>
<td>.967</td>
</tr>
<tr>
<td>Marital status</td>
<td>.564 (.345)</td>
<td>1.757</td>
<td>.716</td>
</tr>
<tr>
<td>Number of siblings</td>
<td>-.045 (.079)</td>
<td>.956</td>
<td>1.016</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-.026 (.146)</td>
<td>.975</td>
<td>1.241**</td>
</tr>
<tr>
<td>Neighborhood friend</td>
<td>-.396 (.295)</td>
<td>.673</td>
<td>.545*</td>
</tr>
<tr>
<td>Online friend</td>
<td>-2.136 (.496)</td>
<td>.118*</td>
<td>-.317*</td>
</tr>
<tr>
<td>Length of acquaintance</td>
<td>.594 (.181)</td>
<td>1.810*</td>
<td>.547 (.165)</td>
</tr>
<tr>
<td>Daily Internet use</td>
<td>.038 (.065)</td>
<td>1.038</td>
<td>.126 (.083)</td>
</tr>
<tr>
<td>Social use</td>
<td>.296 (.265)</td>
<td>1.345</td>
<td>-.169 (.217)</td>
</tr>
<tr>
<td>Instrumental use</td>
<td>-.290 (.247)</td>
<td>.748</td>
<td>-.052 (.224)</td>
</tr>
<tr>
<td>Constant</td>
<td>7.657* (.1760)</td>
<td>3.615* (.1214)</td>
<td>.401 (.1321)</td>
</tr>
<tr>
<td>-2 log likelihood</td>
<td>402.485</td>
<td>715.424</td>
<td>588.300</td>
</tr>
<tr>
<td>Chi square</td>
<td>64.370</td>
<td>41.154</td>
<td>70.225</td>
</tr>
</tbody>
</table>

*p<.01
**p<.05
Table 3. OLS regression predicting strength of ties from place of residence

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Parameter estimate (S.E.)</th>
<th>Beta</th>
<th>Parameter estimate (S.E.)</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.114 (.043)</td>
<td>.089*</td>
<td>.113 (.042)</td>
<td>.088*</td>
</tr>
<tr>
<td>Gender (1=boy)</td>
<td>-.754 (.147)</td>
<td>-.172*</td>
<td>-.764 (.143)</td>
<td>-.174*</td>
</tr>
<tr>
<td>Nationality (1=Jewish)</td>
<td>-.678 (.202)</td>
<td>-.132*</td>
<td>-.818 (.197)</td>
<td>-.160*</td>
</tr>
<tr>
<td>Parents’ marital status (1=married)</td>
<td>-.432 (.226)</td>
<td>-.064**</td>
<td>-.346 (.219)</td>
<td>-.051</td>
</tr>
<tr>
<td>Mother’s education</td>
<td>-.035 (.027)</td>
<td>-.048</td>
<td>-.020 (.026)</td>
<td>-.028</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>.014 (.079)</td>
<td>.006</td>
<td>-.032 (.077)</td>
<td>0.014</td>
</tr>
<tr>
<td>Number of siblings</td>
<td>-.099 (.043)</td>
<td>-.089**</td>
<td>-.107 (.041)</td>
<td>-.096*</td>
</tr>
<tr>
<td>Neighborhood friend</td>
<td>.431 (.152)</td>
<td>.098**</td>
<td>.401 (.148)</td>
<td>.091*</td>
</tr>
<tr>
<td>Online friend</td>
<td>-1.037 (.388)</td>
<td>-.101*</td>
<td>-5.101 (.674)</td>
<td>-.496*</td>
</tr>
<tr>
<td>Length of acquaintance</td>
<td>.376 (.132)</td>
<td>.103*</td>
<td>.260 (.129)</td>
<td>.071**</td>
</tr>
<tr>
<td>Frequency of daily Internet use</td>
<td>.054 (.026)</td>
<td>.083**</td>
<td>.050 (.025)</td>
<td>.076**</td>
</tr>
<tr>
<td>Use of Internet for social purposes</td>
<td>.225 (.147)</td>
<td>.098</td>
<td>.250 (.143)</td>
<td>.109</td>
</tr>
<tr>
<td>Use Internet for instrumental purposes</td>
<td>-.310 (.146)</td>
<td>-.140**</td>
<td>-.333 (.141)</td>
<td>-.150*</td>
</tr>
<tr>
<td>Place similarity</td>
<td>.694 (.278)</td>
<td>.086*</td>
<td>-.106 (.291)</td>
<td>-.013</td>
</tr>
<tr>
<td>Place similarityxonline friend</td>
<td></td>
<td></td>
<td>5.497 (.757)</td>
<td>.443*</td>
</tr>
<tr>
<td>Constant</td>
<td>12.458* (.1003)</td>
<td></td>
<td>13.567 (.985)*</td>
<td></td>
</tr>
<tr>
<td>Rsquare</td>
<td>.116</td>
<td></td>
<td>.169</td>
<td></td>
</tr>
<tr>
<td>Adj. Rsquare</td>
<td>.101</td>
<td></td>
<td>.154</td>
<td></td>
</tr>
</tbody>
</table>

*p<.01  
** p<.05
Table 4. O.L.S. Regression predicting strength of ties on sex similarity

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Parameter estimate (S.E.)</th>
<th>Beta</th>
<th>Parameter estimate (S.E.)</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.106 (.043)</td>
<td>.082*</td>
<td>.101 (.043)</td>
<td>.079*</td>
</tr>
<tr>
<td>Gender (1=boy)</td>
<td>-.753 (.148)</td>
<td>-.172*</td>
<td>-.777 (.146)</td>
<td>-.177*</td>
</tr>
<tr>
<td>Nationality (1=Jewish)</td>
<td>-.702 (.203)</td>
<td>-.137*</td>
<td>-.715 (.201)</td>
<td>-.140*</td>
</tr>
<tr>
<td>Parents’ marital status (1=married)</td>
<td>-.370 (.227)</td>
<td>-.054</td>
<td>-.348 (.225)</td>
<td>-.051</td>
</tr>
<tr>
<td>Mother’s education</td>
<td>-.042 (.026)</td>
<td>-.058</td>
<td>-.023 (.027)</td>
<td>-.032</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>.011 (.079)</td>
<td>.005</td>
<td>.000 (.078)</td>
<td>.000</td>
</tr>
<tr>
<td>Number of siblings</td>
<td>-.105 (.043)</td>
<td>-.094*</td>
<td>-.093 (.042)</td>
<td>-.083**</td>
</tr>
<tr>
<td>School friend</td>
<td>-.442 (.153)</td>
<td>-.101*</td>
<td>-.423 (.152)</td>
<td>-.097*</td>
</tr>
<tr>
<td>Online friend</td>
<td>-1.534 (.387)</td>
<td>-.151*</td>
<td>-3.663 (.624)</td>
<td>-.360*</td>
</tr>
<tr>
<td>Length of acquaintance</td>
<td>.353 (.130)</td>
<td>.099*</td>
<td>.314 (.129)</td>
<td>.088*</td>
</tr>
<tr>
<td>Frequency of daily Internet use</td>
<td>.052 (.025)</td>
<td>.082**</td>
<td>.053 (.025)</td>
<td>.084**</td>
</tr>
<tr>
<td>Use of Internet for social purposes</td>
<td>.247 (.148)</td>
<td>.109</td>
<td>.282 (.147)</td>
<td>.125**</td>
</tr>
<tr>
<td>Use Internet for instrumental purposes</td>
<td>-.315 (.146)</td>
<td>-.143**</td>
<td>-.364 (.145)</td>
<td>-.165*</td>
</tr>
<tr>
<td>Sex similarity</td>
<td>.363 (.199)</td>
<td>.062(+)</td>
<td>.122 (.205)</td>
<td>.021</td>
</tr>
<tr>
<td>Sex similarityxonline friend</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>13.537* (.960)</td>
<td></td>
<td>13.684* (.950)</td>
<td></td>
</tr>
<tr>
<td>Rsquare</td>
<td>.108</td>
<td></td>
<td>.128</td>
<td></td>
</tr>
<tr>
<td>Adj. Rsquare</td>
<td>.093</td>
<td></td>
<td>.112</td>
<td></td>
</tr>
</tbody>
</table>

*p<.01

**p<.05
Table 5. O.L.S. Regression predicting strength of ties on age similarity.

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Parameter estimate (S.E.)</th>
<th>Beta</th>
<th>Parameter estimate (S.E.)</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.110 (.046)</td>
<td>.084*</td>
<td>.113 (.046)</td>
<td>.086*</td>
</tr>
<tr>
<td>Gender (1=boy)</td>
<td>-.737 (.160)</td>
<td>-.164*</td>
<td>.750 (.160)</td>
<td>-.167*</td>
</tr>
<tr>
<td>Nationality (1=Jewish)</td>
<td>-.710 (.220)</td>
<td>-.137*</td>
<td>.739 (.221)</td>
<td>-.143*</td>
</tr>
<tr>
<td>Parents’ marital status (1=married)</td>
<td>-.447 (.252)</td>
<td>-.063</td>
<td>-.452 (.252)</td>
<td>-.064</td>
</tr>
<tr>
<td>Mother’s education</td>
<td>-.025 (.030)</td>
<td>-.034</td>
<td>-.021 (.030)</td>
<td>-.028</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-.020 (.087)</td>
<td>-.008</td>
<td>-.022 (.087)</td>
<td>-.009</td>
</tr>
<tr>
<td>Number of siblings</td>
<td>-.111 (.046)</td>
<td>-.100*</td>
<td>.111 (.046)</td>
<td>-.099*</td>
</tr>
<tr>
<td>School friend</td>
<td>-.440 (.167)</td>
<td>-.098*</td>
<td>.430 (.167)</td>
<td>-.096*</td>
</tr>
<tr>
<td>Online friend</td>
<td>-2.430 (.477)</td>
<td>-.197*</td>
<td>-3.079 (.613)</td>
<td>-.250*</td>
</tr>
<tr>
<td>Length of acquaintance</td>
<td>.553 (.153)</td>
<td>.134*</td>
<td>.514 (.155)</td>
<td>.125*</td>
</tr>
<tr>
<td>Frequency of daily Internet use</td>
<td>.054 (.028)</td>
<td>.080**</td>
<td>.056 (.028)</td>
<td>.082**</td>
</tr>
<tr>
<td>Use of Internet for social purposes</td>
<td>.141 (.163)</td>
<td>.057</td>
<td>.169 (.164)</td>
<td>.068</td>
</tr>
<tr>
<td>Use Internet for instrumental purposes</td>
<td>-.232 (.160)</td>
<td>-.100</td>
<td>-.260 (.160)</td>
<td>-.112</td>
</tr>
<tr>
<td>Age similarity</td>
<td>-.109 (.223)</td>
<td>-.018</td>
<td>-.196 (.229)</td>
<td>-.033</td>
</tr>
<tr>
<td>Age similarityxonline friend</td>
<td></td>
<td></td>
<td>1.575 (.936)</td>
<td>.078(+)</td>
</tr>
<tr>
<td>Constant</td>
<td>12.961 (1.062)*</td>
<td></td>
<td>13.110* (1.064)</td>
<td></td>
</tr>
<tr>
<td>Rsquare</td>
<td>.129</td>
<td></td>
<td>.133</td>
<td></td>
</tr>
<tr>
<td>Adjusted R Square</td>
<td>.112</td>
<td></td>
<td>.115</td>
<td></td>
</tr>
</tbody>
</table>

*p<.01  
**p<.05  
+p<.10
Figure 1.
Predicted probability of dyadic similarity according to place in which the friend was first met
Figure 2

Predicted strength of ties according to place similarity for friends met at school, neighborhood and online
Figure 3 Predicted strength of ties according to gender similarity for friends met at school, neighborhood and online
Figure 4 Predicted strength of ties according to age similarity for friends met at school, neighborhood and online
References


