

## AFRICAN AMERICAN ADOLESCENTS AND NEW MEDIA: ASSOCIATIONS WITH HIV/STI RISK BEHAVIOR AND PSYCHOSOCIAL VARIABLES

**Objectives:** Cell phones and online media are used frequently but we know little about their use among African American adolescents. This study examines the frequency of such use and its relationship to psychosocial variables and STI/HIV risk behavior.

**Setting/Participants:** 1,518 African American, aged 13–18 years, from 2 Northeast US cities (Providence, RI; Syracuse, NY) and 2 Southeast US cities (Columbia, SC; Macon, GA), were assessed from 2008–2009.

**Design:** Participants were assessed on frequency of cell phone and Internet use, psychological constructs (ie, depression, life satisfaction, impulsivity) and HIV/STI risk behaviors (ie, history of intercourse, sexual sensation seeking attitudes, peer sexual risks norms) with reliable scales and measures using an audio computer-assisted self-interview.

**Results:** Over 90% of African American adolescents used cell phones every day or most days and 60% used social networking sites every day or most days (96% used Myspace). Greater frequency of cell phone use was associated with sexual sensation seeking ( $P=.000$ ), riskier peer sexual norms ( $P=.000$ ), and impulsivity ( $P=.016$ ). Greater frequency of Internet use was associated with a history of oral/vaginal/anal sex (OR=1.03, CI=1.0–1.05) and sexual sensation seeking ( $P=.000$ ).

**Conclusion:** These findings suggest that riskier youth are online and using cell phones frequently. The Internet and cell phones may be useful platforms for targeted health promotion and prevention efforts with AA adolescents. (*Ethn Dis.* 2011;21(2):216–222)

**Key Words:** African American Adolescents, HIV/STI Risk, Psychosocial

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### INTRODUCTION

Adolescents spend an average of 7.5 hours using media daily. If multitasking (using multiple media) is taken into account, the total is 10 hrs and 45 minutes. Newer forms of media, including mobile media and Internet-related media, have made significant inroads in young people's lives. In terms of ethnic differences, recent data have shown that the digital divide between African American (AA), Caucasian and Hispanic youth has become significantly reduced with AA adolescents utilizing the Internet and mobile technologies as much as their Caucasian and Hispanic counterparts.<sup>1</sup> Although AA adolescents frequently use cell phones and the Internet, little is known about their preferences and patterns of use or whether their use is related to greater sexual risk and negative attitudes.<sup>2</sup> Therefore, this study examined the relationship of frequency of cell phone and Internet use and STI/HIV risk behaviors and psychological constructs.

Studies have examined the frequency of newer and older forms of media use and its relationship to personal adjustment and psychological symptoms such as depression in adolescents and youth and the results have been mixed.<sup>3,4</sup> The

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Internet may be a source of positive influence and support for some adolescents but more harmful for vulnerable or isolated teens.<sup>5,6,7</sup> A nationally representative sample of 2,002 3rd–12th graders, aged 8–18, found that youth who spend more time with media reported lower grades and lower levels of personal contentment suggesting that Internet use may be related to negative outcomes.<sup>1</sup> In a group of Chinese teenagers, shyness, alienation from peers, and poor school performance were significantly linked to the amount of instant messaging over the Internet.<sup>8</sup> Among 2,080 Turkish adolescents, Internet use was found to be associated with more severe psychiatric symptoms.<sup>4</sup> In addition, longitudinal investigation of first time Internet users (Home Net Study) reported that using the Internet for as little as three hours weekly led to increased levels of depression and reductions in social support over two years.<sup>9</sup> A meta-analysis of 40 studies involving 21,258 participants recently showed that there was a small but statistically significant detrimental effect of Internet use on psychological

well being.<sup>10</sup> Studies of newer forms of media and mood are not limited to Internet use. Heavy cell phone use has been associated with being female and having anxiety and insomnia among Spanish college students aged 18–22.<sup>11</sup> Among 10,191 Taiwanese adolescents, those with significant depression were more likely to have problematic cell phone use which included behaviors of sending more text messages, using cellular phones more than peers, or having higher cell phone bills.<sup>12</sup> Several studies have shown that greater frequencies of television watching, talking on the phone, emailing, instant messaging, text messaging, and playing video games are related to negative psychological outcomes, however, there are few studies that examine these associations among AA adolescents.<sup>13</sup>

Negative attitudes and psychological distress have been found to impact HIV/STI related risk behaviors in adolescents; the relationship between cell phone and Internet frequency and negative psychological outcomes may be a cause for concern. Among 522 AA female adolescents, those with significant psychological distress at baseline were more likely than their peers, after 6 months, to be pregnant, and have had unprotected vaginal sex.<sup>14</sup> Although the frequency of Internet and cell phone use has been associated with psychological distress, very few studies have examined the relationship between psychological distress, sexual risk behaviors, and the frequency of cell phone and Internet use. Even fewer studies have examined these factors for AA adolescents specifically.

Past literature has examined the relationship of sexual content in traditional media (eg, television, film, music) and sexual risk. Interestingly, greater exposure to sexual content in media has been associated with more risky sexual behavior among Caucasians, however, there was no such association among African Americans (media investigated were TV, music, magazines and video games).<sup>15</sup> Among 2,343 Dutch adoles-

cents aged 13–20 years, more frequent exposure to sexual content on the Internet was associated with greater sexual uncertainty and more positive attitudes toward uncommitted sexual exploration with uncommitted partners or one night stands.<sup>16</sup> Among 753 Taiwanese 10–12th grade adolescents, those categorized as Internet dependent scored significantly higher on overall sensation seeking and disinhibition than nondependents.<sup>17</sup> Among adult men who have sex with other men (MSM) and young MSM aged 16–24, the Internet has been shown to be a popular place to meet sex partners and has been linked to high-risk sexual risk behaviors.<sup>18,19</sup> These studies suggest that greater use of the Internet may be associated with HIV/STI risk.

Because of the very limited data available concerning the relationship between sexual risk, psychological factors, and frequency of cell phone or Internet use among African American youth, the goals of this study were largely descriptive and exploratory. Thus, the purpose of these analyses were to: a) investigate if frequency of cell phone and Internet use relates to psychological constructs (ie, depression, life satisfaction, impulsivity); and b) examine if frequency of cell phone and Internet use relates to HIV/STI risk behaviors (ie, history of intercourse, sexual sensation seeking attitudes, peer sexual risks norms). Although past literature is mixed, we hypothesized that increased Internet and cell phone use would be associated with negative psychological outcomes and greater STI/HIV risk.

## METHODS

### Participants

Participants were 1,518 AA adolescents that were recruited in two Northeast (Providence, RI and Syracuse, NY) and two Southeast US cities (Columbia, SC and Macon, GA) for an HIV preventive-intervention that did not have a focus on new media use. (Project IMPPACS).<sup>20</sup>

Participants were recruited from community-based organizations with after-school programs (21%), street outreach (9%), respondent driven sampling (15%), participant referral (29%), and referral from adults in the community (14%). All adolescents, aged 13 to 18 that were able to speak and read English were eligible to participate. Data on new media use were collected from 2008–2009 and 1,518 adolescents assessed completed the media assessment/scale. The final sample for these cross-sectional analyses consisted of 588 males and 930 females, all of whom reported AA race, with 4% also reporting Latino ethnicity. Mean age of participants was 15.31 years (SD=1.12).

### Procedures/Measures

All study protocols were approved by the respective Institutional Review Boards. Informed consent was obtained from adolescents aged  $\geq 18$  and adolescent assent and parental consent were obtained from those aged 13 to 17. Participants completed assessment measures on laptop computers, using an audio computer-assisted self-interview (ACASI) program. Measures were administered by ACASI to minimize literacy issues and enhance confidentiality with report of sensitive behaviors. The assessment battery took approximately 45 minutes to complete and participants were compensated fifty dollars for their time and effort. Adolescents were assessed for demographics variables, psychological constructs, and sexual risk taking attitudes and behaviors.

Demographic information was obtained from each individual (age, sex, and ethnicity). Participants reported on their school performance (“During the past 12 months, how would you describe your grades in school? Are they.....? 1=mostly As [90+], 2=mostly Bs [80–89], 3=mostly Cs [70–79], 4=mostly Ds [60–69], or 5=mostly Fs [below 60]”). A lifetime history of sexual intercourse (defined as receptive and insertive vaginal, anal, or oral intercourse) was also assessed.<sup>21</sup> The

test-retest reliability of measures of sexual behavior used in the Project iMPPACS sample has been reported previously.<sup>20</sup> The iMPPACS sample showed consistency in self-reported sexuality-related data in a sample of African American adolescents residing in four U S cities. Based on established benchmarks,<sup>22,23</sup> 85% of the indices of sexual behavior reported on in this sample showed moderate to excellent levels of agreement between time points assessed. The items have also shown sensitivity to the impact of an intervention.<sup>24</sup>

#### *Internet and Cell Phone Frequency Scale*

Type of media use was assessed using items adapted from the Annenberg Media Survey.<sup>24</sup> This is an annual survey of a nationally representative sample of youth that documents associations between media usage and important variables as well as change in media patterns over time. Single items that assess Internet and other media frequency have been used to determine sex and ethnic differences as well as the relationship between media usage and psychological constructs. For this study, an Internet Frequency Scale was created with items that assessed frequency of using the Internet for news, instant messaging (IM), chatting, online journals, social networks, email. Items were Likert-type with 5 response options of 1=never, 2=less than once a week, 3=once or twice a week, 4=most days, and 5=every day. The range was 6–30 for the Internet related items and Chronbach's alpha=.74 for the Internet Frequency Scale. A Cell Phone Frequency scale was also created with items that assessed frequency of using their cell phones for talking, texting, IMing, and sending pictures and videos. Items were Likert-type with 5 response options ranging of 1=never, 2=less than once a week, 3=once or twice a week, 4=most days, and 5=every day. The ranges were 4–20 for cell phone related items and Chronbach's alpha=.66. The correlation

between the two scales was  $r=.37$ ,  $P<.01$ , indicating that each scale measured related, but distinct, activities.

#### *Center for Epidemiological Studies–Depression Scale*

The 8-item form of the Center for Epidemiological Studies–Depression scale was used to assess symptoms of depression. This scale has extensive validity and reliability data and has been used widely with adolescents.<sup>25</sup> Participants rated each of 8 items on a scale from 0 to 4 (ie, “How often you have felt depressed during the past week”: 1=less than 1 day, 2=1 to 2 days, 3=3 to 4 days, and 4=5 to 7 days (Chronbach's alpha=.88).

#### *Life Satisfaction Scale*

This scale has been used in previous studies with large samples of children and adolescents (8–18 yrs). It has acceptable internal consistency and robust cross-sectional and longitudinal correlations with multiple indices of student engagement in their schooling and positive youth well-being.<sup>26,27</sup> Satisfaction level was rated with a Likert scale: 1=terrible, 2=unhappy, 3=mostly dissatisfied, 4=mixed (about equally satisfied and dissatisfied), 5=mostly satisfied, 6=pleased, and 7=delighted (Chronbach's alpha=.90). Items assessed were satisfaction with life, friendships, school experiences, self, and neighborhood.

#### *Impulsivity Scale*

This scale has been used in large samples of adolescents to establish the relationship between sexual risk and impulsivity and sensation seeking.<sup>28</sup> Participants were assessed with four statements: “I like to explore strange places,” “I like to do frightening things,” “I like new exciting experiences, even if I have to break the rules,” “I prefer friends who are exciting and unpredictable.” Responses were: 1=strongly disagree, 2=disagree, 3=neither agree or disagree, 4=agree, and 5=strongly agree (Chronbach's alpha=.72 )

#### *Sexual Sensation Seeking Scale*

This scale has been used in a previous study with more than 700 African American adolescent girls and found a strong relationship between sexual sensation seeking and sexual risk.<sup>29</sup> Participants indicating a history of vaginal sex answered questions about sexual sensation seeking with ten items (eg, “Having sex with a new partner is exciting to me,” “I enjoy having sex at the spur of the moment”) with Likert-response options to assess agreement/disagreement: 1=strongly disagree, 2=disagree, 3=agree, and 4=strongly agree (Chronbach's alpha=.69).

#### *Subjective Peer Norms for Sexual Risk Behavior*

This scale has been used in several studies with adolescents to examine the relationship between perceived peer norms, outcome expectancies for sexual behavior and sexual risk.<sup>30</sup> To assess peer sexual risk norms participants were asked if the people most important to them think they “should or should not wait until marriage to have vaginal sex,” and “should or should not use a male condom every time you have vaginal sex.” Four options (definitely should not, probably should not, probably should, definitely should) reflect the extent of agreement (Chronbach's alpha=.70).

#### *Data Analyses*

Statistical analyses included descriptive statistics and Chronbach's alpha coefficients for summed cell phone and Internet items. In addition, the associations between frequency of media use and psychological and sexual risk variables were tested with logistic regression and multiple linear regression analyses. We examined demographic variables in relation to the Cell Phone and Internet Frequency Scales. Analyses also examined the relationships between demographic characteristics and sexual and psychological variables. Any statistically significant demographic associations were entered simultaneously with the

**Table 1. Proportion of cell phone and Internet use among 1,518 African American adolescents**

Cell phone items	Proportion that use everyday or most days	Item mean
Use cell phone to talk or text	93.3%	4.68
Use cell phone for pictures	63.1%	3.66
Use cell phone to IM	60.6%	3.44
Use cell phone for videos	40.3%	2.82
Internet items	Proportion that use everyday or most days	Item mean
Social networks	60.4%	3.57
Internet to IM or chat	53.4%	3.27
Internet to find facts/learn	46.9%	3.24
Use email to communicate	37.2%	2.79
Internet to read news	32.3%	2.78
Online journals like blogger	10.1%	1.54

frequency scales in the logistic regressions. These demographic variables were entered in the first step in the multiple linear regressions, prior to entry of either the Cell Phone Frequency Scale or the Internet Frequency Scale.

## RESULTS

Table 1 shows that AA adolescents have access to, and use the Internet and cell phones at high rates and in various ways and overall, cell phones are used with more frequency than the Internet. Cell phone use to talk and text was reported by more than 90% of AA adolescents every day or most days. At least 60% of AA adolescents used cell phones for pictures, to IM or to text. Sixty percent of AA adolescents used social networking sites at least most days, but less than half used the Internet

to learn. Of the 60.4% of AA adolescents using social networking sites, 96% used Myspace, 27% used Facebook, 11.1% used Bebo, and 1.7% used Friendster. The Cell Phone Frequency Scale had a mean of 9.39 (SD=4.03), and the Internet Frequency Scale had a mean of 18.81 (SD=5.28).

Neither the Cell Phone nor Internet Frequency Scales were associated with demographic variables of sex or student grades (Table 2). Age was also not associated with the Cell Phone Frequency Scale ( $r=.001$ ,  $P=.975$ ) nor the Internet Frequency Scale ( $r=.02$ ,  $P=.409$ ). Analyses also examined the relationships between demographic characteristics and sexual and psychological variables (Table 3). Older age was significantly related to a history of oral / vaginal / anal sex (15.14 vs 14.84,  $t=4.71$ ,  $P<.001$ ), and greater sexual sensation seeking ( $r=.08$ ,  $P=.02$ ) but

not other variables. Male sex was associated with a history of oral / vaginal / anal sex, riskier peer sexual norms, greater impulsivity, depression and sensation seeking but not life satisfaction. Poorer school performance (grades Cs or below) was associated with greater sexual sensation seeking, riskier peer sexual norms, greater impulsivity and decreased life satisfaction, but not depression and history of oral/vaginal/anal sex (Table 3).

Since age and sex were significant in the bivariate comparisons with a history of sex, they were entered into the logistic regression analyses for the Cell Phone Frequency Scale and the Internet Frequency scale. The Cell Phone Frequency scale was not associated with a history of oral, vaginal or anal sex (OR=.98, CI=.94–1.01). However, the Internet Frequency Scale was associated with a history of oral, vaginal or anal sex (OR=1.03, CI=1.00–1.05).

Similarly, variables found to be significant in the bivariate comparisons examining the relationships between demographic characteristics and psychological variables were entered in the first block of multiple linear regressions along with either the Cell Phone or the Internet Frequency Scales (see table 4 for variables entered and the AORs). The analyses of the sexual attitude outcomes found that the Cell Phone Frequency Scale was associated with riskier peer sexual norms, and sexual sensation seeking and the Internet Frequency Scale was associated with sexual sensation seeking. The analyses of the psychological variables found that the Cell Phone Frequency Scale was associated with impulsivity. No other associations between psychological variables and media frequency were significant (Table 4).

**Table 2. Bivariate comparisons of Cell Phone Frequency Scale (CPFS) and Internet Frequency Scale (IFS) and demographic variables**

	CPFS			IFS		
	Mean (SD)	t	P	Mean (SD)	t	P
Sex						
Male	9.35 (4.20)	-.27	.791	17.21 (5.58)	-.14	.888
Female	9.41 (3.92)			17.17 (5.09)		
Student grades						
Above average	14.46 (4.03)	1.68	.093	17.29 (5.16)	-.58	.560
Average or less	14.83 (4.03)			17.12 (5.46)		

## DISCUSSION

Nearly all of the AA adolescents reported use of a cell phone to talk or

**Table 3. Bivariate comparisons of sex and grades with sexual and psychological variables**

	Sex				Grades			
	Male mean, (SD)	Female mean, (SD)	t test	P	A/Bs mean, (SD)	C & below mean, (SD)	t test	P
Sexual sensation seeking	21.20 (3.88)	17.04 (3.51)	18.04	<.001	18.43 (3.93)	19.18 (4.42)	2.85	.004
Peer sexual risk norms	5.94 (1.83)	6.77 (1.74)	8.89	<.001	6.66 (1.68)	6.17 (1.96)	5.10	<.001
CES-D	10.44 (3.91)	12.29 (4.98)	8.07	<.001	11.65 (4.71)	11.42 (4.61)	.94	.35
Life satisfaction	33.11 (7.95)	33.10 (6.81)		.98	33.68 (6.81)	32.35 (7.79)	3.44	.001
Impulsivity	12.68 (3.89)	12.19 (3.84)	2.42	<.001	12.16 (3.87)	12.82 (3.77)	3.49	<.001
	Male %	Female %	Chi square	P	A/Bs %	C & below %	Chi square	P
Lifetime sex (yes)	80.6%	74.6%	7.28	.007	75.2%	79.0%	3.01	.08

CES-D, Center for Epidemiological Studies–Depression Scale.

text and the most popular use of the Internet was for social networking. The number of AA adolescents utilizing Myspace as a social networking site was striking compared to other social networking sites. The considerable popularity of Myspace with AA adolescents is important information to consider for STI/HIV prevention interventions attempting to reach AA adolescents. This preference is interesting due to recent reports of Myspace losing members to competing social networking sites such as Facebook.<sup>31</sup> Another, interesting finding from these data was the association of increased cell phone frequency with sexual sensation seeking, impulsivity, and riskier peer sexual norms. These findings suggest that greater use of these technologies may be associated with STI/HIV risk in this population. This

cross-sectional study cannot determine causality of this risk, however, these data do indicate that riskier youth are online and using cell phones frequently. Websites, social networks, and cell phones may be useful platforms for targeted health promotion and prevention efforts among AA adolescents. These technologies could be used to both educate adolescents and recruit adolescents that are at increased risk for prevention programs and/or treatment. Social networking sites such as Myspace could serve as a launching point for health promotion research due to its widespread use and popularity.

Despite studies and meta-analyses supporting the association of media use with decreased well being and psychiatric symptoms,<sup>1,4,8–11</sup> depression and life satisfaction were not found to be related

to the frequency of Internet or cell phone use in this sample of AA adolescents. However, as types of newer media become increasingly available and used by most adolescents, it may be important to study more closely different types of online cell phone and Internet interactions and their association with psychological constructs. For example, specific interactions (eg, with strangers, increased personal disclosure, sex with person met online) and the relationship to psychological symptoms and risk taking should be examined.

A limitation of this study is the measures used are derived from a parent study, Project iMPPACS. This was limiting when measuring specific types of Internet and cell phone interactions. For example, information was not collected on sending photos or chatting

**Table 4. Multiple linear regression analyses of sexual and psychological variables in relation to frequency of cell phone and internet use**

Dependent variables	Cell Phone Frequency Scale						Internet Frequency Scale					
	Adj R <sup>2</sup>	β	SE	Stand. Coef.	t	P	Adj R <sup>2</sup>	β	SE	Stand. Coef.	t	P
Sexual variables												
Sexual sensation seeking*	.27	.11	.03	.11	3.75	.000	.26	.09	.02	.11	4.14	.000
Peer sexual risk normst	.08	.05	.01	.11	4.32	.000	.06	.01	.01	.03	1.13	.258
Psychological variables												
CES-D†	.03	.001	.03	.001	.025	.980	.04	.01	.02	.01	.28	.777
Life satisfaction†	.01	-.04	.05	-.02	-.85	.393	.01	-.06	.04	-.04	-1.65	.099
Impulsivity†	.01	.06	.03	.07	2.42	.016	.01	.02	.02	.03	1.16	.245

Adj R<sup>2</sup> = Adjusted R<sup>2</sup> for full model including demographic variables.

\* Adjusted for sex, grades, and age.

† Adjusted for sex and grades. CES-D, Center for Epidemiological Studies–Depression Scale.

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*Websites, social networks, and cell phones may be useful platforms for targeted health promotion and prevention efforts among AA adolescents.*

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with strangers. Also, each construct was only measured by a single scale. Findings from the current study are also limited by a cross-sectional design, which limits causal inferences. This sample of adolescent participants was enrolled for an HIV preventive-intervention and, despite recruitment from four cities in two geographical regions of the United States, may not be representative of the entire population of AA adolescents. Our sample may have also been impacted by selection bias favoring youth whose parents were supportive of HIV prevention programming, or youth who were less involved in extracurricular activities that would prohibit participation. Consideration should also be made for constantly changing new media technologies and evolving online landscapes. As new technologies and social networks emerge, shifts in popularity and use will occur.

The relationship between media use, psychiatric symptoms and STI/HIV risk behavior is complex, interactive and changing as new technology develops. More studies are needed to investigate different types of online and new media interactions (eg, with strangers, increased personal disclosure, sex with person met online). Currently, 31% of online teens get health, dieting or physical fitness information from the Internet and 17% of online teens report they use the Internet to gather information about health topics that are hard to discuss (eg, drug use, sexual health topics) with others.<sup>32</sup> Our findings suggest avenues for further facilitating the dissemination of health information

and STI/HIV prevention targeting AA adolescents are cell phone technology and the Internet.

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