

## Loneliness, social support, and preference for online social interaction: the mediating effects of identity experimentation online among children and adolescents

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This study explores the practices of online social activities among children and adolescents in order to uncover the connections between preferences for online social interaction and loneliness, social support, and the mediating effect of identity experimentation online. Data were gathered from a random sample of 718 youngsters aged 9 to 19. Analyses revealed that individuals who are lonely and have a lower level of offline social support find opportunities for identity experimentation online more gratifying than those who are less lonely or not lonely. Both loneliness and social support offline were found significantly related to preference for online social interaction, but the relationships were mediated by identity experimentation online. Finally, it was found that age differences exist. In particular, individuals aged 9 to 14 who are lonely and those aged 15 to 19 with little social support show a significant preference for online social interaction. Implications for future research into identity experimentation online and social relationship are discussed.

**Keywords:** children and adolescents; identity experimentation online; loneliness; preference for online social interaction; social support

### Introduction

Past research on the preference for online communication and social interaction has focused on the following question: What, if any, pathological effect does preference for online communication have on offline social relationships (Joinson, 2004; Thayer & Ray, 2006), and what negative outcomes may result (Caplan, 2003; Kraut et al., 1998; Moody, 2001)? The present study marks an important shift from this focus by attempting to uncover an underlying process to explain how two psychosocial variables, namely loneliness and perceived social support offline, might affect the preference for social interaction online among adolescents. In the past, much research has focused on several developmental challenges children and adolescents face today, particularly in the Internet age. They include identity formation (Schwartz & Pantin, 2006), increased independence (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996), emotional openness on the Internet (Leung, 2003), risk-taking (Gullone & Moore, 2000), importance of peers (Haynie, 2002), and puberty and sexual development (Brown, Halpern, & L'Engel, 2005). In this study, we explore the interrelationships among the reasons for online social interaction, including psychosocial well-being (i.e., loneliness and social support) and identity experimentation online.

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In particular, we investigate the effects of online identity experimentation as mediators.

There is growing evidence that adolescents use the Internet to experiment with their identities. Valkenburg, Schouten, and Peter (2008) found that over half of 9- to 18-year-olds who use the Internet had pretended to be someone else while communicating by e-mail, instant messaging (IM), or chat line. Adolescents also spend a great deal of time posting photographs, videos, and personal information on popular websites such as Facebook and YouTube to reveal their preferred identity. Because they experiment with ways of expressing themselves online, some researchers have argued that the Internet is changing the way adolescents prefer to communicate with each other about their identities (Eagle, 2007). Today's youth are confronted with a media environment that is rapidly changing. Technologies are proliferating, merging, and becoming more interactive. Information and communication technologies (ICT) give them more control over their identities than spontaneous face-to-face encounters because they have time to think about what they want to say and how they want to represent themselves. The anonymity afforded by ICT allows adolescents to construct "alternative" identities, positioning themselves differently in online space than in offline space. Playing with identity is often promoted as a "fun" thing to do. Numerous writers have described the thrill of escape from the confines of the body (Turkle, 1995; Valkenburg et al., 2008). Past research suggests that disembodied forms of communication are particularly appealing to young people because in the adult world of offline space they are commonly treated as less knowledgeable, less serious, and less competent than adults (Leung, 2003, 2004).

Moore and Schultz (1983) investigated the personal characteristics associated with adolescent loneliness as well as coping strategies. Loneliness was found to be associated with reluctance to take social risks. Feelings of not being cared for and lack of being intimately tied to others may also have direct, negative effects on seeking alternative means to obtain social support. Coupled with feelings of sadness and hopelessness, adolescents reported engaging in various activities to cope with loneliness, including passively watching television or listening to music (Austin, 1985; Canary & Spitzberg, 1993). Today, the widespread use of the Internet, especially social networking sites (SNS), blogs, online games, and instant messaging (IM) such as MSN, seems to provide numerous options and channels for adolescents to cope with loneliness (Moody, 2001). As a result, they may prefer online social interaction to obtain emotional support and affectionate companionship. This study evaluates the hypothesis that loneliness and lack of social support in the offline world may motivate adolescents to seek social relationships in the online world. In particular, this research attempts to examine the mediating effects of identity experimentation online in attenuating or strengthening the effects of loneliness and social support in the preference for online social interaction.

### **Literature review, hypotheses, and research questions**

#### ***Online identity experimentation and preference for online social interaction***

An identity is the cognitive and effective understanding of who and what we are (Schouten, 1991, p. 413). From the perspective of symbolic interaction, part of this understanding of who and what we are based on a reflexive evaluation, which is the

way that we believe others see us (Solomon, 1983). Markus and Nurius (1986) proposed the idea of self-conception, which included the “now selves” (the self as it presently is perceived by an individual), and the “possible selves” (images of the self that have not yet been realized but that are hoped for or feared). An individual’s identity is composed of some combination of these two. Markus and Nurius (1986) also pointed out that possible selves can be considered cognitive bridges between the present and the future that specify how individuals may change how they are now to what they will become.

According to Erikson (1994), forming identity and developing a coherent sense of the self is a key developmental task in adolescence and more important than any earlier or later developmental stage. Turkle (1995) argued that the Internet is a place for identity experimentation, providing space for self-exploration and redefinition of identity for the possible self. Identity formation includes self-definition, which asks, “Who am I?” and experimentation with identity, which indicates testing different aspects of social roles. The Internet allows adolescents to grasp their identity more easily and intensively; thus, the freedom to experiment with self-expression is attractive to them (Blinka & Smahel, 2009; Yurchisin, Watchravesringkan, & McCabe, 2005). Because blogs allow for the archiving of an adolescent’s memories, feelings, and reactions to various impetuses, they seem to be an ideal tool for working with identity (Huffaker & Calvert, 2005).

For adolescents whose real lives are troubled by low self-esteem, boredom, lack of social support, or unsatisfactory personal relations, they may find identity experimentation more gratifying in the online communication environment, such as online games, chat rooms, ICQ (I seek you), blogs, or social networking sites such as Facebook and MySpace. Past research on virtual communities is replete with stories of the masks of age and race, gender and class, as well as for almost every aspect of identity (e.g., McCrae, 1996; Stone, 1991). This so-called freedom to recreate or to obscure some aspects of the self online allows the exploration and expression of multiple and fragmented selves of human existence (Gackenbach, 1998). According to Turkle (1995), the “self” represented in multi-user domains or multi-use dimensions (MUD) is decentralized, ongoing, anonymous, invisible, and multiple. As a result, an unparalleled opportunity to play with one’s identity and to “try out” new ones is possible. MUDs make possible the construction of an identity that is so “fluid” and “multiple” that one can live through electronic self-representations with unlimited identities (Turkle, 1995) and, as a result, bolster one’s status, gain respect, and raise self-esteem. Similar to MUDs, a more novel and compelling discourse on social networking sites also possesses these special properties of fluid identity, allowing anonymous persona, invisibility, multiplicity, which is sometimes ongoing for adolescent Internet users. These qualities are at the root of the holding power of fluid identity and the evocative potential of online social interactions. However, few social scientific works have examined the ways in which identity experimentation might be related to Internet use or more specifically to the preference for online social interaction.

### *Loneliness*

This study also attends to another predictor of preference for online social interaction: psychosocial health. For example, the loneliness experienced by some

adolescent Internet users might be an indication of psychosocial distress. In broad terms, loneliness is defined as a sense of deprivation in one's social relationships (Murphy & Kupshik, 1992). Lonely people generally feel less socially competent than other people in face-to-face situations (Leung, 2001; Spitzberg & Canary, 1985). In their analysis of loneliness and social uses of the Internet, Morahan-Martin and Schumacher (2003) found that lonely individuals used the Internet and e-mail more often and were more likely to use the Internet for emotional support than others. The reason, as explained by McKenna, Greene and Gleason (2002), might be that lonely individuals are somewhat more likely to feel they can better express their real selves with others on the Internet than they can with those they know offline. A recent study by Valkenburg and Peter (2008) found that lonely adolescents used the Internet to experiment with their identity and that the social competence of lonely adolescents benefited significantly from these online identity experiments. Leung (2002) also found that loneliness is related to valence, accuracy, and the dimensions of self-disclosure in ICQ (I seek you) chat; appropriate, honest, positive, and accurate self-disclosure in ICQ might lead to decreased loneliness when one feels understood, accepted, and cared about.

In contrast, Kim, LaRose, and Peng (2009) showed that instead of relieving their original problems, individuals who were lonely could develop strong compulsive Internet use behaviors resulting in negative life outcomes, including harming other significant activities, such as work, school, or significant relationships. These negative outcomes were expected to isolate individuals from healthy social activities and lead them into more loneliness (Caplan, 2003). Thus, Caplan (2007) pointed out that although several studies report a significant positive correlation between loneliness and negative outcomes due to Internet use (Caplan, 2002; Morahan-Martin & Schumacher, 2003), the relationship between loneliness and preference for online social interaction should be further examined. Therefore, this study proposes that:

- H<sub>1,1</sub>: Lonely individuals will find experimenting with identity online more gratifying than less lonely individuals.
- H<sub>1,2</sub>: Loneliness is significantly (positively) related to preference for online social interaction, but the relationship is mediated by online identity experimentation.

### ***Social support***

In a review of social indicators research, Cobb (1976) defined social support as "information leading the subject to believe that he or she is cared for and loved, that he/she is esteemed and valued, and he/she belongs to a network of communication and mutual obligation". Other scholars have defined social support as "interpersonal transactions involving affect, affirmation, aid, encouragement, and validation of their feelings" (Cobb, 1976; Kahn & Antonucci, 1980). House (1986) gave a third definition in which social support involves "the flow between people of emotional concern, instrumental aid, information, or appraisal".

Existing measures of social support are varied because of the different definitions of social support and the lack of a clear conceptualization of the construct (Donald & Ware, 1984). Recent research, however, has generally attempted to measure the functional components of social support. Functional support is the most important and can be of various types providing the following: 1) "emotional support", which involves caring, love, and sympathy; 2) "instrumental support", which provides

material aid or behavioral assistance and is referred to by many as tangible support; 3) “information support”, which offers guidance, advice, information, or feedback that can provide a solution to a problem; 4) “affectionate support”, which involves expressions of love and affection; and 5) “social companionship” (also called positive social interaction), which involves spending time with others in leisure and recreational activities (Sherbourne & Stewart, 1991).

A sizeable body of research on social support exists, particularly in the fields of medicine and health. Social relationships and social support are potent variables that can reduce exposure to stress, promote health, and buffer the impact of stress on health, thus contributing to increases in various degrees of preference for online social support (Leung, 2007, 2009; Wright, 2000). Other studies have supported the above findings. For example, in Germany, Leimeister, Schweizer, Leimeister, and Krcmar (2008) found that virtual relationships for adult patients are established in virtual communities and play an important role in meeting patients’ social needs. Virtual relationships have a strong effect on the virtual support of patients. The emotional support and information exchange delivered through these virtual relationships may help patients to cope better with their illness. In an international survey, Smedema and McKenzie (2010) also found that online chat had a positive association with social support and well-being among individuals with visual impairments. Furthermore, in a study of online games, Longman, O’Connor, and Obst (2009) found that the players derived social support from participating in a massively multiplayer online game called World of Warcraft. Positive relationships were developed between game engagement and levels of in-game social support. Higher levels of in-game social support were associated with fewer negative psychological symptoms, although this effect was not maintained after controlling for social support derived from the offline sources. Therefore, we hypothesize the following:

- H<sub>2.1</sub>: Adolescents with lower levels of offline social support will find experimenting with online identity more gratifying than individuals with higher levels of social support.
- H<sub>2.2</sub>: Offline social support is significantly related to preference for online social interaction, but the relationship is mediated by online identity experimentation.

### ***Differences between children and adolescents***

Considerable differences in developmental stages exist among children (between birth and puberty) and adolescents (aged 13–19). However, because puberty begins at 10–11 years of age for girls and around 12–13 or as late as 14 for boys, this study considers children to be 14 or younger and adolescents to be between 15 and 19. Adolescence is often characterized as a time of challenge and turbulence (Roth & Brooks-Gunn, 2000). Along with physiological changes that can be quite dramatic, adolescents are faced with increased independence and growing self-discovery. Scholars of adolescent development refer to these changes as developmental transitions or passages between childhood and adulthood (Arnett, 1992). Past research has suggested that during the adolescent development from childhood to adulthood, a wide range of psychological, cognitive, and physiological changes can be observed. In today’s increasingly age-conscious society, children want to be grown-ups, so it is important to recognize the developmental differences between children

and adolescent Internet users in terms of age-differentiated outcomes on media preferences, language, and interpersonal interactions.

Taking particular care to consider the theoretical constructs of loneliness, social support, and identity experimentation in this study, we intend to investigate how these concepts and individual differences, in terms of level of perceived psychosocial health experienced by children (aged 9–14) and adolescents (aged 15–19), and their online activities can predict their degree of preference for online social interaction. Therefore, we posed the following research question:

- RQ: To what extent can demographics, loneliness, offline social support, online identity experimentation, and intensity of social networking activities online predict the preference for online social interaction among (a) the 9–14-year-olds and (b) the 15–19-year-olds?

## **Method**

### *Sample and sampling procedure*

Data were gathered from a probability sample of 718 children and adolescents using a face-to-face structured questionnaire interview from December 2008 to February 2009. Respondents were eligible members of households randomly generated by the Census and Statistics Department in Hong Kong. If there was more than one eligible respondent living in the household, the person who was between the ages of 9 and 19 and had had the most recent birthday was interviewed. The interviewers were trained university students. A total of 238 households were discarded when interviewers found them vacant, for non-residential use, or ineligible, as well as when the interviewers had no response after having visited more than three times or were simply refused by the respondents. Of the 2,304 qualified households, 718 successfully completed the questionnaires, which resulted in a 31.5% response rate. Parents of children under the age of 12 were requested to be present to attend the interview when the interviewees experienced difficulty answering the questions.

The sample consisted of 44.4% males and 55.6% females. The mean age was 14.46, with 14.9% in the age group of 9–11, 73% in the 12–17 year old group, and 12.1% in the 18–19 year old group. This age distribution resembled very closely the 2008 population census in Hong Kong. Of the 718 respondents, 15.3% were elementary school students, 38.6% were junior high students, 32.4% were high school students, and 17.3% were high school graduates. In terms of family income, the mean was in the income bracket of US\$1,928–\$2,571 a month, with 10.4% earning less than US\$1,028 a month, and 9.3% more than US\$5,141 a month. In particular, within the 9–14 age group ( $n = 344$ ), the mean age was 12.2, with 52.6% female, and all were in grade 8 or lower. For the 15–19 age group ( $n = 374$ ), the mean age was 16.53, with 58.3% female, and over 87% were in grades 9 to 12.

## *Measures*

### *Preference for online social interaction*

The construct, preference for online social interaction, was measured using 13 items similar to Caplan's (2002, 2003) studies on the preference for online social interaction. A 5-point Likert scale was used with 1 = strongly disagree or very unlike me



and 5 = strongly agree or very much like me. Sample items included, “Treated better online than in face-to-face relationships”; “feel safer relating to others online rather than face-to-face”; “more confident socializing online than offline”; “more comfortable with computers than people”; “I am willing to give up some of my face-to-face relationships to have more time for my online relationships”; “my relationships online are more important to me than many of my face-to-face relationships”; and “I am happier being online than I am offline”. Reliability alpha was high at .83.

#### *Online identity experimentation*

For the current study, items from Turkle (1995), Leung (2002), and Valkenburg and Peter (2008) were adopted and used to measure online identity experimentation. Respondents were asked how much they agreed that the Internet is particularly gratifying for them to: “to try out new identities”; “to escape from who they are”; “experience things they can’t in the real world”; and “live out a fantasy”. A 5-point Likert scale, with 1 = strongly disagree and 5 = strongly agree, was used in rating the four items. Reliability alpha was acceptable at .78.

#### *Loneliness*

Loneliness was measured with the UCLA loneliness scale (Russell, Peplau, & Cutrona, 1980). Reliability alpha was high at .83.

#### *Offline social support*

To assess social support, a battery of 19 items within four subscales developed by the Rand and medical outcome study (MOS) teams was adopted with slight modifications. The five original dimensions of social support were reduced to four; emotional support and informational support were merged because they were highly correlated and overlapped considerably. As a result, the four support subscales were “tangible”, “affectionate”, “social companionship”, and “emotional or informational”. It was recommended that the subscale scores rather than the total score be used (McDowell & Newell, 1996). Moreover, items from the tangible support subscale were excluded because tangible support mainly refers to medical or health related assistance from friends or close relatives rather than affective or emotional support. Respondents were asked how often each of the support items measured in the remaining three dimensions was available offline. A 5-point scale was used, where 1 = none of the time, 2 = a little of the time, 3 = some of the time, 4 = most of the time, and 5 = all of the time. A principal components factor analysis extracted three factors and explained 72.2% of the variance. Table 1 shows the three factors: “emotional and informational” support (alpha = .85), “affectionate” (alpha = .87), and “social companionship” (alpha = .82).

All inventory items for the offline social support scale, online identity experimentation, and preference for online social interaction underwent extensive pilot testing to insure that the items were comprehensible and relevant to the sample. The pilot testing included back-translation checks and open-ended probes.

#### *SNS intensity*

Respondents were asked how often they used Facebook, IM/MSN, forums, and blogs using a 5-point Likert scale, with 1 = never and 5 = very often. The intensities of

Table 1. Factor analysis of social support.

	Mean	SD	Factor		
			1	2	3
<b>Emotional &amp; informational supports</b>					
1. Someone to give you good advice about a crisis	3.63	.88	.80		
2. Someone you can count on to listen to you when you need to talk	3.78	.88	.78		
3. Someone to confide in or talk to about yourself or your problems	3.73	.93	.59		
4. Someone to give you information to help you understand a situation	3.55	.90	.59		
<b>Affectionate</b>					
5. Someone who understands your problems	3.53	.96		.78	
6. Someone to love and make you feel wanted	3.50	.95		.77	
7. Someone to share your most private worries and fears with	3.57	.93		.64	
8. Someone who comforts you sincerely	3.52	1.00		.58	
<b>Social companionship</b>					
9. Someone to get together with for relaxation	3.63	.93			.81
10. Someone to do something enjoyable with	3.66	.90			.77
11. Someone to have a good time with	3.79	.90			.68
Eigenvalues			6.61	1.74	1.02
Variance explained (%)			60.08	6.77	5.35
Cronbach's alpha			.85	.87	.82

Scale: 1 = Never and 5 = Always. N = 704 (total variance: 72.20%)

these four activities were combined to create a composite SNS intensity variable with a reliability alpha equal to .81.

#### *Demographics*

Demographic information on the respondents such as age, gender, education, and monthly family income were assessed.

## **Results**

### ***Relating loneliness and online identity experimentation***

H<sub>1.1</sub> hypothesized that lonely individuals find online identity experimentation more gratifying than less lonely or non-lonely individuals. To test this hypothesis, a simple regression procedure was conducted with identity experimentation entered as the



dependent variable and loneliness as the predictor. The result shows that loneliness was a significant predictor of identity experimentation ( $\beta = .17, p < .001$ ), which indicates that psychosocially distressed adolescents, especially those who are lonely, tended to value and enjoy the opportunity of experimenting with identities or a fantasy online. Thus,  $H_{1.1}$  was fully supported.

***Mediating effect of online identity experimentation between loneliness and preference for online social interaction***

$H_{1.2}$  predicted that an individual's level of loneliness predicts the preference for online social interaction, but that this relationship is *mediated* by online identity experimentation experiences. To test this hypothesis, a series of hierarchical regression analyses were conducted to determine the extent to which the variance explained by the dependent variable by the target predictors was due to the proposed mediator (Baron & Kenny, 1986; Judd & Kenny, 1981). As shown in Table 2, in regression equation 1, only the target predictor (i.e., loneliness) was entered on the first step to determine the variance it explained. This variance may contain components that are mediated by some other variable (here, experimentation with identity online) and that are unique to the target predictors (i.e., direct or unmediated by any other variables). In the next step, the proposed mediator (i.e., experimentation with identity online) was entered into the equation. At this point, any increment in the variance explained was necessarily due to the unique (residual) effect of the proposed mediator. In regression equation 2, the order of entry for the predictors was reversed. The mediator was entered at the first step and the target predictor was entered second. Entering the mediator at the first step determined the variance in the dependent variable that they explained, both uniquely and in conjunction with the target predictor. The target predictor was entered in the second step, and any increment in explained variance represented the direct (unmediated) effect of the predictor on the dependent variable.

As shown in Table 2, results from the regression model in equation 1 indicated that, after controlling for demographic variables and explaining 7% of the variance, loneliness ( $\beta = .19, t = 3.95, p < .001$ ) by itself accounted for 3% of the variance in preference for online social interaction  $R^2 = .03, F(1, 619) = 16.19, p < .001$ . In contrast, when the influence of online identity experimentation ( $\beta = .43, t = 9.91, p < .001$ ) was entered in the second step, loneliness only accounted for 3% of variance in preference for online social interaction. However, on its own, online identity experimentation accounted for 17% of the variance of the dependent variable  $R^2 = .17, F(1, 618) = 39.56, p < .001$ .

Similarly, the hierarchical regression results in equation 2, with online identity experimentation entered first in the first block, also indicated that identity experimentation ( $\beta = .44, t = 10.2, p < .001$ ) was significantly and positively linked to the preference for online social interaction. After controlling for demographic variables and explaining 7% of the variance, online identity experimentation explained 19% of the total variance in preference for online social interaction  $R^2 = .19, F(1, 619) = 47.92, p < .001$ . When loneliness ( $\beta = .14, t = 3.31, p < .01$ ) was then entered in the second step, loneliness only accounted for 1% of the variance. By itself, identity experimentation explained 19% and a total of 27% from all predictors.

Table 2. Hierarchical regression equations predicting preference for online social interaction.

Eq	Step	Variables entered	B	SE	$\beta$	t	$\Delta R^2$	Total $R^2$
<i>Loneliness and identity experimentation as predictors:</i>								
Control variables:								
1	1	Demographics					.07	.07
		Loneliness	.15	.04	.19	3.95***	.03	.10
2	2	Loneliness	.11	.03	.14	3.31***	.17	.27
		Identity experimentation	.75	.08	.43	9.91***		
2	1	Identity experimentation	.77	.08	.44	10.20***	.19	.26
	2	Identity experimentation	.75	.08	.43	9.01***	.01	.27
		Loneliness	.11	.03	.14	3.31***		
<i>Social support and identity experimentation as predictors:</i>								
Control variables:								
1	1	Demographics					.03	.03
		Emotional & informational	-.57	.20	-.11	-2.85**	.02	.05
		Affectionate	-.44	.20	-.08	-2.17*		
2	2	Emotional & informational	-.49	.18	-.09	-2.80**	.21	.26
		Affectionate	-.37	.18	-.07	-2.09*		
		Identity experimentation	.82	.06	.47	14.40***		
2	1	Identity experimentation	.83	.06	.47	14.45***	.22	.25
	2	Identity experimentation	.82	.06	.47	14.40***	.01	.26
		Emotional & informational	-.49	.18	-.09	-2.80**		
		Affectionate	-.37	.18	-.07	-2.09*		

Notes: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; N = 718.

Overall, loneliness has a moderate independent effect on the preference for online social interaction. In contrast, satisfaction from online identity experimentation had a relatively large independent effect on the preference for online social interaction, accounting for 17–19% of the variance controlling for loneliness. The Sobel test revealed  $t = 4.13$ ,  $p < .001$ . Therefore, as hypothesized, the mediation analysis fully supports the predicted indirect effect of loneliness on preference for online social interaction, and this effect was mediated by online identity experimentation.

### ***Relating social support and online identity experimentation***

H<sub>2.1</sub> hypothesized that adolescents with lower levels of offline social support find online identity experimentation more gratifying than individuals with higher levels of social support. To test this hypothesis, a series of multiple regression procedures were conducted with identity experimentation entered as the dependent variable, and the three dimensions of social support entered on the first step as predictors. Results show that emotional and informational support ( $\beta = -.10$ ,  $t = -2.65$ ,  $p < .01$ ) and affectionate support ( $\beta = -.11$ ,  $t = -2.80$ ,  $p < .01$ ) were significant predictors of identity experimentation online. These results indicate that individuals who have less offline emotional and affectionate support tended to have a stronger desire to experiment with their identity, escape from who they are, or live out a fantasy online. However, no significant relationship was found between the support of social companionship and identity experimentation. Thus, H<sub>2.1</sub> was, to a large degree, supported.

### ***Mediating effect of online identity experimentation between social support and preference for online social interaction***

H<sub>2.2</sub> proposed that offline social support is significantly related to preference for online social interaction, but that the relationship will be *mediated* by online identity experimentation. Similar to testing H<sub>1.2</sub>, a series of regression analyses were performed to determine the extent to which variance explained in the dependent variable by the predictors was due to the proposed mediator (Baron & Kenny, 1986). However, since social companionship was not a significant predictor for identity experimentation online, it was excluded from the regression analyses.

As shown in Table 2, results from the regression model in equation 1 indicated that, after controlling for demographic variables explaining 3% of the variance, emotional and informational ( $\beta = -.11$ ,  $t = -2.85$ ,  $p < .01$ ) and affectionate ( $\beta = -.08$ ,  $t = -2.17$ ,  $p < .05$ ) support by themselves accounted for 2% of the variance in preference for online social interaction  $R^2 = .02$ ,  $F(3, 640) = 9.49$ ,  $p < .001$ . In contrast, when the influence of identity experimentation ( $\beta = .47$ ,  $t = 14.4$ ,  $p < .001$ ) was entered in the second step, the two dimensions of social support only accounted for 2% of variance in preference for online social interaction. On its own, the online identity experimentation accounted for 21% of the variance of the dependent variable  $R^2 = .21$ ,  $F(2, 638) = 51.28$ ,  $p < .001$ .

Similarly, the hierarchical regression results in equation 2 (see Table 2), with online identity experimentation entered first in the first block, also indicated that identity experimentation ( $\beta = .47$ ,  $t = 14.45$ ,  $p < .001$ ) was significantly and positively linked to preference for online social interaction. After controlling for

demographic variables and explaining 3% of the variance, online identity experimentation explained 22% of the total variance in preference for online social interaction  $R^2 = .22$ ,  $F(2, 640) = 80.35$ ,  $p < .001$ . Then, when emotional and informational ( $\beta = -.09$ ,  $t = -2.8$ ,  $p < .01$ ) and affectionate ( $\beta = -.07$ ,  $t = -2.09$ ,  $p < .05$ ) were entered in the second step, social support accounted for an increment of only 1% of the variance. By itself, however, identity experimentation predicted 22% above that explained by two dimensions of social support alone for a total of 26% of the variance by all predictors. The Sobel test with emotional and informational as predictor revealed  $t = -2.55$ ,  $p < .01$ , and with affectionate social support as predictor revealed  $t = -2.65$ ,  $p < .01$ . Therefore, as hypothesized, the mediation analysis largely supports the predicted indirect effect of social support on the preference for online social interaction, and this effect was mediated by online identity experimentation.

### *Predicting preference for online social interaction*

To examine the extent to which demographics, loneliness, offline social support, identity experimentation, and intensity of social networking activities online can predict preference for online social interaction, two parallel hierarchical regressions were performed – one for young children ( $n = 344$ ), aged 9 to 14, and one for adolescents ( $n = 374$ ), aged 15 to 19 (see Table 3) to uncover significant differences between the two groups.

Table 3. Hierarchical regression of demographics, loneliness, social support, online social identity gratification, and SNS intensity on preference for online social interaction.

Predictors	Preference for online social interaction			
	(Age: 9–14; $n = 344$ )		(Age: 15–19; $n = 374$ )	
	$\beta$	$\Delta Adj. R^2$	$\beta$	$\Delta Adj. R^2$
<b>Block 1: Demographics</b>				
Age	-.07		-.05	
Gender (male = 1)	.18**		.12*	
Education	-.03		-.06	
Family monthly income	-.07	.03**	-.15**	.08***
<b>Block 2: Psychosocial</b>				
Loneliness	.15*	.03**	.07	.00
<b>Block 3: Social Support</b>				
Emotional & informational	-.02		-.19**	
Affectionate	-.03		-.00	
Social companionship	-.02	.00	-.23***	.08***
<b>Block 4: Identity Experimentation</b>				
	.31***	.12***	.24***	.06***
<b>Block 5: SNS Intensity</b>				
	.24***	.05***	.19**	.03**
$R^2$		.25		.27
Final adjusted $R^2$		.23		.25

Notes: Cell entries are standardized final regression coefficients. \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ;  $N = 718$

As shown in Table 3, demographic variables were entered first in the first block. Being male was found significant in predicting preference for online social interaction for both the 9–14 and the 15–19 age groups ( $\beta = .18, p < .01$  and  $\beta = .12, p < .05$  respectively). Results also showed that the 15–19 age group with low family monthly income ( $\beta = -.15, p < .01$ ) tended to prefer online social interaction. This indicates that male adolescents or young adults with little family income may feel that they are treated better online than in face-to-face relationships, feel safer relating to others online rather than face-to-face, are more confident socializing online than offline, and that offline social activities may cost more money. The demographics block explained 3% and 8% of the variance for the 9–14 and the 15–19 age groups, respectively. Loneliness ( $\beta = .15, p < .01$ ) was found a significant predictor in the second block on the preference for online social interaction for only the 9–14 age group. This indicates that lonely youth may find online social relationships safer and more comfortable, leading to confidence and even more happiness than in face-to-face relationships. This block accounted for 3% of the variance. To our surprise, when social support variables were entered in the third block, no significant effect was found for the 9–14 year old group. One possible explanation is that the questions posed to the adolescents in the questionnaire actually asked if they could get social support from the “offline world” when they needed it. For the 9–14 age group, if they were satisfied with offline emotional, informational, and affectionate social support from parents, friends and their offline social network, social support in the online world may not be their preferred source of support. In contrast, the results in Table 3 show that social support predictors were found significantly and negatively linked to preference for online social interaction for the 15–19 age group (i.e.,  $\beta = -.19, p < .01$  for emotional & information and  $\beta = -.23, p < .001$  for social companionship). This suggests that older adolescents, who may have difficulties getting social companionship and emotional/informational social support offline, would prefer getting this support online. An additional 4% of the variance was explained for this group.

Online identity experimentation was the fourth block in the stepwise regressions. Results show that identity experimentation was significantly linked to preference for online social interaction both for the 9–14 age group ( $\beta = .31, p < .001$ ) and for the 15–19 age group ( $\beta = .24, p < .001$ ). This suggests that adolescents who prefer online social interaction were motivated by their experiences in trying out a new identity and living a fantasy online. This block explained the largest amount of variance at 12% and 6%, respectively, for both groups. As expected, in the final block, SNS intensity was found a significant predictor for preference for online social interaction for both age groups ( $\beta = .24, p < .001$  and  $\beta = .19, p < .01$ ). This means that heavy users of social networking sites such as Facebook, blogs, IM, and forums were accustomed to online modes of communicating with friends. These are their preferred media. An additional 3–5% of variance were added to the equations and a total of 23% and 25% of the variance were accounted for, respectively.

### Conclusions and discussion

The current study principally supports the hypothesis that loneliness and social support are associated with online identity experimentation. According to the theories presented, adolescents who suffer from loneliness find online experimentation

more gratifying than the less lonely and the non-lonely, which may be because they perceive that the fluidity of online identity may help them enjoy and experience things they cannot in the real world, such as escaping from who they are, living out a fantasy, and trying out new identities.

#### ***Explaining the mediating effect of online identity experimentation***

The results reported above also support the proposition that online identity experimentation is a key contributor to preference for online social interaction, indicating that adolescents who are gratified by having fun trying new identities tended to prefer online social interaction. In fact, the theory asserts that the relationships between loneliness-preference online and social support-preference online are *mediated* by online identity experimentation. The findings support the hypotheses that the relationships between loneliness and social support and preference for online social interaction are *spurious*, and that online identity experimentation is the confounding variable. This suggests that adolescents perceive that being able to experiment with their identity and connect with peers online play an important role in the development of a keen preference for online social interaction. These results are an important contribution to the literature. This perception may be because in today's increasingly age-conscious society, children want to be adults, adults want to be children, and adolescents are preoccupied with maturity and want to be treated as grown-ups. Scholars are reporting important age-differentiated outcomes in media preferences, language, and interpersonal interactions (Leung, 2003; Livingstone, 2008; McCann & Giles, 2002). With the popular use of social networking sites, blogs, and instant messaging among adolescents, it is not difficult to understand why identity experimentation online for the "possible self", as argued by Turkle (1995) and Markus and Nurius (1986), has a significant influence on the preference for online social interaction. In fact, previous research has found that lonely individuals turned out to have a higher preference for online interaction because of the Internet's greater anonymity. Indeed, many perceive online communication as the "Prozac of social communication" (Caplan, 2003; Morahan-Martin & Schumacher, 2000).

#### ***Online space as "private" space in a crowded home***

Another important contribution of the study is the notion that the extensibility afforded by identity experimentation in the online world enables adolescents to reconfigure their social relationships and online identities in online spaces. For many, experimenting with identity online can also help to produce a "private" space in the offline world. Children often have little privacy from parents and siblings within the spatial constraints of the average family home. By claiming that they need peace and quiet to use the Internet for schoolwork (although often they are using it to play games, surf the Internet for fun, e-mail friends, or pretend to be someone online), some adolescents can appropriate a room at home for themselves. Furthermore, for the lonely and those who are low in emotional, informational, affectionate, and companionship support, *online space* may be a place for them to feel safer relating and socializing with others in online rather than face-to-face relationships (often these others are classmates or known friends), particularly for those who are more



comfortable with computers than people. These adolescents are often willing to give up some of their face-to-face relationships to have more time for their online relationships.

It is also interesting to note that the relationship between social support and preference for online social interaction was negative. This finding suggests that the lack of social support offline motivates adolescents to seek support online. Such results are consistent with previous findings that increased offline social support negatively correlated with the social-compensation viewing motives that include companionship, pastime, habit, and escape motivations (Finn & Gorr, 1988; Leung, 2007).

### *Contrasting young children and adolescents*

The regression analyses revealed three unexpected findings. First, although loneliness played a significant role in the development of preference for online social interaction, it significantly predicted preference for online social relationships only for the 9–14 age group, not for the 15–19 age group. One possible explanation is that when the 15–19 age group are lonely, they have more choices and options to alleviate their loneliness, for they enjoy far more independence and freedom compared with the younger group. The 9–14 age group are most likely still in junior high school, while the 15–19 age group are more likely in high school or in college. As such, parents would exercise a more restrictive or supervisory approach to the younger group, while the older adolescents would have more autonomy in their daily activities regarding where to go and what to do when they feel lonely (Livingstone, 2008). Thus, the 9–14 age group may favor online social interaction.

A second unexpected result was the lack of influence from the dimensions of social support on preference for online social interaction, especially on the 9–14 age group but not on the 15–19 age group. One explanation may be that the 9–14 age group are still well protected by their parents from whom they can obtain emotional-informational, affectionate, and companionship support. In contrast, the 15–19 age group are often on their own, particularly when they are in college. As a result, when they are in need of social support, especially emotional-informational and companionship support in the offline world, they have the choice of making the attempt to seek support in the online world.

Finally, the lack of influence from affectionate social support for both age groups on preference for online social interaction may be because the items assessing affectionate social support refer to adolescents wanting support, particularly in seeking others' love, feeling wanted, sharing private worries and fears, and understanding their problems. One possible explanation is that while anonymity, role play, and changing identities might be vital to childhood, not all adolescents participate in online activities for these reasons. It is generally known that most adolescents write blogs and update their Facebook pages on the Internet mostly to communicate with people they know and because they want to be popular among their current friends and to find new friends (Moinian, 2006). Sharing private worries and fears or seeking others' love and feeling wanted online may not be a preferred place for obtaining affectionate support because online relationships may be impersonal and shallow (Kraut et al., 1998).

***Limitations and suggestions for future research***

It would be useful to replicate the present study with longitudinal data to investigate longer term models of the effects of loneliness, social support, and online identity experimentation on the preference for online social interaction. This future study would cast light on the temporal ordering of events. The model tested in the present study hypothesized that loneliness and social support might alter the perception of the importance of online identity experimentation, which in turn would lead to the increased preference for online social interaction. It could also be argued that identity experimentation obtained online predisposes an individual to be lonelier or further deprived of opportunities to receive emotional, affectionate, and social companion support. Thus, a longitudinal design is required to draw conclusions regarding temporal order and causality. Further, studies with subjects from other countries are required to test further the hypotheses for universality.

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**References**

- Arnett, J.J. (1992). Reckless behavior in adolescence: A developmental perspective. *Developmental Review, 12*, 339–373.
- Austin, B.A. (1985). Loneliness and use of six mass media among college students. *Psychological Reports, 56*, 323–327.
- Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.
- Blinka, L., & Smahel, D. (2009). Fourteen is fourteen and a girl is a girl: Validating the identity of adolescent bloggers. *Cyberpsychology & Behavior, 12*, 735–739.
- Brown, J.D., Halpern, C.T., & L'Engel, K.L. (2005). Mass media as a sexual super peer for early maturing girls. *Journal of Adolescent Health, 36*, 420–427.
- Canary, D.J., & Spitzberg, B.H. (1993). Loneliness and media gratifications. *Communication Research, 20*, 800–821.
- Caplan, S.E. (2002). Problematic Internet use and psychosocial well-being: Development of a theory based cognitive-behavioral measure. *Computers in Human Behavior, 18*, 533–575.
- Caplan, S.E. (2003). Preference for online social interaction: A theory of problematic Internet use and psychological well-being. *Communication Research, 30*, 625–648.
- Caplan, S.E. (2007). Relations among loneliness, social anxiety, and problematic Internet use. *CyberPsychology & Behavior, 10*, 234–242.
- Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine, 38*, 301–314.
- Donald, C.A., & Ware, J.E. (1984). The measurement of social support. In R. Greenley (Ed.), *Research in community and mental health. Vol. 4.* (pp. 325–370). Greenwich, CT: JAI Press.
- Eagle, G. (2007). Facebook changes the way teens are communicating. *Peterborough Examiner*. Retrieved from <http://www.thepeterboroughexaminer.com>
- Erikson, E.H. (1994). *Identity and the life cycle*. New York: W.W. Norton.

- Finn, S., & Gorr, M.B. (1988). Social isolation and social support as correlates of television viewing motivations. *Communication Research*, 15(2), 135–158.
- Gackenbach, J. (Ed.). (1998). *Psychology and the Internet: Intrapersonal, interpersonal, and transpersonal implications*. San Diego, CA: Academic Press.
- Gullone, E., & Moore, S. (2000). Adolescent risk-taking and the five-factor model of personality. *Journal of Adolescence*, 23, 393–407.
- Haynie, D.L. (2002). Friendship networks and delinquency: The relative nature of peer delinquency. *Journal of Quantitative Criminology*, 18, 99–134.
- House, J.S. (1986). Social support and the quality and quantity of life. In F.M. Andrew (Ed.), *Research on the quality of life*. Ann Arbor, MI: Survey Research Center, Institute for Social Research, University of Michigan.
- Huffaker, D.A., & Calvert, S.L. (2005). Gender, identity, and language use in teenage blogs. *Journal of Computer Mediated Communication*, 10(2), Article 1. Available at <http://jmc.indiana.edu/vol10/issue2/huffaker.html>
- Joinson, A. (2004). Self-esteem, interpersonal risk, and preference for e-mail to face-to-face communication. *CyberPsychology & Behavior*, 7, 472–478.
- Judd, C.M., & Kenny, D.A. (1981). Process analysis: Estimating mediation in evaluation research. *Evaluation research*, 5, 602–619.
- Kahn, R.L., & Antonucci, T.C. (1980). Convoys over the life course: Attachment, roles and social support. In P.B. Baltes & O. Brim (Eds.), *Life-span development and behavior*, Vol. 3. Boston: Lexington Press.
- Kim, J., LaRose, R., & Peng, W. (2009). Loneliness as the cause and the effect of problematic Internet use: The relationship between Internet use and psychological well-being. *CyberPsychology & Behavior*, 12, 451–454.
- Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist*, 53, 1017–1031.
- Larson, R., Richards, M.H., Moneta, G., Holmbeck, G., & Duckett, E. (1996). Changes in adolescents' daily interaction with families from ages 10–18: Disengagement and transformation. *Developmental Psychology*, 32, 744–754.
- Leimeister, J., Schweizer, K., Leimeister, S., & Krcmar, H. (2008). Do virtual communities matter for the social support of patients? Antecedents and effects of virtual relationships in online communities. *Information Technology & People*, 21, 350–374.
- Leung, L. (2001). Gratifications, chronic loneliness and Internet use. *Asian Journal of Communication*, 11, 96–119.
- Leung, L. (2002). Loneliness, self-disclosure, and ICQ (“I seek you”) use. *CyberPsychology & Behavior*, 5, 241–251.
- Leung, L. (2003). Impacts of net-generation attributes, seductive properties of the Internet, and gratifications obtained on Internet use. *Telematics & Informatics*, 20, 107–129.
- Leung, L. (2004). Net-generation attributes and seductive properties of the Internet as predictors of online activities and Internet addiction. *CyberPsychology & Behavior*, 7, 333–348.
- Leung, L. (2007). Stressful life events, motives for Internet use, and social support among digital kids. *CyberPsychology & Behavior*, 10, 204–214.
- Leung, L. (2009). Effects of motives for Internet use, aloneness, and age identity gratifications on online social behaviors and social support among adolescents. In R. Zheng, J. Burrow-Sanchez, & C. Drew (Eds.), *Adolescent online social communication and behavior: Relationship formation on the Internet* (pp. 120–135). Hershey, PA: IGI Global, Inc.
- Livingstone, S. (2008). Taking risky opportunities in youthful content creation: Teenagers' use of social networking sites for intimacy, privacy and self-expression. *New Media & Society*, 10, 393–411.

- Longman, H., O'Connor, E., & Obst, P. (2009). The effect of social support derived from World of Warcraft on negative psychological symptoms. *CyberPsychology & Behavior*, *12*, 563–566.
- Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist*, *41*, 954–969.
- McCann, R., & Gile, H. (2002). Ageism in the workplace: A communication perspective. In T.D. Nelson (Ed.), *Ageism: Stereotyping and prejudice against older persons* (pp. 163–199). MIT Press.
- McCrae, R.R. (1996). Social consequences of experiential openness. *Psychological Bulletin*, *120*, 323–337.
- McDowell, I., & Newell, C. (1996). *Measuring health: A guide to rating scales and questionnaires* (2nd ed.). New York: Oxford University Press.
- McKenna, K.Y.A., Green, A.S., & Gleason, M.E.J. (2002). Relationship formation on the Internet: What's the big attraction? *Journal of Social Issues*, *58*, 9–31.
- Moinian, F. (2006). The construction of identity on the internet. *Childhood*, *13*, 49–68.
- Moody, E. (2001). Internet use and its relationship to loneliness. *CyberPsychology & Behavior*, *4*, 393–401.
- Moore, D.W., & Schultz, N.R. Jr. (1983). Loneliness at adolescence: Correlates, attributions and coping. *Journal of Youth and Adolescence*, *12*, 95–100.
- Morahan-Martin, J., & Schumacher, P. (2000). Incidence and correlates of pathological Internet use among college students. *Computers in Human Behavior*, *16*, 13–29.
- Morahan-Martin, J., & Schumacher, P. (2003). Loneliness and social uses of the Internet. *Computers in Human Behavior*, *19*, 659–671.
- Murphy, P.M., & Kupshik, G.A. (1992). *Loneliness, stress and well-being: A helper's guide*. London: Routledge.
- Roth, J., & Brooks-Gunn, J. (2000). What do adolescents need for healthy development: Implications for youth policy. *Social Policy Report*, *14*, 3–19.
- Russell, D., Peplau, L.A., & Cutrona, C.E. (1980). The revised UCLA loneliness scale: Concurrent and discriminant validity evidence. *Journal of Personality & Social Psychology*, *39*, 472–480.
- Schouten, J.W. (1991). Selves in transition: Symbolic consumption in personal rites of passage and identity re-construction. *Journal of Consumer Research*, *17*, 412–425.
- Schwartz, S.J., & Pantin, H. (2006). Identity development in adolescents and emerging adulthood: The interface of self, context, and culture. In A. Columbus (Ed.), *Advances in Psychology Research* (pp. 1–40). Hauppauge, NY: Nova Science Publishers.
- Sherbourne, C.D., & Stewart, A. (1991). The MOS social support survey. *Social Science & Medicine*, *32*, 705–714.
- Smedema, S., & McKenzie, A. (2010). The relationship among frequency and type of Internet use, perceived social support, and sense of well-being in individuals with visual impairments. *Disability & Rehabilitation*, *32*, 317–319.
- Solomon, M.R. (1983). The role of products as social stimuli: A symbolic interactionism perspective. *Journal of Consumer Research*, *10*, 9–329.
- Spitzberg, B.H., & Canary, D.J. (1985). Loneliness and relationally competent communication. *Journal of Social and Personal Relationships*, *2*, 387–402.
- Stone, A.R. (1991). Will the real body please stand up? Boundary stories about virtual cultures. In M. Benedikt (Ed.), *Cyberspace: First step* (pp. 81–118). Cambridge, MA: MIT Press.
- Thayer, S.E., & Ray, S. (2006). Online communication preferences across age, gender, and duration of Internet use. *CyberPsychology & Behavior*, *9*, 432–440.
- Turkle, S. (1995). *Life on the screen: Identity in the age of the Internet*. New York: Simon & Schuster.
- Valkenburg, P.M., & Peter, J. (2008). Adolescents' identity experiments on the Internet: Consequences for social competence and self-concept unity. *Communication Research*, *35*, 208–231.

- Valkenburg, P.M., Schouten, A.P., & Peter, J. (2005). Adolescents' identity experiments on the Internet. *New Media & Society*, 7, 383–402.
- Wright, K. (2000). Computer-mediated social support, older adults, and coping. *Journal of Communication*, 50, 100–118.
- Yurchisin, J., Watchravesringkan, K., & McCabe, D.B. (2005). An exploration of identity re-creation in the context of Internet dating. *Social Behavior and Personality*, 33, 735–750.