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Abstract

The popularity of social networking sites (SNS) among adolescents has grown exponentially, with little accompanying research to understand the influences on adolescent engagement with this technology. The current study tested the validity of an extended theory of planned behaviour model (TPB), incorporating the additions of group norm and self-esteem influences, to predict frequent SNS use. Adolescents ($N = 160$) completed measures assessing the standard TPB constructs of attitude, subjective norm, perceived behavioural control (PBC), and intention, as well as group norm and self-esteem. One week later, participants reported their SNS use during the previous week. Support was found for the standard TPB variables of attitude and PBC, as well as group norm, in predicting intentions to use SNS frequently, with intention, in turn, predicting behaviour. These findings provide an understanding of the factors influencing frequent engagement in what is emerging as a primary tool for adolescent socialisation.

Keywords:

social networking sites; theory of planned behaviour; adolescents; group norm.

Predicting adolescents' use of social networking sites from an extended theory of planned behaviour perspective

Adolescents represent the largest and fastest growing demographic sector using the Internet, with the Internet becoming indispensable for instrumental purposes, such as schoolwork and information gathering, as well as for communication purposes (Greenfield, 2004; Subrahmanyam & Lin, 2007). Over the years, communication applications of the Internet, such as email, instant messaging, and blogging, have become well-established in the lives of adolescents, and the Internet has become an important social context for adolescent development (Lenhart, Madden, & Hatlin, 2005; Lenhart, Madden, Macgill, & Smith, 2007). More recently, however, online social networking sites (SNSs), such as MySpace and Facebook, which are web-based services that allow individuals to construct public or semi-public profiles, connect with other users, and view and traverse their list of connections and those made by others within the system have become common online destinations for adolescents (Boyd & Ellison, 2008; Lenhart & Madden, 2007). Although there are currently no reliable data regarding how many people use SNSs, marketing research indicates that SNSs are growing exponentially in popularity worldwide, with more than half of all online Australian adolescents identified as using SNSs (Boyd & Ellison; Comscore, 2007; Nielsen//Netratings, 2008).

Social networking sites

While there have been noted benefits associated with SNS use, including new opportunities for sociability and self-expression, there are also some concerns about its use, particularly frequent use (Lenhart & Madden, 2007; Livingstone, 2008). Specifically, reports indicate that some adolescents are spending up to three hours a day on SNSs, leading to reduced time for other activities, including academic, physical, and face-to-face social pursuits (Livingstone; Rapid Press Release, 2008; Sharif & Sargent, 2006; Vandewater, Shim,&

Caplovitz, 2004). Given the relatively recent introduction of this technology, however, there is currently limited research regarding the influences on adolescents' decision-making related to frequent engagement with this technology. One well-known model that has been used extensively to account for the complexity of influences in the behavioural decision-making process by identifying the important predictors of individuals' behaviour is the theory of planned behaviour (TPB; Ajzen, 1991). Thus, the purpose of the current study was to utilise the TPB to investigate adolescents' engagement in frequent SNS use.

The theory of planned behaviour

The TPB posits that individuals' intentions are the proximal determinants of their behaviour, with intention conceptualised to capture individuals' motivation to perform a given behaviour (Ajzen, 1991). Thus, the likelihood of engagement in the behaviour increases when individuals' intentions to perform the behaviour are stronger. According to the standard TPB model, intention is determined by three constructs: attitude, subjective norm, and perceived behavioural control (PBC). Attitude is conceptualised as referring to individuals' overall evaluations, either positive or negative, towards performing a given behaviour, and is posited to comprise affective (e.g., pleasant/unpleasant) and instrumental (e.g., easy/difficult) evaluations towards the behaviour. Subjective norm refers to individuals' perceptions of social pressure from important referents to perform or not to perform the behaviour. PBC refers to the amount of control individuals perceive they have over performing the behaviour. Thus, when people are confident in their ability to perform a behaviour, engaging in the behaviour is thought to be achievable which, in turn, increases their likelihood of forming a stronger behavioural intention (Ajzen & Madden, 1986). However, PBC is also posited to predict behaviour when individuals are accurate in assessing their skills, resources, and other prerequisites needed to perform the

behaviour. Thus, the TPB posits that attitude, subjective norm, and PBC indirectly predict behaviour mediated via intention, while intention and PBC directly predict behaviour.

The TPB has been applied extensively and successfully to the prediction of a variety of behaviours and in a range of populations, including some studies among adolescents (Davis, Ajzen, Saunders, & Williams, 2002; Hamilton & White, 2008), as well as some studies predicting communication technology-based behaviours (i.e., instant messaging; Yaobin, Zhou, & Wang, 2009). More recently, a study by Pelling and White (2009) used the TPB to investigate predictive factors of high-level SNS use among a sample of young people aged 17 to 24 years, with the standard variables of attitude and subjective norm significantly predicting intentions, and intentions, in turn, significantly predicting behaviour; however, to the best of our knowledge, this is the first study to utilise the TPB to investigate adolescents' engagement in frequent SNS use.

While there is strong overall support demonstrated for the efficacy of the TPB, a large proportion of the variance remains unexplained, with a meta-analysis by Armitage and Conner (2001) reporting that the standard TPB components accounted for 39% and 27% of the variance in intention and behaviour, respectively, across a broad range of behaviours. Further, numerous studies have found that the link between subjective norm and intention is generally weaker than the attitude-intention and PBC-intention links (Ajzen, 1991; Armitage & Conner). These findings have led to proposals for the inclusion of other variables in the model to improve its predictive ability (Terry & Hogg, 1996; White, Terry, & Hogg, 1994). According to Ajzen, the TPB is open to the inclusion of additional predictors as long as there is strong theoretical justification for their inclusion and they capture a significant portion of unique variance in intention or behaviour after the theory's standard variables have been taken into account. The utility of two constructs will be considered in the current study: group norm and self-esteem.

The role of group norms

While Fishbein and Ajzen (1975) contended that the relative importance of attitude, subjective norm, and PBC as predictors of intention will vary as a function of the specific population and behaviour under consideration, Ajzen (1991) proposed that the lack of consistent support for the subjective norm influence on behavioural intention indicates that individuals' intentions are influenced more by their attitudes and perceptions of control than by perceptions of social pressure from others. Alternatively, Terry and colleagues argued that the conceptualisation and measurement of the subjective norm construct is inadequate, with the limited focus on perceived social pressure from others ineffectively capturing the impact of social influence on behaviour (Terry & Hogg, 1996; Terry, Hogg, & White, 1999; White et al., 1994). Accordingly, they advocated that consideration of the effects of group membership, as outlined by social identity and self-categorisation theory perspectives, may provide a more comprehensive explanation of the role of social influence in predicting behavioural outcomes (Hogg & Abrams, 1988; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987).

Social identity theory purports that an important part of the self-concept is derived from individuals' memberships in social groups and categories (Hogg & Abrams, 1988; Tajfel & Turner, 1979). In an extension of this theory, self-categorisation theory proposes that when individuals define and evaluate themselves in terms of a self-inclusive social category, or ingroup, they construct context-specific explicit or implicit prescriptions concerning the appropriate attitudes and behaviours of ingroup members, which are referred to as group norms (Hogg, White, & Terry, 2002). Group norms are then seen to influence behavioural outcomes. Specifically, individuals seek to perceptually accentuate both differences between ingroup and outgroup members, as well as similarities among themselves and ingroup members, on stereotypic dimensions, thereby achieving categorisation as group members (Turner, 1985; Turner et al., 1987). Consequently, behavioural performance is more likely to occur when there is

normative support from the relevant ingroup for performing the behaviour than without this support (Terry & Hogg, 1996). Thus, rather than the effects of social influence conceptualised as being additive across all reference groups that individuals define as important to them, as with the subjective norm construct, group norm is conceptualised so that social influence is intrinsically tied to contextually salient membership in specific social groups, and affects behaviour because the group is behaviourally relevant (Johnston & White, 2003).

In empirical support for the inclusion of group norm in the TPB, Terry and Hogg (1996) found that group norm for friends and peers significantly improved predictions of university students' intentions to engage in frequent exercise, although this was only the case for individuals who identified strongly with the ingroup. Similarly, Johnston and White (2003) found that the group norm construct significantly improved predictions of university students' intentions to binge-drink; however, their results showed that this effect did not vary as a function of ingroup identification. More recently, a study by Mason and White (2008) found that inclusion of group norms relating to friends and peers increased the accuracy of predictions of young women's intentions to engage in frequent breast self-examinations. There appears, therefore, to be strong theoretical and empirical support for the inclusion of the group norm construct in the TPB. In the current study, the role of group norm in the decision-making process for engagement in frequent SNS use among adolescents was examined, and it was expected that adolescents who perceive frequent SNS use to be normative among their friends would have stronger intentions to engage in frequent SNS use themselves.

The impact of self-esteem

Another construct that has been investigated as a potential predictor of behavioural outcomes, particularly in relation to communication technology-based behaviours, is self-esteem (Ehrenberg, Juckes, White, & Walsh, 2008). According to Rosenberg (1989), self-esteem may be

conceptualised as referring to an overall positive or negative evaluation of the self. Given that memberships to social groups and categories comprise an important part of the self-concept, adolescents who enjoy positive peer relationships, such as quality friendships and peer group acceptance, also enjoy other indicators of well-being, including higher self-esteem (Harman, Hansen, Cochran, & Lindsey, 2005; Hartup & Stevens, 1997; Hogg & Abrams, 1988). Furthermore, while, in the past, adolescents' social interactions with their peers predominantly took place face-to-face, the introduction of various technology-based communication tools has heavily influenced the mode and frequency of these interactions (Ehrenberg et al., 2008). Thus, technology-based communication tools, particularly the recently introduced SNSs, provide a new social context for adolescents' social interactions with their friends and peers.

Several TPB studies have investigated the efficacy of the self-esteem construct in increasing the accuracy of behavioural outcome predictions. While some studies have reported that self-esteem did not significantly add to the predictive efficacy of the TPB (Conner, Martin, Silverdale, & Grogan, 1996), other studies have demonstrated support for the inclusion of self-esteem in the TPB (Bryan, Kagee, & Broaddus, 2006; Davis, Johnson, Cribbs, & Saunders, 2002; Wilkinson & Abraham, 2004). For example, Davis et al. (2002) investigated the additional influence of self-esteem on predictions of African American students' intentions to stay in school, with results indicating that self-esteem significantly increased predictions of students' behavioural intention.

While there appears to be some support for the inclusion of the self-esteem construct in the TPB for predicting a range of behaviours, other studies have sought to explore the influence of self-esteem more specifically in relation to predicting technology-based communication behaviours. For example, a study by Joinson (2004) investigated the relationship between self-esteem and university students' communication choices (i.e., face-to-face, email, letter, or

telephone), with results indicating that participants with lower self-esteem showed a stronger preference for email communication than those with higher self-esteem. Similarly, Ehrenberg et al. (2008) found that young people with lower self-esteem reported higher levels of instant messaging use than those with higher self-esteem. Further, Valkenburg, Peter, and Shouten (2006) found that 78% of adolescents reported always or predominantly receiving positive online feedback from other SNS users, and that positive feedback significantly enhanced self-esteem while negative feedback significantly decreased self-esteem. Based on these findings, it has been argued that adolescents with lower self-esteem may seek out and use communication applications of the Internet for socialising more than those with higher self-esteem because this provides them with predominantly positive social interactions that they may not experience in more conventional face-to-face social interactions (Bremer & Rauch, 1998; Harman et al., 2005). It could be argued, therefore, that adolescents with lower self-esteem are more likely to engage in frequent SNS use than those with higher self-esteem.

Alternatively, Bryant, Sanders-Jackson, and Smallwood (2006) reported that there is a co-construction between individuals' face-to-face and online lives, with participants identifying that they use SNSs primarily for socialising with people from their face-to-face lives. Similarly, a study by Lenhart and Madden (2007) found that 91% of adolescents who use SNSs reported using these sites to stay in touch with friends they see frequently. Thus, it could be argued that those adolescents who already have well-established face-to-face peer relationships, accompanied by the associated benefits of higher self-esteem, and who are predominantly using SNSs to further supplement these previously-established relationships, who are more likely to engage in frequent SNS use than adolescents who have weaker face-to-face peer relationships, with the associated lower self-esteem.

Given the relatively recent introduction of SNSs, however, there is currently a paucity of research investigating the influence of self-esteem on engagement in frequent SNS use. Further, there is mixed evidence supporting the influence of lower versus higher self-esteem on engagement in technology-based communication behaviours in general. Thus, while there may be a sound theoretical argument for the inclusion of self-esteem as a predictor of behavioural outcomes in the TPB, especially in the context of adolescents' technology-based communication behaviours, such as SNS use, further research is needed to support this proposal. The current study, therefore, explored the influence of adolescents' self-esteem on engagement in frequent SNS use.

The current study

Overall, the current study aimed to test the validity of an extended TPB model, incorporating group norm and self-esteem, for predicting adolescent engagement in frequent SNS use. From a TPB perspective, it was expected that attitude, subjective norm, and PBC would significantly predict adolescents' intentions to engage in frequent SNS use, and that intention and PBC would significantly predict behavioural performance. Further, it was expected that group norm would significantly add to the efficacy of the TPB in predicting adolescents' intentions to engage in frequent SNS use. Finally, the current study sought to explore the influence of self-esteem on adolescents' engagement in frequent SNS use.

Method

Participants

Two hundred and twenty-nine Year 9 and 10 Australian secondary school students consented to participate in the present study, with 69 of these students reporting that they did not use SNSs. The remaining 160 students (36% male, 64% female) aged 13 to 16 years ($M = 14.36$ years, $SD = 0.76$) completed the main questionnaire, while 139 of these participating students

also completed the follow-up questionnaire one week later (34% male, 66% female) aged 13 to 16 years ($M = 14.36$ years, $SD = 0.74$), representing a return rate of 87%. Responses from the main and follow-up questionnaires were unable to be matched for 21 students due to incomplete or incorrect use of code identifiers by these participants.

Design and procedure

The study used a prospective design, with two waves of data collection conducted one week apart. The first wave of data collection assessed the standard TPB variables (i.e., attitude, subjective norm, PBC, and intention) specified by Ajzen (1991), along with the additions of group norm and self-esteem. The second wave of data collection comprised a self-report measure of the number of days in the past week that participants engaged in SNS use at least twice a day, as measured at a 1-week follow-up.

The university ethics committee and relevant school educational authorities approved the study and, based on availability and convenience, selected schools were approached to participate in the study. Two independent (i.e., non-government) co-educational schools located in middle-class socio-economic areas agreed to provide their students with the opportunity to participate in the study within the project's allotted time-frame. While parental permission was required prior to student participation in one of the schools, the second school had a blanket consent policy in place, with the principal consenting to student participation on behalf of the parents. At both schools, completion of the questionnaires was considered students' consent to participate. In all cases, verbal and written instructions were given to all participants for both waves of data collection, and participants completed the questionnaires at their own pace and in selected class times. A code identifier was used to enable matching between the two waves of questionnaires and to maintain the confidentiality and anonymity of participants. Students who completed both

the main and follow-up questionnaires were eligible to enter a draw to win an iPod Shuffle at each school as a mechanism for thanking students for their time.

Measures

Target behaviour. The target behaviour, engagement in frequent SNS use, was operationalised as the number of days participants engaged in SNS use, for any purpose, at least twice a day. The target level of twice a day was based on previous research findings used by Microsoft Digital Advertising Solutions (2007), which reported an average of 2.4 visits to SNSs per user per usage day. Additionally, an elicitation study using a convenience sample was conducted, with 15 participants ($M = 15.2$ years, $SD = 1.51$) reporting an average of 2.1 visits to SNSs per user per usage day, confirming that socialising online at least twice a day reflects the study's target behaviour of frequent engagement in SNS use within the adolescent population. The target behaviour was framed in terms of the target, action, time, and context, as stipulated by Fishbein and Ajzen (1975; e.g., "Using social networking sites [e.g., MySpace, Facebook, etc.] at least twice a day in the next week is...").

Attitude. Attitude towards using SNSs at least twice a day in the next week was assessed using five 7-point semantic differential response scales (e.g., *unpleasant/pleasant*).

Subjective norm. Subjective norm was measured by two items using 7-point Likert scales (e.g., "Most people who are important to me would want me to socialise online [e.g., using MySpace, Facebook, etc.] at least twice a day in the next week"; 1 *strongly disagree* to 7 *strongly agree*).

PBC. PBC was assessed by four items using 7-point Likert scales (e.g., "I have complete control over whether I could socialise online [e.g., using MySpace, Facebook, etc.] at least twice a day in the next week"; 1 *strongly disagree* to 7 *strongly agree*).

Intention. Three items were used to measure intention with responses recorded on 7-point Likert scales (e.g., “I intend to socialise online [e.g., using MySpace, Facebook, etc.] at least twice a day in the next week”; 1 *strongly disagree* to 7 *strongly agree*).

Group norm. Based on Terry and Hogg (1996), group norm was measured by four items using 7-point Likert scales (e.g., “Most of my friends will socialise online [e.g., using MySpace, Facebook, etc.] at least twice a day in the next week”; 1 *strongly disagree* to 7 *strongly agree*).

Self-esteem. Ten items comprising the Rosenberg Self-Esteem Scale assessed self-esteem (Rosenberg, 1989; e.g., “I feel that I have a number of good qualities.”) Items were rated on 4-point Likert scales ranging from 1 *strongly disagree* to 4 *strongly agree*.

Reported behaviour. One week after completion of the main questionnaire, participants indicated the number of days they had used SNSs at least twice a day in the intervening week (i.e., “Think about the past week. How many days did you socialise online [e.g., using MySpace, Facebook, etc.] at least twice per day?”; 0 [*0 days*] to 7 [*7 days*]).

Results

Descriptive statistics

The means, standard deviations, bivariate correlations, and reliabilities of the standard TPB and additional variables are reported in Table 1. All standard TPB predictors were significantly moderately correlated with intention and reported behaviour, except for the correlation between PBC and reported behaviour. All scales possessed at least moderate reliability. The average number of days per week that participants reported using SNSs to socialise online at least twice a day was 2.84 ($SD = 2.35$). Analysis of the distribution of reported engagement in SNS use indicated that 10.1% of participants self-reported engaging in SNS use at least twice a day for all seven days in the previous week, 10.1% engaged in SNS use for six of the days, 4.3% engaged in SNS use for five of the days, 11.5% engaged in SNS use for four of

the days, 15.8% engaged in SNS use for three of the days, 14.4% engaged in SNS use for two of the days, 9.4% engaged in SNS use for one of the days, and 24.5% reported that there were no days in the previous week where they engaged in SNS use at least twice a day.

Insert Table 1 about here

Regression analysis predicting intention

A hierarchical multiple regression analysis was conducted to examine the proposed predictors of intention to engage in SNS use at least twice per day. The standard TPB variables comprising attitude, subjective norm, and PBC were entered at Step 1, with group norm and self-esteem entered at Step 2. The Step 1 variables accounted for 35% of the variance in intention, $F(3, 154) = 27.29, p < .001$. The Step 2 variables accounted for an additional, significant 10% of the variance in intention, $F(2, 152) = 14.51, p < .001$. When all variables were entered into the equation, the significant predictors were attitude, PBC, and group norm (see Table 2). The regression analysis was conducted also including demographic variables (age and sex) which, when added to the analyses, were not significant and produced the same pattern of results for the standard TPB and additional variables.

Insert Table 2 about here

Regression analysis predicting reported behaviour

An additional hierarchical regression analysis was conducted to explore the effect of intention and PBC on a self-report measure of the number of days in the past week that participants engaged in SNS use at least twice a day (see Table 3). Intention and PBC were

entered at Step 1 with attitude, subjective norm, group norm, and self-esteem entered at Step 2. The Step 1 variables significantly accounted for 45% of the variance in behaviour, $F(2, 135) = 54.44, p < .001$, while the inclusion of additional variables at Step 2 did not significantly add to the model, $F(4, 131) = 1.62, p = .17$. When all variables were entered into the equation, the only significant predictor was intention. The regression analysis was conducted also including demographic variables (age and sex) which, when added to the analyses, were not significant and produced the same pattern of results for the standard TPB and additional variables.

Insert Table 3 about here

Discussion

The current study tested the validity of an extended TPB model, incorporating group norm, for predicting adolescent engagement in frequent SNS use. The study also explored the influence of self-esteem on adolescents' engagement in frequent SNS use. Overall, the results of the study provided partial support for the standard TPB model in that attitude and PBC significantly predicted adolescents' intentions to engage in frequent SNS use, while intention significantly predicted reported SNS use. The results also supported the inclusion of group norm as a significant predictor of adolescents' intentions to engage in frequent SNS use. Self-esteem, however, did not emerge as a significant predictor of behavioural intentions. These findings suggest that adolescents who have more favourable attitudes towards engaging in frequent SNS use, more confidence in their ability to access and utilise SNSs, and believe that frequent SNS use is normative among their friendship group will have stronger intentions to engage in frequent SNS use. Further, adolescents who had stronger intentions to engage in frequent SNS use were more likely to act in accordance with their intentions to do so.

The results of the present study provide partial support for the efficacy of the TPB in predicting adolescent engagement in frequent SNS use. Specifically, the TPB variables explained 35% of the variance in predicting adolescents' intentions to use SNSs frequently, with attitude and PBC emerging as the significant predictors once all of the variables were entered into the regression equation.. The TPB variables of intention and PBC explained 45% of the variance in behaviour, with strong intentions to engage in frequent SNS use significantly predicting self-reported SNS use at a 1-week follow-up. This general support for the TPB is consistent with previous meta-analytic findings (Armitage & Conner, 2001). It should be noted, however, that subjective norm did not predict intentions (once group norm was entered into the regression equation), a finding that is not inconsistent with many previous TPB studies (see Armitage & Conner) and provides support for considering other conceptualisations of social influence, including group norm, in the model. In addition, PBC did not predict behaviour, a similar pattern of results to other TPB studies using an adolescent sample (Hamilton & White, 2008). According to Ajzen (1991), the strength of PBC in directly determining behaviour is dependent on perceptions of control being reflective of actual control and, given the extant literature on "illusions of control" (Langer, 1975) specifically as applied to Internet use (e.g., Matute, Vadillo, Vegas, & Blanco, 2007), it is unlikely that PBC will reflect actual control accurately.

The results of the current study also revealed that group norm significantly predicted behavioural intention. Specifically, inclusion of the group norm construct explained an additional 10% of the variance in intention over and above the standard TPB predictors. Consistent with a social identity theory approach, these findings suggest that adolescents' intentions to engage in frequent SNS use are likely to be greater when they perceive the behaviour to be normative among their friendship group, and are consistent with previous research supporting the role of group norm in determining behavioural intention (Hogg & Abrams, 1988; Johnston & White,

2003; Mason & White, 2008). It should be noted that when group norm was included in the model, subjective norm no longer emerged as a significant predictor of behavioural intention, a finding suggesting that the group norm construct may provide a more comprehensive explanation of the role of social influence in predicting behavioural intention than subjective norm (Terry & Hogg, 1996; Terry et al., 1999). These findings indicate that adolescents are influenced more by what they perceive their friends to be doing and generally approving of than what they believe significant others, such as their parents and teachers, think they should be doing. While this finding is consistent with previous research on adolescent development, it also has important implications for future development of appropriate policies to oversee appropriate SNS use among this population (Savin-William & Berndt, 1990; Waldrip, 2008).

Self-esteem did not emerge as a significant predictor of behavioural outcomes regarding adolescents' engagement in frequent SNS use; however, these results are not inconsistent with the mixed findings for the role of self-esteem on behavioural outcomes, both in TPB research in general (Bryan et al., 2006; Conner et al., 1996;) and in communication technology literature specifically (Ehrenberg et al., 2008; Lenhart & Madden, 2007). For instance, while some studies have shown that adolescents with lower self-esteem tend to seek out computer-mediated social interactions with others more than those with higher self-esteem (Ehrenberg et al., 2008; Joinson, 2004; Steinfield et al., 2008), others have reported that adolescents with higher self-esteem are more likely to engage in frequent SNS use to maintain and manage their already-established face-to-face social relationships (Lenhart & Madden, 2007). Further investigation is needed, therefore, to explore the impact of self-esteem on behavioural outcomes in this context, including the possibility that there may be indirect effects of self-esteem on behaviour mediated via the other constructs of the TPB model.

Overall, the results of the present research provide support for the efficacy of an extended TPB model, incorporating group norm, for predicting adolescent engagement in frequent SNS use. Support for the inclusion of the group norm construct suggests it is important to take into account adolescents' perceptions of what their friends are doing and the behaviours that they endorse. Also, while there is extensive research supporting the efficacy of the TPB in predicting a range of behaviours among adults, the current study adds to the smaller amount of research examining adolescents' intentions and behaviour, providing further evidence in support of the applicability and efficacy of the TPB among a broader range of age groups.

The findings of this study suggest that efforts to maintain or encourage frequent SNS use (e.g., by service providers or other agencies) may benefit from advocating the advantages associated with frequent use (e.g., increased contact and links between friends), increasing adolescents' perceptions of normative approval and frequency of peer engagement in SNS use, and encouraging adolescents to believe that it is within their control to frequently access and utilise these sites. Conversely, in efforts to limit or reduce frequent SNS use (e.g., by educational providers or parenting groups), highlighting the disadvantages for adolescents associated with frequent use (e.g., reduced time for partaking in extracurricular activities), encouraging the perception that the norm of use among peers is lower than they might expect, and introducing barriers (e.g., time-limited access or penalties for use) to create a perception of less control over frequent use will be effective.

Although this study is one of only a handful to date that has investigated the influences associated with the new and rapidly growing phenomenon of SNS use among adolescents and, to the best of our knowledge, one of the first to examine the predictors of adolescent engagement in frequent SNS use, the current study has a number of limitations that should also be noted. First, the study's sample consisted of students from two high school year levels only and the current

findings should be applied to a broader range of adolescents to confirm the model's utility.

Second, all participants were from independent schools and, therefore, it may be useful to further investigate adolescent engagement in frequent SNS use among students from different types of school environments, especially to broaden the socio-economic status range. Further, the target behaviour was worded in relation to at least 2 visits per day but there may be better metrics of frequent use including number of hours spent (especially uninterrupted) engaging with the technology. In addition, this study did not make a distinction between early engagers with the technology and those more recently initiated as there may be a difference in the predictors of use for users in each category. Finally, despite the benefit of employing a prospective design to disentangle the measurement of the predictors of behaviour from assessing behaviour itself, the reliance on a self-reported measure of behaviour is a limitation of the study and future research should consider other, potentially more reliable means of measurement, such as unobtrusive computer monitored SNS use.

Overall, the present research demonstrated some support for the application of the TPB model in the context of predicting adolescent engagement in frequent SNS use. The current study also provided support for incorporating group norm into the TPB model to improve the model's predictive ability. There was, however, no support demonstrated for the inclusion of self-esteem as a predictor of adolescents' behavioural outcomes related to frequent SNS use in this study. Based on this preliminary investigation, future research should continue to identify the determinants of engagement in frequent SNS use among adolescents to further our current understanding of this new and growing communication phenomenon and to aid in the development of appropriate strategies and policies to inform its appropriate use.

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Table 1

Means, Standard Deviations, Bivariate Correlations, and Reliabilities for Attitude, Subjective Norm, PBC, Intention, Group Norm, Self-Esteem, and Reported Behaviour

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Attitude	4.73	1.28	(.87)	.47***	.26**	.51***	.43***	.00	.44***
2. Subjective norm	4.28	1.42		(.52***)	.25**	.47***	.61***	-.05	.34***
3. PBC	5.35	1.32			(.80)	.29***	.24**	-.18*	.16
4. Intention	3.53	1.69				(.94)	.59***	.11	.66***
5. Group norm	4.58	1.33					(.85)	.09	.37***
6. Self-esteem	2.12	0.54						(.87)	.17
7. Reported behaviour	2.84	2.35							-

Note. Mean scores in the current study are based on 7-point scales (1-7), except for self-esteem (1-4) and reported behaviour (0-7). The figures in parentheses on the diagonal are alpha coefficients. For subjective norm, which was measured with two items, Pearson's *r* and the associated significance is reported.

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

Table 2

Hierarchical Multiple Regression Analysis Predicting Intention

Step and variable	<i>B</i>	<i>SE</i>	β	<i>R</i> ²
Step 1				.35***
Attitude	.45	.10	.34***	
Subjective norm	.33	.09	.28***	
PBC	.19	.09	.14*	
Step 2				.45***
Attitude	.36	.09	.27***	
Subjective norm	.10	.10	.08	
PBC	.17	.08	.13*	
Group norm	.49	.10	.38***	
Self-esteem	.32	.19	.10	

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

Table 3

Hierarchical Multiple Regression Analysis Predicting Reported Behaviour

Step and variable	<i>B</i>	<i>SE</i>	β	<i>R</i> ²
Step 1				.45***
Intention	.92	.09	.68***	
PBC	-.09	.12	-.05	
Step 2				.47
Intention	.84	.12	.62***	
PBC	-.07	.12	-.04	
Attitude	.27	.14	.15	
Subjective norm	.02	.15	.01	
Group norm	-.10	.16	-.06	
Self-esteem	.47	.28	.11	

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