Knowing when not to use the Internet: Shyness and adolescents’ on-line and off-line interactions with friends

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Abstract

The goal of the study was to explore the content of on-line and off-line peer interactions among shy and non-shy adolescents. Participants were 148 ten-to-eighteen year old adolescents in Rome, Italy (n = 98) and Ottawa, Canada (n = 50). Participants completed self reports of shyness and loneliness and web logs of their interactions with friends both in person and on-line. Among the results, there was little general difference in the general content and emotion expressed during the two modalities of interaction with friends, both of which were used in a wide variety of ways. Importantly, shy participants used the on-line modality more extensively than their non-shy counterparts to express negative emotions and to convey content regarding negative exchanges with peers. Such use of electronic communication may be an important contributor to their loneliness.

1. Introduction

In recent years, the use of computers and the Internet has increased, particularly among adolescents. From 2004 to 2009, the average amount of time 8- to 18-year-olds in the US spend on a computer has increased from approximately 1 h, to an hour and a half daily (Rideout, Foehr, & Roberts, 2010). At age 6, about 77% of children have already used a computer, 15% of whom do so daily (Calvert, Rideout, Woolard, Barr, & Strouse, 2005). Computer use increases throughout childhood and adolescence, where children typically use a computer for entertainment purposes 46 min/day, and adolescents use computers an average of 1 h and 39 min/day for entertainment. The increase in the use of technology, over time, as well as throughout childhood, has prompted researchers to examine what children and adolescents are doing on the computer and on-line.

Adolescents use computers and the Internet for many reasons, such as to complete homework, play games, watch videos, and look at pictures (Rideout et al., 2010). However, much time on-line is spent communicating with peers. Rideout et al. (2010) found that 44% of the time spent on-line is used to communicate in some way with other adolescents. Specifically, 25% of time on-line is spent on social networking sites (i.e. FaceBook, MySpace), 13% of time is spent instant messaging, and 6% of time is spent e-mailing. Approximately 40% of adolescents will spend almost an hour a day on social networking sites (Rideout et al., 2010).

Adolescents tend to communicate privately (i.e. instant messages or e-mail), and mostly with individuals they are also friends with off-line. In these communications, they talk primarily about everyday topics like other friends and gossip (Gross, 2004). However, communications on-line are different in many ways from face-to-face communications. For example, electronic communication lends itself to particular styles of communicating emotions, some of which may be maladaptive. Research comparing different types of communication indicate that computer mediated communications have higher rates of informal speech and flaming (i.e., online communication with hostile intent) than face-to-face and videoconferencing communications (Castella, Abda, Alonso, & Silla, 2000). Interestingly, individuals are more apprehensive and more careful with wording when they spread rumors off-line, and make more attempts to add credibility to online rumors when they are of a harmful nature (Bordia & Difonzo, 2004).

Considering so much of time spent on the Internet is spent communicating with others, the effects that communication on the Internet has on social interactions, friendships, and other aspects of functioning has become of interest to many researchers. In the
present study, we focused on shy adolescents, who tend to experience difficulties in their off-line peer interactions.

1.1. Electronic communication and the friendships of shy/socially anxious youth

Shy adolescents tend to be nervous and anxious in novel social settings and embarrassed and self-conscious when they perceived themselves as being socially-evaluated (Rubin, Coplan, & Bowker, 2009). Shy and socially-anxious adolescents experience difficulties in their social interactions, and are prone to rejection, victimization, and internalizing problems (e.g., Bowker & Raja, 2011). However, considerably less is known about how shy adolescents interact on the Internet than in their face-to-face encounters with peers.

There have been several reasons proposed for why shy and socially anxious individuals might use the Internet as a substitute for face-to-face social interactions. One reason might be that the Internet offers an alternative means of occupying one's time through non-social uses of the Internet like information seeking or playing games, exacerbating social withdrawal. However, it is also possible that shy individuals use the Internet to enhance relationships by finding friends, and building friendships by facilitating social interactions that might be considered more difficult face-to-face (Schneider & Amichai-Hamburger, 2009). There are two competing theories to explain social interactions on-line between socially anxious and non-anxious individuals. The first, the social compensation hypothesis, states that socially anxious adolescents turn to the Internet to communicate and form relationships with peers, because these interactions are more difficult in person (Schneider & Amichai-Hamburger, 2009). The other theory is the rich-get-richer hypothesis. This hypothesis suggests that introverted individuals who are already comfortable in face-to-face social situations will use the computer and Internet to further their social opportunities (Schneider & Amichai-Hamburger, 2009). There is evidence that both theories may be, in part, correct.

In support of the rich-get-richer hypothesis, Lee (2009) showed that adolescents who had strong social relationships when they were young used Internet communications most often, and these communications in turn predicted closer friendships later on. Higher ratings of self-reported friendship quality have been associated with greater Internet use (Willoughby, 2008). Similarly, long-term findings have suggested that adolescents who had strong social relationships when they were young used Internet communications most often, and these communications in turn predicted closer friendships later on (Baiocco et al., 2011b). However, other research participants, 36.7% showed signs of problematic Internet use. These adolescents use the Internet for many hours per week; most utilize dysfunctional coping strategies and show less effective coping strategies than did the other participants. Of the participants, 36.7% showed signs of problematic Internet use. These adolescents use the Internet for many hours per week; most utilize dysfunctional coping strategies and show worse interpersonal relations than peers who do not show signs of problematic Internet use. Moreover, Italian adolescents appear to be particularly attracted by the technologies of social communication, which offer them the opportunity to interact with others while maintaining anonymity and privacy. However, adolescents who use the Internet more frequently than their peers report less acceptance. More recent data, working with a sample of 684 adolescents (14–19 years) found that 93.1% have an Internet connection at home and 60.2% can use the computer in their bedrooms. Adolescents usually spend 2 h on-line a day during the week and a little more on the weekend. Compared with female adolescents, male adolescents spent more time on the Internet overall (Baiocco, Laghi, Carotenuto, & Del Miglio, 2011a).

Although both adolescent girls and boys use the Internet to communicate with peers, there appear to be some gender differences in how they communicate and why. Some research shows that girls use the Internet more frequently to communicate than boys (Bonetti et al., 2010; Rideout et al., 2010). Girls spend more time than boys on social networking sites. Both boys and girls visit these types of sites a similar number of times each day, but girls will spend more time on them at each visit (Rideout et al., 2010). They also communicate about different subjects, where girls communicate more about shopping, clothes, their feelings, relationships and gossip, while boys communicate more about videogames and sports (Bonetti et al., 2010). In contrast, some research shows boys use the Internet to communicate more frequently than girls whereas girls report more contacts with friends off-line, and closer, more intimate friendships (Baiocco et al., 2011b). However, other research
indicates that adolescent boys and girls use the Internet for social interactions similarly and equally (Gross, 2004; Prezza et al., 2004).

There are also gender differences in the way that males and females communicate on-line. Women tend to use more self-disclosure while men use more assertion of facts. When interacting in same-gender communications, males use more coarse language and flaming, while females use more individually oriented language (i.e. “I”), show more satisfaction, and higher group development (Savicki & Kelley, 2000). In adolescents, females use cyber gossip more than males, and late adolescents use cyber gossip more than early adolescents (Oluwole, 2009).

1.2. The present study

The objective of the current study was to compare the content of the on-line and off-line interactions between adolescents and their close friends, with a specific focus on shy adolescents and negative emotional exchange. Most of the studies reviewed above have yielded valuable insight regarding how electronic communication is used by adolescents. However, little is known about intra-individual differences between on-line and off-line communication with friends.

Another objective of the study was to clarify the role of any atypical online exchanges with friends in the emergence of loneliness among shy adolescents. This mediation hypothesis was grounded theoretically and empirically in the findings of off-line interaction studies indicating that shy children are particularly vulnerable to the detrimental effects of negative peer experiences (Gazelle & Ladd 2003; Gazelle & Rudolph 2004; Ladd, Kochenderfer-Ladd, Eggum, Kochel, & McConnell, 2011). Such negative experiences are believed to exacerbate shy children’s pre-existing tendency towards internalizing problems (Stevenson-Hinde & Glover, 1996). Unfortunately, shy children and adolescents often encounter such negative experiences with peers (e.g., Bowker & Raja, 2011; Coplan & Arbeau, 2008). The dependent variable of loneliness was selected on the basis of previous findings showing that shy children tend to be more lonely than their sociable counterparts (e.g., Coplan & Weeks, 2010; Coplan, Closson, & Arbeau, 2007). A final objective was to improve on the questionnaire methodology used in most previous studies on electronic communication and friendship by gathering information about specific social interactions on the day they occur using web-logs. Such time-sampling methods are known to reduce the error entailed in retrospective measurement of interactions, which depend heavily on the vagaries of human memory (e.g., Brandstatter, 2007).

2. Methods

2.1. Participants

The participants were 148 ten-to-eighteen years old adolescents in Rome, Italy (n = 98 mean age = 13.7, SD = 2.1, 63% girls) and Ottawa, Canada (n = 50, mean age = 13.1, SD = 1.2, 67% girls). Both are large urban areas, the capitals of their respective countries. Demographic data on the volunteers for this study are not available but the schools approached are reasonably typical for their cities.

2.2. Measures

The measures were translated from English to Italian by the first author. They were back-translated into English to ensure the accuracy of the translation.

2.2.1. Friendship nominations

Participants were asked to nominate one best friend and to list any other friends they had contact with both face-to-face and on the Internet. They were also asked to indicate where they met each friend (i.e., at school, in the neighborhood, on the Internet, at a family event, other) and the length of their friendship (1 week or less, 1–4 weeks, 2–6 months, 6 months to a year, or longer). Friendship nominations were divided into three sections: “Friends you connect with on-line”, “Friends you connect with only on-line”, and “Friends you connect with only or mostly off-line”. The analyses are based on the data pertaining to the friends contacted most frequently on-line and off-line.

2.2.2. Children’s shyness questionnaire

Shyness was assessed using the 11-item self-report version of the CSQ (CSQ: Crozier, 1995). Participants were asked to respond to items such as “I find it hard to talk to someone I don’t know” on a three-point scale: (1) “No,” (2) “Don’t know,” (3) “Yes.” The internal consistency of this scale was acceptable in both the Italian (α = .80) and Canadian samples (α = .75).

2.2.3. UCLA loneliness scale – version 3

Loneliness was assessed using five items from the UCLA scale (Russell, 1996) that were more pertinent to our study. Participants indicated their responses on a four-point scale, ranging from (1) “Never” to (4) “Always.” E.g., “How often do you feel alone.” The internal consistency of this scale was also acceptable in both the Italian (α = .84) and Canadian samples (α = .85). This short form was introduced for on-line research by Valkenburg and Peter (2007).

2.2.4. Content logs

Adolescents’ daily contact with friends on-line and off-line (e.g., at school, in the neighborhood) was assessed using web-logs about their social interactions. Each participant was assigned seven daily logs per calendar month, for 3 months, with a minimum of three completed logs required per month. The log appeared after the participants logged on with their usernames and passwords, often after receiving a reminder e-mail or text message from the research team. In a dialog box, participants were presented after logging on with a list of the friends they had indicated at the beginning of their participation in the study. They and were asked to select the name of the friend(s) they had been in contact with that day. They were then asked to indicate which method(s) of communication was/were used to communicate with each friend they had contact with on the particular day. (i.e., at school, in the neighborhood, on the Internet, at a family event, on the phone, by text message, other). Finally they were asked to indicate from a list of options the content and emotional tone of each exchange. For example participants could select the content of their communication from a list of options pertaining to: common interests (i.e., music, sports, tv, etc.), making plans for a joint activity with the friend, news (without positive or negative evaluation) about people they know, celebrity gossip, feelings (anger, sadness, happiness, disappointment), good and bad comments about peers, school/teachers, and whether they found a girl or boy “cute.” Participants were asked to respond to the same questions for any contact they had with other friends on-line and off-line using the same questions and format.

Although participants were asked to complete up to seven daily logs per calendar month for a 3-month period1, there was considerable variation in the number of logs completed across participants, although the totals were almost identical in the two countries and for male and female participants. Including entries of “I did not interact with my friends today,” participants completed an average

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1 We proposed no hypothesis regarding cultural differences. The researchers live and work in Ottawa, Canada and Rome, Italy. These preliminary analyses were conducted to rule out differences between the two sites, permitting aggregation of the data. A study of cultural differences would require cultures that were more dissimilar to these in ways that are relevant to the hypotheses.
Proportion scores were created by dividing the total frequency of each content item in both the online and offline contexts by the corresponding total number of logs completed in that context. Summary scores were then created by combining relevant log content codes separately in the on-line and off-line contexts (aggregated on a conceptual basis and empirically substantiated): (1) **positive emotions** included the number of log entries where participants indicated feeling happy; (2) **negative emotions** included entries where participants indicated feeling sad or angry (with \( r \) values for correlations between pairs of component items ranging from .52 to .73, all \( p < .001 \); (3) **positive interactions** included entries where participants indicated positive comments about common acquaintances and comments about the attractiveness of a person known to both friends or positive reports of events that happened to them in the peer context (\( r \) values from .44 to .68, all \( p < .001 \); (4) **negative interactions** included entries where participants indicated negative comments about common acquaintances or reports of negative exchanges with peers; and (5) **neutral interactions** included entries where participants indicated an exchange about school, common interests (e.g., sports, music), celebrities, making plans with friends, or (neutral) information about a common acquaintance (\( r \) values from .29 to .54, all \( p < .01 \).

### 2.3. Procedure

Participants were recruited through the local district school boards in Ottawa, Canada and Rome, Italy. Active informed parental consent was required in both countries. In Canada, once the school principals approved the study in their schools, the researchers conducted a short presentation during homeroom or classroom time to advertise the study and distribute invitation postcards (pre-paid, pre-addressed) to the students. Home access to a computer and the Internet was necessary for participation. Interested students filled out their first/last name and home address outside of school time and mailed the postcards to the University of Ottawa. Researchers then mailed back an information letter addressed to the parents, two parental consent and two child assent forms, as well as a pre-paid, pre-addressed envelope. Adolescents were requested to return one signed copy of the parental consent and child assent, and, subsequently, they were emailed their personal numerical username and password, and instructions to log onto the study website. Upon their first login, participants were assigned a basic demographic questionnaire and the friendship nomination form, followed by the shyness, social anxiety, and loneliness scales. Canadian participants who completed the specified number of logs received an honorarium of $25.00.

In Italy, the participants were permitted to participate in the study during the time they spent in the computer laboratories of their schools. Research assistants from La Sapienza University were present during that time to answer any questions and offer help with the website if requested. Roman students were offered an entry in a raffle for a small prize.

### 3. Results

#### 3.1. Preliminary analyses

The goal of these preliminary analyses was to determine if demographic variables (country and gender) needed to be controlled for in subsequent analyses. To begin with, participants from Italy and Canada did not differ statistically on any study variables. Accordingly, results are presented across the entire sample. Boys and girls did not report significant differences in terms of shyness. However, some gender differences were evident in the log entries, with girls reporting a higher proportion of total “content” (i.e., positive, neutral, and negative) in their interactions both on-line (\( F(1,126) = 11.16, \ p < .01, \ \eta^2 = .081 \)) and off-line (\( F(1,128) = 11.78, \ p < .01, \ \eta^2 = .084 \)). Subsequent analyses were thus computed both with and without the inclusion of child gender. The pattern of results was identical and no significant interactions with gender were observed. Accordingly, results are presented without the inclusion of child gender.

#### 3.2. Differences in log entry content between shy and comparison children

The goal of these analyses was to explore whether shy and comparison adolescents differed in their on-line versus off-line interactions with friends. Although there is no “firm rule” for creating groups of “shy” children and adolescents, standard practice among previous researchers involves cutoff scores in the top 15–25% of the sample (e.g., Coplan & Weeks, 2010; Ladd et al., 2011; Rubin, Wojslawowicz, Rose-Krasnor, Booth-LaForce, & Burgess, 2006). Accordingly, two groups of adolescents were created based self-reported shyness scores: (1) shy (\( n = 25 \), with shyness scores at or above the 20th percentile in the present sample); and (2) comparison (\( n = 115 \), with shyness scores below the 80th percentile).

A series of \( 2 \times 2 \) mixed repeated measures ANOVAs was then performed, with shyness group (shy and comparison) serving as a between-subjects variable and context (on-line and off-line) serving as a within-subjects variable. Separate analyses were performed for the dependent variables assessing positive emotions, negative emotions, positive interactions, negative interactions, and neutral interactions.

For positive emotions, results indicated a significant main effect for shyness group, \( F(1,121) = 3.92, \ p < .05, \ \eta^2 = .030 \), but no significant effect for context, \( F(1,121) < 1, \ ns, \ \eta^2 = .001 \). Overall, shy adolescents reported a significantly higher proportion of positive emotions in their logs (\( M = .68, \ SD = .27 \)) as compared to comparison adolescents (\( M = .52, \ SD = .36 \)). However, this main effect was superseded by a significant Shyness Group \( \times \) Context interaction, \( F(1,121) = 7.82, \ p < .01, \ \eta^2 = .061 \). Relevant means are presented in Fig. 1. Results from follow up simple effects analyses indicated that as compared to comparison peers, shy adolescents reported a higher proportion of negative emotional content in their on-line – but not off-line – log entries.

For positive emotions, results indicated no significant main effects for shyness group, \( F(1,122) < 1, \ ns, \ \eta^2 = .005 \), or context, \( F(1,122) = 1.41, \ ns, \ \eta^2 = .011 \). The Shyness Group \( \times \) Context interaction was not statistically significant, \( F(1,122) < 1, \ ns, \ \eta^2 = .005 \).

For negative emotions, results indicated a significant main effect for shyness group, \( F(1,122) = 6.68, \ p < .01, \ \eta^2 = .052 \), but no significant effect for context, \( F(1,122) < 1, \ ns, \ \eta^2 = .001 \). Similar to the findings with negative emotions, shy adolescents also reported a significantly higher proportion of negative peer interactions in their logs (\( M = .77, \ SD = .22 \)) as compared to comparison adolescents (\( M = .57, \ SD = .34 \)). However, as previously, this main effect was superseded by a significant Shyness Group \( \times \) Context interaction, \( F(1,122) = 7.53, \ p < .01, \ \eta^2 = .058 \). Relevant means are presented in Fig. 2. Results from follow up simple effects analyses indicated that as compared to comparison peers, shy adolescents reported a higher proportion of negative peer interaction content in their on-line – but not off-line – log entries.
For positive peer interactions, results indicated no significant main effects for shyness group, \( F(1,121) < 1, \text{ ns}, \partial \eta^2 = .001 \), or context, \( F(1,121) = 1.86, \text{ ns}, \partial \eta^2 = .015 \). The Shyness Group \( \times \) Context interaction was also not statistically significant, \( F(1,121) < 1, \text{ ns}, \partial \eta^2 = .005 \).

Finally, for neutral peer interactions, results indicated no significant main effect for shyness group, \( F(1,121) < 1, \text{ ns}, \partial \eta^2 = .003 \). There was a significant effects of context, \( F(1,121) = 4.52, p < .05, \partial \eta^2 = .036 \). Overall, adolescents reported a significantly higher proportion of neutral peer interactions in their off-line logs (\( M = .61, SD = .25 \)) as compared to their on-line logs (\( M = .57, SD = .26 \)). The Shyness Group \( \times \) Context interaction was not statistically significant, \( F(1,121) < 1, \text{ ns}, \partial \eta^2 = .003 \).

3.3. Moderating role of negative online content on the link between shyness and loneliness

The goal of the final set of analyses was to explore whether negative online experiences might be particularly problematic for shy children in terms of exacerbating feelings of loneliness. Specifically, we assessed the moderating role of negative on-line log content (e.g., negative emotions, negative peer interactions) in the association between shyness and loneliness. In order to accomplish this goal, a hierarchical regression analysis was performed employing Cohen’s partialed products technique (Aiken & West, 1991). Loneliness served as the dependent variable. In Step 1, the standardized main effect variables of shyness (treated as a continuous variable for these analyses) and negative online content (aggregated score combining negative emotions and negative peer interactions) were entered. In Step 2, the two-way interaction term was entered – as represented by multiplicative products (i.e., Shyness \( \times \) Negative On-line Content). Results are displayed in Table 1.

At Step 1, shyness was significantly and positively associated with loneliness. However, this main effect was superseded at Step 2 by a significant Shyness \( \times \) Negative Online Content interaction. To explore this interaction, a simple slopes analysis was performed (Aiken & West, 1991). Results are displayed in Fig. 3. Increasing values of negative online content corresponded with an increased positive association between shyness and loneliness. In other words, negative on-line experiences appeared to act as an exacerbating factor, strengthening the positive association between shyness and loneliness among adolescents. In contrast, among adolescents who reported lower levels of negative online content in their logs, the relation between shyness and loneliness was attenuated.

4. Discussion

The goal of the study was to explore the content of on-line and off-line peer interactions among shy versus non-shy adolescents. We also sought to examine whether the experience of on-line peer interactions characterized by greater negative content might serve exacerbate feelings on loneliness in shy adolescents. Overall, the total accumulated log data indicate that adolescents (of both genders and in both countries) use on-line and off-line communication in a great variety of ways. Except for the shy subgroup, there do not seem to be substantial systematic individual differences between the content or emotional valence of on-line and personal exchanges with friends. This may not always have
been the case and may not apply to communities where electronic communication is not as widespread as in the two places where the participants in this study live. In particular, we wonder whether the relative absence of gender differences as well as the total absence of cross-national differences might be attributable to the increasingly pervasive availability of electronic communication, which may be obscuring individual differences that were evident in earlier studies. The fact that female participants indicated more frequent use of all categories of on- and off-line communication may reflect the greater interest of girls and women in close, dyadic friendship (e.g., Benenson, Apostoleris, & Parnass, 1997).

Shy adolescents did differ from their non-shy counterparts in the reported content of their on-line (but not off-line) peer exchanges. Indeed, our findings were indicative of a potentially mal-adaptive pattern of use of electronic communication among shy adolescents. More specifically, when compared to other adolescents, a greater proportion of shy youth’s communication involving negative feelings and events occurred on-line. It is possible that shy adolescents felt more comfortable expressing affectively laden negative experiences in this context because of their general tendency to prefer on-line communication (Pierce, 2009; Valkenburg & Peter, 2007), particularly when it comes more personal topics (Bonetti et al., 2010; Pierce, 2009; Valkenburg & Peter, 2007).

Alternatively, perhaps more socially-competent adolescents sense that it is difficult to achieve precise expression of emotion with the on-line modality, which is relatively devoid of many of the emotion cues that might provide essential clues to meaning. Without clues as to how the friend is receiving the information, the sender may risk overloading the friendship with communicative negative events or feelings. As embodied in Coyne’s theory of depression, which holds that the negative affect communicated by depressed people engenders avoidance by those around them (Strack & Coyne, 2004), shy adolescents may not understand that they are jeopardizing their friendships in this way.

It was important to measure both the on-line and face-to-face interactions of shy adolescents to gain some understanding of the significance of the use of electronic communication to convey negative emotions and negative peer experiences. Had our data been limited to on-line interaction, as have the data of many earlier studies of Internet use by shy individuals, it might have been tempting to speculate that shy adolescents use the Internet to compensate for an inability to express their negative emotions face-to-face. However, our data indicate that shy and non-shy adolescents do not in fact differ in the expression of negative emotion or negative experience in face-to-face encounters, although shy adolescents are more prone to discuss negative feelings and experiences on-line. Thus, the data are more consistent with the inference that shy adolescents simply have more negative affect and negative experience in general than other adolescents.

Unfortunately, our findings also indicated that the tendency for shy adolescents to express a greater proportion of their negative affect and experience on-line appears to have negative consequences. Results from moderation analyses indicated that the link between shyness and loneliness was exacerbated among adolescents who reported more negative on-line content in their exchanges with friends. It has been previously suggested that increased use of the Internet may cause increased loneliness in adolescents (Prezza et al., 2004). However, our findings help to clarify this assertion, indicating that negative on-line interactions with friends may be particularly damaging to the off-line peer relationships of shy adolescents.

4.1. Caveats and future directions

The results of this study should be considered among some caveats. To begin with, although the web-log method adds important detail and precision to data collected using questionnaires, this method did turn out to have some disadvantages as well. Importantly, there was wide variation in the compliance with the expectations of this study. Some participants were interested enough to provide more logs than they were asked to. However, many others stopped participating before they sent in some of the information we requested. Thus, convenient as on-line data collection is, researchers attempting to use these methods in longitudinal studies must understand that their data collection will necessarily compete with the other attractions available on-line to adolescents. Furthermore, more detail about the negative interactions between the shy adolescents and their friends would be helpful. In addition to the quantitative differences we reported herein, there may be qualitative differences between the on-line exchanges of negative affect and negative experience of shy and non-shy adolescents. These would have to be explored using other methods. As well, our web-log method involved only one member of the friendship dyad, making it impossible to gauge the responses of the friends.

It will also be of interest for future researchers to track the future course of on-line and offline friendship interactions. Our findings are limited by the relatively short-time span of the data collection. As well, all of the data from the current study were derived from self-reports. In this regard, relations between constructs may have been heightened by shared-method variance. Future research thus would benefit from capturing the perspective of the other friend. Finally, the single time-point for data collection and correlational nature of our study allow for alternative interpretations of the “direction of effect” of our findings. For example, we posited that the experience of negative on-line peer interactions might exacerbate feelings of loneliness among shy adolescents. However, it is also plausible that shy adolescents who are already lonely also tend to be more likely to use the Internet to communicate their negative emotions and experiences to their friends.

Notwithstanding these limitations, this study provides some of the first empirical data directly comparing the content on-line and off-line interactions among shy and versus non-shy adolescents. Although the data indicate that electronic and face-to-face interactions with friends tend to be highly similar in content and emotional valence, our findings do suggest that there may be certain types of exchanges that are not equally suitable for both modalities. At present, there is little guidance provided to young people in learning how to use electronic communication. Perhaps this should be re-thought. Learning how to use electronic communication – and when not to use it – may be a very important form of social skills training, and one that could realistically be delivered in preparation for harmonious interpersonal relationships in the electronic age.

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References


