



Online Friendship Formation, Communication Channels, and Social Closeness

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Abstract: Studies of the quality of online social relationships are divided in their conclusions regarding the strength of social ties. Early conceptualizations described the weakness of electronic media in supporting social ties. By contrast, others have emphasized the compensating character of the Internet for specific social groups. This study investigated differences between adolescents who created online friendships and those who did not, and how far the place where a friend was met (online or face to face) was related to the quality of social relationships, namely the perceived strength of social ties. Examining the dyadic friendship structure of a representative sample of Israeli adolescents, the study provides important contributions to the rapidly growing literature on online social relationships in general, and on youth networks in particular. The results support the social compensation approach to the study of online social relationship formation. The motivation for online friendship formation proved to be related to adolescents' attempts to compensate for a lack of social support by using the Internet for communication. Furthermore, while face-to-face relationships remained highly important, for those adolescents who found in the Internet others with whom they developed intimacy, online ties were strong and meaningful. Additionally, adolescents with strong virtual ties were found to be distinctive in their social background. Our findings call for a qualification of the theoretical approach to online social ties, and imply that it is not the technology per se that obstructs or facilitates the formation of social friendship but the social embeddedness of the ties.

Keywords: Adolescents, computer mediated communication, online friendship formation, social networks, tie strength.

Introduction

In recent years interest has grown in the extent to which Internet is used in social relationships (Haythornthwaite & Wellman, 2002). Surveys indicate that the most frequent use of the Internet is for communication purposes and that computer-mediated communication facilitates not only the maintenance of social ties but also the formation of new relationships among individuals (McKenna, Green, & Gleason, 2002; Parks & Floyd, 1996). For some users, the Internet is becoming another location to meet and socialize; relations created there tend also to migrate to other settings (Hampton & Wellman, 2002; Mesch & Levanon, 2003; Wellman & Gulia, 1998). This study set out to investigate differences between Israeli adolescents who create online friendships and those who do not, and the extent to which the place where a friend was met (online or face to face) is related to the quality of social relationships, namely the perceived strength of social ties.

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The use of the Internet for relationship formation is of particular interest among adolescents. Adolescence is a stage characterized by critical developmental changes in the social and physical realm. As children enter their teenage years, they interact less frequently with their parents, and peer relationships take on greater importance. Peers act as emotional confidants, providing each other with advice and guidance, serving also as models of behavior and attitudes (Giordano, 2003). Still, parents continue to influence their children's attitudes and behaviors in important ways (Collins & Russell, 1991). But while in childhood, parents were the main source of social relationships, in adolescence parents are only one circle and peers represent an important component (Giordano, 2003).

Furthermore, adolescents are a segment of the population who are early adopters of information and communication technologies, and are actively involved in adopting the Internet (Kiesler, Zdaniuk, Lundmark, & Kraut, 2000). Studies show that the use of the Internet by adolescents is mainly for social purposes (Gross, Juvonen & Gable, 2002; Lenhart, Raine, & Lewis, 2001). Through the Internet, adolescents meet new friends, communicate after school hours, exchange gossip and information about homework, and provide and receive social support (Gross et al., 2002). A recent U.S. survey confirmed the existence of these relationships and reported that 14% of U.S. teenagers have formed close online friendships (Wolak, Mitchell, & Finkelhor, 2003). Forming online relationships might be one of the most appealing aspects of Internet use among young people, given that forming social relationships is virtually a developmental imperative of adolescence.

While online relationships are becoming a part of the social world of many adolescents, few studies have examined systematic differences in the quality of online and face-to-face social relationships, using large samples. Furthermore, though few these studies present contradictory findings. In examining the distinctive characteristics of adolescents who form online friendships and the strength of their ties, the current study aims to make a contribution to a rather neglected aspect of the literature on how Internet use affects the structure and quality of adolescent social relationships.

Theoretical Perspectives

Past studies on adolescents' relationship formation have principally relied on two perspectives: social needs and social compensation. The *social needs perspective* (Buhrmester, 1996; Wolak et al., 2003) argues that individuals form relationships to meet compelling needs for intimacy, self-validation, and companionship. This requirement is in particular high for adolescents, as adolescence is a developmental stage at which the individual's social circle is expanding from the family to the peer group. While the need for affiliation is universal, some individuals certainly lack the skills and ability to create and sustain intimate relationships. Personal characteristics such as low self-esteem, social anxiety, or shyness decrease people's ability to form face-to-face social ties (McKenna, et al., 2002; Mesch, 2001).

Low self-esteem is often the result of a lack of unconditional parental and peer support during childhood, which creates feelings of inadequacy in adolescence (Harter, 1993). Individuals who report low self-esteem are more likely to report, as adolescents, having fewer friends and being lonely (Armstrong, Phillips, & Saling, 2000). A debate has emerged in recent years on whether the Internet is a technology that causes loneliness (Kraut et al., 1998; Nie, Hillygus, & Erbring, 2002) or whether loneliness drives some individuals to the Internet (Amichai-Hamburger & Ben Artzi, 2003). Recent studies show less evidence of a sheer technological effect on loneliness, embracing more favorably the argument that individuals reporting low self-esteem and loneliness are more likely to use the Internet for social purposes (Amichai-Hamburger & Ben Artzi, 2003).

From a more socio-structural perspective, social network analysts have also tended to this view. They have argued that virtual communities can be seen as social networks, linking individuals from different neighborhoods, cities, and countries (Wellman, et al., 1996; Wellman & Gulia, 1998). Computer-supported social networks may provide their members with companionship, social support, information, and a sense of belonging (Wellman & Gulia, 1998). According to this perspective, systematic differences may be expected to exist between individuals who meet friends online and offline. The likelihood of online friendship formation will presumably be higher for adolescents who report low self-esteem and who also lack social closeness to face-to-face friends. As individuals have needs for intimacy and companionship, the use of the Internet for communication purposes provides a new venue to meet others and create close relationships.

Some empirical evidence supports this expectation. Studies have shown that frequent Internet use is more likely to occur among individuals suffering from social anxiety, low self-esteem, and lack of sociability. Adolescents having fewer friends in general and fewer friends who always listened to them in particular, experiencing problems in forming intimate friendship, are more likely to be frequent Internet users (Mesch, 2001).

In sum, the social needs argument leads us to two expectations. First, a negative relationship will exist between social closeness in face-to-face friendships and the likelihood of online friendship formation. Individuals who are close to their face-to-face friends will have less need to develop online friendships. Second, a negative relationship will exist between self-esteem and online friendship formation. The likelihood of online friendship formation will be higher for adolescents who report low self-esteem.

A second perspective is *social compensation*, which focuses on the quality of relationships between parents and adolescents as a motivation for friendship formation. The assumption is that adolescence is a stage at which families need to adjust and maintain their relationships to accommodate the ever-maturing adolescent. Changes in parent-child relationships are influenced by adolescents' intensifying desire to enlarge their sense of autonomy and independence. Children become less accepting of their parents' authority over their personal lives and activities, and are more willing to disagree with them openly, which may lead to heightened conflict (Smetana, 1988; Youniss & Smollar, 1985). Many contentious exchanges concern parents' regulation of adolescents' everyday lives, such as curfew rules, monitoring of friendships, and rules governing personal activities such as phone and TV use (Collins & Russell, 1991; Smetana, 1988).

Accordingly, parents and peers represent opposing interests in the adolescent's struggle for autonomy and the expectation is that parental bonding should negatively correlate with peer bonding (Steinberg & Silberberg, 1986). When adolescents are in conflict with their parents, or receive little support from the parental home, they search for friendship with peers to compensate for the decreasing parental support and understanding. According to this hypothesis, relational compensation is quite likely for those who experience little parental support (Helsen, Vollebergh, & Meeus, 2000; Van Beest & Baerveldt, 1999). Their motivation for online relationships is the search for compensating social support. Individuals who lack parental social support and have unsatisfactory relationships will turn to the Internet to find others who share their negative life experiences and to find social support in online relationships.

Furthermore, adolescents who are alienated from their parents are less able to satisfy their emotional needs through face-to-face relationships. Disclosing intimate information on conflicts with parents to face-to-face friends might be embarrassing. By contrast, online friends, who are unknown to the adolescent's social circle, offer an alternative route of positive social support and connection. For girls and boys, being highly troubled and distant from parents is a key factor for online friendship formation (Wolak et al., 2003). In sum, the *social compensation* approach assumes that adolescents have a strong need for affiliation. However some children experience lack of communication or overt conflict with their parents, and tend to suffer from problems in interpersonal relationships with face-to-face friends. The expectation of this approach is that the likelihood of making friends online will be higher for adolescents that report a high level of conflict and a low level of closeness to their parents.

Strength of Social Ties: Online and Face To Face

The literature on social networks 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 of the tie, trust, reciprocity, and duration of the association. Weaker ties are evinced in more casual relationships and in sparser and less intimate 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, reciprocity, emotional as well as instrumental exchanges, and frequent interaction (Haythornthwaite, 2002; Marsden & Campbell, 1984).

Studies on the quality of online relationships are divided in their conclusions regarding the strength of social ties that are created and maintained through the Internet. The outlook on the social impact of the Internet is derived from arguments regarding "social affordability", dominated by two contrasting views, technological determinism and social constructivism. Early conceptualizations, assuming technological determinism of the Internet, described the weakness of electronic media in supporting social ties. The "reduced social cues perspective" is based on the observation that computer mediated communication (CMC) allows for the exchange of fewer cues than face-to-face environments and suggest that CMC is less appropriate for the support of emotional exchanges and the delivery of complex information and a sense of social presence. Thus, this early perspective, assuming technological determinism, 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 (Rice & Love, 1987; Sproull & Kiesler, 1986).

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 more prone to shyness, social anxiety, and loneliness 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).

A long-standing finding in the literature on close social relationships is that strong and stable ties are likely to develop among individuals who share interests and attitudes (Popielarz, 2000). While we are more attracted to others who share our interests, concerns, and opinions, realizing this attraction might be difficult in face-to-face relationships. Friendship formation is structurally shaped by the environments in which we are exposed to others, being nested in work, school, or leisure activities. This general tendency of “homophily” is especially prevalent among adolescents (e.g., Giordano, 2003; Kandel, 1978). Still, availability of similar others who share our interests, concerns, and opinions may be limited. The emergence of a “network society” (Castells, 1996; Knorr-Cetina, 2001), enables individuals to find similar others across time and place. The unique structure of CMC facilitates self-disclosure, trust, and intimacy, which are central to the formation of strong ties, especially among youth (McKenna et al., 2002).

Empirical evidence provides mixed support for these perspectives. A few studies report that the quality of online social interactions is lower than face-to-face interactions (Walther & Boyd, 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 email communication as inferior to communication in person as a means of maintaining personal relationships (Cummings, Butler, & Kraut, 2002). In other words, off line 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 more information about themselves in online than in face-to-face communication (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 the studies investigated the adolescent population. The mixed results of previous studies might be due to inadequate controls. The quality of social ties is heavily dependent not only on the place where friends meet, but also on many other variables, which were not controlled in previous studies; these include gender, channels of communication, and content of the communication.

Studies have reported the existence of gender differences in the quality of social relationships. We argue that relationship quality is apparently related to the operation of three factors, which were considered in the current study: content of the communication, channel of the communication, and interaction effects. First, the level of disclosure of intimate information is related to the strength of social ties. Findings from a range of studies indicate that females engage in greater disclosure of their innermost thoughts and feelings than males (Buhrmester, 1996). Gender differences are observed both in the topics that friends choose to discuss and in the style of the conversation itself. According to these studies, the content of communication is related to the strength of the ties. We expected to find a positive relationship between personal and intimate communication content and the strength of ties. On the other hand, we anticipated that less personal and intimate communication, on topics such as TV, music, school, and politics, would be negatively related to the strength of social ties.

The reduced social cues perspective implies that because of the characteristics of the Internet, online communication is less suitable for the development of strong ties than face-to-face and phone communication. Therefore, in the current study, we introduce measures of the main channel used for communication with the first friend named. We asked respondents to indicate the main channel of communication, and measures of face-to-face, phone, and online communication were applied.

Finally, we allowed for the possibility that strong ties are the result of a combination of the medium in which the communication is conducted and the content of the communication. We assumed that online communication per se may not be related to the quality of a tie, but is related to the extent that trust develops and the content is intimate and personal. To test this hypothesis, we conducted a test of this interaction effect.

Summary of Study Hypotheses

In this section we briefly summarize the guiding hypotheses of the study. Following the social needs approach:

- H₁: Adolescents that report being close to their face-to-face friends are less likely to make friends online.
- H₂: Adolescents that report high self-esteem are less likely to make friends online.

Following the Social compensation approach, the expectations of the current study are:

- H₃: Adolescents that reports being distant from their parents are more likely to make friends online.
 - H₄: Adolescents that report a high level of conflict with their parents are more likely to make friends online.
- Regarding the quality of social ties, in this study is expected:
- H₅: social ties that were created online are likely to be weaker than social ties that were created face-to-face.
 - H₆: The effect of the origin of the social tie (online or face to face) on tie strength will differ according to its content.

The Israeli Context

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 (Central Bureau of Statistics, 2002). As elsewhere, in Israel there is a digital divide and socioeconomic differences are reflected in Internet use. Most Internet users reported earning an average or above-average income, and being of western origin (Central Bureau of Statistics, 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. As to purpose, the overwhelming majority of adolescent Internet users reported that it was mainly for social purposes. Studies have started to examine the relationship of Internet use and social involvement, and 14% of Israeli adolescents reported having friends that were met online (Mesch & Talmud, in press). 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, in press). Israeli parents are more skeptical than U.S. parents about the possibilities that the Internet offers. Less Israeli than American parents believe that the Internet is an important component of children's' education (Turow & Rivak, 2002). Regarding intergenerational relationships, it was found that Israeli adolescents that are frequent Internet users do not spend less time with their parents but yet report lower levels of closeness to their parents. It is likely that high frequency of Internet use is leading to conflicts over privacy and computer time use (Mesch, 2003).

Methods

Data collection

This study was a part of the Annual National Youth Survey, conducted by the Minerva Center for Youth Studies at the University of Haifa. The data were collected between June and October 2001. The annual survey covers a representative sample of 1000 households in Israel in which one randomly selected adolescent was interviewed. The interviews were conducted in person at the respondent's home by trained interviewers.

Measures

Respondents were asked to write the first name of six friends. For each friend they were asked to indicate whether this friend was first met on the Internet, at school, or in the neighborhood. From this question we computed a measure distinguishing the setting in which the first friend was met; a dummy variable was created and coded 0 when the first friend was met face to face (in the neighborhood, at school, or in extracurricular activities) and 1 when the friend was met online (through chat rooms, icq, or email use). This variable was used as one of the dependent variables in the multivariate analysis, and a logistic regression was conducted. *Strength of ties* was measured using a number of variables. Referring to the first friend named, respondents were asked to indicate how close they felt to the friend, how important this friend was to him/her, how far he/she would ask for help from this friend, and how much he/she trusted this friend. Responses were on a 5-point Likert scale. The items were subjected to factor analysis using a varimax rotation. One factor was found and a scale was built with a reliability of $\alpha = .81$. *Parental marital status* was measured by an item asking whether the parents lived together or were separated/divorced.¹ Two measures were used as indicator of parent-adolescent relationship. First, closeness to parents was measured through three survey items probing how close the adolescent felt to

¹ This was coded as a dummy variable, where married was coded 1.

his/her parents; how much parents were willing to listen and how much the adolescent felt close to their parents. Answers were on a 4-point Likert scale from total disagreement to total agreement². Secondly, a measure of parent-adolescent conflicts was constructed by means of three survey items. Adolescents were asked how much in the last year parents “have sworn at you”, “have yelled at you”, and “have hit you”. Answers were on a 4-point Likert scale.³ The construct *closeness to friends* was created by means of three items. Adolescents were asked “to what extent is it important for you to be with friends”, “to what extent have you had close friends for a long time”, and “to what extent are your friends willing to listen to you”.⁴ An item asked the adolescent to indicate the *most frequent channel of communication* with the first friend he/she named. The variable was coded as a series of dummy variables. When the most frequent channel of communication was school, meetings in private houses, parties, extracurricular activities, or common activities it was defined as face-to-face communication. The second dummy variable indicated whether the main channel of communication was by phone. The third dummy variable indicated whether it was online. To measure the *content of communication*, respondents were presented with a list of ten topics and were asked to indicate the extent they communicated mainly on the topics with the first friend that was named. From the list, three variables were created. Intimate content included topics such as the family, personal problems, and romantic relationships. Leisure content included TV shows, music, sports and fashion. Other content included topics such as teachers, food, and politics. For each type of content, items were summed and the average on the scale for each respondent was calculated. Internal validity of the scales was in the range of $\alpha = .60$ to $.65$.

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 state the activities that they most often engaged in when connected to the Internet. From their answers two measures were created. One referred to use for social purposes (playing games with friends online, chatting with other people, participating in bulletin boards or forums). The other referred to uses of the Internet for instrumental purposes (downloading software and computer games, listening to music or watching movie clips, learning the Internet as a future occupation). In addition, in the multivariate analysis we controlled for the adolescent’s age,⁵ gender and for mother’s education as a crude proxy for the household’s socio-economic status. Self-esteem was a composite variable created by means of ten items from a reduced Rosenberg’s (Rosenberg, 1965) self-esteem questionnaire. Items were summed and the average on the scale for each respondent was calculated with internal reliability of $\alpha = .80$.

Results

Sample Description

Response rate was high and of the 1000 adolescents contacted, 987 agreed to participate in the study. Table 1 shows that respondents’ average age was 15.49 years (SD 1.66), and girls and boys were almost equally represented. In terms of socioeconomic status the average father’s education was 13.42 (SD 3.42), and average mother’s education was 13.38 (SD 3.14). The average education of Israeli households with Internet connection is higher than the average education of the total population. Differences in parents’ education were tested and found not be statistically significant, so only mother’s education was introduced in the multivariate analysis⁶. Regarding family status, 87.6% of respondents reported that their parents were married and 12.4% of parents are separated or divorced. In terms of Internet connection, 36.3% of the adolescents reported being connected. All the results of the current study refer to youth that have access to the Internet and, therefore are at risk of making friends online.

Respondents were asked where they had first met their friends. For the whole sample it was found that 63.3% percent had first met in the neighborhood, 24% at school, and 12.6 % online. Regarding the place of residence of the first friend, it emerged that 78.5% of the friends who were met in the neighborhood, 72% of those met at school and 40.5% of those met online were currently living in the same neighborhood or city as the respondent.

2 Items were summed and combined into a single scale ($\alpha = .88$)

3 1 indicates “never” and 4 “very often”. Items were summed and combined into a single scale ($\alpha = .77$).

4 The items resulted in a single dimension, after using a principal component analysis with varimax rotation. Items were summed and resulted in a scale with acceptable internal validity ($\alpha = .73$).

5 Age was coded as a dummy variable, coded 1 for late adolescents (16-18 years old) and 0 for young adolescents (13-15 years old).

6 The average father’s education was 13.42 years of schooling (SD 3.42) and mother’s education 13.38 (SD 3.14). Using a t-test it was found that the difference between mothers’ and fathers’ educational attainment is not statistically significant. In the explorative analysis each one of the measures was introduced separately and the results were identical when father’s education was introduced and when mothers’ education was introduced. In the paper we show the models in which only mother’s education was introduced.

As to gender, 18.9% of the friends met at school, 28% of those met in the neighborhood, and 39% of those originally met online were of the opposite gender to the respondent. As to age, 15% of the friends met at school, 21% of the friends met in the neighborhood and 37% of the friends met online were different from the respondent in age. Not only adolescents are making new friends in the Internet, but also these friends are changing the extent of similarity in gender and age of their social networks.

Table 1
Means, Standard Deviations and Range of Study Variables

	Mean	SD	Range	<i>n</i>
Age	15.49	1.66	13-18	393
Male	.53	.49	0-1	391
Jew	.90	.29	0-1	393
Mother Education	13.38	3.14	6-21	349
Married	.87	.36	0-1	393
Self Esteem	7.83	2.56	0-20	387
Adolescent Parent Conflicts	5.21	2.06	0-12	387
Friends Closeness	10.71	1.58	0-12	391
Daily Frequency of Internet user	2.55	2.35	0-8	393
Social Use	5.02	3.12	0-12	346
Instrumental use	8.49	4.14	0-12	343
Duration of knowing the friends	3.68	.810	1-4	385
Friend was met online	.126	.320	0-1	380
Face to Face communication	.159	.366	0-1	382
Phone communication	.575	.494	0-1	382
Online communication	.264	.441	0-1	382
Personal content	1.669	1.159	0-3	393
TV/music content	.1755	1.093	0-3	393
School content	.88	1.082	0-3	233

Adolescents reporting having online friends were on average younger than adolescents reporting not having online friends (15.11 years and 15.65 years; $p < .05$), but no significant differences were found in gender and socio-economic status. As to family environment, adolescents reporting having online friends were not different from those not having online friends in terms of closeness to their parents; but they reported a higher level of conflict with their parents and less closeness to their face-to-face friends. In frequency and types of Internet use, adolescents reporting having online friends used the Internet more during the day and more for social purposes than adolescents reporting not having friends who were met online.

The correlation matrix, specified in Table 2, provides some interesting background information. Conflicts between adolescents and parents are more likely to be reported in less educated families ($r = -.027, p < .05$). Adolescents that report conflict with their parents are less attached to face to face friends ($r = -0.13, p < .05$) and report knowing their friends less ($r = -0.22, p < .05$). Online friendship is positively associated with family conflicts ($r = 0.25, p < .05$), and lower attachment to friends ($r = -0.17, p < .05$). Online friendship formation, as offline friendship formation requires investment of time and this is reflected in a positive correlation with the extent of Internet use for social purposes ($r = 0.34, p < .05$).

Table 2
Person Correlations Between the Variables Used in This Study

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Online Friends	1.0														
2.Strength of Ties	-0.19**	1.0													
3.Age	-0.07	0.11**	1.0												
4.Mother Education	-0.21*	0.01	0.07	1.0											
5.Family Conflicts	0.25*	0.09	-0.07	-0.27*	1.0										
6.Self Esteem	-0.02	0.06	0.01	-0.06	0.23	1.0									
7.Family Cohesion	-0.08	-0.02	-0.11**	0.14*	-0.32*	-0.26*	1.0								
8.Friends Closeness	-0.17*	0.14*	0.06	.020*	-0.13*	-0.19*	0.16*	1.0							
9.Frequency of use	-0.02	0.07	-0.03	-0.03	-0.05	-0.02	-0.07	-0.09	1.0						
10.Social use	0.34*	0.34	-0.01	-0.05	-0.18**	-0.08	-0.05	-0.09	0.30*	1.0					
11.Instrumental use	0.18*	-0.09	-0.06	-0.07	0.08	-0.12**	-0.02	-0.07	0.35*	0.45**	1.0				
12.Duration of relation	-0.46*	0.11*	0.08	0.19*	-0.22**	-0.05	0.02	0.19**	-0.06	-0.31**	-0.12*	1.0			
13.Personal content	-0.18*	0.48*	0.17*	0.11*	-0.06	0.06	-0.10*	0.17**	-0.01	-0.10*	-0.08	0.22*	1.0		
14.Tv/music content	-0.06	0.14*	-0.01	0.05	-0.08	-0.02	0.05	0.10*	0.04	-0.05	0.05	0.15*	0.41*	1.0	
15.School content	-0.03	0.13*	0.19*	0.10*	0.02	0.01	-0.01	0.07	-0.05	-0.10*	-0.03	0.06	0.31**	0.36**	1.0
N	380	380	380	339	377	374	379	378	380	380	380	376	380	380	380

* $p < 0.05$

** $p < .01$

Predicting Online Friendship Formation

Table 3 presents the results of a logistic regression predicting the likelihood of on line friendship formation. The analysis was done in two steps.

Table 3
Logistic Regression Predicting Online Friendship Formation

	<i>Model</i>		<i>Model</i>	
	<i>1</i>		<i>2</i>	
	<i>b</i>	<i>Odds Ratio</i>	<i>b</i>	<i>Odds Ratio</i>
Age	-.107 (.097)	.898	-.120 (.108)	.887
Male	.386 (.339)	1.471	.289 (.385)	1.335
Jewish	-1.088 (.372)	.337**	-1.589 (.438)	.204**
Mother's education	(.055)	1.064	.047 (.063)	1.048
Parental status (1=married)	-.037 (.521)	.964	-.315 (.569)	.730
Adolescent- parents conflicts	.488 (.131)	1.629**	.331 (.154)	1.392*
Self-esteem	.020 (.179)	1.020	.032 (.196)	1.032
Closeness to parents	-.057 (.163)	.945	-.148 (.193)	.863
Closeness to friends	-.166 (.092)	.847+	-.099 (.111)	.906
Daily Internet use			-.196 (.096)	.822
Social use of Internet			.914 (.250)	2.495**
Instrumental use of Internet			.444 (.294)	1.558
Constant			.197 (2.100)	1.217
-2loglikelihood	305.173		243.385	
Chi Square	34.511*		96.299*	
df	9		12	
n	336		336	

Note: Standard errors are in parentheses

+*p* < .10 ;

**p* < .05

***p* < .01

In the first model, variables measuring demographic characteristics and measures of closeness to family and friends were introduced. In the second model, variables measuring frequency and types of Internet use were added. This analytical strategy was applied because it was suspected that age, gender and closeness to family and friends might be related to the frequency and types of Internet use, canceling some of the effects.

According to the results of the first model, online friendship formation appears not to be a developmental process as the effect of age was found not to be statistically significant. The expectations from the social needs

perspective were not confirmed and both closeness to friends and self-esteem did not reach statistical significance. The most salient finding of this analysis was the positive effect of adolescent-parent conflicts on the likelihood of making online friends. Adolescents who reported perceiving high levels of conflicts with their parents reported a higher likelihood of online friendship formation. The coefficient is substantial and indicates that an increase in one standardized unit of conflicts with parents is associated with an increase in 62 percent in the odds of online friendship formation. Here one may argue that conflicts between adolescents and their parents might be the result of the extent that the adolescent use the Internet, and do not represent a more or less constant characteristic of the parent-adolescent relationship. Alternatively it can be argued that online friendship formation is the result of more opportunities for online interaction. For this reason we introduced measures of frequency and types of Internet use in Model 2, shown in Table 3. Results indicating a positive effect of adolescent-parent conflict on the likelihood of online friendship formation held even after controlling for the measures of frequency and types of Internet use. The coefficient was reduced but still indicates that an increase in one standardized unit in adolescent parents conflicts is associated with an increase in almost 40 percent in the odds of online friendship formation. When these measures were introduced, it was not frequency of Internet use but its use for social purposes that proved related to the likelihood of online friendship formation. Adolescents who reported using the net for social purposes were more likely to report having online friends.

A slightly different question that was explored is the extent that the set of independent variable is associated with the number of online friends. For this purpose an OLS regression analysis was conducted when the dependent variable was the proportion of online friends out of the total friends named (analysis not shown). The results were similar and indicated that an increase in parent adolescent conflicts is associated with an increase in the proportion of friends that were met online ($\beta=.120, p < .01$). Frequency of Internet use for social purposes was positively related to the proportion of friends that were met online as well ($\beta=.310, p < .01$). The model, with only these two statistically significant coefficients explained 24 percent of the variance in the proportion of online friends.

Predicting Strength of Ties

Friendship differs from being “just friends” in the level of closeness and intimacy that is reached. One way to explore this closeness and intimacy is to investigate the factors associated with the strength of ties. The last question we considered was to what extent online relationships among adolescents in Israel are strong or weak ties. To consider this question we conducted an O.L.S. multivariate analysis predicting the strength of ties.

The results are presented in Table 4. The first model presents the results for an additive model. As expected, males reported having weaker ties than females. Conflict with parents appears not to have exerted an additive effect on the strength of ties. One salient finding is that adolescents reported that ties that were made online were weaker than ties made face to face. The channel of communication was not related to the strength of ties: whether the main channel of communication with friends was face to face or by phone, there was no difference in the strength of the ties. However, the content of the communication did make a difference. The more personal the topics of communication, the stronger were the ties to friends. Note that the size of the coefficient is the largest in the model, ($\beta=.426, p < .01$) indicating that personal communication is the most important variable in the model. Frequency of Internet use was statistically significantly related to the strength of the ties. The type of Internet use is important as well, and adolescents who reported using the Internet for instrumental purposes reported having weaker ties.

We have seen that adolescents who reported having online friends reported the ties with them as weaker. But the literature indicates that online relationships have the potential to become more intimate because Internet characteristics such as anonymity support the development of intimacy. This argument suggests an interactive effect. If the relationship was created online and the content is personal, are the ties weak? This question was explored in the second model, in which an interaction between online friendship and intimate communication was introduced. It was found that the interaction term was statistically significant, indicating that for adolescents who met a friend online and developed intimate communication, the tie was reported to be stronger than the tie to a face-to-face friend. To further explain this effect, we present this interaction effect graphically in Figure 1.

The graph presents the conditional predicted values of strength of the tie, for face-to-face friends and for friends met online, according to three different levels of intimate and personal content of communication. The graph shows that for online friends the strength of ties becomes considerably higher when the content of personal communication is high. When it is low, the strength of a face-to-face tie is higher than for online friends. When the content is average, the strength of the tie does not differ according to the place where the friend was met.

Table 4
Ordinary Least Squares (OLS) Coefficients: Strength of Relationships

	<i>Model</i>		<i>Model</i>		<i>Model</i>	
	<i>1</i>		<i>2</i>		<i>3</i>	
	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β
Age	.008 (.018)	.014	.006 (.018)	.011	.005 (.018)	.010
Male	-.142 (.062)	-.072*	-.154 (.062)	-.078**	-.142 (.061)	-.072*
Jewish	-.417 (.075)	-.181**	-.414 (.075)	-.180**	-.428 (.075)	-.186**
Married	-.126 (.086)	-.044	-.127 (.086)	-.044	-.127 (.085)	-.044
Adolescent- parents conflicts	.038 (.035)	.034	.042 (.035)	.039	-.165 (.076)	-.151*
Self-esteem	-.044 (.032)	-.043	-.044 (.032)	-.043	-.038 (.032)	-.038
At weekends	.017 (.036)	.014	.019 (.035)	.016	.018 (.035)	.016
Length of acquaintance	.088 (.0520)	.057	.076 (.052)	.049	.096 (.052)	.061
Online Friend	-.475 (.155)	-.107**	-.826 (.210)	-.186**	-.527 (.156)	-.119**
Phone communication	-.013 (.077)	-.006	-.010 (.077)	-.005	-.019 (.077)	-.009
Online communication	-.092 (.119)	-.031	-.086 (.119)	-.029	-.091 (.118)	-.031
Personal content	.363 (.029)	.426**	.349 (.030)	.410**	.367 (.029)	.430**
TV music content	-.023 (.041)	-.019	-.023 (.041)	-.018	-.024 (.041)	-.019
School content	-.034 (.031)	-.037	-.037 (.030)	-.039	-.037 (.030)	-.039
Frequency use	.024 (.010)	.085**	.104 (.059)	.103*	.023 (.010)	.080*
Social use	.102 (.059)	.101	.104 (.059)	.103	.090 (.059)	.089
Instrumental use	-.140 (.058)	-.141**	-.142 (.052)	-.143**	-.131 (.058)	-.132*
Constant	-.501 (.351)		-.405 9.352)		-.493 (.349)	
Online Friend x personal content			.298 (.121)	.104**		
Online Friend x Adolescent- parents conflicts					.085 (.028)	.207**
Adj Rsquare	.217		.232		.234	
n	352		352		352	

Note: Standard errors are in parentheses

+ $p < .10$

* $p < .05$

** $p < .01$

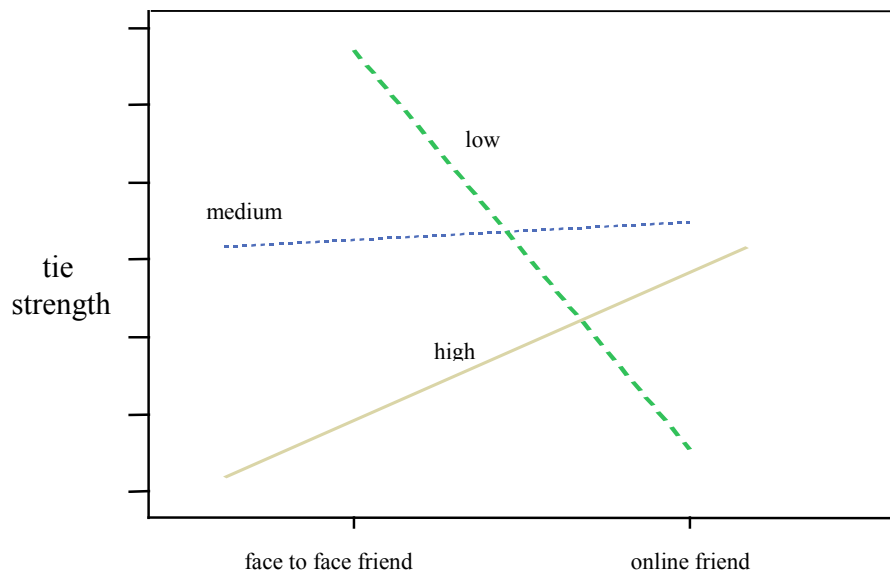


Figure 1. Interaction Effects of Intimate Content of Communication and Online Friends on Strength of Ties.

In the previous analysis we found that adolescents who perceived their relationships with parents as conflicting were more likely to form relationships online. Yet in the first model we found that having conflicts with parents was not related to the strength of ties. Now the question is whether these adolescents make close friends through the Internet. To explore this question, we included an interaction term in the third model, to represent whether the effect of online friendship on tie strength differed for adolescents who reported low and high conflicts with parents. The interaction term was significant, indicating that when adolescents who suffered from conflicts with their parents made friends online, they reported these friendships to be close and rewarding. This finding provides strong support for the *compensation approach*. This finding is also presented graphically in Figure 2.

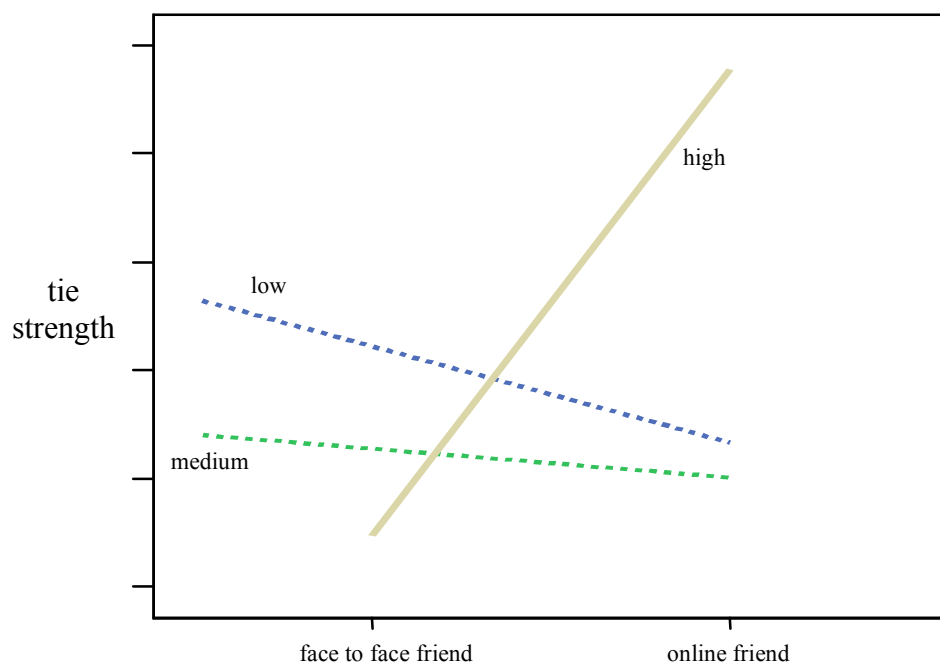


Figure 2. Interaction Effects of Family Conflict and Online Friendship on Strength of Ties.

The graph presents the conditional predicted values of strength of the tie, for face-to-face friends and for friends met online, according to three different levels of adolescent parent conflicts. The graph shows that for high levels of adolescence-parents conflicts the strength of ties to online friends is considerably higher than to face-to-face friends. For low levels of adolescent-parent conflicts, the strength of a face-to-face tie is higher than for online friends. By contrast, for adolescents experiencing medium levels of conflict with their parents, the strength of the tie with an online friend was not lower than the strength of tie with a face-to-face friend.

Discussion

The purpose of this study was to investigate the nature of online social relationships. The findings show that while adolescents increasingly used the Internet for communication purposes, only a relatively small percentage of them reported that their first friend was met through the Internet. Consistent with previous studies on online friendship formation conducted in other countries (e.g., Wollak et al., 2003), we found that online friendship formation was a strategy used by adolescents who reported having conflicts with their parents. From the findings it can be inferred that adolescents who report experiencing an argumentative and conflicting climate with their parents search for social support not in their face-to-face social circle but through the use of the Internet for communication purposes. It is likely that these adolescents bypass their face-to-face friends in the search for social support, to avoid the embarrassment of disclosing their personal problems to close friends, and they take advantage of a number of major features of Internet communication. Online communication is characterized by anonymity, which apparently allows adolescents to find others who share the same grievances, and to search for social support.

The expectations of the social needs perspective that systematic differences may be expected to exist between individuals who meet friends online and offline such that the likelihood of online friendship formation will presumably be higher for adolescents who report low self-esteem and who also lack social closeness to face-to-face friends were not supported. Adolescents that form online relationships do not appear to be more lonely but to report conflicting relationships and to use online communication to search for social support beyond their face to face social circle.

An important yet neglected question concerns the strength of online and face-to-face relationships. We examined this issue extensively using a model in which other potential determinants of strong ties, such as channels of communication, place of acquaintance, and content of communication, were introduced. We also controlled for other potential determinants of relationship quality, which were absent from previous studies. Our findings showed that the content of communication was related to the strength of ties. Personal and intimate communication was positively related to strength of ties. This finding highlights the importance of reaching intimacy in interpersonal relationships as a precondition for the formation of strong ties. Intimacy is needed for trust and reciprocity, necessary in any close relationship. Furthermore, at first sight our findings showed that face-to-face ties were stronger than online ties, indicating that it is through face-to-face interaction that adolescents reach that intimacy in their interpersonal relationships. Whether Internet features such as anonymity facilitate self-disclosure and intimacy requires a test of interaction effects. The important question is whether adolescents who report reaching intimacy through personal communication with online friends, and adolescents who are motivated in their search for online friends by the quest for social support that they cannot find in their parents, can develop strong ties. Our findings show that this is the case.

The findings offer a number of important contributions to the rapidly expanding literature on online social relationships in general, and on virtual networks among youth in particular. The results can be interpreted as providing support for the social compensation approach to the study of online social relationships. The motivation for online friendship formation appears to be related to lack of social support and the attempt of adolescents to compensate by using the Internet for communication purposes. Furthermore, our results show that while face-to-face relationships remain highly prevalent, for adolescents who seek social support through the Internet and find others with whom they develop intimacy, online ties are strong and important. Additionally, we found these adolescents to be distinctive in their social background. Finally, our findings call for a qualification of the theoretical approach to online social ties. A common feature of technological determinist views (e.g., "lack of social clues theory") is their assumption that some technological features are a barrier (or an advantage) in online relationship formation. Thus, it is not the technology per se that is a barrier or a facilitator in social friendship formation, but the social embeddedness of the ties. We addressed this issue by postulating the social affordances of the Internet. The effect of the Internet on the online relational quality is *conditional*: to the extent that adolescents experience lack of social support, they turn to the Internet, searching for friends. But friendship is made only on the basis of the ability to reach intimacy, trust, and reciprocity, which ultimately depend on the social interaction that individuals create and not on sheer technological features.

Our findings imply an association between adolescent and parent conflicts and online friendship formation. Yet, using a cross sectional design we cannot clearly point to the direction of the association. Claims can be made that conflicts result from competition for computer time or that conflicts drive the adolescent to use the computer. The nature of this association should be studied in more detail using a longitudinal design. The finding indicating that online social ties are weaker than offline social ties is an important contribution. But its implication is limited because of the nature of ego network data in which one respondent reports the perceived closeness of the relationships. Future studies should attempt to gather data from both kinds of friends to corroborate the central findings of the current study. In addition, to fully understand the results of family conflicts on adolescents and the family's well being, studies that include measures of frequency, intensity, and consequences of the conflicts over the Internet use should be conducted in the future.

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