

Cybersex and Addiction: A Quantitative Examination of the Use of Mxit Among Adolescents  
in South Africa

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### **Abstract**

A growing body of research focuses on Internet addiction, specifically with regard to the association between Internet addiction and cybersexual engagements. Research has focused on adults who access the Internet from desktop computers. The present study sought to expand the literature by examining Internet addiction and cybersexual engagements in adolescents who access the Internet via the popular mobile-phone application, Mxit. I administered a 30-item survey to a 152 Grade 8 and 9 respondents, from a range of socioeconomic (SES) backgrounds. Data analysis focused on developing a demographic profile of those who might be classified as addicted and on measuring the strength of the association between Mxit addiction and cybersexual engagements. Results showed that individual's from low SES backgrounds who had used the technology for more than 2 years, and whose current use totalled more than 4 hours per day were most susceptible to Mxit addiction. Further, the data showed a strong positive relationship between compulsive Mxit use and the tendency to engage in cybersexual engagements. These findings are discussed in light of the implications of these new ways of engaging among South African adolescents.

## **Introduction**

Adolescence is an important life stage for psychosocial development, particularly in the spheres identity and sexuality. These aspects of the self are often negotiated in the relationships adolescents have with their peers and within wider social networks. Across the globe, and particularly in the developed-world countries, adolescents are increasingly resorting to the virtual world to interact and socialize with peers (Subrahmanyam, Smahel, & Greenfield, 2006). This new and popular way of relating through virtual mediums such as the Internet has sparked concern in the media and the public, and has been the centre of academic debate. In the psychological literature, a large body of work has examined the negative effects of heavy Internet usage on psychosocial development and functioning. Of particular concern in this literature is the perceived relationship between sex on the Internet and Internet addiction. For instance, a syndrome titled “Hypersexual Disorder” is being proposed as a new diagnostic category in the fifth edition of the American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders (DSM-V). A proposed subtype of this diagnostic category describes the compulsive engagement in ‘cybersex’, or sexual activity on the Internet (Kafka, 2010).

Little research on excessive Internet use and its implication has been conducted in the developing world. Further, although adolescents in both the developing- and developed-world countries engage socially through virtual mediums, little is known about adolescent activities on these mediums, and the implications of prolonged or excessive use by these individuals.

### **Internet Addiction: The Current State of Affairs**

An increased focus on Internet sexuality in its various forms has emerged within the broader area of ‘Internet addiction’. Although no consensus has been reached as to a standard definition of Internet addiction, researchers often agree that it might be defined as a behavioural addiction of an individual to the Internet (Griffiths, 2001). This definition of Internet addiction, as well as the criteria for classifying it as a pathology, is often adapted from criteria for pathological gambling contained in the text revision of the fourth edition of the DSM (DSM-IV-TR, American Psychiatric Association, 2000). By making use of this model of pathology, IA is viewed as a disorder of impulse-control in the absence of an intoxicating substance (Young, 1998).

In the psychological assessment of Internet addiction broadly, or of Internet sexual addiction more specifically, researchers have drawn on the factors associated with DSM-type

addiction criteria (Chou, Condrón, & Belland, 2005). Although these criteria are often adapted for particular research/clinical assessment purposes, a number of constructs are common to many Internet addiction measures. These constructs are: salience; neglect of social life and productivity; reduced self-control; anticipation or preoccupation; and escapism and excessive use.

*Salience* refers to the importance of the behaviour in the individual's life and daily activities. For example, Internet sexual activity may become the most important activity in which an individual engages. The activity becomes a dominant force in the individual's life. This dominance manifests cognitively, in the form of preoccupation and fantasy, as well as emotively, in that individual begins to 'crave' the feelings evoked by the activity. As a result, the salience of the activity begins to take effect behaviourally such that the individual may deteriorate socially. Thus the behaviour interferes with real-world functioning, and the addicted individual may neglect his/her social activities or responsibilities (Griffiths, 2001).

*Reduced social activity* is often a consequence of the excessive amounts of time spent online, but the concept of *reduced self-control* demonstrates the potential pervasiveness of the online activity. Individuals feel compelled to be online. This compulsion is particularly evident in individuals who engage in *online sexual activity* (OSA). The sexual gratification of sexual engagements online becomes associated with pleasure, either in the form of escapism or masturbation (Delmonico & Carnes, 1999). The subjective experience of the individual, in the form of psychological escape and pleasure, can lead to *excessive use* or 'tolerance', that is increasing amounts of usage are needed to obtain these desired experiences (Griffiths, 2001). For example, individuals who become sexually aroused in a sex chatroom may find themselves chatting for longer and being preoccupied with their next chatting experience in order to continue to be aroused.

### **Cybering**

Although 'cybersex' has become a fairly widely used term in the mainstream media, the term 'cybering' tends to be more frequently used in the research literature on Internet addiction. *Cybering*, in this context, is defined as two or more individuals engaging in simultaneous, real-time, sexual or erotic conversations with use of an online medium (e.g., chatrooms, instant messaging, and newer forms of mobile-phone-based applications). These activities are often engaged in for sexual gratification or for mutual online masturbation (Daneback, Cooper, & Månsson, 2005). Typically, individuals who engage in cybering are strangers to one another who meet online with the purpose of gaining sexual gratification

from the online experience (Griffiths, 2001). Thus, cybering can be conceptualized as a specific form of online sexual activity.

In light of the addiction criteria described previously, which are equally applicable to online sexual activity, cybering in relational mediums such as chatrooms (Carvalheira & Gomes, 2003) and or instant messaging platforms (Huang & Leung, 2009) has been found to be the most prominent in eliciting behaviour associated with the described criteria. That is to say that addicted individuals tend to engage in cybering for excessive amounts of time (Daneback, Ross, & Månsson, 2006), become preoccupied with the activity, and most become compulsive in their use (e.g., Caplan, 2002).

### **Theoretical Understandings of Cybersexual Addiction**

The literature describing theoretical frameworks that attempt to advance understanding of Internet sexual addiction is fairly limited. An influential and often-cited model is the ‘triple A engine’. This model proposes that the addictive quality of sexual engagements on the Internet is due to three primary factors: accessibility, affordability, and anonymity (Cooper, Griffin-Shelley, Delmonico, & Mathy, 2001).

In the context of the ‘triple A engine’, *accessibility* refers to the ease with which individuals can connect to the Internet, as well as the individual’s ability to find what he/she is looking for. *Affordability* refers to the minimal economic burden of the Internet in relation to the abundance of particularly sexual services and transactions that may be found in the individual’s environment. Lastly, *anonymity* refers to the belief that one can safely conceal one’s real-world identity in online relations.

A variation on the triple A engine model, is the ACE model, which states that anonymity, convenience and escape are the three primary factors associated with online sexual compulsion (Young, Pistner, O’Mara, & Buchanan, 1999). Anonymity is not surprisingly, a factor common to both models. It has a powerful effect on individual Internet-based sexual relations. A number of studies exploring sexual relations in chatrooms have discovered that anonymity is a major mediating force, and is the key factor in the appeal of online sexual relations in contrast to real-world encounters (see e.g., Carvalheira & Gomes, 2003). Anonymity is proposed to allow for greater control over the sexual experience and for the exploration of sexual fantasies without fear or prejudice (Griffiths, 2001).

Anonymity is also a major factor in the proposed *online disinhibition effect*, which describes how individuals experience an online sense of dissociation in a number of ways. For example, individuals may engage in a number of behaviours that would not ordinarily

occur in their offline reality. The online self and actions become compartmentalized and separate from the offline self. This separation allows individuals to engage in role-play and the construction of 'online identities'. These online identities may be created freely as the physical self is essentially invisible online and all communication can be text-based (Suler, 2004).

### **The Two Conflicting Views of Cybering**

The dominant view of cybering is largely negative, such that many studies have associated heavy Internet use with compulsive cybering activity. For example, Meerkerk, Van Den Eijnden, and Garretsen (2006) found a positive correlation between compulsive Internet use and using the Internet for sexual gratification.

The conceptual link between addiction and cybersexual engagements has been explored within research, which has demonstrated that cybersexual engagements leads to extended periods of time online, and that it is, thus indicative of addiction. Further, studies conducted by Cooper, Scherer, Boies, and Gordon, (1999) demonstrated that frequent cybersexual engagements led to 70% of participants hiding their online use, and to interference with their offline functioning. Consequently, a large body of research has attributed cybersexual engagements to either excessive use or to an impairment in offline functioning, (Carvalheira & Gomes, 2003; Huang & Leung, 2009) as individuals are constantly pre-occupied with their next cybersexual engagement. This preoccupation subsequently results in lower scores on measures of general well-being (Caplan, 2002).

In contrast, the second view of cybering that is encapsulated within the body of research conducted on the potentially positive effects of online sexual engagements is limited in comparison to the work on the addictive qualities of cybering. A study exploring cybering in Portuguese chatrooms, using a self-report questionnaire, found that individual chatters reported a sense of safety in their sexual expression and were comfortable in sharing sexual fantasies (Carvalheira & Gomes, 2003). This disinhibition effect may lead to individuals expressing themselves more freely in the online space than they might in the offline environment (Suler, 2004).

As a result, many marginalized individuals who feel discriminated against because of their sexual orientation or behaviours turn to the Internet. For instance, a study conducted on Australian same-sex attracted youth, ages 14-21 ( $N = 749$ ), found sexual relations online to be positive (Hillier & Harrison, 2007). The authors argued that cybering was empowering for homosexual adolescents, as it provided a safe environment in which they could explore their

sexualities. The implication here is that same-sex attraction may be practiced freely and without ridicule online before adolescents identify themselves to the outside world as homosexual. In other words, the Internet provides a space where sexual identity can be practiced before real-world decisions are made.

The research reviewed above highlights the importance of online relational mediums in identity development and the exploration of sexuality. The ability to explore these aspects of the self in a relatively safe environment, may explain the increased use of online mediums among adolescents.

### **Cybering and Increased Concern for the Youth**

In recent years, an increasing number of studies of Internet-addicted behaviour have focused on adolescents. The lack of parental control and the accessibility adolescents have to unknown individuals and to online sexual activity has spurred a growing interest in this particular research area (van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008). Furthermore, adolescents are a particularly interesting group to study because (a) they represent a substantial portion, (up to 30% by some estimates) of Internet users (Milani, Osualdella, & Di Blasio, 2009) and (b) investigators have found a negative association between age and compulsive Internet use, with younger users apparently more prone to developing compulsive online behaviours (Meerkerk, Van Den Eijnden, & Garretsen, 2006). Of particular concern here is that adolescents appear to be attracted to the relational aspects of Internet use, in particular instant messaging and chatrooms (van den Eijnden et al., 2008; Huang & Leung, 2009). Adolescents' use of the Internet for social networking purposes extends to engagements in online sexual interactions. For instance, 53% of the respondents in the Portuguese study on cybersex in chatrooms were between the ages of 15 and 24 years (Carvalho & Gomes, 2003).

The prominence of adolescent online sexual activity may be attributed to the developmental stage in which many of these young adults find themselves. Adolescence is an important time for developing stable identities, not the least of which is sexual identity (Erickson, 1958 cited in Subrahmanyam et al., 2006). Because Internet-based relational mediums such as chatrooms are anonymous, adolescents experience greater freedom in exploring their identities and sexuality online than offline. A qualitative study conducted on experienced Internet users between the ages 12 and 22 years, demonstrated that a number of users had described their first sexual experience as being virtual or online. Other users stated that the Internet was a place to experiment with gender and sexual identity, as it allowed for

these aspects of the self to be transformed and changed with ease within the online relational medium (Smahel, 2003 cited in Subrahmanyam et al., 2006).

### **Applicability of Current Theoretical Understanding to the South African Context**

Most research examining cybersexual relationships and Internet addiction has been conducted in predominantly developed countries such as the United States of America. Although a large body of work has originated outside of Western countries (e.g., the studies conducted in Asia, such as those by Huang & Leung, 2009; Ni, Yan, Chen, & Liu, 2009), little or no work has been done in the developing world or in relatively resource-poor countries, such as South Africa.

A vast number of South Africans have no access to computer-based Internet. As a substitute, mobile-phone technology is used to stay connected. Studies demonstrate that the Internet is accessed more from mobile handsets in South Africa than from fixed line-based computers (Donner & Gitau, 2009). The extensiveness of mobile-phone use throughout the South African population is due to the limited infrastructure and relatively high cost of fixed lines (Hodge, 2005).

Advancements in mobile technology have also allowed for mobile applications such as Mxit to become popular with South African adolescents. Mxit, a mobile-phone based application that allows for instant messaging, has become highly popular amongst South African youth (Bosch, 2008). The technology's popularity is attributed largely to its convenience, the fact that it is not limited to any particular mobile-phone network, and that it allows for adolescents to communicate with friends and meet new individuals in real-time communication (W. Chigona, A. Chigona, Ngqokelela, & Mpofu, 2009). Further, Mxit has a high adoption rate among South African adolescents as it allows for cheap and rapid communication. The application costs a minimal fee to be downloaded from any mobile-phone that allows for Internet access. For example, to send instant messages on Mxit is more affordable than communicating with Syntax Message Systems (SMS). Unlike sending a SMS, Mxit is charged based on the data that is transferred (W. Chigona et al., 2009; Donner & Gitau, 2009).

Psychological research into technologies such as Mxit is limited, however; most often research into this kind of technology focuses on perceptions surrounding the technology itself, the demographic profile of its users, and how it may be used educationally. Mxit has been found to be increasingly more popular among low and middle-income South African youth, and is viewed by many users as not only a mobile system but as a part of young



people's lives. Many of these users tend to utilize their mobile Internet for self-expression, through social networking sites such as Mxit, rather than for utility-based purposes such as information searching or email (Donner & Gitau, 2009)

The salience of the technology in young people's daily lives has brought Mxit under scrutiny, particularly among non-users such as parents whose scepticism is fuelled by the media with reports of Mxit addiction and sexual deviance among adolescents (Gounden, 2008). These non-users of Mxit therefore tend to perceive Mxit as not only dangerously addictive, but also encouraging antisocial behaviour offline (W. Chigona et al., 2009).

The findings of the studies conducted in South Africa emphasize the need for further research, particularly within the unique framework of resource-limited countries. As mobile-phone technology has become increasingly popular among adolescents, gaps in the current research should be examined from a psychological perspective to understand Mxit's potentially addictive qualities and the behaviours occurring among adolescents on Mxit. These gaps in knowledge can relate particularly to the potentially positive or negative implications of a technology such as Mxit, which is more accessible and affordable than computer-based Internet and whose use is dominated by the youth population.

### **The Present Study**

The current study sought to address the gaps in current knowledge about Mxit as a potentially addictive application for adolescent users. A number of claims have been made in the media amidst the widespread interest in the potentially negative factors associated with its use, yet empirical investigations into the factors associated with Mxit's popularity are limited. Further, little is known about the potential negative and positive effects of compulsive or excessive Mxit usage.

As this research was the first of its kind in South Africa and the first to examine Mxit use from a psychological perspective it had both descriptive and explanatory aims. Firstly the research aimed to examine the demographic profile of Mxit users, with particular attention to those individuals who present with what may be defined as addictive usage. Secondly, I aimed to explore South African adolescent usage of Mxit within the framework of previous studies; that is to say, I investigated, in Mxit users, the association between addiction and relational aspects of communication (and particularly sexual relations in the form of cybering).

Those two general aims may be stated in these more specific terms:

1. I set out to determine what percentage of Mxit users may be classified as addicted to the application, with addiction being defined according to the criteria outlined above. So those users who exhibited high or frequent use of the technology, and who demonstrated salience of Mxit in their daily lives, and reduced social activity as a result of their compulsive Mxit usage, would be classified as addicted to the application.
2. I set out to describe the demographic profile of users who might be more susceptible to addictive or compulsive use.
3. I set out to determine if there is an association between Mxit addiction and adolescents engaging in cybersexual activity on Mxit.
4. I set out to explore which of the factors, associated with cybersexual relationships, are predictive of addiction among adolescent users. For example, which of the factors associated with compulsive cybersexual engagements, such as anonymity, are predictive of compulsive Mxit use.

## **Methods**

### **Research Design and Setting**

The proposed study was largely exploratory in nature and adopted a quantitative survey-based approach. As the study was exploratory, the survey method allowed for a number of factors such as age, socioeconomic status (SES), and various addiction factors to be explored. Further, the sensitive nature of studying sexual behaviour makes survey methods popular, as it allows respondents an increased sense of anonymity and thus often leads to more truthful responses (Babbie, 2001). Previous research in this field has predominantly made use of survey methods (Döring, 2009).

The dependent variables that were measured were the level of Mxit addiction and level of cybersexual engagement. The factors that were examined in relation to these variables have been selected in accordance to previous research. The initial factors examined with relation to addiction were salience, neglect of social life, reduced self-control, anticipation or preoccupation, escapism, and excessive use. The factors examined with relation to cybering were anonymity and wearing masks, lack of social skills and a preference for cybersex.

### **Participants**

A stratified sampling method was utilized, such that schools in the Cape Town area were stratified according to SES. The classification of schools into high, medium or low SES brackets was based on the school's annual fees and the number of facilities offered to pupils.

Specifically, schools classified as high SES were private schools that had annual school fees over R30 000 per annum and that had a wide variety of facilities to offer pupils (e.g., five or more computer and science lab facilities as well as sporting facilities). Schools classified as middle SES had annual school fees between R10 000 and R30 000, and two or more computer and science lab facilities, as well as sporting facilities. Lastly, schools classified as low SES had annual school fees below R10 000 and has no more than two computer or science lab facilities to offer pupils. Only English-medium schools were included in the sampling frame because the survey instrument was developed in English and

there were concerns about maintaining its validity<sup>1</sup>. The Western Cape Education Board website was used to retrieve the details of various schools in the Cape Town area, and a list of schools that matched the criteria outlined above was generated randomly.

The sampling frame was also stratified according to age: only learners in Grade 8 and 9 were included in the study, as the majority of Mxit users are in high school (Bosch, 2008). Further, early adolescence has been identified as a crucial time for identity development; it is during this phase of development that adolescents explore their identity and their sexuality (Subrahmanyam et al., 2006). Thus, it is important to investigate whether young adolescents engage frequently within a medium such as Mxit, which allows for identities to be constantly re-shaped.

Although the target sample size was 350 Grade 8 and 9 learners, the final sample size fell somewhat short of that number primarily because potential participants did not obtain parental consent to participate. Table 1 shows the demographic profile of the final sample ( $N = 152$ ).

Table 1.  
*Demographic Characteristics of Respondents.*

Variable	Total Sample	Socioeconomic Status		
		High SES	Low SES	Middle SES
	( $N = 152$ )	( $n = 87$ )	( $n = 31$ )	( $n = 34$ )
Age	14.3 (.77)	14.4	14.3	14.2
*Education	8.52 (.5)	8.6	8.4	8.4
Sex (M:F)	77 : 72	37 : 48	6 : 24	34 : 0
Race (W : B : C : I : O)	104 : 27 : 13 : 5 : 1	78 : 0 : 6 : 1 : 1	0 : 27 : 3 : 0 : 0	26 : 0 : 4 : 4 : 0

\*Number of completed years of schooling

## Materials

As the proposed study was novel in its aims, there was no pre-established measure that could be used. Thus, I devised a new measure: a 30-item questionnaire divided into three sections, with sections 2 and 3 making use of a 5-point Likert-type format (see Appendix A). Previous literature demonstrates that the Likert format is common when exploring cybersexual behaviour. Further, the measure included two reverse-scored items to detect participants using response sets (Finchilescu, 2002).

<sup>1</sup> Because this was the first study in this research programme, and because I was operating in a time- and resource-limited context, equivalent surveys were not developed in other languages, and English-language surveys would not have been suitable to administer to non-English speaking pupils.

The first section of the questionnaire pertained to the respondents' demographic information and their general Mxit use. The second section of the questionnaire (questions 6-14) is modified version of the Internet-Related Problem Scale (IRPS; Young, 1998) and the Internet Addiction Test (IAT; Armstrong, Phillips & Saling, 2000). This section provides an abbreviated version of an addiction subscale, to assess if respondents score highly on addictive factors associated with Mxit. Respondents were required to respond to each statement on a 5-point Likert-type scale; thus the possible range of scores is 8-40, where higher scores indicate more addictive use of the Mxit application.

The third section of the survey (questions 15-30) was adapted from the measure used by Carvalheira & Gomes, (2003) in their study assessing cybering behaviour among individuals in a Portuguese chatroom. The three major factors associated with cybering behaviour are, lack of social skills, anonymity and the ability to 'wear masks', and a preference for cybersex. The questions used to assess these factors were adapted and applied to adolescent cybersexual engagements on Mxit. Thus, the third section of the survey examines the presence of adolescent relationships on Mxit, and asks about whether these are cybersexual in nature. Once again, a 5-point Likert-type format was utilized; this time the possible range of scores varied from 12-60, with higher scores denoting a higher level of cybersexual engagement.

In constructing the survey, a number of Mxit users ( $n = 5$ ) between the ages of 14-20 were informally consulted regarding the format and wording of items, as well as the survey layout. Once items had been finalized, I paid attention to the survey's appearance. Mxit, in its popularity among adolescents, has developed a mobile-based online subculture. Users are free to modify and select the appearance of their user screens, allowing for customization and personalization of the Mxit experience. In light of these facts, I wished to make the survey visually rich, much like the application, without distracting from the main focus of the items. To ensure the survey was tailored to and inviting to Mxit users, visual details were added to the survey that reminded users of their Mxit experience. The addition of colour and visually appropriate layout is believed to increase survey response rates (Fanning, 2005).

## **Procedure**

The survey was piloted beforehand on Mxit users ( $n = 10$ ) in the relevant age range. The relevant psychometric properties were assessed, and the content and length were adjusted as necessary.

Schools fitting the eligibility criteria outlined above were approached to participate. Parental consent forms, adolescent assent forms, and information letters were sent to the schools to be distributed to the potential respondents. Due to the sensitive nature of the research in the exploration of adolescent sexual activities on Mxit, informed consent (Appendix B) was obtained from the parent's or legal guardians of all respondents before they were allowed to participate in the study. Respondents were also administered a separate assent form (see Appendix C) before being enrolled in the study. Those respondents who returned both the personal assent and parental consent forms were invited to enrol in the study.

A suitable time for survey administration was arranged with the schools. Participants were seated in a classroom, and a register was passed around and signed. (The list of names was later used to randomly select a prize draw winner). To ensure confidentiality and anonymity of the participants, the consent forms and register were administered separately from the survey.

The survey administrator gave a brief introduction, again going over the ethical issues such as confidentiality and the ability to withdraw at any time without penalty. Immediately thereafter, the administrator gave instructions for completing the survey. The survey was administered in a paper-and-pencil fashion in classrooms. The survey was administered and respondents were given ample time to complete it. The average completion time was 20-30 minutes. After all the individuals in the classroom had completed the survey, the documents were collected and placed in a sealed box marked with the respondents' school and grade. Respondents were thanked, and a general debriefing was undertaken, inviting those that were uncomfortable with the survey to discuss their concerns in the class or later in a one-on-one conversation. Further, typed debriefing forms were on hand for those participants who might have liked a hard copy.

A prize of a R1000 gift voucher was allocated to one respondent in each participating school; the winner from each school was drawn at random and the prizes will be distributed by the end of the school year. As the issue of Mxit is currently of great concern to parents, parents who have given consent will be invited to a presentation of the results of the study at a school meeting. Alternatively, a feedback document has been drawn up, presenting the findings of the study. This document has been made available to both parents and participating schools.

The study procedures adhered to the ethical guidelines outlined by the Health Professions Council of South Africa (HPCSA) and the University of Cape Town (UCT)

Codes for Research. Ethical approval from the Western Cape Education Board was granted, and selected schools were only approached once all ethical approval had been given.

### **Statistical Analysis**

I used the SPSS statistical software package, version 18 (SPSS, 2009) to complete all analysis. Firstly, I examined the data with an eye toward the assumptions underlying parametric statistical tests; specifically I sought to ensure the data did not violate the assumptions of normality, homogeneity or independence. When the data upheld all those assumptions, I used parametric statistical tests. When they did not, I used non-parametric tests. The level of statistical significance for all analyses was set at  $p < .05$

Recall that the proposed research has two specific aims. The first aim was to establish whether Mxit addiction was present in the sample and to further examine the demographic profile of users who may be classified as addicted to Mxit. In order to assess what may constitute Mxit addiction, a factor analysis was conducted, to examine the underlying factors that constitute an addiction subscale and a cybersexual engagement subscale. In order to identify the demographic profile of those individuals who score highly on these scales, I compiled a detailed descriptive statistics. Furthermore, regression analysis was used to examine the relationship between demographic factors (SES, age, race, and sex) and compulsive Mxit use (i.e., to establish whether particular demographic factors predict Mxit addiction, as measured by the score on the addiction subscale on the survey measurement).

The second aim of the study was to establish if Mxit addiction is related to cybersexual engagements on Mxit. A correlation matrix was created to examine the relationship between each of the cybersexual factors and addiction (as measured by the appropriate subscales on the survey instrument).

## Results

### Proportion of Adolescents Classified as Addicted to Mxit.

The first aim of the present study was to examine the pattern of usage among adolescent Mxit users, and then to determine what proportion of adolescents sampled users, might be classified as addicted to Mxit.

Table 1 shows descriptive statistics related to Mxit usage in the current sample, derived from responses to the first five survey questions. As can be seen, the majority of the sample answered yes to using Mxit, and this percentage of users is higher than the parentage of users answering yes to owning personal mobile phones. Respondents use Mxit predominately for the purpose of keeping in contact with family and friends, as opposed to using the other Mxit facilities. There appears to be a trend in the Mxit usage such that only a small percentage of the respondents reported to have used Mxit over 4 years, or utilize the application for more than 3 hours per day.

To examine what percentage of the sampled users could be classified as addicted to Mxit, it was necessary to first define which combination of survey items provided a measure of addiction. To help formulate such a definition, a principal component analysis (PCA) was conducted on items 6 to 30 of the survey. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis,  $KMO = .796$ , and the KMO value for most of the individual items was  $> .06$ , which is above the acceptable limit of  $.05$  (Field, 2009). The only exception here was item 27, which had a KMO value of  $.463$ . Another measure of sampling adequacy, Bartlett's test of sphericity, rejected the null hypothesis that the intercorrelation matrix of these items emerged from a population in which the items are noncollinear (i.e., an identity matrix),  $\chi^2(300) = 1049.069, p < .001$ . Taken together, these measures suggested that it was appropriate to conduct a PCA on the survey data.

I therefore proceeded with the analysis and obtained eigenvalues for each component in the data. Seven components had eigenvalues greater than Kaisers' criterion of 1; in a combination they explained 62.63% of the variance. However, the scree plot (see Figure 1, Appendix D) indicated that it was more plausible to retain 3 or 4 factors. After further analysis was conducted, and 3 factors were retained on the convergence of the scree plot, the principle of parsimony, and the amount of variance being explained in the underlying factors after extraction. This 3-factor structure explained 41.3% of the variance in the model. Table 2 summarizes the rotated factor loadings. Factors were rotated using orthogonal rotation methods (Varimax), and Cronbach's  $\alpha$  was used as a measure of inter-item reliability.



Item 27 was excluded from the final factor solution, as it did not contribute significantly to the overall variance, and was a problematic item in the anti-image matrix. Further, this item did not load significantly on any of the three extracted factors.

The three extracted factors labelled Addiction (consisting of items 7, 8, 10, 11, 12, 13, 14 and 22); this factor constituted the Addiction subscale of the survey. The other extracted factors were Preference for Cybersex (consisting of items 6, 18, 19, 20, 23, 25, 29 and 30) and Anonymity (consisting of items 9, 15, 16, 17, 21, 24, 26 and 28), which together constituted the Cybersexual Engagement subscale. Items in the Addiction subscale described the behaviours and cognitions associated with addiction criteria previously outlined. For example, this subscale therefore examined if Mxit was a salient feature in the respondents daily life, if signs of preoccupations with Mxit were present, and if Mxit use was a form of escape or was compulsive. Items in the Cybersexual Engagement subscale described behaviours related to respondents feeling more comfortable in sexually expressing themselves on Mxit as opposed to offline (the Preference for Cybersex factor), and experimentation with sexual identity, for example pretending to be a different gender (Anonymity factor).

The development of separate Addiction and Cybersexual Engagement subscales allowed participants to be classified according to the scores obtained on each subscale. For the Addiction subscale, scores in the 8-16 range denoted mild Mxit use. Scores in the 17-32 denoted moderate Mxit use, and scores above 33 suggested a level of use indicative of Mxit addiction. Similarly, scores on the Cybersexual scale were classified as either low (16-32), moderate (33-48), or high (> 48).

Table 1.  
*Pattern of Mxit Usage in the Adolescent Sample (N = 152)*

Item	Value	Frequency	Cum. Freq	% Freq	Cum. % Freq
Q1: Do you have a cell phone?	Yes	148	148	97.40	98.00
	No	3	151	2.00	100.00
	Missing	1	152	0.70	
Q2: Do you have Mxit on your cell phone?	Yes	141	141	92.80	93.40
	No	10	151	6.60	100.00
	Missing Values	1	152	0.70	
Q3: How long have you used Mxit?	0-2 years	73	73	48.00	50.30
	2-4 years	59	132	38.80	91.00
	4-6 years	10	142	6.60	97.00
	More than 6 years	3	145	2.00	100.00
	Missing Values	7	152	4.60	
Q4: Roughly how many hours do you spend on Mxit per day?	0-1 hours	73	73	48.00	50.30
	1-3 hours	53	126	34.90	86.90
	3-4 hours	8	134	5.30	92.40
	More than 4 hours	11	145	7.20	100.00
	Missing Values	7	152	4.60	
Q5: What do you spend <u>most</u> of your time doing on Mxit?	Talking to friends and family that I know in real life	142	142	93.4	97.90
	Entering competitions	0	142	0	97.90
	Downloading music, ringtones, wallpapers or games	0	142	0	97.90
	Chatting in 'Chat Zones' and meeting new people.	3	145	2.00	100.00
	Missing Values	7	152	4.60	

Note: Missing values were included in the analysis

Table 2.  
α

		.811	.664	.786
		Subscale		
		Cybersexual Engagement		Addiction
Item #	Item	Preference for Cybersex	Anonymity	Salience/ Excessive Use
Q19	I sometimes flirt or say sexual things to people I meet on Mxit	<b>.793</b>	.104	.033
Q23	I go onto Mxit to talk about sex.	<b>.719</b>	.131	-.117
Q30	I get 'turned on' or excited when I say sexual things to people I do not know on Mxit	<b>.684</b>	.116	-.011
Q29	I have a boyfriend/ girlfriend in person but I prefer to flirt and say sexual things to them on Mxit.	<b>.653</b>	.082	.215
Q20	I feel more comfortable flirting or saying sexual things on Mxit rather than in person.	<b>.603</b>	.078	.279
Q6	I go onto Mxit until late at night even if I have school the next day	<b>.542</b>	-.034	.299
Q25	I am shy and I find it easier to find a boyfriend/ girlfriend on Mxit.	<b>.467</b>	.407	.182
Q18	I have/ had a relationship (boyfriend/ girlfriend) with a person on Mxit I've never met.	<b>.455</b>	.335	.255
Q17	I sometimes pretend to be a different gender.	.012	<b>.725</b>	.082
Q9	I would rather be on Mxit than out with my friends.	.137	<b>.626</b>	.198
Q15	I sometimes lie about my age to chat in the 'over 18' Chat Zones.	.429	<b>.534</b>	-.181
Q21	I like that I am anonymous (no one knows who I am) on Mxit.	-.025	<b>.510</b>	.157
Q16	I sometimes pretend to be someone else.	.324	<b>.460</b>	.310
Q26	I feel I can be the 'real me' on Mxit, but not in person.	.048	<b>.432</b>	.065
Q28	I have had 'cyber' relationships with someone on Mxit, who I have never met in real life.	.387	<b>.422</b>	.163
Q 24	I am always honest about who I am in Chat Zones.	.130	<b>.392</b>	-.250
Q 27	I don't ever hide my Mxit use.	.069	.168	-.150
Q13	I use Mxit when I'm bored.	.134	-.195	<b>.665</b>
Q12	I feel excited when I think about going onto Mxit again	.104	.417	<b>.655</b>
Q14	I spend more airtime on 'Moola', than I originally planned to.	-.079	-.006	<b>.611</b>
Q10	I feel annoyed, angry or sad when I cannot go onto Mxit.	.359	.261	<b>.594</b>
Q7	My friends and family have complained that I am on Mxit too much.	.246	.097	<b>.565</b>
Q11	I use Mxit when I am feeling isolated or lonely.	.075	.149	<b>.550</b>
Q8	I think about going on Mxit even if I am doing other things.	.450	.112	<b>.491</b>
Q22	I sometimes go onto Mxit in secret.	.224	.252	<b>.438</b>
Eigen Values		4.086	2.943	3.292
% of Variance		16.35	11.77	13.17

*Rotated Factor Loadings of the Items in the Mxit Survey.*

With the Addiction subscale thus established, I proceeded to calculate what proportion of the current sample could be classified as addicted to Mxit. Frequency analysis was utilized in conjunction with the classification of Addiction subscale scores outlined above. Table 3 summarizes the cumulative frequency and percentages of the adolescent sample on the Addiction subscale. Table 3 shows that the percentage of users that may be classified as demonstrating compulsive Mxit behaviour is a very small proportion of the overall sample. The adolescents within the sample fall predominately into the mild or moderate range of usage. However, those adolescents that may be classified as severe on the addiction subscale are from low SES backgrounds. The adolescents who fall within the severe range would be classified as addicted to Mxit, as high scores on the addiction subscale fulfil the addiction criteria previously outlined. Thus a score of 33 or more implies that Mxit is used for excessive and extended periods of time (more than 4 hours per day), the adolescent is preoccupied with Mxit, and uses Mxit as a form of escapism.

Table 3.

*Cumulative Percentages of Classified Mxit use According to Subscales (N=152)*

Scale	Descriptor/ Range	Total Cumulative %	Socioeconomic Status (%)		
			High SES	Middle SES	Low SES
Addiction Subscale	Mild (8-16)	49.30	57.00	50	28.10
	Moderate (16-32)	50.00	43.00	50	68.80
	Severe (33+)	0.70	0	0	3.10

### Demographic Profile of Potentially Addicted Mxit Users

As Table 3 shows, the number of participants in each addiction range was broken down by SES. This was the preferred variable by which to categorize the sample, as race was found to be highly contingent upon SES, which is true for the much of the South African population. This contingency was confirmed by a chi-square test of independence, which indicated a statistically significant association between SES and race,  $\chi^2(8, n = 150) = 145.16$ ,  $p < .001$ ,  $r = .697$ .

Descriptive statistics showed that, on the Addiction subscale, adolescents from low SES schools scored higher,  $M(SD) = 21(9.1)$ , than those from middle and high SES schools,  $M(SD) = 16.20(5.98)$  and  $16.36(5.13)$ , respectively. As the assumption of homogeneity of variance was violated for these data, a Kruskal-Wallis test was used to determine if the mean addiction scores differed significantly across school SES groups. The analysis detected statistically significant between-group differences,  $H(2) = 11.693$ ,  $p = .003$ . Jonckheere's test revealed a significant trend in the data: as SES become lower, the median addiction score increased,  $J = 4184.50$ ,  $z = 2.87$ ,  $r = .23$ .

I used multiple regression analyses to further examine which factors played an important role in determining addictive Mxit use. So, demographic variables (SES, sex, age) and variables related to Mxit use (number of years of use, current usage patterns) were entered as predictor variables, while the score obtained on the Addiction subscale was used as the outcome variable. Results from that analysis are presented in Table 4.

Data from previous studies indicated that Mxit is utilized heavily by middle-to-low SES South African youth. Further, as previously demonstrated, the addiction scores for the adolescents sampled differed significantly across school SES groups. Thus, SES was the first predictor to be assessed in relation to addiction scores. As Table 4 shows, this step of the model was statistically significant. The second predictor to be entered into the regression model was sex. This predictor was not statistically significant, and was therefore removed from subsequent analysis. This finding is consistent with that of (Young, 1998), who found no sex differences in terms of those individuals classified as compulsive Internet users.

The final model contained only one outlier, which is less than 5% of the total number of cases. Eleven cases with a Mahalanobi's distance above 10, with a maximum of 13.673, were identified; however, the corresponding Cook's distances showed that these cases did not have undue influence on the dataset, and thus the cases were not deleted. The model was reliable, was statistically significant ( $p < .001$ ), and explained 30.6% of the variance in the scores obtained on the Addiction subscale.

Table 4.  
*Regression Analyses of Predictors Associated with the Outcome Variable Addiction Score*

Steps in the model	Addiction Subscale Score			
	$\beta$	<i>b</i>	<i>t</i>	<i>p</i>
Step 1				
Constant		14.256	12.143	< .001***
SES	.222	1.784	2.784	.006*
Step 2				
Constant		11.449	5.985	< .001***
SES	.218	1.752	2.728	.007*
Sex	.149	1.929	1.861	.065
Step 3				
Constant		-15.184	-1.582	.116
SES	.238	1.912	3.041	.003*
Age	.241	2.042	3.090	.002*
Step 4				
Constant		-13.319	-1.372	.172
SES	.253	2.034	3.199	.002*
Age	.201	1.701	2.495	.014*
Years of use	.191	1.756	2.371	.019*
Step 5				

Constant		-15.198	-1.733	.085
SES	.112	.898	1.478	.142
Age	.201	1.704	2.769	.006*
Years of use	.065	.595	.851	.396
Current use	.443	3.268	5.703	< .001***

*Note:* Number of years was defined as 0-2, 2-4, 4-6, or 6+ years. Similarly, Hours per day was defined as 0-3, 3-4, 4-6, or 6+ hours on average per day.

Step 1:  $R^2 = .049$

Step 2:  $\Delta R^2 = .022$ ,  $R^2 = .071$

Step 3:  $\Delta R^2 = .058$ ,  $R^2 = .107$

Step 4:  $\Delta R^2 = .035$ ,  $R^2 = .142$

Step 5:  $\Delta R^2 = .164$ ,  $R^2 = .30$

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

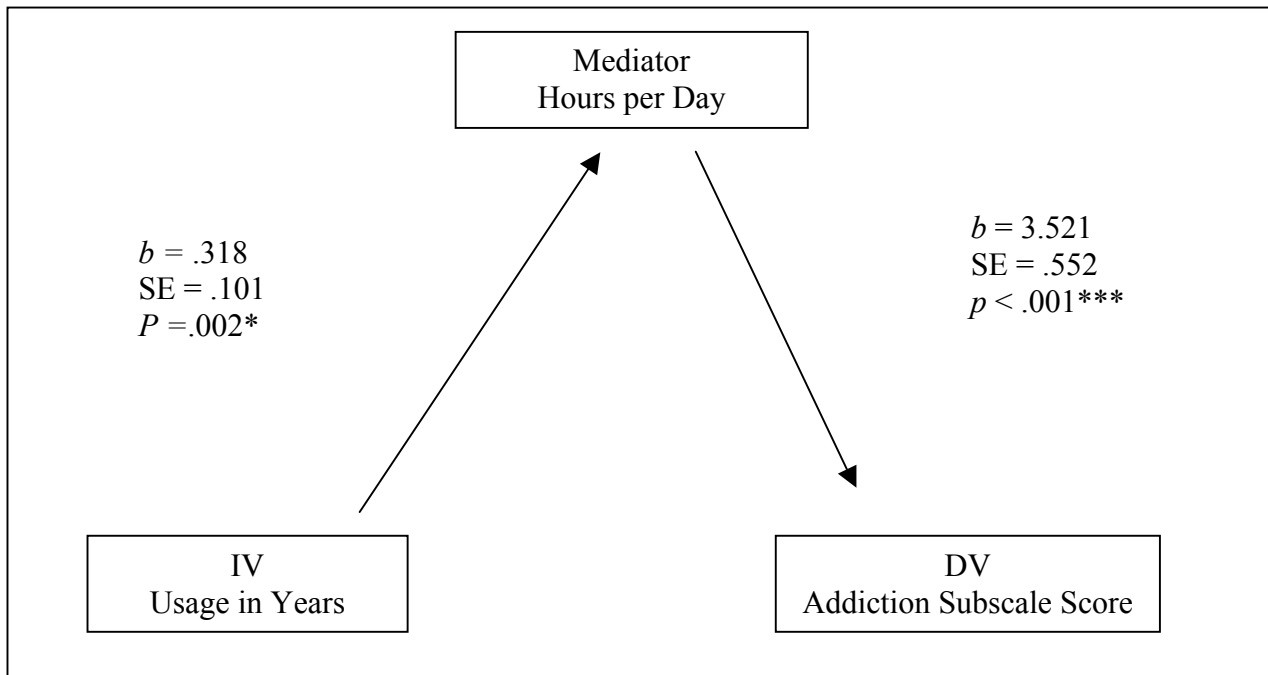
Although a large body of research has found that gender is not a significant predictor of addiction, other research has countered this argument (e.g., Chou & Hsiao, 2000). For this reason, sex as a predictive factor of Mxit addiction in the current sample was explored further. I aimed to assess if SES remained an important predictive factor even when the addiction scores were examined separately according to the adolescent's sex. A separate multiple regression analysis was run, making use of the same hierarchical model that was described previously, however in this analysis the data was split according to sex. With the data now split according to the biological sex of the sample, two separate analyses (one for males, another for females) were run to compare the means of the addiction scores across the three SES brackets.

In boys, there was a statistically significant between-SES groups effect,  $F(2) = 4.599$ ,  $p = .013$ . Post-hoc analyses, was conducted using the Games-Howell test, indicated a significant difference in the mean addiction scores of male High SES vs. Low SES adolescents,  $M(SD) = 15.25 (3.1)$  vs.  $21.14 (4.89)$ ,  $p < .05$ . In girls, there were no statistically significant between-SES groups effect,  $F(1) = 1.860$ ,  $p = .177$ . Thus SES is only a significant factor in boys' Mxit usage (that is, high-SES boys tend to have lower addiction levels than low-SES boys. SES is not, however, a factor in girls' Mxit usage).

Further, I suspected a mediational relationship between the number of years of Mxit use, on the one hand, and the pattern of current usage, on the other hand. Mediation was suspected because the beta values associated with the number of years of Mxit use, reduced and became no longer significant when the variable hours per day, was added to the model. Therefore, mediation analysis was conducted using Addiction subscale scores as the outcome variable, number of years of use as the predictor, and current usage as the mediator. Figure 2



shows this mediation relationship. The Sobel test was conducted in order to confirm these findings, and was determined to be significant,  $z = 2.823$  (0.4),  $p < .001$ .



*Figure 2.* Full mediating relationship between the predictor variables *hours per day* spent on Mxit and the *number of years* Mxit has been utilized and the outcome variable on *Addiction subscale scores*. SE denotes the standard error of  $b$

### The Relationship between Compulsive Mxit use and Cybersexual Engagements.

A large body of previous research describes the relationship between cybersexual engagements and the compulsive use of an Internet-based technology. For example, compulsive Internet use has been associated with individuals engaging in cybersex in chatrooms (Carvalho & Gomes, 2003). Therefore, it was important in the current study to establish whether this association between cybersexual engagements and compulsive use was applicable to Mxit. The relationship between Mxit addiction and cybersexual activity is useful to describe so that one can better understand the ways in which adolescents relate to one another within the confines of a portable, mobile phone-based online relational medium. Such a description began by examining what proportion of the sample were engaging in cybersexual activity on Mxit. Table 5 presents descriptive statistics to that end.

Table 5  
*Scores on the Cybersexual Engagement Subscale: Range and Relation to SES (N = 152)*

Range	Descriptor	Total Cumulative %	Socioeconomic Status (%)		
			High	Middle	Low
16-32	Low level	90.20	88.40	85.30	56.30
33-38	Moderate level	7.80	11.60	11.80	37.50
> 48	High level	2.00	0	2.90	6.20

As Table 5 shows, only a small proportion of the adolescents (2%) reported a high level of engagement in cybersexual activity, with the majority of these adolescents coming from low SES backgrounds. (A high level of cybersexual engagement implies that cybersexual activity on Mxit occurs frequently (denoted by the *Often* and *Always* response options on the Likert-type scale)). These findings are similar to the demographic pattern that was found for scores on the Addiction subscale. There was a positive correlation between scores on the Addiction subscale and those on the Cybersexual Engagement subscale, Pearson's  $r = .661, p < .001$ , two-tailed.

### Prediction of Addiction from Aspects of Cybersexual Engagement

The final aim of the analysis was to determine which of the qualities of cybersexual relationships are related to the level of addiction among adolescent users. Otherwise stated, the question here was which of the factors associated with compulsive cybersexual engagements (e.g., anonymity) would be associated with compulsive Mxit usage.

Once again, a multiple regression analysis was used to explore this relationship, with Addiction subscale score as the outcome variable, and scores on the two factors that

combined to create the Cybersexual Engagement subscale (viz., Preference for Cybersex and Anonymity) entered as separate predictor variables. As shown in Table 6, both these variables were found to be significant predictors of Addiction scores, and the overall model explained approximately 45% of the variance in the scores obtained on the Addiction subscale.

Table 6  
*Regression Analysis: Anonymity and Preference for Cybersex as Predictors of Addiction*

Steps in the model	Addiction Subscale Score			
	$\beta$	<i>b</i>	<i>t</i>	<i>p</i>
Step 1				
Constant		9.796	9.709	< .001***
Anonymity	.554	0.645	8.150	< .001***
Step 2				
Constant		7.372	7.502	< .001***
Anonymity	.209	0.243	2.533	.012*
Preference for Cybersex	.512	0.556	6.219	< .001***

Note. Step 1:  $R^2 = .307$ ; Step 2:  $\Delta R^2 = .143$ ,  $R^2 = .450$ .  
\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

The results of the data analysis showed a partial mediation between Anonymity and Preference for Cybersex. Figure 3 is a path diagram depicting this mediational relationship. The Sobel Test was conducted to verify the partial mediation relationship,  $z = 5.44$  (0.07),  $p < .001$ . This relationship implies that Anonymity is an important predictor of Mxit addiction, but that Anonymity is partially mediated by a Preference for Cybersex. Therefore, a preference for cybersex is a stronger predictor of Addiction subscale scores as a Preference for Cybersex incorporates the explanatory power of Anonymity. It may therefore be concluded that individuals enjoy sexual engagements online partly because this form of sexual activity is anonymous.

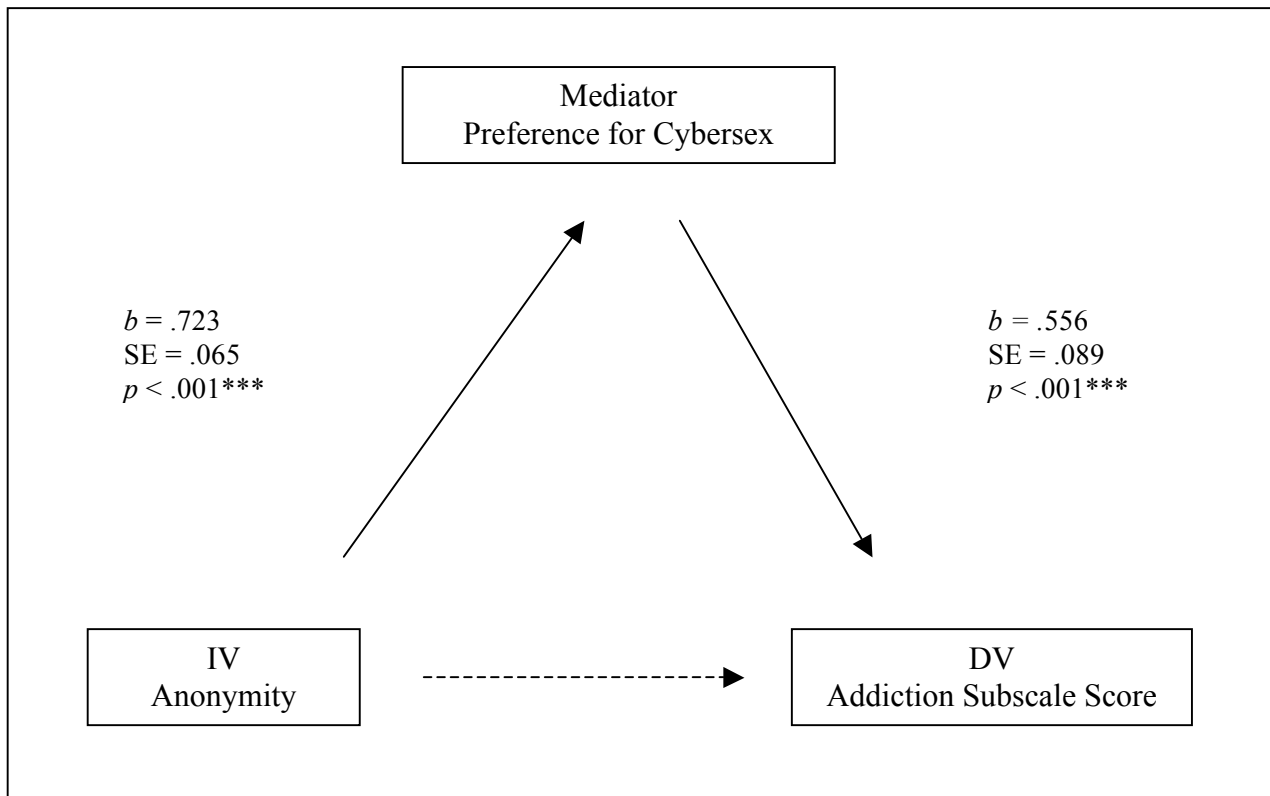


Figure 3. Partial mediating relationship between the predictor variables Anonymity and Preference for Cybersex and outcome variable Addiction. SE denotes the standard error of  $b$ .

## Discussion

Since the launch of Mxit, in early 2005, the mobile-based application has become popular among South African adolescents, with more and more of them joining the Mxit revolution every day. The high adoption of the technology has caused alarm amongst some parents and the media. Rumours of Mxit-driven adolescent sexual activity, paedophiles preying on young girls after meeting them in Mxit chatrooms, and Mxit addiction have all been the centre of much debate surrounding the use of the application.

The first aim of the present study was to explore what proportion of the adolescent sample demonstrated a compulsive use of Mxit. Findings demonstrate that Mxit remains a popular technology amongst Cape Town youth. Even respondents who did not have a personal mobile phone reported they used Mxit on a shared mobile phone. In other words, respondents who did not own a personal mobile phone made arrangements with family members or friends to share their phones in order to continue their Mxit activities, and so these individuals were not excluded from Mxit or isolated from their peers. Hence, the frequency of Mxit usage was higher than the number of respondents who reported owning personal cell phones.

A similar finding was reported by Kreutzer (2009), who stated that the lack of personal mobile ownership did not create a “mobile divide” among adolescents, as these individuals continue to use Internet-based relational mediums. The current finding further confirms that Mxit use is not divided along socioeconomic lines: respondents unable to afford a personal mobile phone were still able to participate in Mxit. Although South Africa may be viewed as having a “digital divide” (Mehra, Merkel, & Bishop, 2004) in which individuals from low-SES communities have limited access to computers or computer-based Internet, this divide does not extend to mobile phone access or to Mxit use.

In order to quantitatively assess individual levels of Mxit use, and to classify that use as mild, moderate, or severe, an Addiction subscale was derived using principal component analysis. This subscale turned out to draw on survey items drawn originally taken from the Internet Addiction Test (IAT; Young, 1998) and from the Internet Related Problem Scale (IRPS; Armstrong, Phillips & Saling, 2000).

Interestingly, the Addiction subscale was found to be comprised of a single factor. The factor comprised items that related to predominately *salience* and *excessive use*, as well as, to a lesser extent, escapism. Within the current sample, most adolescents fell into what may be classified as the mild to moderate range of Mxit use, with only a small number (0.7%) demonstrating compulsive levels of use. Although this percentage is fairly low,

considering the sample size it is a fairly substantial number of users (1.06 users in a sample of 152 adolescents) that demonstrate addictive Mxit behaviour. Further, Mxit's corporate arm estimated recently that there are more Mxit users in South Africa than there are fixed landlines, and that Mxit has over 20 million log-ons per day (Makoe, 2010). With the rate at which the technology has grown, and the way in which it continues to become an important means of adolescents communicating and relating to one another, the small percentage of users classified as addicted to Mxit in the current sample may be a cause for concern in terms of the raw numbers of individuals exhibiting such behaviours.

Compulsive levels of Mxit use appear to be more prominent among respondents from low SES schools. This pattern of data may be attributed to the limited access that low-SES respondents may have to other forms of relational medium technology, such as computer-based Internet. Further, Mxit is the most affordable way in which adolescents can communicate via technology: It is cheaper than both mobile-phone calls or SMS messaging (Donner & Gitau, 2009).

Hence, affordability and accessibility may be important factors in understanding relatively higher rates of Mxit addiction among low-SES adolescents. But perhaps another important factor to consider in explaining why low-SES adolescents show more signs of compulsive use in comparison to their middle- or high-SES counterparts is the issue of safety. In a qualitative study conducted by Donner & Gitau, (2009) a number of interviewees reported they felt Mxit afforded them great freedom to communicate with their peers without having to leave the safety of their homes. Interviewees reported that it often was not safe in dangerous neighbourhoods to go outside and socialize with friends. This implies that Mxit allows adolescents to interact and socialize with their peers without being bound to a particular location or space (Castells, 2007). Interactions become simply about logging onto Mxit anywhere and at any time.

### **Predicting Mxit Addiction**

Determining the variables that adequately predict Mxit addiction is complex and multidimensional. However, the current study identified a number of candidate predictor variables. The first important predictor was found to be SES, which is clear from the significant difference in addiction scores across the SES brackets. In contrast, race was not found to significantly predict Mxit addiction and was removed from the final regression model. However, in South Africa, race and SES are highly correlated due to the racial and socioeconomic divides created by Apartheid. Thus, concluding that race is contingent upon

SES has high external validity within the South African context. Two other predictors identified by the current analyses were age and time spent using the technology.

*Age.* This is an important predictive factor, as Mxit has become an important dimension of youth culture. More than 80% of Mxit users are between the ages of 12 and 25 years old (Mxit, 2010, cited in Makoe, 2010). Mobile phones have become prolific throughout adolescent culture as it is the means by which individuals of that age relate to one another. Further, mobile phones and related technology have become an important form of self-expression and allow for the reinforcement of peer networks (Castells, 2007).

Studies examining youth culture have found mobile phones play important role in adolescents developing their own personal space (Bosch, 2008). The development of personal space and autonomy is viewed as a symbolic emancipation or distinction between youth culture and older generations (Ling, 2007). The need for the distinction between youth culture and older generations is indicative of a broader shift away from family dependence and toward peer relationships in adolescence. Positive peer relationships have been found to promote a healthy sense of self-worth and psychological well-being. Technology such as Mxit has become a relatively new means by which many adolescents harbour and maintain these peer relationships in the transition towards autonomy and independence (Hartup, 1996).

Further, mobile phones allow adolescents to have a private space for self-expression, a space that is not directly monitored by parents or authority figures. This need for private space may also account for the high usage of Mxit among low-SES adolescents. In areas of scarce resources, individuals often live in confined spaces and in close proximity to others. This close-quarter living and lack of privacy may encourage low-SES adolescents to engage in Mxit-based relationships and interactions, in order to seek private autonomous space (Kreutzer, 2009).

In light of these facts and this situation, Mxit may also become a form of escapism. Adolescents have the ability to not only create a private space in which to exercise self-expression and to engage with peers, but Mxit also allows for everyday realities to be transcended (W. Chigona, Kankwenda, & Manjoo, 2008). Adolescents, in their everyday lives, are faced many sources of pressure and turmoil, both internally- and externally-driven. For example, the adolescent-parent relationship is often characterized by conflict, as the adolescent's increasing need for independence requires a constant renegotiation of boundaries with his or her parents (Allen, Hauser, O'Connor, Bell, & Eickholt, 1996). Further, adolescents often feel the need to escape from pressure that stems from school, peer

relationships, and home life (Chou & Peng, 2007). These pressures may be exacerbated in resource-scarce situations, where adolescents not only have to worry about the ordinary concerns associated with being a teenager, but also with basic survival needs, such as food or safety.

**Notions of Time as a Predictor of Addiction.** The amount of time that one spends on a particular Internet-based medium has been demonstrated to be an important factor in the conceptualization of Internet addiction, and, more specifically, of cybersexual addiction. A number of authors (e.g. Daneback et al., 2005; Young, 1998) have used the length of time spent online engaging in some form of relational medium as indicative of addiction criteria such as *salience* and *excessive use*. As previously defined, salience refers to the importance of the behaviour in the individual's life and daily activities. The more time spent engaging in the relational medium, such as Mxit, the more salient the activity must be in the individual's life. The salience of Mxit in adolescent lives was adequately captured in the qualitative study by W. Chigona et al., (2009), where a number of respondents indicated an element of dependency, and described how Mxit is an integral part of their daily lives.

In the present study, both proximal (hours per day) and distal (usage in years) concepts of time were significant predictors of Addiction subscale scores. However, a mediational relationship was found between these two time-related variables and Addiction scores. Specifically, the relationship between the numbers of years an adolescent has used Mxit and his/her Addiction score was mediated by the number of hours per day the adolescent spent on Mxit. Thus, if an adolescent has had the Mxit application for an extended period of time (e.g., for more than 2 years), and still continues to engage heavily in Mxit communication on a daily basis, this is indicative of compulsive use. However, if an adolescent has had Mxit for only a short time, and engages for a number of hours per day on average, this is not indicative of compulsive use in a pathological sense, as this pattern of behaviour may be more reflective of the technology being novel to the individual. If an adolescent continues to engage in Mxit for increasing amounts of time, even after being exposed to the technology for a number of years, this may imply reduced *tolerance*.

Similarly, Young (1998) concluded that Internet addiction was present when users felt compelled to spend increasing amounts of time online in order to gain the same satisfaction that was initially experienced. Young, (1998) classified computer-based Internet users as addicted even if they had been using the technology for only a few months, and thus did not incorporate the individuals' usage in years into her conceptualization of addiction. However,



in contrast to Young (1998), the current mediation relationship implies that Mxit addiction can be linked to time factors only when Mxit has been used for a number of years, and the novelty has worn off, yet the adolescent still continues to actively engage for more than 2 hours per day.

### **Mxit Addiction and Cybersexual Engagement**

The compulsive use of Mxit can also be examined in light of the cybersexual activity that adolescents may engage in, either in Mxit chatrooms or with individuals on their contact list. In the current data, there was a strong positive association between Addiction subscale scores and Cybersexual Engagement subscale scores. The proportion of individuals that may be classified as addicted (0.7%) was similar to the proportion of individuals classified as having high levels of cybersexual engagement (2%). High levels of cybersexual activity were found predominantly in adolescents from middle- and low-SES backgrounds. This result may, however, be confounded by fact that the middle-SES sample was comprised of only males. The examination of cybersexual activity across SES and gender would thus have to be studied further with a larger and more representative sample in the future.

The relationship between Mxit addiction and cybersexual activity is in line with a large number of previous studies that have explored this relationship within the context of Internet addiction in adults (e.g., Cooper, Delmonico, & Burg, 2000; Young et al., 1999). This relationship has not been explored extensively in relation to adolescent relationships, however, with only a few studies substantiating the current findings. Adolescent relationships online differ from similar engagements by adults, as adolescence is a unique time in an individual's life and the activities engaged in may have different implications. As mentioned previously, adolescence is an important developmental stage with regard to identity formation; it is also crucial, however, with regard to the development of self-concepts surrounding sexuality and intimacy (Subrahmanyam & Greenfield, 2008). Thus, the prevalence of cybersexual engagements on relational mediums, such as Mxit, must be examined in light of the important developmental stage in which adolescents find themselves.

A number of authors have attributed the appeal of online relational mediums, such as Mxit, to adolescents because of the ability to be anonymous when engaging on the mediums (e.g., Subrahmanyam & Greenfield, 2008; Valkenburg & Peter, 2008). As these mediums are often text-based and characterized by reduced visual and auditory cues, adolescents have the ability to experiment with their identities. Adolescence is an important time for the development of a self-concept and identity in relation to others, and online relational

mediums allow for multiple identities to be experimented within the online world, that is often entirely separate from the adolescent's offline reality. Thus adolescents have the freedom to engage any way they chose, with little real life consequences (Turkle, 1995 cited in Valkenburg & Peter, 2008). Identity negotiation is more prominent in early adolescents, as young adults transition out of the mindset of childhood and begin to foster a sense of autonomy and independence. A number of studies have reported that preadolescents and early adolescents, as a result of this transitional time, are reported to spend a large quantity of time on relational mediums experimenting with identity, in comparison to older adolescents (Gross, 2004; Valkenburg, Schouten, & Peter, 2005).

The results of the present study substantiate the findings of previous authors and found that anonymity was a significant predictor of Addiction subscale scores. Perhaps the salience of Mxit in adolescent's life, may in part, be the result of anonymity and the ability of young individuals to experiment with their online identity and sexuality. Bosch, (2008) found that young adolescent girls allocated their mobile phones an independence-giving role as it allowed for safe sexual experimentation.

Although anonymity was found to predict Addiction subscale scores, this relationship was also partially mediated by a preference for cybersex. A preference for cybersex can be understood as an individual's preferred way of engaging sexually and becoming aroused. A preference for this form of sexual engagement has been attributed to individuals who find it difficult to engage socially in offline reality, and who experience difficulties in face-to-face relationships (Carvalheira & Gomes, 2003). A preference for cybersex was also found to be a significant predictor of Addiction subscale scores. Adolescents may develop a preference for cybersex as it allows them to experiment sexually in a safe environment. This felt safety is largely associated with anonymity of engaging on a relational medium. Anonymity allows for the disinhibition effect, such that adolescents can freely engage in fantasy and sexual exploration with minimal offline consequences (Suler, 2004). This effect may be compulsive for adolescents as they explore and negotiate their sexual identities. Thus, the relationship between anonymity and Addiction subscale scores is partially mediated by an adolescent's preference for cybersex.

The theoretical framework of the *triple A engine* (Cooper et al., 2001) is applicable to the current sample, and offers an explanatory framework in order to understand adolescent Mxit behaviour. Compulsive Mxit use was identified predominantly in low-SES adolescents, as the technology is both *affordable* and more *accessible* than other forms of computer-based technology. Further, *anonymity* can partially account for high scores on the Addiction

subscale, even though this relationship is partially mediated by an individual's preference for cybersex. Similarly, the proposed ACE model (Young, et al., 1999) is equally applicable as *anonymity*, *convenience*, and *escape* were also factors associated with the patterns of Mxit usage in the current sample.

### **Limitations and Directions for Future Research**

The ethical protocol surrounding respondents under the age of 18 can often place constraints on the sample obtained. For the current study, the ethical requirement of obtaining parental consent before an adolescent may participate in a research study resulted in a smaller sample size than originally envisioned. Although adolescents may have been willing to participate, they may not have received consent from their parent or guardian, or may have been refused permission to participate. It is therefore recommended that future research ensure that an incentive for participation is made available to both parents and adolescent respondents. By providing an incentive for parents, perhaps in the form of information regarding the study's findings, parents will be made to feel more a part of the research process. A further constraint created by the need for parental consent is the issue of providing informed consent to parents who may not speak English as a first language. It may be useful to provide consent forms in a number of languages that are predominant in the area so as to bolster the number of adolescent participants.

Future research should also aim to generate a larger sample size, with equal proportions of male and female respondents across each SES bracket. Such sampling will allow for a more detailed analysis of the Mxit usage trends across both sex and SES.

Further, the data may be enriched by utilizing both quantitative and qualitative data collection methods in order to gain a deeper insight into adolescents' subjective experience of their Mxit use. For instance, focus groups or similar interviewing methods may be used to gain insight into the ways in which adolescents perceive their Mxit use, as well as the ways in which they construct their offline and online identities.

The real-world behavioural implications of compulsive cybersexual engagements should be investigated further, as little research has fully explored the implications of this form of sexual behaviour on an adolescent's psychosexual development and identity formation.

## **Summary and Conclusions**

The present study aimed to contribute to the existing literature regarding Internet addiction and cybersexual engagements among adolescents on Internet-based relational mediums. The exploration of mobile-based technology is highly pertinent for a developing country such as South Africa, as individuals, particularly in resource-scarce areas, tend to engage online via mobile Internet technology. The convenience and accessibility of Mxit has allowed for the application to become increasingly popular among adolescents. The current study demonstrated that Mxit is salient in adolescents' lives, has varied levels of use across SES brackets, and has perhaps become an important way in which adolescents develop and maintain peer relationships. Although only a small percentage of adolescents in the current sample may be classified as compulsive users, even this small percentage is a cause for concern when the size of the Mxit population is considered. As Mxit provides an anonymous platform in which adolescents may explore their identities, and particularly their sexual identities, it is not surprising that a relationship between cybersexual engagements and addiction scores was found. The implications of these ways of relating require further investigation in order to help understand the psychosexual development of adolescents within the relatively unique context of contemporary South Africa.

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## APPENDIX A

**The use of Mxit among Adolescents in South Africa**

Please complete the following survey to the best of your ability. There are only 30 questions for you to answer.

Your honesty is appreciated. This survey is **strictly confidential**, and your answers here will not be revealed to **anyone except for the researcher**.



By participating in the following survey you will be entered into a draw to win a R1000 gift voucher for Cavendish Square. Each school shall have its own draw, and the prize will be given to the lucky winner from each school in November. Please make sure you sign the register, this information will be used to enter you into the draw!

**The following survey may contain sensitive or sexually-related questions.**

**Date:** \_\_\_\_\_

*Please fill out the following information about yourself:*

**School:** \_\_\_\_\_

**Grade:** \_\_\_\_\_

**Age:** \_\_\_\_\_

**Sex:** M / F

**Race:** White/ Black/ Coloured/ Indian/ Other



*Please complete all of the following questions to your best ability, by placing an X in the box that corresponds with your answer.*

**1) Do you have a cell phone?**

- Yes
- No

**2) Do you have Mxit on your cell phone?**

- Yes
- No *(If No, you do not need to continue with this survey)*

**3) How long have you used Mxit?**

- 0-2 years
- 2-4 years
- 4-6 years
- More than 6 years

**4) Roughly how many hours do you spend on Mxit per day?**

- 0-1 hours
- 1-3 hours
- 3-4 hours
- More than 4 hours

**5) When on Mxit, what do you spend most of you time doing?**

- Talking to friends and family that I know in real-life
- Entering competitions
- Downloading music, ringtones, wallpapers or games
- Chatting in Chat 'Zones' and meeting new people

*If you spend most of your time on Mxit chatting in Chat 'Zones' and meeting new people, or talking to friends you know in real life, please respond to the following statements:*

**6) I go onto Mxit until late at night even if I have school the next day.**

- Never
- Rarely
- Sometimes
- Often
- Always

**7) My friends and family have complained that I am on Mxit too much.**

- Never
- Rarely
- Sometimes
- Often
- Always

**8) I think about going on Mxit even if I am doing other things.**

- Never
- Rarely
- Sometimes
- Often
- Always

**9) I would rather be on Mxit than out with my friends.**

- Never
- Rarely
- Sometimes
- Often
- Always

**10) I feel annoyed, angry or sad when I cannot go onto Mxit.**

- Never
- Rarely
- Sometimes
- Often
- Always

**11) I use Mxit when I am feeling isolated or lonely.**

- Never
- Rarely
- Sometimes
- Often
- Always

**12) I feel excited when I think about going onto Mxit again.**

- Never
- Rarely
- Sometimes
- Often
- Always

**13) I use Mxit when I'm bored.**

- Never
- Rarely
- Sometimes
- Often
- Always

**14) I spend more airtime on 'Moola', than I originally planned to.**

- Never
- Rarely
- Sometimes
- Often
- Always

Please respond to the following statements in relation to Mxit Chat Zones and chatting with people you do not know in person.



**15) I sometimes lie about my age to chat in the 'over 18' Chat Zones.**

- Never
- Rarely
- Sometimes
- Often
- Always

**16) I sometimes pretend to be someone else.**

- Never
- Rarely
- Sometimes
- Often
- Always

**17) I sometimes pretend to be a different gender.**

- Never
- Rarely
- Sometimes
- Often
- Always

**18) I have/ had a relationship (boyfriend/ girlfriend) with a person on Mxit I've never met.**

- Never
- Rarely
- Sometimes
- Often
- Always

**19) I sometimes flirt or say sexual things to people I meet on Mxit.**

- Never
- Rarely
- Sometimes
- Often
- Always

**20) I feel more comfortable flirting or saying sexual things on Mxit rather than in person.**

- Never
- Rarely
- Sometimes
- Often
- Always

**21) I like that I am anonymous (no one knows who I am) on Mxit.**

- Never
- Rarely
- Sometimes
- Often
- Always

**22) I sometimes go onto Mxit in secret.**

- Never
- Rarely
- Sometimes
- Often
- Always

**23) I go onto Mxit to talk about sex.**

- Never
- Rarely
- Sometimes
- Often
- Always

**24) I am always honest about who I am in Chat Zones.**

- Never
- Rarely
- Sometimes
- Often
- Always

**25) I am shy and I find it easier to find a boyfriend/ girlfriend on Mxit.**

- Never
- Rarely
- Sometimes
- Often
- Always

**26) I feel I can be the 'real me' on Mxit, but not in person.**

- Never
- Rarely
- Sometimes
- Often
- Always

**27) I don't ever hide my Mxit use.**

- Never
- Rarely
- Sometimes
- Often
- Always

**28) I have had 'cyber' relationships with someone on Mxit, who I have never met in real life.**

- Never
- Rarely
- Sometimes
- Often
- Always

**29) I have a boyfriend/ girlfriend in person but I prefer to flirt and say sexual things to them on Mxit.**

- Never
- Rarely
- Sometimes
- Often
- Always

**30) I get 'turned on' or excited when I say sexual things to people I do not know on Mxit.**

- Never
- Rarely
- Sometimes
- Often
- Always

Thanks for participating in this study. If you have any questions or concerns please feel free to ask. If you would like more information about the study in the form of a printed copy, this can be made available to you.

Your participation and honesty is appreciated, and will be kept confidential!





## APPENDIX B



**University of Cape Town  
Psychology Department**

Telephone +27 21 650-3430  
Fax: +27 21 650-4104

Department of Psychology  
University of Cape Town  
Rondebosch 7701  
South Africa

**RESEARCH CONSENT FORM****Adolescents Name:****Age:****Gender: M F****School:****The use of Mxit among Adolescents in South Africa**

Hello! My name is Tarah Swanepoel, and I am conducting a research study on behalf of University of Cape Town Department of Psychology.

We are administering a survey to adolescents between the ages of 12 and 16 years in the Cape Town area to gather information about their activities on the cell-phone based application 'Mxit'. The information gathered will be used to investigate questions such as how many hours each day adolescents spend on Mxit, and what things they use Mxit for.

*I have read and understood these statements*

Those adolescents that would like to participate in the study, and who obtain consent from their parent or guardian, will be asked to fill out a simple survey containing 30 questions. The survey will be given out during a convenient time at school, in the classroom setting. The survey will take 10-20 minutes to complete. The responses from the surveys will give valuable insight into how and why Mxit is used by adolescents. Your informed consent and participation is therefore greatly appreciated.

Some questions in the survey may be about things that some people find quite personal, or that may be difficult to answer. However, if the respondent feels uncomfortable at anytime, he/she is welcome to withdraw from the study. Respondents are not forced to participate, and they are not forced to answer questions they are not comfortable with. Time will be allocated at the end of the survey for a full question-and-answer session about the research, and I or another responsible adult will address respondents that were upset by the survey in any way.

*I have read and understood these statements*

As participation in the study is appreciated and time will be taken to complete the survey, I will compensate respondents for their time and participation. All those that participate in the study will be entered into a prize-giving draw. There will be a separate prize draw for every participating school. The prize will be a R1000 gift voucher for Cavendish Square.

Parents consenting to their child's participation in the study will be invited to a presentation by the researchers. That presentation will be given at one of the participating schools and will

be designed to allow us to give you feedback on the results of the study. Alternatively, a feedback document detailing the findings of the study will be made available to schools and parents.

Remember, participation is voluntary, and even if a respondent obtains informed consent from their parent or guardian, the respondent is able to decline participation in the study, or to withdraw at anytime. All the contents of the survey are strictly confidential, as is the raw data formulated. Neither the contents of the survey, nor anything said in confidence during the debriefing session will not be revealed to anyone outside of the research group. The data collected from respondents will be used in statistical analysis.

*I have read and understood these statements*

If anything is unclear or if you have any further questions please feel free to contact:

Tarah Swanepoel at [SWNTAR002@uct.ac.za](mailto:SWNTAR002@uct.ac.za)  
Kevin Thomas (Supervisor) [Kevin.thomas@uct.ac.za](mailto:Kevin.thomas@uct.ac.za)

If you consent to your child's participation in this study, or you as a legal guardian wish to give informed consent for the above stated adolescent, please ensure all information in this form has been carefully read and then complete the following information.

***Child's Name/Agreement:***

I (print name) \_\_\_\_\_ wish to participate in the study.

Sign: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/2010

***Parent's/Guardian's Agreement:***

I (print name) \_\_\_\_\_ give informed consent to allow my child to participate in the study.

Sign: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/2010

***Researchers Signature:***

Date: \_\_\_\_/\_\_\_\_/2010

## APPENDIX C



University of Cape Town  
Psychology Department

**The use of Mxit among  
Adolescents in South  
Africa**

**ADOLESCENT ASSENT FORM**

Name:

Age:

School:

Gender: M F

We want to tell you about a research study we are doing. A research study is a way to learn more about something. We would like to find out more about adolescents' use of Mxit, and the sorts of relationships young people have on Mxit. You are being asked to join the study because Mxit is very popular among people your age. Many people believe Mxit is dangerous and this study hopes to find out what really happens on Mxit, and if there is anything to truly worry about.

If you agree to join this study, you will be asked to fill in a survey with 30 questions. The first section will ask you about your age, what school you go to, and so on. The second section will ask you about your general Mxit use. The last section will ask you about your relationships on Mxit, particularly with people you have not met in person.

Some of the questions in the third section may be on sensitive topics. You might feel a little shy or uncomfortable in answering some of these questions, as they ask about flirting on Mxit or using sexual language. Some of the questions may ask you how you feel about doing this in chat rooms or Chat Zones.

I do not know if being in this study will help you, but I will compensate you for your time and participation. All those that participate in the study will be entered into a prize-giving draw. There will be a separate prize draw for every participating school. The prize will be a R1000 gift voucher for Cavendish Square for you to spend on whatever you like.

You do not have to join this study. It is up to you. You can say okay now and change your mind later. All you have to do is tell us you want to stop. No one will be angry at you if you don't want to be in the study or if you join the study and change your mind later and stop.

Before you say **yes or no** to being in this study, we will answer any questions you have. If you join the study, you can ask questions at any time. Just tell the researcher that you have a question.

If you have any questions about this study please feel free to contact Tarah Swanepoel ([swntar002@uct.ac.za](mailto:swntar002@uct.ac.za))

If you sign your name below, it means that you agree to take part in this research study.

\_\_\_\_\_  
Date (MM/DD/YEAR)

\_\_\_\_\_  
**Signature of Adolescent Participant**

## APPENDIX D

## Scree Plot

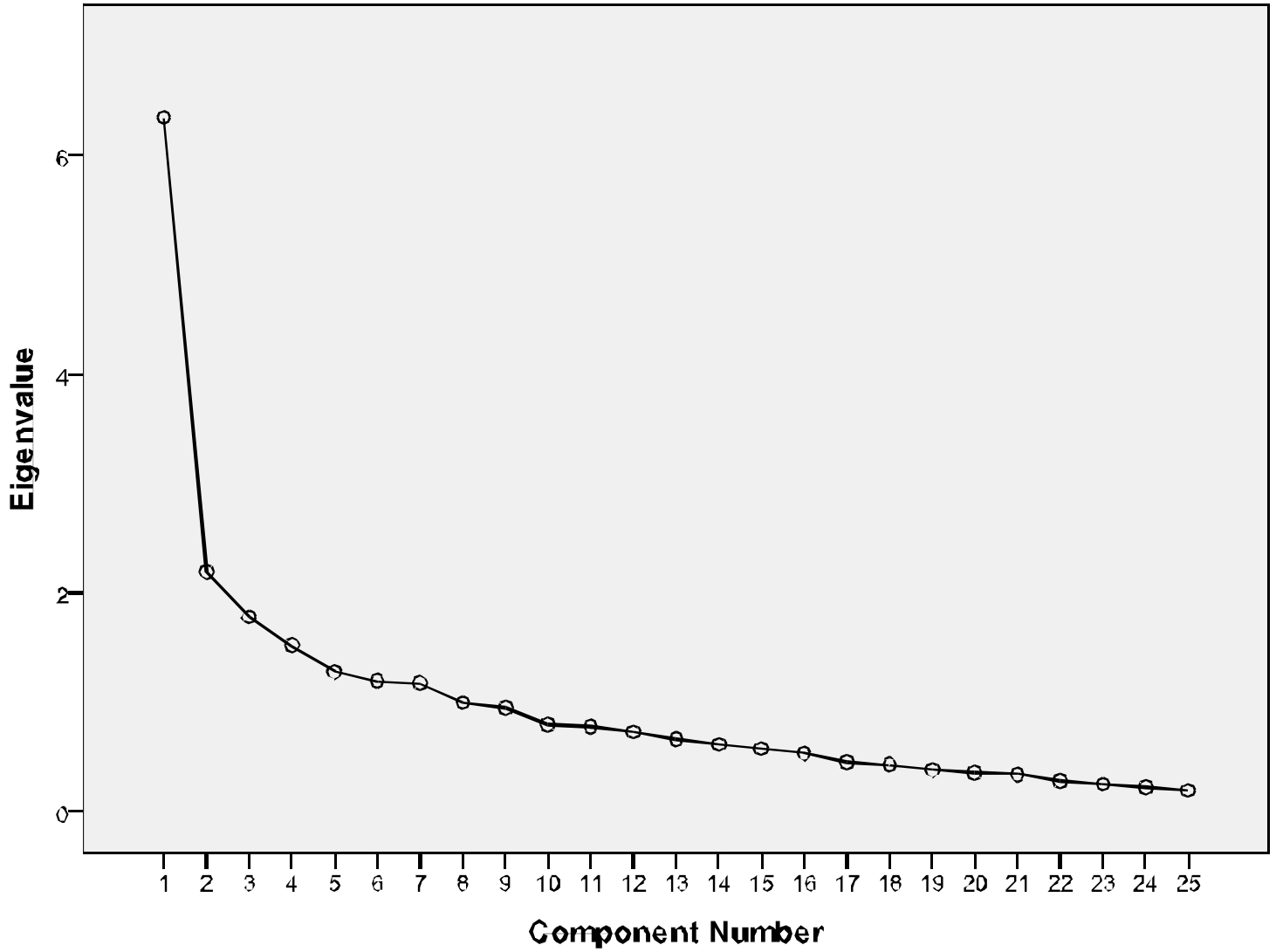


Figure 1. Scree plot showing the principle components analysis of the *Use of Mxit Among Adolescent* survey.

**PLAGERISM DECLARATION**

1. I know that Plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.
2. I have used the Harvard formatting for citation and referencing. Each significant contribution to, and quotation in, this essay/report/project from the work or works, of other people has been attributed, cited and referenced.
3. This project is my own work.
4. I have not allowed, and will not allow anyone to copy my work with the intention of passing it off as his or her own work.

**NAME:**

**STUDENT NUMBER:**

**SIGNATURE:**