



A study of adolescents' online and offline social relationships

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Abstract

Recent studies have shown that adolescents use the Internet not only to maintain social relationships with distant relatives and friends but also to create new relationships online; some of these friendships become integrated into their social circle. Past studies focused mainly on the effect of the Internet on existing relationships or the nature of online-only ties, so studies comparing the quality of online and face-to-face relationships are missing. The goal of the current study is to bridge this gap. In keeping with previous studies on social association, I argue that the quality of social relationships is dependent on duration and diversity of topics and activities carried out together. Time is important as it facilitates the development of a collective shared history and identity. Intimacy develops through the participation in shared activities and discussion of diverse issues of personal concern. Using a representative sample of the adolescent population in Israel, it was found that closeness to a friend is a function of social similarity, content and activity multiplexity and duration of the relationships. Friendships originated in the Internet are perceived as less close and supportive because they are relatively new and online friends are involved in fewer joint activities and fewer topics of discussion. The implications of the findings are discussed.

As the proportion of households in the population of Western countries gaining access to the Internet is increasing, empirical evidence is accumulating that the Internet is becoming more and more integrated in individuals' everyday life, including the formation and maintenance of intimate and non-intimate social relationships (Wellman and Giulia, 1999; Haythornthwaite and Wellman, 2002). Early studies reflected a concern with decreasing social involvement and compared Internet users and non-users in the extent of involvement with existing social relationships. The results on the impact of the Internet on *existing relationships* were mixed. Some found a decrease in the involvement with previous ties (Kraut et al., 1998; Nie et al., 2002) but others have shown that Internet use does not affect involvement in close relationships and the community (Katz and Rice, 2002; Hampton and Wellman, 2003; Mesch and Levanon, 2003) and even supports and maintains relationships with friends and family after moving to a new location (Cummings et al., 2004). Other studies restricted themselves to the study of online social relationships only, documenting the existence of supportive, intimate and personal relationships online (McKenna and Bargh 1998; Walther and Boyd, 2002).

Lately, empirical evidence has shown that individuals use the Internet not only for existing close ties but also to create new relationships in which companionship, social support and information exchange take place. In some cases these online relationships become incorporated into the Internet users' face-to-face social circle (Parks and Floyd, 1996; Hampton and Wellman, 2002; Mesch and Levanon, 2003; Wolak et al., 2003; Mesch and Talmud, 2004). The effect of the Internet on existing relationships has been extensively studied, but the literature is wanting in the comparative study of the quality of personal relationships created online and those created in face-to-face settings. The goal of the current study is

to fill this gap. Using recently collected data of a representative sample of the adolescent population in Israel, the differential quality of personal relationships created online and face-to-face was investigated.

Keywords: computer mediated communication, online and offline social networks, Internet use, strength of ties

Study overview

The conceptual model guiding the current study assumes that association with others, and the quality of this association, is a socially structured process. Individuals and families differ in their human, economic and social capital, and according to the level of these resources we engage in daily activities (work, study, leisure) in different contexts in which we associate with others. The likelihood of association with others is higher when others are similar in social characteristics because we belong to the same social contexts, are subjected to a similar socialization process and therefore develop similar interests and concerns. Thus, social similarity is a salient factor, as individuals that share a similar social status such as age, gender and place of residence, are more likely to share interests and concerns that facilitate the formation of common ground for social exchange. Once a relationship has been established the strength of that relationship is dependent on the ability of individuals to be involved in common activities and intimate conversations. In part, this ability is a function of relationship duration, as intimacy and participation in common activities requires time. In that sense, the model departs from communication models that emphasize the role of channels of communication. Rather, the choice of channel is seen as partially dependent on social characteristics of the relationship, such as similarity and intimacy.

In order to test the current model, a survey of a representative sample of Israeli adolescents (n=996) was conducted. Adolescents aged 12-18 were asked to provide information on the extent to which they have access to the Internet, and their patterns of use. In addition, respondents were asked to provide information regarding their friends. Using an ego network technique, adolescents provided information on whether the friend was met face-to-face (school, neighborhood) or online (chat rooms, email or Instant messenger) and whether they are similar in terms of age, gender and place of residence. Friends met online and in face-to-face settings were compared in terms of social similarity, relationship duration and relationship content. The findings show that online ties are more distant than offline ties because they are less developed than face-to-face ties. The length of association with online friends is shorter than with friends who were met face-to-face, indicating that fewer opportunities for intimate discussion and participation and joint activities explain the relational quality differences.

The structure of the paper is as follows. First, a review of literature on adolescent friendship is presented. This period in life is one in which the social circle of the individual expands rapidly outside the family, thus presenting an opportunity for

the study of the sources of relationship formation and its quality. Second, central findings of the literature on online and offline relationships are presented as a basis to the conceptual model guiding the current study. Then, the study methodology and findings are presented followed by a discussion of the implications of the theoretical implications of the findings.

Personal relationships during adolescence

The current study focuses on the nature of social relationships during adolescence. During this period, social relationships outside the family expand and their quality has been linked to various behavioral outcomes (Giordano, 2003). Social interaction with peers provides a forum for learning and refining the socio-emotional skills needed for enduring relationships. Through interactions with peers, adolescents learn how to cooperate, to take different perspectives, and to satisfy growing needs for intimacy (Rubin et al., 1998; Crosnoe, 2000). Youths who report having friends are more confident, more altruistic, and less aggressive, and demonstrate greater school involvement and work orientation (Hartup and Stevens, 1997).

Youniss and Smollar (1985) have argued that adolescents' friends are intimate and more accepting than parents, who are necessarily more oriented toward the future and more concerned with the potentially negative consequences of their child's behavior. This greater level of acceptance helps explain the high levels of self-disclosure and mutual trust that often develop for the first time at this age, and that are characteristics of close friendship ties (Giordano, 2003). In that sense, personal relationships are for adolescents a type of social support. Those with more supportive friendships were shown to have higher self-esteem, to suffer depression or other emotional disorders less often, and to be better adjusted to school than youths with less supportive friendships (Berndt et al., 1989; Hartup and Stevens, 1997; Collins et al., 1999; Beraman and Moody, 2004). The rapid growth of friendship at adolescence provides a unique setting for the comparative analysis of friendships created online and offline that is addressed in this study.

The quality of face-to-face and online social ties

The literature on personal relations has long been concerned with the quality of the ties that bind individuals. One way to measure this quality is by the strength of these ties (Marsden and Campbell, 1984). A tie's strength is usually assessed by means of a combination of factors such as perceived closeness, intimacy and trust. Weaker ties are evinced in more casual relationships and in sparser exchanges; they typify relationships of those who enjoy fewer kinds of support. Strong ties exist in relationships on a high level of intimacy, involving more self-disclosure, shared activities, emotional as well as instrumental exchanges, and

long-term interaction (Marsden and Campbell, 1984; Haythornthwaite and Wellman, 2002).

Studies on the quality of online relationships are divided in their conclusions regarding the qualities of social ties that are created and maintained through the Internet. Positions on the social impact of the Internet derive from arguments regarding 'social affordability', dominated by two contrasting views, communication channel determinism and social constructivism. Early conceptualizations, assuming the technological qualities of the Internet, described the weakness of electronic media, as a communication channel, in supporting social ties. The 'reduced social cues perspective' is based on the observation that computer-mediated communication (CMC) allows the exchange of fewer cues than face-to-face environments and suggests that CMC is less appropriate for the support of emotional exchanges or the conveyance of complex information and a sense of social presence. This early perspective is quite skeptical of the ability of CMC to support strong ties. Moreover, precisely because CMC provides access to a wider audience of individuals who may share interests and hobbies, it has been suggested that the reduced social cues environment on which CMC is based is more suited for supporting weak ties by reducing the risks associated with contacting unknown others (Sproul and Kiesler, 1986; Rice and Love, 1987). While recognizing that computer-mediated communication is often impersonal, Walther has argued that in many cases it becomes hyper-personal leading to social ties that are intimate, supportive and emotionally meaningful. According to this approach, through time online ties develop a shared system of clues, using expressions and emoticons that overcome the lack of social presence (Walther, 1996).

Social constructivists, by contrast, argue that some features of online communication, such as anonymity, isolation, lack of 'gating features', and ease of finding others with the same interests, make it easier for individuals to form strong ties (Joinson, 2001; McKenna et al., 2002). The formation of close interpersonal relationships requires the establishment of trust, that is, a sense that intimate information disclosed in interpersonal exchanges is not widely disseminated and is not used to ridicule friends. The relative anonymity of the Internet reduces the risks of such disclosure, especially intimate information, because such intimate information can be shared with no fear for embarrassment resulting from disclosing intimate information to members of the close-knit, often transitive, face-to-face social circle (McKenna et al., 2002).

Empirical evidence for these perspectives is mixed. A few studies report that the quality of online social interactions and relationships is lower than that of face-to-face interactions. Employees of a multinational bank reported that email communication was less reliable than face-to-face. In another study, college students evaluated email communication as inferior to communication in person as a means of maintaining personal relationships (Cummings et al., 2002). In other words, offline friends are perceived as closer because the frequency of communication with face-to-face friends is higher than with online friends.

Other studies, however, have shown that people often disclose intimate information about themselves online (Joinson, 2001; McKenna et al., 2002). The

high levels of self-disclosure in CMC interactions proved to be related to anonymity (Joinson, 2001). Individuals who disclosed personal and intimate information over the Internet reported greater closeness to their online friends (McKenna et al., 2002). Yet, none of these directly compared the quality of online and face-to-face relationships.

It is the argument of this paper that the quality of social ties is heavily dependent not only on the place where friends meet, but also on social similarity, which were not studied in previous studies. While I do not underestimate the relevance of communication channels in shaping some aspects of social relationships, the selection of communication channels is at least partially shaped by social factors that determine the very formation of the relationship and its quality. In the next section, the conceptual model is presented.

Social similarity and the nature of social ties

Studies on the formation, development, maintenance, and dissolution of close social relationships have emphasized the importance of social similarity (Hartup and Stevens, 1997; Maccoby, 1998; McPherson et al., 2002). This notion holds that 'contact and friendship formation between similar individuals occurs at a higher rate than among dissimilar individuals' (McPherson et al., 2002). Social similarity is the result of opportunities for interaction emerging from the social structuring of activities in society that expose individuals to each other.

Social similarity is an exogenous variable that reflects both opportunities for mutual exposure and friendship selection, and as such, shapes the content and the quality of the relationship being created. In that sense, social similarity among friends is frequent because it provides important rewards. Similar individuals are likely to participate in enjoyable joint activities with others who have similar interests, hence to receive validation of their attitudes and beliefs. Participation in the same activities increases the frequency and duration of social interaction. Furthermore, similarity has been associated with stable and strong ties (Hallinan and Kubitschek, 1988). When social 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 Kubitschek, 1988).

The nature of social interaction and strength of ties

Friendship is distinguished from other types of social relationships because contact with friends is more intense. Intensity is usually a feature that describes the history of the relationship and refers to its duration (Lee and Campbell, 1992). A central characteristic of friendships is the development of a history of shared experiences that define a feeling of belonging and shared identity. In addition, the

development of central characteristics of friendship such as trust and reciprocity are at least partially temporal processes. Trust develops through a process of mutual disclosure of personal information, and this requires time.

Another important dimension is the content of a relationship. Different from formal relationships, in which social interaction is partial and based on social status, friendships are more holistic. A friend differs from a co-worker or a relative in that friends are not restricted to a few topics of conversation or a few shared activities. To be friends is to be together and to talk about anything. In that sense, an important concept is multiplexity, a notion that describes the content of relationships. Multiplexity suggests that a relationship is stronger when a tie between two people encompasses multiple activities or topics of conversation rather than a single activity or shared topic. Studies have shown that higher multiplexity is reported among friends who report having a similar social background such as age, gender, and ethnicity (Stoller et al., 2001). In other words, background similarity or homophily increases the likelihood of multiplexity. Individuals who share status characteristics are more likely to have a broad spectrum of topics to talk about and activities to get involved in. While in some studies multiplexity has been used as a proxy for tie strength (Stoller et al., 2001), in the seminal work of Mardsen and Campbell (1984) it was not found to be a central component of tie strength. These authors showed that emotional intensity, indicated by measures of closeness and trust, is the best measure of the strength of a tie.

The Israeli context

In Israel, Internet use is expanding rapidly. In 1998, only 11% of Israeli households reported having access to the Internet; the figure had risen to 30% by 2002 (CBS, 2002). As elsewhere, in Israel there is a digital divide. Internet use is proving higher among males than females, and socioeconomic differences are reflected in Internet use. Most Internet users reported earning an average or above-average income, and being of Western origin (CBS, 2002).

Adolescents' use of the Internet has expanded even faster. While in 2001 only 35% of the adolescent population had access to the Internet, by 2004 65% had access at home. As to purpose, the overwhelming majority of adolescent Internet users reported that it was mainly for social purposes. Almost 74% of these respondents said that they liked to meet new people through the net (Minerva Center of Youth Studies, 2004).

In Israel, as elsewhere, youth represent a significant proportion of Internet users and in this sense they call for special attention. Furthermore, most current research focuses on English-speaking countries. Little is known about the connection between Internet use and social relationships in non-English-speaking countries.

Studies have started to examine the relationship of Internet use and social involvement, and 14% of Israeli adolescents reported having friends whom they

met online (Mesch and Talmud, 2004). These adolescents were found to have a more dispersed and heterogeneous network in terms of gender and age than those who did not have online friends (Mesch and Talmud, 2004). The goal of this paper is to investigate the differential quality of social relationships created online and face-to-face among adolescents in Israel. In this, and in keeping with the literature reviewed, we focus on the effect of social similarity, duration of the relationship, and multiplexity on the strength of ties among adolescents in Israel.

Methods

This study 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 2004. The annual survey covers a representative sample of 1000 households in Israel. The sampling procedure begins with a random sample of 60 localities 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 degree of perceived closeness to each friend.

In the survey, each adolescent was asked 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 through 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 to which 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 degree of similarity in age, gender, and place of residence between the respondent and the first friend who was named.

Measures

Dependent variables

Intensity of friendship was determined by means of a single measure. Following the work of Lee and Campbell (1992) respondents were asked to state how long they had known each friend.

To measure multiplexity, content and activity multiplexity were distinguished and two different scales were built. Adolescents were presented with a list of nine items and were asked to indicate for each one if it was a frequent topic of conversation between them and their friends. The topics were school, parents, family, friends, sports, personal problems, music and TV programs, romantic relationships, and dress and fashion. The measure of content multiplexity was built by summation of all the topics. The scale had an acceptable reliability of $\alpha=0.674$ (means=4.57 sd=2.11). The second measure, activity multiplexity, was constructed of five items, these being activities; adolescents were asked to indicate which activities they did with the first friend they named. Responses were meeting at parties, meeting at homes, meeting at school, going out together, and participating in the same extracurricular activities. The scale showed an acceptable reliability of $\alpha=0.607$. The final scale was built as a sum across all the items.

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 him/her, how important he/she was for them, how far they would ask him/her for help, and how far they trusted him/her. Responses were given on a five-point Likert scale. The items were subjected to a factor analysis using varimax rotation. One factor was found and a scale was built with reliability $\alpha=0.811$. Next the scale was built by a simple summation of the responses over all the items.

Independent variables

A unique feature of the current survey is that it 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 he/she was first met on the Internet, at school, in extracurricular activities, or in the neighborhood. From this question we computed a measure distinguishing the setting in which the first friend was met. A dummy variable was created indicating the place in which the friend was met for the first time; the relevant categories were face-to-face (neighborhood, at school, in extracurricular activities) and online (through chat rooms, bulletin boards, or email use).

A number of measures of Internet use were used. Adolescents were asked to report the number of hours per day that they used the Internet. The variable was introduced as a continuous measure. Secondly, adolescents were asked to indicate for how long they had access to the Internet from home, and the variable was introduced as a continuous measure.

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. A conservative approach to the measurement of neighborhood was taken and a dummy variable that was coded 1 when the first friend was reported to live in the same neighborhood or the same city was created. When the friend was reported as living in another city or another country the variable was coded 0. This conservative approach was taken because in some central and northern areas of the country the density of the population is such that having a friend in a nearby neighborhood may mean having a friend in another city.

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 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 were within 12 months of each other's age (Hartup and Stevens, 1997).

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 genders of ego and of alter were the same and 0 when they were not.

In addition, in the multivariate analysis, adolescent's age, gender, number of siblings, and nationality (1=Jew) and for mother's education were introduced.

Sample description

Of the 1000 adolescents contacted, 987 agreed to participate in the study. Respondents' average age was 15.52 years (sd 1.66); girls and boys were almost equally represented (52% were boys). In terms of religious denomination, 79% were Israeli Jews. In socioeconomic status, average father's education was 12.63 years (sd 3.50) and average mother's education was 12.52 years (sd 3.37). Regarding family status, 86.8% reported that their parents were married and 13.2% of parents were separated or divorced.

Access to the Internet was reported by 66.7% of the adolescents. Respondents were asked where the first friend was met: 60% first met the friend at school, 28% in the neighborhood, and 12% first met online. In our sample, the majority of the adolescents met their closest friend at school, but a significant percentage (40%) met their closest friend in other social settings such as the neighborhood and online. The descriptive analysis showed that for the whole sample 53.4% of the friends first named lived in the same neighborhood as the respondent, 85% were of the same gender as the respondent, and 87% were the same age as the respondent.

Adolescents reporting having online friends did not differ in age from those reporting not having online friends (15.51 years and 15.65 years; $p=n.s.$). Gender differences existed as a higher percentage of boys than girls reported having online friends. Of those reporting having a friend who was met online, two-thirds were boys and only one-third were girls.

Regarding socio-demographic, adolescents who reported that their friend was met at school or in the neighborhood showed on average a higher percentage of age similarity. While 89% of the adolescents who did not have an online friend reported that their friends were about their age, only 77% of the respondents who had an online friend reported this. A similar situation emerged regarding gender similarity. Of the adolescents without an online friend, 88% had friends of the same gender; for the ones with an online friend the percentage was 69%. These differences are important as they indicate greater dissimilarity in dyadic characteristics; this should be controlled, as in previous studies social similarity has proved a predictor of stable relationships and strong ties. Furthermore, multivariate analysis that controls for age is needed as social similarity in age, gender, and residence diminishes as adolescents grow older.

Differences in the mean duration, multiplexity and strength of the association with the first friend named were found. When the adolescent reported that the friend was met online, the average strength of the tie turned out to be lower (12.10; $sd=2.52$) than when the friend was met face-to-face (13.92; $sd=1.79$). The heterogeneity of tie strength was higher for online friends, as indicated by the standard deviations. Duration of the friendship was also higher for face-to-face friends; on average they reported a duration of 3.81 years ($sd=0.55$) while for those reporting an online friend, duration was 3.07 years on average ($sd=1.21$). As to multiplexity, statistically significant differences were found for respondents who reported meeting an adolescent online and face-to-face. Adolescents whose friend was met online reported fewer topics of conversation (mean=3.78, $sd=2.36$) than adolescents who met their friend face-to-face (mean=4.57, $sd=2.17$), a difference that was statistically significant ($p<0.05$); they also reported fewer shared activities (for online friend, mean=2.77, $sd=1.49$); for face-to-face friend mean=3.61, $sd=1.77$). Having established a significant difference in the number of topics discussed and shared activities, it was interesting to know if the topics and activities differed not only in number but also in type.

Adolescents were asked, after they had indicated whether the first friend they named was met in a face-to-face setting or online, to state the activities they engaged in with this friend. Table 1 presents these activities, as engaged in proportionately by adolescents reporting meeting the first friend face-to-face and online. Distinct differences are evident in activities undertaken with face-to-face friends and with online friends. Certain activities were reported more by adolescents with a face-to-face friend than by adolescents with an online friend. Face-to-face relationships yielded a higher proportion of phone conversations, meetings at school, meetings at friends' houses and of hanging out together. Regarding going to parties together, no differences were found, and as regards to extracurricular activities in the evenings, online friends were more likely to participate together. Overall, face-to-face friends apparently engaged in different activities from online friends. Yet as seen from the table, online relationships were

not wholly virtual. Friends who met online did engage in face-to-face activities, but it is important to keep in mind that they were just fewer, not non-existent.

Table 1. Proportion of adolescent and friend engaging in shared activities according to origin of the relationship

Things we do together	Friend was met face-to-face	Friend was met online
Phone conversations	0.741	0.583**
Going to parties	0.364	0.305
Meeting at school	0.65	0.331*
Meeting at friends' houses	0.684	0.194*
Hanging out	0.669	0.361*
Going to school extracurricular activities	0.09	0.11*

** $p < 0.01$, * $p < 0.05$

Given that Internet friends met online met face-to-face less often, it was reasonable to inquire into the nature of this relationship and to want to know the resources they exchanged in order to be considered friends. To address this question the proportion of adolescents with face-to-face and online friends according to topics of discussion was compared.

Table 2. Proportion of adolescent and friend discussing diverse topics according to origin of the relationship

Topics we discuss together	Friend was met face-to-face	Friend was met online
School	0.63	0.60
Parents	0.50	0.39
Friends	0.75	0.71
Hobbies	0.421	0.421
Personal problems	0.593	0.368*
TV shows and movies	0.618	0.526
Romantic relationships	0.499	0.342**
Fashion and dieting programs	0.546	0.421

** $p < 0.01$, * $p < 0.05$

For most of the non-personal topics (school, parents, friends, hobbies, TV shows, movies and fashion) the difference in the proportion of face-to-face and online friends who talked about them was not statistically significant. With several topics, such as school and friends, the proportion was quite high (more than 60% of adolescents with a face-to-face friend and adolescents with an online friend). Yet

two topics did show a significant difference: personal problems and romantic relationships. A higher proportion of adolescents who met their friend face-to-face than of adolescents who met their friend online discussed intimate issues. Thus, intimacy was higher among face-to-face friends than among online friends.

But how were these differences in certain activities and topics of conversation associated with the quality of relationships? I start exploring this issue by presenting the bivariate correlation matrix. Table 3 present the bivariate correlations, means and standard deviations of the variables included in the analysis.

The purpose of this exploratory analysis was to examine the pattern and size of associations among its variables. The bivariate correlations between the dependent variables were significant and of low magnitude, not threatening multicollinearity. As can be expected, the strength of the relationship was positively correlated with content multiplexity ($r=0.316$, $p<0.01$), activity multiplexity ($r=0.169$, $p<0.01$), and duration of the relationship ($r=0.175$, $p<0.01$). As required for testing a mediating effect, the strength of the relationship was negatively related to the origin of the relationship ($r=-0.123$, $p<0.01$), indicating that without controls, relationships originating in face-to-face settings, such as school or neighborhood, were perceived as closer than relationships originating online. The importance of social similarity can be appreciated as well. All the measures of social similarity were negatively related to age, indicating that with age, gender similarity and similarity in residence diminish. The direction of the bivariate correlation was the same for residential similarity but was not statistically significant. The correlation indicates, as in many past studies, that homophily decreases with age. The measures of multiplexity and duration of the relationship were also related to the quality of the relationship. Age similarity was positively related to content and activity multiplexity, indicating that similar individuals tend to conduct more diverse activities together and to talk about more topics. Gender similarity was only related to activity multiplexity, indicating that individuals of the same sex are likely to spend more time together in more diverse activities. Interesting as they are, bivariate results are limited, as they do not control for different variables. To conduct this test, a multivariate analysis was needed.

Table 3. Correlations and descriptive statistics for the sample

Tie strength	1.0													
Content multiplexity	0.322**	1.0												
Activity multiplexity	0.189**	0.380**	1.0											
Duration	0.148**	0.093*	0.089*	1.0										
Online friend	– 0.128**	– 0.082*	– 0.106**	– 0.292**	1.0									
Age	0.063	0.067	–0.031	0.023	0.035	1.0								
Gender (1=Male)	– 0.118**	– 0.219**	–0.070	–0.011	0.061	0.032	1.0							
Nationality (1=Jew)	0.051	0.039	0.092	0.039	–0.027	0.021	0.08	1.0						
Parental status	–0.038	–0.052	0.045	0.008	–0.018	– 0.005	0.025	0.046	1.0					
Parental education	–0.007	–0.003	0.038	0.064	–0.054	– 0.036	0.075	0.233**	0.047	1.0				
Number of siblings	–0.020	–0.031	–0.073	–0.034	–0.004	0.027	0.027	– 0.298**	–0.012	– 0.353**	1.0			
Gender similarity	0.042	0.030	0.063	0.203**	– 0.137**	– 0.079*	0.029	–0.062	0.011	0.014	0.030	1.0		
Age similarity	0.062	0.093*	0.106**	0.046	–0.050	– 0.047	– 0.014	0.042	– 0.120**	0.015	– 0.004	0.257**	1.0	

Residential similarity	0.177**	0.022	-0.011	0.127**	-	-	0.015	-0.033	0.052	-0.050	-	0.145**	0.059	1.0		
					0.161**	0.069					0.015					
Duration of Internet use	0.107**	0.093*	0.135**	0.014	-0.012	0.037	0.008	0.294**	0.020	0.314**	-/274	-0.003	0.070	-0.008	1.0	
Daily frequency of use	-0.010	-	0.062	-0.019	.049	0.021	0.055	0.058	0.022	-0.035	-	-0.071	-	-0.004	0.013	1.0
		0.085*									0.101		0.057			
Means (sd)	13.9	4.49	3.55	3.76	0.12	15.53	0.51	0.80	0.78	13.219	2.60	0.85	0.87	0.53	3.4	3.9
	(1.85)	(2.21)	(1.78)	(0.64)	(0.22)	(1.67)	(0.50)	(0.39)	(0.25)	(3.28)	(1.48)	(0.34)	(0.33)	(0.49)	(1.5)	(4.42)

* $p < 0.01$, ** $p < 0.05$

Table 4 presents the results of regressing socio-demographic variables, propinquity, similarity variables, and the origin of the friendship on the length of time friends had known each other. The results show that length of acquaintance was related to measures of propinquity and similarity. As may be expected, friends living in the same neighborhood were acquainted for longer, reflecting the effect of propinquity and probably length of residence on length of time a friend had been known. Furthermore, friends of the same sex reported a longer duration of friendship.

The second model in Table 4 presents the results of regressing the same variables on our measure of content multiplexity. In this table I find some different effects; age and gender were related to multiplexity, probably reflecting developmental processes. Older adolescents were more likely to report discussing more topics and day-to-day issues with their friends. Previous literature has shown that as adolescents become older they are more likely to confide in their friends about their grievances. In addition, as adolescents grow older the issues that generate mutual interest become more diversified and broad. On the other hand, it is noticeable that girls reported more topics of conversation than boys. The literature on gender differences in friendships reports that for girls, friendship means talking and intimacy on different topics; for boys, friendship is more doing things together. This may explain why boys' interests are more focused and narrow.

Propinquity and similarity were also associated with the diversity of topics that adolescent friends discuss. Adolescents whose friend resided in the same neighborhood reported a wider diversity of topics of conversation than adolescents whose friends lived in another neighborhood or city. Proximity is certainly an important component of opportunity, as easy and casual access to a friend probably means more informal opportunities for conversation in which more wide-ranging topics of conversation are likely to arise. Gender homogeneity is important as well. Apparently cross-gender friendships are more restricted in their topics of conversation.

The third model in Table 4 present the results regressing the independent variables on activity multiplexity. Gender was again negatively related to activity multiplexity, indicating that boys were less likely than girls to engage in a large variety of activities with their friends. Nationality was also found to have a significant effect: Israeli Jews were more likely to share more activities together. In this analysis, similarity of gender, age and propinquity were found not to be related to the diversity of activities that adolescents undertake together. The origin of the friendship was notably related to the degree of activity multiplexity. Adolescents who met their friends in face-to-face settings such as the school or the neighborhood reported, as expected, a more diverse number of activities together. Table 5 presents a three-stage OLS in which the independent variables are regressed on the strength of ties.

Table 4. OLS regression predicting duration of friendship, topic multiplexity, and activity multiplexity

Variable name	Duration of friendship		Content multiplexity		Activity multiplexity	
	Parameter estimate (se)	Standard parameter estimate	Parameter estimate (se)	Standard parameter estimate	Parameter estimate (se)	Standard parameter estimate
Age	0.031 (0.015)	0.081**	0.126 (0.052)	0.101*	-0.009 (0.045)	-0.008
Gender (1=male)	0.001 (0.051)	0.001	-0.815 (0.173)	-0.196*	-0.128 (0.149)	-0.037
Nationality (1=Jew)	0.084 (0.071)	0.054	-0.037 (0.242)	-0.007	0.144 (0.208)	0.033
Parents' marital status (1=married)	-0.004 (0.013)	-0.012	-0.060 (0.044)	-0.057	0.055 (0.038)	0.062
Mother's education	0.005 (0.009)	0.027	-0.054 (0.030)	-0.083	-0.017 (0.026)	-0.030
Number of siblings	0.004 (0.020)	0.009	-0.146 (0.068)	-0.101*	-0.049 (0.059)	-0.040
Gender similarity	0.402 (0.077)	0.221*	-0.138 (0.262)	-0.023	0.112 (0.224)	0.022
Age similarity	-0.031 (0.082)	-0.016	0.377 (0.280)	0.059	0.574 (0.242)	0.106*
Propinquity	0.114 (0.052)	0.090**	0.013 (0.178)	0.003	-0.023 (0.153)	-0.007
Duration of use	0.003 (0.018)	0.008	0.209 (0.061)	0.154*	0.185 (0.052)	0.164*
Frequency of daily use	0.002 (0.006)	0.011	-0.040 (0.021)	-0.081**	0.027 (0.018)	0.063
Online friend	-0.806 (0.118)	-0.281*	-0.707 (0.307)	-0.076*	-0.879 (0.343)	-0.111*
Constant	2.794* (0.309)		3.672* (1.049)		2.743 (0.901)	
Adjusted R ²	0.150		0.090		0.052	

* $p < 0.01$, ** $p < 0.05$

Table 5. OLS regression predicting strength of ties

Variable name	Basic model		Content multiplexity		Activity multiplexity		Friendship duration	
	Parameter estimate (se)	Standard parameter estimate	Parameter estimate (se)	Standard parameter estimate	Parameter estimate (se)	Standard parameter estimate	Parameter estimate (se)	Standard parameter estimate
Age	0.095 (0.046)	0.089**	0.069 (0.045)	0.065	0.097 (0.045)	0.092**	0.079 (0.045)	0.074
Gender (1=male)	-0.347 (0.152)	-0.097**	-0.170 (0.150)	-0.048	-0.362 (0.149)	-0.103*	-0.378 (0.149)	-0.108*
Nationality (1=Jew)	0.005 (0.213)	0.001	0.015 (0.206)	0.003	0.021 (0.209)	0.005	-0.014 (0.209)	-0.003
Parents' marital status (1=married)	-0.051 (0.039)	-0.057	-0.036 (0.038)	-0.040	-0.063 (0.038)	-0.072	-0.053 (0.038)	-0.060
Mother's education	-0.028 (0.027)	-0.049	-0.015 (0.026)	-0.027	-0.023 (0.026)	-0.042	-0.029 (0.026)	-0.052
Number of siblings	-0.013 (0.059)	-0.010	0.021 (0.058)	0.017	-0.004 (0.059)	-0.004	-0.023 (0.058)	-0.019
Gender similarity	-0.294 (0.230)	-0.057	-0.268 (0.222)	-0.052	-0.343 (0.224)	-0.068	-0.503 (0.231)	-0.100**
Age similarity	0.182 (0.250)	0.032	0.106 (0.241)	0.019	-0.012 (0.247)	-0.002	0.120 (0.245)	0.022
Propinquity	0.579 (0.157)	0.162*	0.576 (0.151)	0.161*	0.574 (0.153)	0.163*	0.533 (0.154)	0.151*

Duration of use	0.160 (0.054)	0.137*	0.111 (0.053)	0.096**	0.105 (0.053)	0.092**	0.137 (0.053)	0.120*
Frequency of daily use	0.006 (0.018)	0.014	0.015 (0.018)	0.035	0.016 (0.018)	0.038	0.020 (0.018)	0.046
Online friend	-0.959 (0.346)	-0.120*	-0.792 (0.635)	-0.100	-0.584 (0.344)	-0.074	-0.378 (0.360)	-0.048
Content multiplexity			0.227 (0.037)	0.264*				
Activity multiplexity					0.164 (0.044)	0.162*		
Duration							0.413 (0.135)	0.143*
Constant	12.431* (0.933)		11.548* (0.913)		12.095 (0.924)*		11.468* (0.996)	
Adjusted R ²	0.062		0.124		0.132		0.072	

* $p < 0.01$, ** $p < 0.05$, + $p < 0.10$

In the first step, demographic variables and origin of friends were regressed on closeness to friends. The model shows that propinquity was positively related to the strength of the ties in all the analyses. The results indicate that individuals who lived in the same neighborhood reported more closeness and trust in their friends. The same result was found in all the models even when other relevant variables were controlled. Face-to-face friends were more likely to be reported as close friends. In the next step I incorporated the measures of content multiplexity. The results show that this variable was a suppressor of the effect of friend's origin, as it became statistically non-significant. The next model in Table 5 shows a similar result for activity multiplexity. Again, the introduction of this variable washed out the effect of origin of the friendship. The third model introduced the measure of duration of the relationship, and it washed out the previous statistically significant effect of the origin of the friend.

The results indicate that online friends were perceived as less close both because of inadequate duration of the friendship and insufficient multiplexity of communication.

Discussion

The goal of the current study was to study the differential quality of online and offline social relationships. In studying this topic a conceptual model that assumes that relationships are socially structured, based on broad social processes of sorting and selection of individuals according to their resources in different social contexts that shape the likelihood of association, was presented and tested. Adolescents sharing social statuses are more likely to associate because these social statuses shape their concerns and interests. Thus social similarity, and not communication channels as suggested by theories of computer-mediated communication, are the exogenous factors that cause individuals to associate. Once they have done so, the intensity, content and duration of the relationship is shaped at least partially by their shared social status, and these in turn shape the quality of the association. This conceptual model was empirically tested in a representative sample of adolescents that had access to and use of the Internet. This data set was particularly suited to test the hypothesis because it allowed a distinction between adolescents who made friends online and those who did not.

The findings provide partial support for the association of social similarity and various measures of intensity and content of the relationship. As suggested by the conceptual model, gender similarity and propinquity were positively related to the duration of friendship. Adolescents of the same sex reported knowing each other longer. Individuals residing in the same location reported the same. Regarding the number of topics discussed, measures of similarity were not found to be related; regarding activity, only age similarity was related. However, in all the models measuring intensity and content of the relationships the origin of the relationship was found to be significant. Adolescents with an online friend reported that this friend was known for a shorter time than face-to-face friends, they discussed fewer topics, and they participated in fewer shared activities. The finding seems to

indicate that online friends play a reduced and probably more specialized role in the lives of adolescents than face-to-face friends at extracurricular activities and parties. But they are met less at school, and respondents hang out with them less. As to the content of the topics discussed, not only was there less discussion of topics but the topics discussed tended not to be of a personal nature, such as romantic relationships and personal problems.

The multivariate analysis revealed that without controlling for the intensity, content and activities of the relationship, online friends tended to be perceived as less close than face-to-face friends. The model that included measures of similarity showed that even after controlling for similarity measures, in particular propinquity, online ties were still weaker. This finding indicates that the reason that online ties are perceived as distant is not their geographical distance. When measures of the intensity, content and shared activities were introduced, the effect of origin of the relationship washed out. This statistical result provides some explanation of why relationships created online are perceived to be weak ties. First, the time dimension in any association appears to be important, probably because duration of the relationship is a proxy for shared events and circumstances in which a history of the relationship is developed, and it is in the context of these shared events that mutual trust and reciprocity develops. Second, independently of the duration, the number of topics discussed and the number of shared activities washed out the effect of friendship origin. This result indicates that independently of time, close relationships tend to be holistic, not restricted to particular activities and topics. Online relationships at this point appear to be restricted to non-personal topics and not everyday activities, and in that sense they are perceived as less integrated in the daily life of the individuals and as more distant.

Conclusion

The findings of the study provide partial support for the expectation of communication perspectives in that ties that originated online appear to be weaker than the ones that originated offline. In that sense, the central expectation of the social constructivists that the anonymity, isolation and lack of gating features of computer-mediated communication make it easier to form strong ties was rejected in this study. One plausible explanation for the discrepancy of our results with those of some previous studies is the different nature of the research design. Social constructivists relied on experimental designs, in which a small sample of a highly self-selected population is used. Our study relies on a national representative sample of adolescents, and sources of variation not accounted in experimental designs are included in a larger study.

Although the limited clues of computer-mediated communication were not directly tested in this study, the empirical findings do not support the assumption that the channel of communication is responsible for the lack of intimacy with online ties. Taken together, the results provide partial support for the hypothesis and expand the hyper-personal model of online relationships. Walther (1996) has argued that

although computer-mediated communication is a limited channel, time is critical as it allows the development of shared clues and symbols of communication. The effect of relationship duration found in this study supports this argument. Relationship duration is critical as it facilitates not only the development of shared language and understandings but also provides opportunities for interaction.

At the same time, our findings expand these arguments as it is shown that not only duration explains the lack of intimacy in online social ties but multiplexity also has a central role. Online social relationships then, appear to become personal when intimacy in topics of conversation and shared activities develop. It is through expansion of topics to conversation that relationship boundaries are created and intimacy exercised. Furthermore, multiple shared activities provide opportunities for the formation of shared memories conducive to a shared identity of friends. In that sense, and in contradistinction to McKenna et al. (2002) who attribute this intimacy to Internet anonymity, it was found that social similarity of the partners is the force behind this intimacy.

The current study adds to the expanding literature on Internet communication and relationship formation. The study highlights the centrality of social characteristics of friends and their social interaction, factors that have not been emphasized in previous studies that were based on communication theories only. The field will benefit from studies that uncover the mechanism by which individuals share their personal concerns and find space in the Internet and their daily life for shared activities.

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