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Computer-Mediated Communication Use Among Adolescents and Its Implication for Psychological Need Satisfaction

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ABSTRACT

Online self-disclosure and online communication are two communication behaviours that, on the basis of prior research and theory, would appear to be related both to one another and to psychological need satisfaction. This study explored these relationships among a sample of 190 secondary school students drawn from a district in Malaysia. Respondents completed a questionnaire battery, which included measures of online self-disclosure, online communication and psychological need satisfaction. Quantitative data were then entered and analysed via Statistical Package for Social Sciences (SPSS). The results demonstrated that adolescents disclosed more during same-sex interaction than opposite-sex interaction. The findings also showed a positive relationship between online communication and same-sex disclosure for adolescent girls, but not necessarily for boys. Hierarchical regression analyses confirmed that for male and female adolescents, same-sex disclosure, opposite-sex disclosure and online communication were found to be predictive of adolescents' experiences of psychological need satisfaction in online friendships. No interaction effect was found between online self-disclosure and online communication on psychological need satisfaction. The contribution of this study is two-fold. First, currently, little research exists examining the association between online self-disclosure, online communication and psychological need satisfaction in a single published study. Second, we extend previous research with a more nuanced understanding of psychological need satisfaction embedded in the context of CMC.

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INTRODUCTION

Due to considerable technological advancements in networked computing, a variety of activities, arguably move towards being virtual. For decades, Computer-Mediated Communication (CMC) has garnered widespread research attention. According to Walther (1992), CMC refers to "a synchronous and asynchronous electronic mail and computer conferencing by which senders encode in text messages that are relayed from the senders' computer to receivers" (p. 52). It functions as a medium to expand and create more social opportunities across geographical distance (Baym, 2010; Walther & Parks, 2002). Ironically, prior studies generally indicated that CMC is attached to stigmas, ostensibly because of the unwitting, naïve or careless use of the technology by some users (Whitty & McLaughlin, 2007). In earlier years, Turow's (1999) work documented that computer-mediated relationships were not rewarding to its users, yet carry more risks of victimisation. In the same year, Young (1999) reported that the power of computer technology is overwhelming as it can turn users to become addicted zombies.

In the following years, CMC has even been demonised as causing people to become dispositionally depressed or lonely (Beard, 2002; Kraut *et al*., 1998; Strivers, 2004; Yao-Guo *et al*., 2006). Nevertheless, Kraut *et al*.'s (2002) later works found that the increased CMC use decreased perceived loneliness and depression, and, at the same time, increased perception of social connectedness and well-being. While these findings are informative, judging by survey data and increasing anecdotal evidence, it is notable that the CMC user base appears to be on the rise (Nurullah, 2008; Lenhart *et al*., 2010). More importantly, the adolescent population constituted a bigger fan base of CMC than other age populations. It seems that overly negative portrayals of CMC did not seem to impede the popularity of CMC among teenagers. Instead, CMC is becoming more prevalent, thanks to Twitter and Facebook (Lenhart *et al*., 2010; McKenna *et al*., 2002; Stafford *et al*., 1999; Wolak *et al*., 2003).

Based on Whitty and McLaughlin's (2007) research, the discussion of online socialisation should not only be limited to its detrimental effects, but also to positive ramifications . To the best of our knowledge, research on psychological need satisfaction relating to CMC behaviours is an under-researched area, although a great deal of research has addressed psychological need as motives for CMC use (McKenna *et al*., 2002; Wolak *et al*., 2003). In fact, psychologists have long noted that a person's behaviour perseverance is shaped by the level of satisfaction derived from an activity (Deci & Ryan, 1985; 2008; Sheldon & Gunz, 2009). People who derive satisfaction from an activity tend to re-engage in the same activity. Linking satisfaction to CMC, we argue that the prevalence of CMC use

would not be high if people did not acquire satisfaction from its usage. Following from this, we embarked on this study to investigate psychological need satisfaction in online friendships using a sample of adolescents and to examine CMC-related behaviours such as online self-disclosure and online communication. This study was carried out in the state of Selangor and involved 190 secondary school students who made up the respondents of this research. This paper is organised as follows: Introduction followed by theoretical and conceptual framework, research methodology, result findings and finally, a summary of the discussion.

THEORETICAL FRAMEWORK

Both Self-Determination Theory (SDT; Deci & Ryan, 1985; 2008) and Uses and Gratification Theory (UG; Katz, Blumler, & Gurevitch, 1974) are used to guide this research theoretically. Both theories have been applied in a variety of disciplines from psychology to media studies (Sheldon *et al*., 2001; Papacharissi & Rubin, 2000; Ryan *et al*., 2006; Sheldon & Gunz, 2009). SDT is primarily concerned the satisfaction of three psychological needs (Deci & Ryan, 1985; 2008; Sheldon *et al.*, 2001). These needs consist of: a) autonomy, which refers to human agency or volition for one's action and decision (b) competence, which refers to a sense of mastery and self-proficiency in order to interact effectively with one's world, and (c) relatedness, which refers to feelings of being cared for, liked and valued by other individuals. Satisfaction of these three needs is assumed to bring about optimal well-being and psychological vitality. By contrast, poor health, depression and low self-esteem are expected to ensue if these needs are thwarted.

More significantly, all three needs are theoretically assumed to be universally required by every individual regardless of culture and context variability (Ryan & Deci, 2008; Ryan *et al.*, 2006; Sheldon *et al.*, 2001; Sheldon & Gunz, 2009). Perceived need satisfaction related to any behaviour can enhance individuals' willingness to strengthen that behaviour. Although psychological needs are important, the satisfaction of the psychological needs is by no means considered to be automatic. Instead, it is facilitated through one's social relationships and contexts (Deci & Ryan, 1985; 2008). Those who feel fulfilled in their social relationships have a better chance of experiencing psychological need satisfaction, while those who are left unfulfilled experience dissatisfaction. In this regard, humans are naturally inclined towards integration into the social matrix to acquire the satisfaction of these three psychological needs, which in turn, facilitates their well-being (Deci & Ryan 1985; 2002; Reeve, 2009).

Presently, it seems socialisation via CMC is a common practice (Wolak *et al*., 2003; Lenhart *et al*., 2010). By using it, people can get to know others, relate to them, learn from them and share with them without physical constraints (Baym, 2010; Walther & Parks, 2002). UG was thus incorporated to explain why people use media and what they use them for (Katz

et al., 1974). This theory posits that (1) the social and psychological origins of (2) needs which generate (3) expectations of (4) the mass media or other sources lead to (5) differential patterns of media exposure (or engagement in other activities), resulting in (6) need gratifications and (7) other consequences, perhaps mostly unintended ones" (Katz *et al*., 1974, p. 510).

Specifically, UG assumes media use is purposive and motivated; therefore, users are active rather than passive consumers of media. Users often evaluate their available media options and should choose a medium that best fulfils their needs. Media choice, therefore, lies within the users' capacity to meet desired outcomes or goals. This notion can be literally defined as 'audience-centered,' and prompts a research shift from "what media do to people" to "what people do with media" (Papacharissi & Rubin, 2000). It is noted that the degree of the users' gratification obtained from the media exposure will contribute to the continuance of media use. Taken together, these two theories give a clear justification that individuals are always fully aware of what they are doing and proactive enough to ensure their needs are met while avoiding events or occasions that thwart need fulfilment. A blend of both theories lends a better explanation of the mechanics of the relationship examined in the present study than either theory does on its own.

LITERATURE REVIEW

Despite CMC's growing popularity, relatively little is known about psychological need satisfaction in the CMC context. The present study examines whether electronically mediated communication supports psychological need satisfaction of adolescents. In fact, there is some tentative evidence suggesting that CMC is provided with a sense of purpose, challenge and opportunities for self-fulfilment, each of which is potentially linked to psychological need satisfaction (Ryan *et al*., 2006). Drawing on much evidence to date, it is not hard to find that people are not passively affected by technology, but are indeed, actively shaped its use (Hughes & Hans, 2001; McKenna *et al*., 2002; Ryan *et al*., 2006).

For example, some scholars found that CMC was highly interactive and flexible, enabling users to express the way they truly feel and think (Stafford *et al*., 1999; Bargh *et al*., 2002). The relative anonymity of cyberspace was also found to create a safer atmosphere in which users can be more liberal with their expressions (Ben-Ze-ev, 2003). People are thus allowed to exercise autonomous behaviours based on their desires without interference. This accommodates their increasing desire for autonomy. In some instances, CMC was seen to promote and facilitate one's world as comprehensible, manageable and meaningful (Queensland University of Technology, 2008, July 17). The text-based nature of CMC was found to be beneficial for individuals to build Internet literacy and was probably accompanied by a feeling of competence. Further, its real time interactive feature also facilitated

communication of affection (Baym, 2010; Hardey, 2004). Walther and Parks (2010) and McKenna *et al*. (2000) believe that digitally enabled interaction allows people to have opportunities to interact with others who have similar interests, values and beliefs using both asynchronous and synchronous communication tools, such as email, instant messaging and social networking sites. The literature seems to suggest that there are three different aspects to psychological needs: autonomy, competence and relatedness, which are all attainable in the CMC context.

In explaining how people satisfy psychological needs from the online socialising practices, sociologists and psychologists have become interested in examining whether a relationship exists between online self-disclosure and online communication. From a sociological perspective, self-disclosure and time spent on communication in a social interaction are essential investments to develop close relationships (Derlega *et al*., 1993; Morry, 2005). Typically, the relationship formation process requires individuals to increase self-disclosure and time commitment.

Based on Schouten *et al*. (2007), online self-disclosure refers to the extent to which the individual reveals information about himself to others over the Internet. Bargh *et al*. (2002) found that young people were more comfortable disclosing their inner world to their screen-life friends than to their real-life friends. The findings clearly revealed that one's "true self was more accessible in memory following an interaction with a stranger over the Internet compared to after a face-to-face interaction" (p. 44). Ben-Ze-ev (2003) supports this viewpoint, suggesting that self-disclosure appears to be prevalent in online interactions because one feels more anonymous, distant and safe by hiding behind the screen, and potential rejection is less common in cyberspace. The act of disclosing more about oneself online heightens trust and intimacy, and in turn, increases relationship satisfaction. A longitudinal study also unanimously showed that young people who disclosed more of their true selves online were more likely to have close, long-lasting online relationships and ultimately, reported higher satisfaction derived from the relationships (McKenna *et al*., 2002).

With respect to online communication, Bonetti *et al*. (2010) defined it as amount of time spent (i.e. frequency and duration) in communicating online. Research has found that the more the online communication, the greater the satisfaction reported (McKenna *et al*., 2002). Another study also contended that greater frequency of interaction with online friends positively impacted psychological well-being (Bargh & McKenna, 2004). These findings may be attributable to the fact that conscious investment of time in social interactions results in relational closeness (Morry, 2005).

Still, gender gap exists on digital divides (e.g. amount of time online, self-disclosure online). For example, some studies reported that females tended to involve significantly more in online communication (Bonetti *et al*., 2010; Lenhart *et al*., 2010) and

placed greater emphasis on sharing true emotions than males (Cho, 2007; Schouten *et al.*, 2007). However, research findings are inconsistent across the studies. Some studies showed that males were more likely users of technology (Lenhart *et al.*, 2007; Subrahmanyam & Smahel, 2011) and were more likely to embrace the Internet (Kraut *et al.*, 1998) than females. Thus, males reported longer durations for communicating using the Internet (Jones, Johnson-Yale, Millermaier, & Pérez, 2009), and communicated online more frequently with people they had never met physically than females did (Soh *et al*., 2013). Additionally, males generally showed higher levels of self-disclosure in their online interactions than did females (Barak & Gluck-Ofri, 2007; Subrahmanyam & Smahel, 2011) because males were traditionally encouraged to suppress their emotions and feelings. Therefore, they displayed greater courage by articulating their inner selves than females, who chose to remain anonymous. Based on existing research, we aimed to meet the following research objectives:

i. To compare the levels of online self-disclosure, online communication and psychological need satisfaction between male and female adolescents
ii. To examine the relationship between online self-disclosure, online communication and psychological need satisfaction for male and female adolescents
iii. To identify factors predicting the psychological need satisfaction for male and female adolescents

METHOD

Sample

A survey was carried out among a sample of students in two secondary schools. Formal approval was obtained to carry out anonymous questionnaires. On the day of recruitment, a short, cover letter explaining the purpose of the research and a consent form were given to the respondents. Upon their agreement, respondents were asked to fill in the questionnaire. Of the 240 sets of the questionnaire sent to potential respondents, 200 were returned, out of which 10 were uncompleted, giving a response rate of 78.33%. To increase comprehension of the questionnaire among the respondents, the questionnaire had been previously translated into Malay using Brislin's method (for full review, see Willgerodt *et al.*, 2005). The pilot study of the translated version of the questionnaire showed good reliability.

Instrumentation

To collect respondents' demographic information, we asked questions about their gender, age, race, family monthly income, family size, number of sibling, parents' highest educational attainment, family structure and several general questions about online communication patterns.

Online self-disclosure was measured using Online Intimate Self-disclosure (OISD; Schouten *et al*., 2007). Respondents

were asked to report their self-disclosure with a male friend and female friend with whom they most communicated online. This scale consisted of 7 items each for the male friend and female friend. Each item rated on a scale of 1 (*I tell nothing about this*) to 5 (*I tell everything about this*). Higher scores indicated higher self-disclosure online. Example of items included "*Thing I am worried about*" and "*Moments in my life when I feel guilty*." The scale was good internally and consistent with this sample (α = .89 for online self-disclosure to boys; α = .88 for online self-disclosure to girls).

Online communication was measured using Online Communication Scale (OCS; Bonetti *et al.*, 2010). Respondents were asked to report the frequency and duration of communication virtually. This scale consisted of 4 items. One item rated on a scale of 1 (none) to 4 (every day), and three items rated on a scale of 1 (less than 15 minutes) to 4 (more than 4 hours). Z-score was thus to calculate and higher scores indicated higher involvement in online relationships. Example of items included "*How many days in the past week were you online to communicate/interact with online friends?*" and "*On the average weekend, approximately how long in total do you communicate/interact with online friends*?" The scale was good internally and consistent with this sample (α = .85).

Psychological need satisfaction was measured using Need Satisfaction in Relationship Scale (NSRS; La Guardia *et al*., 2000). Respondents were asked to report how satisfied they were in terms of psychological needs in online friendship. This scale consisted of 9 items. Each rated on a scale of 1 (*not true at all*) to 7 (*very true*). Higher scores indicated higher satisfaction. Example of items included "*When I am with online friend(s), I feel free to be whom I am*" (autonomy), "*When I am with online friend(s), I feel like a competent person*" (competence), and "*When I am with online friend(s), I feel loved and cared about*" (relatedness). The scale was good internally and consistent in this sample (α = .89).

Data Analysis

Using SPSS 18.0, descriptive statistics such as frequency, percentage, mean and standard deviation were used to describe demographic characteristics and study variables. An independent sample *t*-test was also computed to examine study variables between gender groups. Correlation analyses, on the other hand, was used to examine the relationship between the study variables. Hierarchical regression modelling was finally performed to assess the effect of online self-disclosure and online communication on psychological need satisfaction. An interaction effect between online self-disclosure and online communication was also included in the analyses. To reduce multicollinearity that may occur with interaction terms, all the continuous scores were centered on the respective sample mean prior to creating interaction terms (Cohen *et al*., 2003). The level of significance in this study was .05.

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RESULTS

Demography of Respondents

Table 1 presents the demographic profile of the sample. Of the total sample, 94 were males and 96 were females. Participants' ages ranged from 14 to 16 years, with a mean age of 14.78 years (*SD* = .98). Malay adolescents (50.5%) constituted a majority of the sample, followed by Chinese (36.8%) and Indian (12.6%). About 56% of the participants indicated that they lived in an urban area and the remaining 43.7% reported that they lived in suburban areas. The average for family size and number of siblings was 5.49 (*SD* = 2.01) and 3.14 (*SD* = 1.83) respectively. Most of the participants came from middle-class families (Median = RM2000). The educational level of the respondents' parents ranged from primary education to graduate school: 7.9% and 6.3% had attended primary school; 56.3% and 49.5% had attended secondary school; 22.1% and had 23.2% completed the diploma/STPM level; 8.9% and 14.7% had university degrees; and 4.7% and 6.3% had obtained Master/PhD degrees, for mothers and fathers, respectively. Finally, about 93% of the participants reported that they lived with both biological parents, and the remaining 7% either stayed with a single parent or step-parent.

Descriptive Analysis for Communication Platforms and Channels

Table 2 presents participants' communication platforms and channels. As can be seen, Social Network Sites were the most used channel (*n* = 130, 68.4%). The other 13% (*n* = 24) preferred Twitter. The remaining respondents either preferred Online Games Sites (*n* = 22, 11.6%), Instant Messaging, Email (*n* = 6, 3.2%) or Forum (*n* = 2, 1.1%). Using multiple responses scoring, 176 out of 190 participants (92.6%) subscribed to Social Network Sites during the survey time. The results are not surprising as Facebook is the most popular communication platform among young people due to its interactive nature to create a personal network and its entertainment activities that teens love (Lenhart *et al*., 2010). Over half of the participants indicated that they had used Email (53.2%), Online Games Sites (52.1%) and Instant Messaging (50.5%) respectively. Approximately two-fifths of the respondents had used Twitter. Interestingly, only one-tenth of the respondents had used Forum.

Gender differences in Measures Used

Table 3 displays means and standard deviations of study variables for male and female sub-samples. Skewedness and kurtosis were first conducted to check the normality of data. Using a (± 3.0) criterion for skewedness and kurtosis, we found that all the measures were within the acceptable ranges, implying that normality assumptions

were not violated (Onwuegbuzie & Daniel, 2002). In addition, the *t*-test was used to compare the difference in self-disclosure, communication and psychological need satisfaction ratings among male and female adolescents. On average, male adolescents scored higher male-friend disclosure (M = 15.83, SD = 6.96) than female counterparts (M = 11.94, SD = 6.71). This difference was statistically significant, t (188) = 4.28, p <

TABLE 1
Profile of Respondents (N = 190)

Variable	F	%	M (Med)	SD
Age			14.78	.98
Monthly household income *			(2000)	
Family size			5.49	2.01
Number of siblings			3.14	1.83
Gender				
Male	94	49.5		
Female	96	50.5		
Ethnicity				
Malay	96	50.5		
Chinese	70	36.8		
Indian	24	12.6		
Place of origin				
Urban	107	56.3		
Suburban	83	43.7		
Mother's academic qualification				
Primary school	15	7.9		
Secondary school	107	56.3		
Diploma/STPM	42	22.1		
Degree	17	8.9		
Master/PhD	9	4.7		
Father's academic qualification				
Primary school	12	6.3		
Secondary school	94	49.5		
Diploma/STPM	44	23.2		
Degree	28	14.7		
Master/PhD	12	6.3		
Family Structure				
Father and Mother	177	93.2		
Mother/Father only	9	4.8		
Father and step-mother/Step-father and mother	4	2.1		

Note. F = Frequency, *%* = percentage, *M* = Mean, *Med* = Median, *SD* = Standard deviation, *Min* = Minimum, *Max* = Maximum.
Variable with asterisk was calculated using median instead of mean as it is less affected by extreme observations in the dataset (Babbie, 2007).

.001. On the other hand, male adolescents scored lower female-friend disclosure (M = 14.84, SD = 6.64) than female adolescents (M = 17.06, SD = 5.49). This difference was also statistically significant, t (188) = -2.29, $p < .05$. However, neither online communication nor psychological need satisfaction was significant across the gender groups.

Pearson's Product Moment Correlation Coefficient on Study Variables for Male and Female Sub-Samples

As recorded in Table 4, all the correlations were moderate to strong in magnitude. Among the male sub-sample, psychological need satisfaction was related to same-sex disclosure (r = .29, $p < .01$), opposite-sex disclosure (r = .41, $p < .001$) and online communication (r = .24, $p < .05$).

TABLE 2
Profile of Participants' Online Communication Channels

Computer-mediated channel	F	%
Most used communication channel (Tick only one answer)		
Instant Messaging	6	3.2
Social Network Sites	130	68.4
Twitter	24	12.6
Email	6	3.2
Forum	2	1.1
Online Games Site	22	11.6
Currently used communication channel (Tick all that apply)		
Instant Messaging	96	50.5%
Social Networking Sites	176	92.6%
Twitter	77	40.5%
Email	101	53.2%
Forum	19	10.0%
Online Games Site	99	52.1%

Note. F = frequency, %= percentage

TABLE 3
Means and Standard Deviations of Measures by Gender

Variable	Males		Females		t-value
	Mean	SD	Mean	SD	
Disclose toward boy	15.83	6.96	11.94	6.71	4.28***
Disclosed toward girl	14.84	6.64	17.06	5.49	-2.29*
Online communication	.12	3.41	-.27	2.76	.87
Psychological need satisfaction	36.21	11.53	35.83	10.29	.23

* $p < .05$. ** $p < .01$. *** $p < .001$.

Also noteworthy was that the relationship between online communication and same-sex disclosure (r = .13, p > .05) and opposite-sex disclosure (r = .12, p > .05) were essentially uncorrelated. On the other hand, analyses of the female sub-sample indicated that psychological need satisfaction was positively correlated with same-sex disclosure (r = .28, p < .01), opposite-sex disclosure (r = .30, p < .01) and online communication (r = .34, p < .01). Online communication was positively related to same-sex disclosure (r = .28, p < .01), but unrelated to opposite-sex disclosure (r = .18, p > .05). It is notable that same-sex disclosure was significantly and strongly correlated with opposite-sex disclosure across the male (r = .51, p < .001) and female sub-samples (r = .60, p < .001).

Determinants of Psychological Need Satisfaction

The data were finally analysed using hierarchical multiple regression analyses. As recorded in Table 5, the first of the analyses examined the main effects of online self-disclosure (same-sex and opposite-sex disclosure) and online communication on psychological need satisfaction for the male sub-sample. When looking solely at the

TABLE 4
Intercorrelation Matrix on Primary Variables for Male and Female Samples

Variable	1	2	3	4
1. Same sex disclosure	-	.60***	.28**	.28**
2. Opposite sex disclosure	.51***	-	.18	.30**
3. Communication	.13	.12	-	.34**
4. Need satisfaction	.29**	.41***	.24*	-

Note. Correlations above the diagonal are based on female sample (n = 96). Correlations below the diagonal are based on male sample (n = 94).
* p < .05. ** p < .01. *** p < .001.

TABLE 5
Online Self-Disclosure and Online Communication as Predictors of Psychological Need Satisfaction

Variable	Male Reports of Satisfaction				Female Reports of Satisfaction			
	β		R^2	ΔR^2	β		R^2	ΔR^2
	Step 1	Step 2			Step 1	Step 2		
Same-sex disclosure	.11*	. 11*	.21	.21	.19*	.19*	.18	.18
Opposite-sex disclosure	.32**	.32**			.10*	.10*		
Online communication	.23*	.24*			.28**	.28**		
Same-sex disclosure X Online communication		-.15	.21	.00		.00	.18	.00
Opposite-sex disclosure X Online communication		.06				.00		

Note. Regression coefficients are presented in standardized unit.
* p < .05. ** p < .01. *** p < .001.

main effects, the results showed that same-sex disclosure ($\beta = .11$, $p < .05$), opposite-sex disclosure ($\beta = .32$, $p < .01$) and online communication ($\beta = .23$, $p < .05$) emerged as statistically significant predictors of psychological need satisfaction. That is, male adolescents who reported higher levels of self-disclosure and who spent more time on communication were more likely to have higher psychological need satisfaction. Self-disclosure to opposite-sex friends may be more powerful than that of same-sex disclosure and online communication. The overall regression model F (3, 90) = 8.01, $p < .01$ was significant and 21% of the variance in psychological need satisfaction was accounted for. However, there was no incremental change in R^2 from step 1 to step 2, suggesting that the interaction effect did not account for a significant proportion of the variance of the criterion variable after controlling for main effects. In the analyses of the female sub-sample, the findings revealed significant effects of same-sex disclosure ($\beta = .19$, $p < .05$), opposite-sex disclosure ($\beta = .10$, $p < .05$) and online communication ($\beta = .28$, $p < .01$) on psychological need satisfaction. That is, female adolescents who reported more self-disclosure and more time spent on communication tended to report greater psychological need satisfaction. Online communication may be more powerful than that of same-sex disclosure and opposite-sex disclosure. Together, the combined predictors explained for 18% of the variance in psychological need satisfaction, F (3, 92) = 6.50, $p < .01$. Similar to the male sub-sample, no significant interaction effect and additional variance in psychological need satisfaction was found.

DISCUSSION AND CONCLUSION

Given that the use of CMC has dramatically increased across the globe, it is important to explore the benefits of socialising and making friends online (Nurullah, 2008; Lenhart *et al*., 2010). In this article, we attempt to fill the gap in the literature by investigating the extent to which online communication, online self-disclosure and psychological need satisfaction are related to each other. This study reported five major findings: (a) there was a significant difference between the genders in online self-disclosure. Both male and female adolescents tended to self-disclose more in same-sex rather than in opposite-sex interaction; (b) both same-sex and opposite-sex disclosure online were significantly correlated with psychological need satisfaction, that is, adolescents who reported higher levels of same-sex disclosure and opposite-sex disclosure were more likely to demonstrate higher levels of psychological need satisfaction; (c) online communication positively influenced psychological need satisfaction regardless of gender differences, that is, adolescents who spent a greater amount of time communicating online had higher psychological need satisfaction; (d) online communication was positively correlated with same-sex disclosure for adolescent girls, but not necessarily for boys, that is, female adolescents who spent more time communicating online reported

higher tendency to reveal information about themselves to same-sex friends; and (e) same-sex, opposite-sex disclosure, and online communication uniquely explained the variance in psychological need satisfaction. Opposite-sex disclosure was the strongest predictor of psychological need satisfaction for male adolescents whereas online communication was the strongest predictor of psychological need satisfaction for female adolescents.

As the theories claim, social relationships and contexts are necessary to meet psychological need satisfaction (Deci & Ryan, 1985; 2008; La Guardia *et al*., 2000). Given that technology evolves, individuals are more wired now than ever and ready to seek close relationships on the Internet (Bargh *et al*., 2002; McKenna *et al*., 2002). A great deal of literature documents that CMC has become a salient social phenomenon and the concept of being "always connected" has become an embedded feature of modern life (Walther, 1992; Walther & Parks, 2002). Individuals are always aware of their media use and proactive enough to meet psychological gratifications that they desire from CMC experiences (Papacharissi & Rubin, 2000). In support of this view, findings from the current study indicated that adolescents who not only spent more time on online communication, but who also self-disclosed more elicited more gratification through mediated communication. The possible explanation is that more personal information-sharing and time spent communicating foster genuine and intimate relationships and ultimately help to achieve psychological need satisfaction in online friendships (Bonetti *et al*., 2010; Schouten *et al*., 2007). Unfortunately, we are unable to test these potential explanations or whether the perception of "genuine and intimate relationships" mediates the aforementioned relationships. Future research in this area is warranted.

This study provided two major contributions to existing research. First, currently little research exists examining the association between online self-disclosure, online communication and psychological need satisfaction in a single published study. Second, none focuses specifically on psychological need satisfaction in the CMC context. These results provide initial evidence for the links between online communication, online self-disclosure and psychological need satisfaction by surveying a Malaysian sample. The study nevertheless has its limitations. Because we studied a relatively small number of students, our results may not be generalised to all adolescents who currently engage CMC. Small sample, sample bias, self-reporting nature and analyses that require more statistical power to administer were limitations in this study. Therefore, a more heterogeneous sample is called for in future research in order to run more powerful analyses.

Despite these limitations, the findings suggest that computer-mediated interactions may not be as negative as many assume. Surprisingly, today's younger generation tends to perceive CMC as a need-satisfier.

This is counter to public perception that often views CMC as putting people at risk of different types of victimisation. This is not to say that physical social relationships do not provide psychological need satisfaction to adolescents (Deci & Ryan, 1985, 2008), but only to highlight that these needs are achievable in virtual environments as well. In other words, psychological need satisfaction is of fundamental importance regardless whether it is achieved through offline or virtual means. If adolescents are satisfied with their psychological need in online relationships, then rationally, adolescents should have no reason to not engage in computer-mediated communication. Hence, the present study may shed some light on the popularity of social media.

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