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The Quality of Online and Offline Relationships: The Role of Multiplexity and Duration of Social Relationships

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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. Research has 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 this study is to bridge this gap. In keeping with previous studies on social association, we argue that the quality of social relationships is dependent on duration and diversity of topics and activities carried 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, we find 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 less joint activities and less topics of discussion. The implications of the findings are discussed.

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

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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 nonintimate social relationships (Haythornthwaite & Wellman, 2002; Wellman & Giulia, 1999). Early studies reflected a concern with decreasing social involvement and compared Internet users and nonusers on the extent of their involvement in their existing social relationships. They found that the impact of the Internet on existing relationships was mixed. Relying on samples of new users only, they found a decrease in the involvement with previous ties (Kraut et al., 1998; Nie et al., 2002). However, more recent studies using larger samples have shown that Internet use does not affect involvement in close relationships and the community (Katz & Rice, 2002; Hampton & Wellman, 2003; Mesch & Levanon, 2003). It even supports and maintains relationships with friends and family after moving to a new location (Cummings et al., forthcoming). Other studies restricted themselves to the study of online social relationships only, documenting the existence of supportive, intimate, and personal relationships online (Walther & Boyd, 2002; McKenna & Bargh, 1998).

Recent studies have shown that individuals use the Internet not only to maintain 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 circles (Parks & Floyd, 1996; Hampton & Wellman, 2002; Mesch & Levanon, 2003; Wolak et al., 2003; Mesch & Talmud, 2004). The effect of the Internet on existing relationships has been extensively

studied, but the literature is wanting in comparative studies 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, we investigated the differences in the quality of personal relationships created online and face-to-face.

PERSONAL RELATIONSHIPS DURING ADOLESCENCE

We focused on personal 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 socioemotional 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, Bukowski, & Parker, 1998; Crosnoe, 2000). Youth who report having friends are more confident, more altruistic, and less aggressive, and demonstrate greater school involvement and work orientation (Hartup & 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 and are characteristics of close friendship ties (Crosnoe et al., 2003; Giordano, 2003). In that sense, for adolescents personal relationships are a type of social support. Those with more supportive friendships have been shown to have higher self-esteem, to suffer depression or other emotional disorders less often, and to be better adjusted to school than youth with less supportive friendships (Berndt et al., 1989; Hartup & Stevens, 1997; Collins et al., 1999; Beraman & Moody, 2004).

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 & 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 with a high level of intimacy, involving more self-disclosure, shared activities, emotional as well as instrumental exchanges, and long-term interaction (Marsden & Campbell, 1984; Haythornthwaite, 2002).

Studies on the quality of online relationships are divided on their conclusions regarding the qualities of social

ties that are created and maintained through the Internet. Early conceptualizations, with a technological deterministic bent, described the weakness of electronic media in supporting social ties. According to the "reduced social cues perspective," computer-mediated communication (CMC) allows the exchange of fewer cues than face-to-face environments and therefore it is less appropriate for the support of emotional exchanges or the conveyance of complex information and a sense of social presence. Correspondingly, reduced social cues make the CMC environment more suited for supporting weak ties by reducing the risks associated with contacting unknown others (Sproul & Kiesler, 1986; Rice & Love, 1987). This early perspective is quite skeptical of the ability of CMC to support strong ties.

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 (McKenna et al., 2002; Joinson, 2001). The formation of close interpersonal relationships requires the establishment of trust, that is, a sense that intimate information disclosed in interpersonal exchanges will neither be widely disseminated nor used to ridicule friends. The relative anonymity of the Internet reduces the risks of such disclosure, whereas disclosing intimate information to members of a face-to-face community can be embarrassing (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 (Haythornthwaite, 2002). Employees of a multinational bank reported that e-mail communication was less reliable than face-to-face (Cummings, Butler, & Kraut, 2002). In another study, college students evaluated e-mail communication as inferior to communication in person for maintaining personal relationships (Cummings, Butler, & Kraut, 2002). In other words, offline friends are perceived to be closer because the quality of communication with face-to-face friends is higher than with online friends.

Other studies, however, as discussed earlier, have shown that people often disclose intimate information about themselves online (McKenna et al., 2002; 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.

The argument put forward in this article is that the quality of social ties is heavily dependent not only on the place where friends met, but also on their social similarity, intensity, and content of the relationship, which have not been examined in previous studies. While we 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. Social ties among individuals that are socially similar are more likely to be stable. Length of the relationship facilitates the development of a shared identity, and participation in diverse activities and multiple conversations generate intimacy and closeness. In the next section we review findings of previous studies and expand the rationale of the current study.

Social Similarity (Homophily) and the Quality of Social Ties

Studies on the formation, development, maintenance, and dissolution of close social relationships have emphasized the importance of social similarity (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” (Degenne & Forse, 1999; McPherson et al., 2002). Social similarity is the result of opportunities for interaction emerging from the social structuring of activities that expose individuals to each other.¹

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 interest and thereby receive validation of their attitudes and beliefs (Aboud & Mendelson, 1996). Participation in same activities increases the frequency and duration of social interaction. Furthermore, similarity has been associated with stable and strong ties (Hallinan & 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 & Kubitschek, 1988).

Relationship Duration

Friendship is distinguished from other types of social relationships because contact with friends is more intense. Intensity is usually a feature that reflects the history of the relationship and refers to its duration (Lee & 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 (McKenna & Bargh, 1998).

Multiplexity

Another important dimension is the content of a relationship. The concept of multiplexity is used to describe the different dimensions a relationship contains and is high when individuals are connected in multiple activities and discussions. Different from formal relationships, in which social interaction is partial and based on social status, friendship is more holistic. A friend differs from a coworker 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.

Multiplexity exists when a tie between two or more people encompasses multiple activities or topics of conversation rather than a single activity or shared topic. Studies show that multiplexity increases ties strength (Boissevain, 1974; Knoke & Kuklinski, 1982). Additionally, multiplexity is statistically associated with social similarity (homophily) and is reported among friends who have a similar social background, such as age, gender, and ethnicity (Stoller, Miller, & Guo, 2001). In other words, background similarity or homophily increases the likelihood of multiplexity.

Thus, in any network, there are a number of different flows between a pair of persons, and multiplexity is a concept that denotes the diversity of flows. Multiplexity is divided into activity multiplexity (shared social actions) and content multiplexity (the number of issues that a pair of friends share). Multiplexity was a typical indicator of village community life, and is an important indicator of intimacy and trust (Wasserman & Faust, 1995).

Individuals who share status characteristics are more likely to have a broad spectrum of topics to talk about and activities to get involved in. A dyad sharing many activities and interests is multidimensional, and their emotional attachment and relational strengths are high. While in some studies multiplexity has been used as a proxy for tie strength (Stoeller 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.

Our goals for the current study are twofold. First, we examine the relationship of online and offline ties on friendship duration, activity, and content multiplexity. Second, we examine the differential contribution of friendship origin, duration, and multiplexity on relational quality. Here it is important to note the contrast with the technological determinism perspective, in which the poor quality of

online relations is assumed to reflect the technology and not the shared characteristics of the communicators.

The emergence of online ties does not occur at random. It is plausible to hypothesize that patterns of online relationship formations are associated with distinctive features of the society under study. In the next subsection we provide an overview of Internet use in Israel.

The Israeli Context

Studying the relational quality of online and offline networks in Israel should be particularly interesting because the country has been both internationally oriented and densely knit (Shavit, Fischer, & Koresh, 1994; Fischer & Shavit, 1995), and also deeply divided (Smootha, 1992). Israel's relatively small size and "besieged society" mentality has made its residents feel trapped on a dense island of ties (Kimmerling, 1985). Internet use thus provides in this context new opportunities for increasing the size and the diversity of social ties.

In Israel, Internet use is rapidly expanding. 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 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, 65% had access by 2004. 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, adolescents 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 & 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 & Talmud, 2004). Thus the Israeli society presents a unique setting for investigating the association between friendship origin, characteristics, and tie strength. In the next section we describe the study and expand on the measurement of the central concepts of the study.

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, sociodemographic 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 for each of the friends named the length of time that he/she had known him/her, and the extent to which he/she felt closeness, trust, and comfort in asking for help.

The interviews were conducted face-to-face in the respondent's house by trained interviewers. Certain items on the questionnaire measured the sociodemographic characteristics of the adolescent and of ego networks (up to six friends). Here we focused 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) we asked respondents to state how long they had known each friend.

To measure multiplexity, we conceptually distinguished content multiplexity and activity multiplexity, for which 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 $\alpha = .674$ (means = 4.57, SD = 2.11). The second measure, activity multiplexity, was constructed of eight items, these being activities; adolescents were asked to indicate which activities they did with the first friend they named. Responses were meeting at parties, homes, and schools, going out together, and participating in the same extracurricular activities. The scale showed an acceptable reliability of $\alpha = .607$. 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 much they would ask him/her for help, and how far they trusted him/her. Responses were given on a 5-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 $\alpha = .811$. Next the scale was built by a simple summation of the responses over all the items.

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 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 e-mail 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 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. In order to measure propinquity, 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 that was coded one 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. 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 1 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, 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 the 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 we controlled for each adolescent's age, gender, number of siblings, nationality (0 = Arab Israeli and 1 = Israeli Jew), and mother's education.

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, the father's average education was 12.63 years (SD 3.50) and the mother's average education was 12.52 years (SD 3.37). Regarding family status, 86.8% reported that their parents were married and 13.2% separated or divorced. Access to the Internet was reported by 66.7% of the adolescents. Respondents were asked where they met their first friend: 60% first met the friend at school, 28% in the neighborhood, and 12% 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. [not significant]). 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 sociodemographic similarity, in the exploratory analysis we found demographic differences between the respondent and his/her friend. 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.

We also investigated differences in the mean duration, multiplexity, and strength of the association, with the first friend named. 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; $SD = 1.79$). Duration of the friendship was also higher for face-to-face friends; on average they reported a duration of 3.81 ($SD = .55$), while for those reporting an online friend duration was 3.07 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 ($p < .05$); they also reported fewer shared activities (for online friend, mean = 2.77, $SD = 1.49$; for face-to-face friend, mean = 3.61, $SD = 1.77$). The multivariate analysis examines to what extent being engaged in fewer activities truly reflects the source of the friendship or residential distance between the dyads. After having established a significant difference in the number of topics discussed and shared activities, we looked in more detail at the qualitative dimension. We wanted to know if the topics and activities differed not only in number but also in type.

We asked the sampled adolescents, 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 more reported 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'

TABLE 1

Proportion of adolescents and friends 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	.741	.583 ^b
Going to parties	.364	.305
Meeting at school	.650	.331 ^a
Meeting at friends' houses	.684	.194 ^a
Hanging out	.669	.361 ^a
Going to school	.090	.110 ^a
extracurricular activities		

^aSignificant at $p < .01$.

^bSignificant at $p < .05$.

houses, and hanging out together. As regards going to parties together, no differences were found, and as regards extracurricular activities in the evenings, online friends were more likely to go out together. Overall, face-to-face friends apparently engaged in different activities from online friends. Yet as we see from the table, online relationships were not entirely 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 nonexistent.

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

It is interesting that for most nonpersonal 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 (Table 2). 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? We 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

TABLE 2

Proportion of adolescents and friends discussing diverse topics according to origin of the relationship

Topics we discuss together	Friend was met face-to-face	Friend was met online
School	.631	.602
Parents	.503	.392
Friends	.753	.711
Hobbies	.421	.421
Personal problems	.593	.368 ^a
TV shows and movies	.618	.526
Romantic relationships	.499	.342 ^b
Fashion and dieting programs	.546	.421

^aSignificant at $p < .01$.

^bSignificant at $p < .05$.

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 expected, the strength of the relationship was positively correlated with content multiplexity ($r = .316, p < .01$), activity multiplexity ($r = .169, p < .01$), and duration of the relationship ($r = .175, p < .01$). As required for testing a mediating effect, the strength of the relationship was negatively related to the origin of the relationship ($r = -.123, p < .01$), 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, similarity in gender and 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 previous studies, that homophily decrease 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 4 present the results of regressing sociodemographic 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 we 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 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 presents the results regressing the independent variables on activity multiplexity. In this analysis, similarity of age was found 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 at school or the neighborhood reported, as expected, a more diverse number of joint activities. Propinquity, namely, living in the same neighborhood, was statistically insignificant. This result indicates that sharing activities among friends is related to the origin of the relationship (online versus offline) and not to residential distance.

Table 5 presents a three-stage O.L.S. in which the independent variables are regressed on the strength of ties. 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

TABLE 3
Correlations and descriptive statistics for the sample

[illegible]^aSignificant at $p < .01$.^bSignificant at $p < .05$.

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	Standard parameter estimate
Age	.031 (.015)	.081 ^b	.126 (.052)	.101 ^a	-.009 (.045)	-.008
Gender (1 = male)	.001 (.051)	.001	-.815 (.173)	-.196 ^a	-.128 (.149)	-.037
Nationality (1 = Israeli Jew)	.084 (.071)	.054	-.037 (.242)	-.007	.144 (.208)	.033
Parents' marital status (1 = married)	-.004 (.013)	-.012	-.060 (.044)	-.057	.055 (.038)	.062
Mother's education	.005 (.009)	.027	-.054 (.030)	-.083	-.017 (.026)	-.030
Number of siblings	.004 (.020)	.009	-.146 (.068)	-.101 ^a	-.049 (.059)	-.040
Gender similarity	.402 (.077)	.221 ^a	-.138 (.262)	-.023	.112 (.224)	.022
Age similarity	-.031 (.082)	-.016	.377 (.280)	.059	.574 (.242)	.106 ^a
Propinquity	.114 (.052)	.090 ^b	.013 (.178)	.003	-.023 (.153)	-.007
Duration of use	.003 (.018)	.008	.209 (.061)	.154 ^a	.185 (.052)	.164 ^a
Frequency of daily use	.002 (.006)	.011	-.040 (.021)	-.081 ^b	.027 (.018)	.063
Online friend	-.806 (.118)	-.281 ^a	-.707 (.307)	-.076 ^a	-.879 (.343)	-.111 ^a
Constant	2.794 ^a (.309)		3.672 ^a (1.049)		2.743 (.901)	
Adj. <i>R</i> squared	.150		.090		.052	

^aSignificant at $p < .01$.

^bSignificant at $p < .05$.

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 we 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 nonsignificant. 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 because of inadequate friendship duration and insufficient communicative multiplexity.

DISCUSSION

The goal of the current study was to study the differences in the quality of online and offline social relationships. In studying this topic, we suggested 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. Adolescents sharing social statuses are more likely to associate because

TABLE 5
OLS regression predicting strength of ties

Variable name	Parameter estimate (SE)	Standard parameter estimate	Parameter estimate (SE)	Standard parameter estimate	Parameter estimate	Standard parameter estimate	Parameter estimate	Standard parameter estimate
Age	.095 (.046)	.089 ^b	.069 (.045)	.065	.097 (.045)	.092 ^b	.079 (.045)	.074
Gender (1 = male)	-.347 (.152)	-.097 ^b	-.170 (.150)	-.048	-.362 (.149)	-.103 ^a	-.378 (.149)	-.108 ^a
Nationality (1 = Israeli Jew)	.005 (.213)	.001	.015 (.206)	.003	.021 (.209)	.005	-.014 (.209)	-.003
Parents' marital status (1 = married)	-.051 (.039)	-.057	-.036 (.038)	-.040	-.063 (.038)	-.072	-.053 (.038)	-.060
Mother's education	-.028 (.027)	-.049	-.015 (.026)	-.027	-.023 (.026)	-.042	-.029 (.026)	-.052
Number of siblings	-.013 (.059)	-.010	.021 (.058)	.017	-.004 (.059)	-.004	-.023 (.058)	-.019
Gender similarity	-.294 (.230)	-.057	-.268 (.222)	-.052	-.343 (.224)	-.068	-.503 (.231)	-.100 ^b
Age similarity	.182 (.250)	.032	.106 (.241)	.019	-.012 (.247)	-.002	.120 (.245)	.022
Propinquity	.579 (.157)	.162 ^a	.576 (.151)	.161 ^a	.574 (.153)	.163 ^a	.533 (.154)	.151 ^a
Duration of use	.160 (.054)	.137 ^a	.111 (.053)	.096 ^b	.105 (.053)	.092 ^b	.137 (.053)	.120 ^a
Frequency of daily use	.006 (.018)	.014	.015 (.018)	.035	.016 (.018)	.038	.020 (.018)	.046
Online friend	-.959 (.346)	-.120 ^a	-.792 (.635)	-.100	-.584 (.344)	-.074	-.378 (.360)	-.048
Content multiplexity			.227 (.037)	.264 ^a				
Activity multiplexity					.164 (.044)	.162 ^a		
Duration							.413 (.135)	.143 ^a
Constant	12.431 ^a (.933)		11.548 ^a (.913)		12.095 (.924) ^a		11.468 ^a (.996)	
Adj. <i>R</i> squared	.062		.124				.072	

^aSignificant at $p < .01$.

^bSignificant at $p < .05$.

these social statuses shape their concerns and interests. Thus social statuses, 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 are 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 relational intensity and content of the relationship. As suggested by the literature, we found that 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, confirming our argument, 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 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 reveals that without controlling for the intensity, content, and activities of the relationship, online friends tend to be perceived as less close than face-to-face friends. The model in which we included measures of social 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 explanations of why relationships created online are perceived to be weak. 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 nonpersonal 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.

Unlike previous studies, which used mainly experiments, this study used a representative, national sample and specifies some of the conditions under which online ties become strong ties. Our study has twofold implications for the study on online social networks: On the one hand, we seem to partially support the technological deterministic perspective—online ties seem to be weaker, less holistic, and less personal in comparison with offline relations. Furthermore, content and activity multiplexity and tie duration are less likely in online relations. Yet it is

important to note that when detecting the etiology of relational strength, content multiplexity, residential propinquity, and relational duration are the key source of relational strength. This key finding may be a partial support of the contrasting view of the social constructivism perspective on online ties. Future studies need to identify in a much broader sense the conditions under which the technological characteristics of the Internet impact relational quality, and the specific settings in which social network structure affects relational strength.

NOTE

1. In the social network literature the notion of homophily denotes that association is more likely with similar than nonsimilar individuals. For this reason in this article the notions of social similarity and homophily are used interchangeably.

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