Net-friends: Adolescents' attitudes and experiences vs. teachers' concerns

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Abstract

This study has three chief purposes: (1) identify Taiwan adolescents' attitudes and experiences regarding their online relationships, (2) understand teachers' attitudes and concerns about students' online relationships, and (3) investigate the discrepancies between students and teachers on these issues. The researchers surveyed 494 middle and high school students in Taiwan and interviewed 21 teachers as well. The results indicated that having net-friends is a part of Taiwan adolescents' social lives. They are quite honest about the personal information they reveal with their online friends and generally have very positive attitudes regarding their online relationships. Some have gone beyond online interactions to meet in person, often without telling their parents or teachers.

In contrast, this phenomenon of online friendships is not common for teachers. Most teachers did not have first-hand experiences themselves because they are either too busy or have no desire to use the Internet to form friendships. Teachers generally think students are too young to handle the complicated, anonymous, casual interactions found in cyberspace and they believe students should know more about how to protect themselves in online relationships. Interpretations and comments are discussed and recommendations for future studies are provided.
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1. Introduction

Adolescents usually contend with strong psychological and developmental dynamics and face two daunting yet crucial tasks: developing a sense of identity (e.g., Erikson, 1968) and developing meaningful and intimate interpersonal relationships (e.g., Baumeister & Leary, 1995). Therefore, making friends is one of the major tasks during adolescence and extends throughout one's entire life span.

As network technology continues its explosive growth, the Internet has become and will continue to be a large part of adolescents' lives. The Internet, in many ways, is not only an information superhighway, but is also a powerful social domain that connects its users around the world. In other words, it provides an incredible array of interpersonal communication options. Therefore, in order to fulfill their deep need for friendship and belonging, many adolescents turn to the Internet to form relationships, to make so-called "net friends," in addition to friends made in real life. Some teens even move beyond online communication and interact directly through the telephone or face-to-face encounters (McCown, Fischer, Page, & Homant, 2001; Wolak, Mitchell, & Finkelhor, 2002).

Although Internet friendships have become a popular teen phenomenon, many teachers, for several reasons, have deep concerns about this trend. For example, schools and teachers are usually the first ones to introduce students to the Internet (in Taiwan this usually happens in the fourth grade.) Moreover, schools and teachers are expected to be responsible for students' safety and for what they teach about the Internet. As more and more students use the Internet to form new relationships, some teachers may be skeptical about the technology, thinking online relationships are shallow, impersonal, or marked by deceit (i.e., Bonebrake, 2002). Other concerns include the fear that over-involvement with online friendships may harm the students' daily routines and responsibilities, or that students may not be aware of the hidden dangers lurking online (Chou, Peng, Hsieh, & Chang, 2004).

As we are tragically aware, these concerns have sometimes become teachers' and parents' real-life nightmares. While this study was under progress, a sad but true story happened in Taiwan. On July 22, 2005, a 15-year-old boy, 185 cm (about 6′2″) tall and weighing 95 kg (209 lbs.), was found dead in a ditch in central Taiwan. The day before his body was found, he had left home as usual to go to his nearby vocational high school. He told his mother that he would go to meet his net-friend after school but he disappeared afterward. Before he was kidnapped and killed, his parents and teachers knew nothing about his complicated net-life in which he had a close "godfather". The godfather, whom the boy had met in an online role-play game, visited with him in cyberspace for a period of time and gave him a variety of presents, in real life, such as a digital camera. The boy's classmates were the only people who had ever heard of the online figure, who has now been accused as the killer. His mother cried out: "Don't let your kid have net-friends" (Bai & Cheng, 2005).

Clearly, this story represents the worst-case scenario for having net-friends and the mother's grievous call is understandable. However, whether kids should be allowed to have net-friends is worthy of research. Indeed, while the Internet has powerful potential for allowing positive relationship to develop, as many studies have demonstrated and as many adolescent may think, it can also be misused and has some inherent risks, as many teachers and parents in Taiwan and elsewhere believe. Besides the risks documented by research, such as online flaming (Joinson, 1998), overuse or addicted to the Internet

(Chou, 2001; Chou, Condron, & Belland, 2005), compulsive and destructive over-reliance on screen personae and relationships (Turkle, 1995), or heightened emotional loneliness (Moody, 2001; Morahan-Marin & Schumacher, 2003), Taiwan teachers are most concerned about their students moving beyond online interactions to face-to-face encounters, and the above-mentioned story deepens their concerns.

However, as Aquilar (1996, cited in Cooper & Sportolari, 1997) commented, journalists often do not fully understand the medium but take simplistic and sensational approaches to characterize cyberspace as full of destructive, superficial, sexual relationships. The present authors also noticed that many teachers may not have any online relationships themselves. The authors have attended more than 30 in-service sessions for Taiwan junior and senior high school teachers and found that most of the teachers expressed concern about students' online relationships but few had any experience with such relationships or therefore knew little about how to help their students. It seems that students and teachers have strongly different viewpoints, attitudes, and experiences regarding Internet relationships.

Therefore, this present study was motivated by the considerable increase in online relationships among adolescents and concerns among teachers, and such a phenomenon requires study within various cultural contexts. There are three purposes behind this study. The first is to identify Taiwan adolescent's attitudes and experiences regarding their online relationships. The second purpose, on the other hand, is to understand teachers' attitudes and concerns about students' online relationship formation behaviors. The last is to investigate the discrepancies between students and teachers on these issues. By studying both sides – student and teacher – of the same issue, this study aims to find the differences in the viewpoints and shed some light on how the teachers can provide counseling and guidance, if needed.

2. Literature review

2.1. The formation of online relationships

Past research has affirmed that the need to form and maintain strong interpersonal bonds has been described as a fundamental human need, and that close peer relationships contribute positively to adolescent self-esteem and well-being (i.e. Gross, Juvonen, & Gable, 2002). Unlike the phases formulated and defined by theories and studies on interpersonal relationships (such as Albada, Knapp, & Theune, 2002), the formation of online relationships has different definitions and special features (Nice & Katzev, 1998). For example, *physical attraction* (or *appearance*) in face-to-face (FTF) situations becomes text-based expressions someone presented in online synchronous or asynchronous communications. *Physical proximity* in FTF becomes propinquity in cyberspace; in other words, Internet users, regardless of their actual geographic location, are actually "together" in shared chat-rooms, online games, or particular software for communication (such as MSN, Messenger, etc.; see Gross et al., 2002). *Similarity* in FTF is usually defined as the perception of being both physically attractive and attitudinally similar to oneself (Brehm, 1992). The Internet increases one's chances of connection with like-minded people because of both the computer's ability to sort along many dimensions simultaneously (Cooper & Sportolari, 1997) and because of the Internet's widespread reach (Bonebrake, 2002). *Self-disclosure* in FTF is defined as the reciprocal exchange of personal information in the beginning of a relationship, which greatly increases

intimacy. Studies (e.g., Cooper & Sportolari, 1997; McKenna, Green, & Gleason, 2002) have shown that people often feel more comfortable disclosing very personal and private information online than they do in FTF interactions. Bonebrake (2002) stated that, however, the fast pace of self-disclosure does leave online relationships vulnerable or lead to a lack of trust and rapport.

In contrast to people in FTF situations, the Internet has some technical or interface features which facilitate the formation of online relationships. *Anonymity* is the primary feature and affects online communicators in different ways (Bargh, McKenna, & Fitzsimons, 2002; Bonebrake, 2002; McKenna et al., 2002). Some people may feel more comfortable disclosing very personal and private information online than they do in FTF. However, others can take the benefits of anonymity to use impression management and experiment with different persona. In these cases, the Internet helps create a relatively safe, low-risk, and low-anxiety social domain (Nice & Katzev, 1998). However, anonymity also allows people to feel freer to express their frustration, anger, rage, or even assaults on others. Studies (e.g., Joinson, 1998) have shown that the reduced social norms, constraints, and body language in FTF situations let some people feel less inhibited and demonstrate taboo behaviors online.

Some studies especially mention the *informal written language* of online relationships. What Peris et al. (2002) call "a new communication code," this language has been developed by chat users and emphasizes input speed over correct spelling. Because of its informality, online written text resembles oral communication more than do most other forms of writing (Cooper & Sportolari, 1997). It is interesting to note how this type of writing helps the formation of online relationships, especially regarding initial impressions and further self-disclosure. It is more interesting to investigate, in the anonymous online environment, what Internet users reveal in their writings. In fact, except for some empirical data reported by McCown et al. (2001) on college students, the knowledge of what adolescents disclose, conceal, or deceive about their personal or private information when they make online relationships is scarce. Therefore, one of the issues the present study tackles is the actual exchange of information online. In particular, what exact information do adolescents disclose or lie about when forming online relationships?

2.2. Adolescent Internet use for relationship and related concerns

Adolescent use of the Internet to develop interpersonal relationships has become a common and world-wide phenomenon. Past research (e.g., McKenna et al., 2002) has shown that people not only use the Internet as a means of maintaining ties with existing family and friends but also as a way to form close and meaningful new relationships. For maintaining existing relationships, Gross et al. (2002) observed that new technologies have been advanced to further facilitate synchronous online interaction with known others. For example, instant messages (IMs) allow users to be informed when friends are logged on and to chat with them through text windows on the screens of the two parties. In this case, the Internet is used more like a face-to-face "hanging out" or talking on the phone. That is also why a fifth of American teenage Internet users chose IMs as the major means of contacting friends (Pew Internet & American Life Project, 2001).

For forming new relationships, on other hand, Gross et al. (2002) indicated that the Internet provides adolescents a beyond-school space to interact with distant associates and strangers. Wolak et al. (2002) also stated that adolescents may be especially drawn

to online relationships, not only because of their intense interest in forming connections, but also because the Internet frees them from some of the constraints by giving them easy access to a world beyond that of their families, schools and communities. In this case, youth who grow up with the Internet are more empowered to widely and easily expand their social horizon beyond physical constraints than can older generations who are still adjusting to the Internet. This is probably why the expansiveness of the Internet, coupled with the above-mentioned "anonymity" and "informality" features, raises general concern and anxiety among many adults. Wolak et al. (2002) showed that one area of concern has been the ease with which online communications permit young people to converse with and form relationships with people they have never met face-to-face; moreover, initial face-to-face meetings between online friends are considered the primary source of danger in online relationships. Sometimes the media coverage helps raise awareness reporting on manipulative adults who use the Internet to lure teenagers into meetings for illicit sexual purposes. Livingstone (2003) also indicated that by far the most public concern has centered on the growing incidence of unwanted or inappropriate sexual contact between teenagers and adult strangers. As Aftab (2000) discussed this risk, "(t)he real danger online comes from meeting people offline" (p. 33).

Several studies have focused on teachers' concerns. For example, in Chou et al. (2004), 160 sampled Taiwan junior and senior high school teachers expressed their concerns about the safety of net relationships, especially for female students. In Wishart's study (2004), three of the 10 most frequently cited important safety issues by 577 British schools are e-mail, students giving out personal details, and chat rooms. The author strongly suggested local education authorities provide support for schools aimed at teaching children about the use of chat rooms and instant messaging safety.

The above discussions provide the conceptual framework (definitions and features) for understanding the formation of online interpersonal relationships, the different ways teens use the Internet to build relationships (maintaining existing friendships or forming new ones), and concerns raised among teachers as well as the general public. This study attempts to go beyond the simple comparisons between face-to-face and online relationships or the Internet use for maintaining existing relationship as some studies have done. Instead, this study attempts to concentrate on new relationships formed entirely online as self-reported by Taiwan adolescents. Since these kinds of relationships raise the most safety concerns among the public and since the authors are researchers helping make policy regarding information communication technology in Taiwan's school systems, this study also focuses on teachers' perspectives, in terms of their experience and attitudes. Specifically, the research questions of this study are:

1. What online relationships are the adolescents (Taiwan junior and senior high school students) actually experiencing?
2. What information do these students disclose, or misrepresent, in their online relationships?
3. What are these students' attitudes toward forming online relationships?
4. What do differences among students' backgrounds (gender and grade) play in their attitudes toward forming online relationships, time on the Internet per day, amount of time online used for communicating with friends, and number of net-friends?
5. What are the relationships among students' backgrounds, attitudes toward, and experiences with online friendships?

6. What are the teachers' own experiences, attitudes toward, and concerns about students' online relationships?
7. What are the discrepancies in attitudes between students and teachers toward and experiences with online friendships?

3. Methods

3.1. Survey subjects and distribution process

At the time of this study, the target population was approximately 2,531,452 Taiwan junior and senior high school students (12–15 and 15–18 year-olds, respectively). The stratified sampling plan used was based on the Educational Statistics of the Republic of China, Taiwan (Ministry of Education, Republic of China on Taiwan, 2003), and was distributed in schools among Taiwan's four geographic areas (North, South, East, and Central). The researchers distributed 1124 paper-and-pencil questionnaires to 33 classes at twelve randomly selected junior and senior high schools in the four geographic areas. Half of the questionnaires were given to male students and the other half to females. A total of 1067 valid data samples were collected (validity rate = 94.93%). Among them, 812 (76.10%) of the sampled students had used the Internet to communicate with their friends. However, since this study only examined friendships formed entirely online, not just using the Internet to maintain friendships formed in real life, we discounted some of the questionnaires. Therefore, we accepted as valid 494 (46.30%) of the samples because they came from students who had used the Internet to form completely new online friendships. These 494 samples were the ones we used to draw the following statistics and discussion. The other 573 (53.70%) samples indicated that the students had never formed new friendships online and were thus discarded from our study.

3.2. Instruments

The present researchers developed a survey questionnaire with five sections. Before answering the questionnaire, the subjects were reminded that "net friends" were only friends made entirely online. The questionnaire's first section differentiated between the two kinds of Internet friendships by asking: "Have you met people and then formed friendships only online?" If yes, subjects were directed to the second section. If no, subjects were asked to return the questionnaires to their teachers.

The second section requested the subjects' demographic information, such as gender, age, and grade. This section also asked about their average hours of Internet use overall, hours of daily Internet use for communicating with friends after school, and their age when they made their first online friend. This section also asked the subjects what Internet application(s) they used when making online friends. The subjects could choose whatever was applicable: websites designed specifically for making friends, Internet communication software (e.g., MSN, Messenger, ICQ, Skype), Bulletin Board Systems (BBS), online games, chat-rooms, e-mail, websites for trading goods, etc.

The third section asked the subjects about their actual experience with online friendships. Topics included the number of their net-friends, the age ranges and genders of their net-friends, communication methods (telephone, regular mail, etc.) with their net-friends,

and whether they ever met their net-friends in person. If they had met their net-friends in person, then they needed to answer the following questions. Before their first meeting, had they checked on the net-friend's background, chatted on the telephone, or asked for a photo or video clip? Had they told their parents or teachers about the meeting, or asked another person to meet instead but him/herself did not go, etc.? This section also asked whether they had gone to the meeting alone or with someone, etc.

The fourth section asked the subjects to reveal more specific information about their online relationships. In particular, the subjects were asked about what personal information they had shared online or items they had perhaps lied about: name, gender, age, birthday, height, weight, bust size, photo, phone number, e-mail address, home address, school, whether they had boy/girl friend(s) or not, sexual experience, etc.

The fifth section was the net-friend attitude scale; it asked what the subjects think about online friendships. The attitudinal objects included anonymity, similarity, safety, convenience, increase in self-exposure and promotion, curiosity about the other sex, screen persona, sincerity, fun, and so on. A total of 32 statements were listed, such as *I think the Internet is a convenient place for making friends, I think making friends online is safe, Net-friends help me relieve the pressures of school work, The Internet helps me meet people of the opposite sex, etc.* Subjects were required to read the statements and indicate the extent of their agreement based on the options provided on a 4-point Likert scale: strongly disagree, disagree, agree, and strongly agree (counted as 1, 2, 3, and 4, respectively). Thus, higher scores indicate more positive attitudes toward online friendships.

The net-friend attitude scale was pilot tested by a sample of 205 students from the target population. In order to establish the scale validity, an exploratory factor analysis was used to reduce items by deleting invalid ones. Eight items were deleted from the original 32 due to their low validity. Thus, the final version of the scale consisted of 24 items, as used in the following statistical analyses. Factor analysis of the scale revealed five major factors and contributed a total of 61.70% explained variances, and the reliability (Cronbach's α) of the questionnaire was 89.96.

3.3. Interview subjects and questions

The second method used in this study involved interviewing teachers. About 21 junior high and senior high school teachers from Taiwan's four geographical areas were interviewed. We used the "snowball method" to recruit our interviewees, that is, we interviewed teachers and then asked them to recommend other possible candidate teachers to be interviewed. All interviewees were computer teachers, school counselors, or student affairs officers (also teachers) who had concerns about or dealt with students' problems caused by Internet relationships. Among the 21 teachers, 10 taught in senior high schools (Teachers A–J) and 11 in junior high (Teachers K–U). Nine teachers were male and 12 were female. They were in the 28–45 year-old age range, with a mean age of 37.25 and a standard deviation of 4.26. The range of teaching experience was 3–23 years, with a mean of 13.10 and a standard deviation of 6.18. The interview methods were either face-to-face or over the telephone. E-mails were also used to clarify unclear recordings or meanings of words/sentences. Each interview took 30–50 min. Transcripts of the recordings were sent back through e-mail to be checked by the interviewees. The major interview questions were:

(1) Have you had any first-hand experience with online relationships? If yes, please describe them.
(2) Are you aware of the popularity of online relationships among students?
(3) Do you agree with and encourage, or disagree with and discourage, students from forming online friendships? Why or why not?
(4) What concerns do you have toward students forming online relationships?
(5) Is it necessary for teachers to inform their students about the safety issues surrounding online relationships? If yes, what kinds of information should be incorporated and what design strategy should be used?

4. Results

4.1. Sample demographic information and descriptions of Internet experiences

The mean average of the samples' ages was 15.67 years, with a standard deviation of 4.73. Among 494 valid samples, 247 (50.0%) were from male students and 247 (50.0%) were from females; 296 (59.9%) were high school students and 198 (40.1%) were junior high school students.

The average overall time the subjects used the Internet was 2.39 h per day (SD = 1.90) and the time used for communicating with friends was 1.34 h (SD = 0.13) per day. Interestingly, 98.18% (485 subjects) had personal computers at home while only 1.82% (9 subjects) did not. Among the 485 subjects who had computers at home, 473 (97.53%) had Internet accesses.

4.2. Students' actual experiences with online relationships

The data indicated that the average age of the subjects to have their first experience making online friends was at 12.91 years (about grades 7 or 8). The applications that subjects used most frequently for making online friends were, listed in descending order, Internet communication software (e.g., MSN, Yahoo Messenger, ICQ, Skype, etc.), (349 subjects, 70.6%); online games, (327, 66.20%); chatrooms, (263, 53.2%); e-mail, (183, 37.0%); and websites for making friends, (150, 30.4%). The least frequent applications included BBS (54, 10.9%) and websites for trading goods (41, 8.3%).

Subjects reported that they had, on average, 8.87 online friends (SD = 14.79, median = 5, mode = 3), the age of these net-friends was 16.79 years (SD = 2.54), and most friends ranged in ages from 11 to 25 years old. We learned that 15.5% (76 subjects) reported that they only had net-friends of the same sex, 16.7% (82 subjects) had only net-friends of the opposite sex, while 67.8% (333 subjects) had both male and female net-friends. The average number of net-friends they met in person was 0.96 (SD = 2.52). It is noted that 67.4% (333 subjects) had never met their net-friends in person.

As shown in Table 1, 32.6% (161 subjects) had met their net-friends in person. Among them, 81.4% (131) had used the telephone to communicate before the meeting but a shocking 75.8% (122 subjects) did not check the backgrounds of the net-friends by any other methods. About 69.6% (112 subjects) asked their friend(s) to escort them to the meeting, and 57.8% (93) asked for a photo or video image of the net-friend before the actual meeting while 42.2% (68) did not. It is worth noting that a disturbing 74.5% (120 subjects) did not tell their parents about the meeting, and 98.1% (158) did not tell their teachers.

Table 1
Steps taken before meeting net-friends in person ($N = 161$)

Steps taken	Yes % (n)	No % (n)
Talk on the telephone	80.1 (129)	19.9 (32)
Ask friend(s) as companion to the meeting	69.6 (112)	30.3 (49)
Tell friends about the meeting	58.4 (94)	41.6 (67)
Ask for a photo or video image	57.8 (93)	42.2 (68)
Tell parents about the meeting	25.5 (41)	74.5 (120)
Check the background via alternative ways	18.6 (30)	81.4 (131)
Tell teachers about the meeting	1.9 (3)	98.1 (158)
Ask someone else to go to the meeting instead	1.9 (3)	98.1 (158)

However, 58.4% (94 subjects) did tell their friends about the upcoming meetings, while 41.6% (67) did not. It is also noted that 98.1% (158 subjects) went to the meeting in person; only 1.9% (3) asked someone else to go to the meeting instead but did not go to the meeting him/herself.

4.3. Students' information disclosed or lied about in online relationships

In the questionnaire, 13 types of information were listed for students to check if they had ever faithfully disclosed or lied about to their net-friends. As in Table 2, the types of information that subjects most frequently told the truth about to their net-friends were gender (456 subjects, 92.3%), e-mail address (398, 80.6%), age and/or birthday (374, 75.7%), and name (299, 60.5%). The least frequent information shared was about sexual experience (29, 5.9%), bust size (22, 4.5%), and other (11, 2.2%), including love history, personal interests, or hobbies. The information that subjects most frequently lied about to their net-friends were name (145, 29.4%), age and/or birthday (140, 28.3%), residential address (124, 25.1%), and gender (110, 22.3%). The information that subjects least frequently lied about were bust size (35, 7.1%), photo (33, 6.7%), and other (24, 4.9%), including grade level or family members.

Table 2
Information subjects have disclosed or lied about to their net-friends ($N = 494$)

Information item	Faithfully disclose % (n)	Deceive % (n)
Gender	92.3 (456)	22.3 (110)
E-mail address	80.6 (398)	8.5 (42)
Age/birthday	75.7 (374)	28.3 (140)
Name	60.5 (299)	29.4 (145)
Residential address	59.5 (294)	25.1 (124)
School	57.9 (286)	17.2 (85)
Having boy/girl friend(s) or not	49.2 (243)	17.8 (88)
Phone number	48.4 (239)	16.4 (81)
Height/weight	39.3 (194)	18.2 (90)
Photo	28.9 (143)	6.7 (33)
Sexual experience	5.9 (29)	4.9 (24)
Bust size	4.5 (22)	7.1 (35)
Other	2.2 (11)	17.0 (84)

4.4. Students' grade and gender differences in attitudes toward online relationships, time on the Internet, and number of net-friends

In order to assess Taiwan junior and senior high school students' attitudes toward their online friendships, a 24-item scale was distributed and calculated. The 494 valid subjects indicated a mean score of 2.75 based on a 4-point scale, and the standard deviation was 0.61. Table 3 shows the t-test investigating the grade differences in attitudes toward online relationships, as well as in their overall time on the Internet, time used for communicating with friends, and number of net-friends. The results indicated that junior high students spent significantly more time on the Internet per day ($t = 2.34$, $p < 0.05$) and time for communicating with friends than did senior students ($t = 2.83$, $p < 0.01$). However, there were no differences in their attitudes toward online relationships or number of net-friends between junior and senior high students.

Table 4 showed gender differences in their attitudes, time on the Internet, online time for communicating, and number of net-friends. The results showed that male students had more positive attitudes toward online relationships and spent more time on the Internet per day than did female students ($t = 4.00$, 2.73, respectively, $p < 0.01$). However, there were no gender differences in time on the Internet for communicating or number of net-friends.

4.5. Correlates of students' net-friend attitudes, net-friend numbers, time on the Internet for communicating with net-friends

As shown in Table 5, a Pearson correlation (r) analysis was conducted to check the relationship between the subjects' net-friend attitudes, number of net-friends, and time on the

Table 3
Grade differences in attitude toward online relationships, overall time spent online per day, time spent online for communicating, and number of net-friends

Variable	Junior ($n = 198$)		Senior ($n = 296$)		t
	M	SD	M	SD	
Attitudes toward online relationship	2.76	0.52	2.75	0.43	0.12
Time on the Internet per day	2.63	2.08	2.21	2.75	2.34[a]
Time on the Internet for communicating	1.58	1.63	1.18	1.45	2.83[b]
Number of net-friends	8.82	15.72	10.32	27.44	−0.68

[a] $p < 0.05$.
[b] $p < 0.01$.

Table 4
Gender differences in attitudes toward online relationships, overall time spent online per day, time spent online for communicating, and number of net-friends

Variable	Male ($n = 247$)		Female ($n = 247$)		t
	M	SD	M	SD	
Attitudes toward online relationship	2.84	0.46	2.67	0.47	4.00[a]
Time on the Internet per day	2.62	2.22	2.15	1.48	2.73[a]
Time on the Internet for communicating	1.45	1.74	1.22	1.29	1.64
Number of net-friends	10.44	29.11	9.00	16.10	0.67

[a] $p < 0.01$.

Table 5
Correlation between subjects' net-friend attitudes, number of net-friends, and time on the Internet for communicating with net-friends

r-Value	Net-friend attitudes	Net-friend number
Number of net-friends	0.187[a]	
Time on the Internet for communicating with net-friends	0.162[a]	0.124[a]

[a] $p < 0.01$.

Internet for communicating with net-friends. Results indicated that the subjects' net-friend attitudes were significantly correlated with both their number of net-friends ($r = 0.187$) and their time spent online communicating with their net-friends ($r = 0.162$); in addition, the number of net-friends also significantly correlated with their time spent using online communication ($r = 0.124$).

4.6. Interview results of teachers' own experiences, attitudes toward, and concerns about students' online relationships

In order to understand teachers' experiences with and attitudes toward online friendships, 21 teachers were interviewed. The summary of the interview results are as follows.

(1) All teachers had heard of the term ''net-friends'', but almost none had experienced such friendships themselves. The major reasons for not having done so were a lack of time or low motivation to go online for companionship.

(2) Although all of the interviewed teachers use e-mail, only 10 teachers (47.62%) read their school BBS on a daily basis; they used these applications mainly for communicating with friends known in real life (which were not counted as ''net-friends'' in this study), and for school or daily life information. Only three teachers (14.29%) indicted that they had previously used MSN, out of curiosity; however, since their friends did not use MSN and they had no one to talk to, they did not continue using it.

(3) Almost all teachers were fully aware of the burgeoning popularity of students' online relationships. Teachers knew of this thanks to students' journals, informal chats, eavesdropping on students' conversations, and information from the mass media or other colleagues.

(4) About 10 teachers (47.61%) agreed that students should be allowed to develop online relationships if safety precautions can be followed. However, these teachers would not actively encourage their students to pursue online friendships.

(5) Sixteen teachers (76.19%) expressed deep concerns about students' online relationships. The major concern was that students may not be aware of the hidden dangers lurking behind online friendships. It seems that junior high school teachers were more concerned about online relationships than were senior high teachers because the younger students are simply less mature. It also seems that teachers of female students were more concerned than those of male students.

(6) Almost all the teachers suggested that students be given some instruction about Internet safety. However, such instruction or guidance is woefully lacking in most schools today.

(7) When designing such safety instructions, some teachers suggested using authentic, real-world examples (e.g., newspaper clippings) instead of textbook-like materials, and encouraged thought-provoking discussions or role-play games rather than simple rote memorization of a list of safety tips. In addition, multimedia learning materials (e.g., flash animations) could be incorporated to attract and keep students' interest.

5. Discussion

5.1. Students' online friendship experiences

One of the research questions was to investigate Taiwan junior and senior high school students' actual experiences in online relationships. The results indicated that, among 1067 returned valid samples, 494 students (46.30%) used the Internet not only to interact with friends known in real life, but also to form new relationships. That is also why only they became the valid samples for further investigation.

Subjects reported that, on average, their first experience with making online relationships was when they were about 12–13 years old (about grades 7–8), that is, about the time they became teenagers. As mentioned above, adolescents strongly need to develop meaningful and intimate relationships, and the results show that they started to use the Internet to fulfill this need. The results also show that they used a variety of Internet applications, instead of physical proximity, to create online relationships. From most to least frequent are Internet communication software (e.g., MSN, Yahoo Messenger, ICQ) (70.6%), online games (66.2%), chat rooms (53.2%), e-mail (37.0%), websites for making friends (30.4%), BBS (10.9%), and websites for trading goods (8.3%). These results are quite different from those of Wolak et al. (2002) in which the descending order was chat rooms, instant messages and e-mails, and gaming sites from US national data of an adolescent sample. Somewhat to our surprise is the rank of online games as the second major way to form online relationship, and such a majority of our sample played online games. The implication of this results is online games are quite popular among our junior and senior students, and they are not only for adolescence entertainment or enjoyment but also for their social domain where they form and maintain relationships (see also Chou & Tsai, in press-a, in press-b).

The results also indicated that the students spent an average of 2.38 h (143 min) per day on the Internet after school. Of this time, more than half (1.34 h, about 80 min) was for communicating online with their friends. Therefore, it can be concluded that, for these students, the Internet is not only an informational resource but also a powerful interpersonal medium in which they can develop a variety of friendships (see also Bargh & McKenna, 2004). As Wolak et al. (2002) stated, given the interest adolescents naturally have in forming close relationships and the amount of time and emotional energy they put into their friendships, the Internet has indeed become another means for young people to form relationships.

Among different kinds of friendships as McKenna et al. (2002) categorized, this study focused on the ''brand new'' one, that is, people met and friendships formed online only. The sample in this study reported that, on average, they had about 9 such friends, but it is worth noting that the variation in number is quite large (SD = 14.79). Most students (72, 14.57%) had three such net-friends, but some reported having up to 60! Of course,

the variation may be due to their definition of "friend" or "net-friend," that is, some students may have loose definitions such as people met frequently while playing online games while others counted only long-lasting, intimate friends. However, regardless of the type or number, net-friends are a part of middle school students' social life, and the Internet is doubtless a convenient and easy way to form and maintain this kind of contact. This result seems to be an international phenomenon, as reported in Sjöberg (1999), in which Swedish teenagers also used the Internet to form "virtual friendships". Therefore, "the school yard is no longer perceived as the obvious meeting point" (p. 129).

When asking about the age of net-friends, the average age reported was 16.79, that is, close to the age of the subjects. However, the age range was from 11 to 25 years old. However, since it is easy to deceive others about one's age online, the actual ages of the net-friends are questionable. When asking about the genders of net-friends, two-thirds of the students had both male and female friends, but it is interesting to note that some students only made friendships with one gender. Specifically, the results indicated about 16% of the students only had net-friends of the same sex, while 17% only had friends of the opposite sex. However, since it is also easy to lie about your sex online (Weiser, 2001), the actual genders of the net-friends are debatable. As Weiser (2001) noted, the Internet permits its users to express their concealable identities (e.g., gender) and to interact with others who share such identities. Users, such as the sample students in this study, can experiment with their online gender and interact with others. Simply put, subjects form friendships with both genders to fulfill their different needs and/or to extend their friendship patterns in real life. For example, girls may seek a close yet platonic friendship online where they can share their feelings or fulfill their curiosity about boys. It can be concluded that the Internet helps overcome the geographical and time barriers for making friends and makes it easier to meet new people – in both genders and in broader age range. In sum, online relationships indeed fulfill an adolescent need, at least partially, for friendship. From this perspective, net-friendships can be encouraged, with some kind of safety precautions, especially for those who lack friends and social skills in real life.

In this study, about two-thirds of students did not meet their net-friends in person, while one-third did. How did they meet and did they do anything before meeting? These questions are probably what Taiwan teachers and parents want to know most. The results show that less than 20% of students have checked the background information through other ways before going to the meetings. It is probably because they might think they have conversed on the Internet and have known whatever they wanted to know about the person; they felt no need to check on the friend-to-meet. However, more than 80% of the students had talked on the telephone, and more than half of the students had asked for a photo or video clip. It is probably for the arrangement and logistics of meetings (e.g., time/place confirmation, easy recognition), but not for background checks. It is especially worth noting that only a quarter of students would tell their parents, and less than 2% tell their teachers, but more than half would tell their friends about the meeting. These results mean that meeting with net-friends in person is a relatively private activity which adolescents do not like to share with elders in their family or in schools, but only with their peers. These results are also very different from Wolak et al. (2002) in which 60% of 101 American youths who attended a face-to-face meeting told a parent prior to the meeting. Of those who did not tell a parent, most did tell a friend about the meeting, and only 10% told no one. It seems that Taiwan adolescence in the present study took fewer precautions than did youth elsewhere. This finding is certainly a matter of concern.

5.2. Students' personal information disclosed or lied about online

The second question of this study was what personal information Taiwan adolescents have disclosed or lied about in their online relationships. The results showed that gender was most faithfully disclosed by most subjects (92.3%), followed by e-mail address (80.6%), age/birthday (75.7%), and name (60.5%). However, it is also interesting to note that gender, age/birthday, and name were also among the top list that adolescents lied about to their net-friends (22.3%, 28.3%, and 29.4%, respectively), plus the residential address (25.1%). The e-mail address was, on the hand, among the least lied about. Bust size and sexual experience were reported on the least, whether truthfully or falsely. This could be due to the relatively conservative Chinese culture or youth sub-culture in which adolescents are uneasy sharing such information. Comparatively speaking, more types of personal information were more faithfully disclosed than lied about in adolescents' online relationships. About 30 students entered their written answers to the item of ''other'' on the questionnaire and indicated that they might hide or just did not talk about the personal information, but they never lie to their net-friends. It seems that adolescents tended to be truthful in their online interactions. This result is consistent with those reported in McCown et al. (2001). However, as Bargh et al. (2002) stated, engaging in anonymous Internet interactions should provide caution and guidance as to the seductive nature of expression of the true self and the rose-colored glasses through which users tend to view their Internet partners.

5.3. Students' attitudes toward forming online relationships

What are adolescents' attitudes toward the formation of online relationships? The results showed that subjects in this study have relatively positive attitudes – an average of 2.75 on a 4-point Likert scale. In other words, on average, subjects tend to agree to 24 statements about online relationships. This means that Taiwan adolescents generally agree that online relationships helped them in many ways. Examples of perceived benefits included: increased chances of self-exposure and self-promotion, escape from pressures (homework, parental, school, etc.), more chances to experiment with their ''ideal self,'' more chances to fulfill their imaginations about the opposite sex, and the belief that such relationships are fun, convenient and safe. Moreover, male students seemed to be more positive than female students. This could be because male students, in general, have a better control or use of the computers/networks. Or, as one male student interviewed in our pilot study told us, boys are more likely to play around and to experiment, but feel safe in this new social domain, ''because we have nothing to lose''. The gender differences and the possible explanations are fascinating and clearly show the need for further investigation.

5.4. Students' grade and gender differences in Internet use and number of net-friends

Besides the positive attitudes, the male students spent more time on the Internet overall per day than did the female students. In addition, the junior high students spent more time on the Internet overall per day, and time communicating with their friends, although they did not have more positive attitudes than their senior counterparts did. This could be because they are just starting to make online friends, feel more excited about it, and have

to invest more time on it than do older adolescents. However, there was no difference in grade and gender in terms of average net-friend numbers.

5.5. Relationships among students' attitudes toward online relationships, time on the Internet, and number of net-friends

The results show that there were significantly positive relationships among adolescents' attitudes toward online relationships, time on the Internet for communication, and number of net-friends. In other words, the more time they spent on the Internet for communication, the more net-friends and more positive attitudes toward the online relationship formation, and vice versa. These results are similar to the findings of Bonebrake (2002) that the total number of new relationships formed online correlated with the amount of time a participant spent interacting with their online relationship partner. However, the statistics in the present study could not show the causal relationship. Is the time invested leading the attitude, or does the attitude draw adolescents to go online? Either way, it seems clear that adolescents who spend more time on the Internet have higher numbers of net-friends and more positive attitudes toward the online relationships. However, the small but significant correlations, ranging from 0.124 to 0.187, may indicate that variance in attitudes may be largely due to factors other than time on the Internet and net-friend numbers. Possible mediating factors such as motivations and gratification levels, as suggested by Weiser (2001), need further investigation.

5.6. Discrepancy between students' attitudes and experience vs. teachers' concerns

This study also investigated the discrepancy between students' and teachers' viewpoints. Table 6 summarizes the basic findings and provides the authors' interpretations and comments.

In sum, the results indicate that net-friends are a part of our adolescents' social lives; they use a variety of applications and spend relatively large amounts of time online communicating with their friends on a daily basis. They are quite honest in terms of what personal information they reveal during the formation of online relationships and have very positive attitudes toward their online relationships. They started to form online relationship since they were only 12 or 13 years old, and have about nine such friends aged from 11–25 years old. Some have gone beyond online interactions to meet in person, without telling their parents or teachers.

In contrast, the net-friend phenomenon is less common for people over 30; that is also why most of the interviewed teachers were skeptical or concerned about online relationships. Although they have heard of this phenomenon among their students, they did not have many first-hand experiences themselves. They said that they were too busy or simply had no desire to use the Internet to form new relationships, but rather just used the new technology to maintain old friendships. Teachers generally think students are too young to handle complicated, anonymous, causal online interactions. One junior high school teacher put it this way:

> I just don't think students are mature enough to know the dark side of people, in real life as well as on the net. I am not saying the net is full of bad guys, but I do think it

Table 6
The discrepancy dimensions between students and teachers

Dimension	Student (based on 494 survey subjects)	Teacher (based on 21 interviewed)	Interpretations and comments
Age of first experience with online relationship	12–13 years-old	Only heard but without first-hand experience	Teachers did not 'grow up' with the Internet; net-friends are not part of their social life
Number of net-friends	Average 9	0	Teachers did not have net-friends because a lack of time or no motivation
Use of Internet applications to make online friendships	Use a variety ways (such as messenger, ICQ, online games, chat-rooms)	Use only e-mail to communicate with people known in real life	Teachers need to be motivated to understand more for the sake of their students
Internet use time for communicating with online friends	Average 1.34 h	N/A	Teachers are too busy or have no desire to use the Internet for social interactions
Personal information released online	Gender, e-mail, age, etc.	N/A	Students are quite honest when they form online relationships. However, teachers suggest they disclose as little personal information as possible
Meeting with net-friend in person	One-third of the students did	N/A	Some students actually meet their net-friend in person but teachers are deeply concerned about these meetings
Things conducted before the actual meeting	Phone conversation, companion, perhaps with photos	N/A	Students may adopt some precautions, but these safeguards are not comprehensive. Teachers think that students should know more about how to protect themselves online and offline
Telling parents and teachers about the face-to-face meeting	Low percentage	N/A	Students were not willing to share the meeting information with elders. Teachers think that students should at least tell their parents
Attitudes toward the formation of online relationships	Positive	Skeptical and concerned	There is a discrepancy and more dialog between students, teachers and parents is needed on this issue

> *provides more chances and is easier for my students to meet one in such a causal, relaxing, anonymous place...(Teacher B)*

Teachers suggest students should not reveal too much personal information to protect themselves. However, as one teacher pointed out, it was a paradox to do so:

> *I told my students to hide, or lie if needed, about their personal information when they talk online. But at the same time, I hope all their net-friends are honest and reveal true information about themselves, it is impossible, and paradoxical...(Teacher S)*

Teachers fully understand middle school students' strong need to make friends, and hope they know better to protect themselves in relationships both online and in real life. As one teacher mentioned in the interview:

> *In school, we have already taught students traffic safety, fire safety, personal safety, but why not Internet safety? I told my students not to talk to strangers carelessly on the street, but how about strangers on the net?(Teacher J)*

Based on the student survey results and teacher interview results, the authors provide the following interpretations and comments.

1. Although they have not grown up with the Internet and net-friends are not part of their social life, teachers need to understand more about the popular phenomenon among middle school students and its impacts on their social and psychological development. The mass media may have provided some unusually shocking and sad stories about online relationships, but may under-represent the positive side of the relationships. In other words, the full picture of online relationships still needs to be drawn by teachers themselves. The findings of the present study provide a basis for further understanding of this youth phenomenon.
2. Teachers, parents and anyone who works with young people need to recognize that the formation of relationships online is quite different from that of offline. For example, text-based expressions and disclosures replace personal appearance in face-to-face encounters and users' cyberspace propinquities are more required than their physical proximity. In addition, some features of the Internet such as anonymity, informality, and expansiveness make special contributions to the online formation, leading to a beneficial or harmful, safe or hazardous relationship.
3. Teachers need to know more about the Internet applications (such as instant messages, chat rooms) for personal communication, not only for their students' sake, but also for enhancing their own Internet literacy. Teachers can join chat-rooms, for example, to exchange their teaching experiences and share good practices.
4. While students use the Internet intensively and widely for a variety of information and activities, they should know the Internet can be a "double-edged sword" or "whole package deal" in which users can benefit or be abused. We should take the benefits from the Internet to increase our capacities and abilities, to broaden our life experiences, and fulfill our needs, but at the same time protect ourselves from others' malicious intents or behaviors.
5. Online relationships can be very positive and rewarding for adolescents, but guidance and precautions are definitely needed (McCown et al., 2001). Guidance includes taking small, slow steps in moving adolescent virtual relationships into their real-life social net-

work of family and friends, and understanding that any relationship is founded on shared interests, goals and values which are factors contributing to durable, long-lasting friendships (Bargh et al., 2002). Pre-cautions include double-checking the background of potential net-friends (e.g., using Google or interpersonal networks to search), asking friend(s) to go along to the meeting, asking for a photo or video image beforehand, telling elders about the meeting, and so on. As Wolak et al. (2002) suggested, discussions with friends and family can be ''reality checks'' for online relationships. Indeed, the more ways an online friendship intersects with face-to-face networks, the safer it probably is.

6. The authors suggest some Internet safety curricula should be created for students (see also Chou et al., 2004). As some teachers mentioned, the design principles should include using authentic, real-world examples (instead of textbook-like materials); presenting multimedia course materials; encouraging ongoing, thought-provoking discussions; role-play games (instead of simple rote memorization of a list of safety tips); and most importantly, encouraging open communication among students, parents, and teachers regarding students' online experiences – both the rewarding and the uncomfortable aspects.

Future research should continually tackle the essence and impacts of online relationships. For example, research should examine how students integrate the online relationship into their social life, how net-friends fulfill their developmental needs and help form interpersonal identity (Allison & Schultz, 2001), or how they influence offline behaviors (Seepersad, 2004).

Possible research topics also include the relationship between personality/individual characteristics and online relationship formation. We need to keep re-defining and re-visiting the phases of the formation of online relationships, as well as their social and psychological consequences (see also Haythornthwaite, 2001), especially on the troubled adolescents. For example, Bargh et al. (2002) found that lonely and socially anxious late-adolescents are the most motivated to find Internet friends and romantic partners. McKenna et al. (2002) indicated that those who are socially anxious and lonely are somewhat more likely to feel that they can better express their real selves with others on the Internet than they can with those they know offline. Wolak, Mitchell, and Finkelhor (2003) also found that adolescents who are troubled or who have difficult relationships with their parents may be more vulnerable to online exploitation. Moreover, adolescents with problems who go online may lack the protective networks of other adolescents.

Furthermore, research on the parents' role and knowledge of their children's online relationships is definitely needed. Although the present study only focuses on high school students and their teachers' perspectives, it does not mean to ignore the parents' share in this issue in any way. On the contrary, this study suggests that parents play a crucial role and have great influence on children's online as well as offline relationships. Wishart (2004) concluded that while the vast majority of British schools are teaching Internet safety in a restricted environment, more attention should be paid to children's activities such as surfing the Web and visiting chat rooms while at home, which is more likely an unsupervised and unfiltered environment. Bargh et al. (2002) suggested that parents should pay as much attention to children's Internet friends as to their non-Internet friends.

Finally, we need to develop more Internet safety curricula and evaluate their effectiveness. By doing so, we educators as researchers can give our charges proper guidance and help make appropriate policies derived from theoretical and empirical research results. The effort and results presented in this study are perhaps a first step toward addressing this need.

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