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# Exploring User Acceptance of a Text-message Base Health Intervention among Young African Americans

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## Abstract:

Information technology has been used in diverse ways. It has been used in both the public and private sectors to reduce costs and increase satisfaction. Technology may also be instrumental in improving individuals' healthy behaviors. For instance, statistics suggest that technology-based interventions may promote healthy sexual behaviors; however, few studies have explored willingness to participate in technology-mediated interventions. In this study, we use the diffusion of innovation theory to identify factors that influence one's intention to use a text-message service to receive sexual health information. The results indicate that technology diffusion factors rather than risk beliefs and privacy concerns impacted participant's intention to use a text-message intervention. The findings of this study have significant implications for innovative uses of technology to promote health. Mobile-health interventions that are easy to use and that provide more benefits than other interventions are most likely to be adopted. However, these interventions should seek to maximize privacy protections and communicate clearly about these protections.

**Keywords:** Technology Adoption, Diffusion of Innovation, Privacy Concerns, Text Messaging, Health Intervention, Perceived Risk.

## 1 Introduction

According to the Pew Research Internet Project, 90 percent of American adults have a mobile phone and 58 percent of American adults have a smartphone (Pew Internet Research Project, 2014). Mobile marketing is rapidly growing. The open rate is a measure of how many people on an email list open (or view) a particular email message. The open rate of short message service (SMS) correspondence is 98 percent compared with 22 percent for emails (Buchanan, 2014). As such, given its level of adoption, mobile technology is a great avenue to deliver health information (Vogel, Viehland, Wickramasinghe, & Mula, 2013) and is an emerging format among technology-based interventions (Fjeldsoe, Marshall, & Miller, 2009; Leach-Lemens, 2009; Lim, Hocking, & Hellard, 2008). Information technology has had a major impact on the healthcare sector (Djamasbi, Fruhling, & Loiacono, 2009; Wilson, Wang, & Sheetz, 2014). Health information technologies provide additional opportunities for health professionals to deliver interventions.

According to Cutler (2004, p. 2), behavioral interventions are “interventions designed to affect the actions that individuals take with regard to their health”. At the individual level, “interventions encourage people who are at high risk for a particular disease to do something about it. Examples are programs that encourage smokers to quit...or diabetics to exercise (Cutler, 2004, p. 2)”. Technology-based interventions have shown a lot of potential over the past decade by using computer technology as the primary or sole medium to deliver interventions to a variety of participants (Bull, Levine, Black, Schmiede, & Santelli, 2012; Noar et al., 2011). The promise shown by technology-based interventions is partially based on the large number of advantages they have over more traditionally delivered programs (Kelley, Chiasson, Downey, & Pacaud, 2011). Technology-based interventions eliminate frequently cited barriers to prevention/care access such as transportation, insurance, and the need to provide childcare for participants with children (Cole-Lewis & Kershaw, 2010; Ybarra & Bull, 2007). Similar to traditional programs, technology-based interventions allow one to culturally tailor message but surpass traditional interventions because recipients can easily share the content with their social networks (Noar et al., 2011). Technology-based interventions can play an important role in health-related prevention interventions by disseminating information to participants via avenues they are familiar with and regularly use (e.g., mobile technology, interactive webpages, and social networking sites).

Mobile technology used to deliver health-based prevention and interventions through voice calling, the Internet, video messaging, and text messaging is referred to as mobile health or m-health (Ybarra, Holtrop, Prescott, & Strong, 2014; Krishna, Boren, & Balas, 2009). M-health is particularly valuable with younger populations given how often they access and use mobile technology, especially text messaging (Lasica, 2007; Lenhart, 2010; Levine, McCright, Dobkin, Woodruff, & Klausner, 2008), which allows researchers to capitalize on their existing cultural behaviors. According to Cocotas (2013), “young Americans send almost ten times as many texts as Americans over 55...[and] U.S. smartphone owners aged 18 to 24 send 2,022 texts per month on average—67 texts on a daily basis—and receive another 1,831”. Technology-based interventions have many advantages, but there are additional advantages to using text messaging, especially with younger populations. For example, text messaging does not require great technology expertise, it is readily available on most models of mobile telephones, it is asynchronous, participants can access the messages confidentially (Cornelius and St. Lawrence, 2009) and at their convenience (Fjeldsoe et al., 2009), and it is the most frequently used mobile data service (Lasica, 2007). Researchers have begun to explore the usefulness of text message interventions for diverse health risks such as methamphetamine use (Reback, 2014), hypertension (Bobrow et al., 2014), cervical cancer (Lee, Koopmeiners, Rhee, Raveis, & Ahluwalia, 2014), and diabetes (Saffari, Ghanizadeh, & Koenig, 2014).

Despite the potential advantages of technology-based interventions, text messaging to provide sexual health messages presents some challenges relative to traditional face-to-face health interventions. For example, barriers to technology adoption such as concerns about privacy or risk associated with technology such as improper access, errors, and unauthorized secondary use may impact participants' willingness to use technology-based interventions (Dinev & Hart, 2006; Van Slyke, Shim, Johnson, & Jiang, 2006). Individuals may be concerned about confidentiality and privacy of data when receiving information about sensitive topics such as sexual health (Deglise, Suggs, & Odermatt, 2012). Technology-based prevention services provide fewer opportunities for participants to evaluate the sources of information and build relationships and trust (Wang & Emurian, 2005).

Researchers have shown text messaging to be useful in delivering information, interventions, and maintenance for many other health-related behaviors, such as smoking cessation, asthma and diabetes

management, and depression (Cornelius & St. Lawrence, 2009). An emerging body of literature has found preliminary support for the efficacy of text messaging services to increase access and use of sexual health services (Levine et al., 2008.), decrease time between diagnosis and treatment of a sexually transmitted infection (STI) (Menon-Johansson, McNaught, Mandalia, & Sullivan, 2006)), and increase sexual protective behaviors and knowledge (Gold et al., 2011). For example, Gold et al. (2011) found that text messaging was effective in reducing individuals' number of sexual partners and increasing their knowledge about sexual health.

Large-scale efforts to use sexual health messaging include the San Francisco Department of Public Health efforts to develop "SEXINFO" to deliver an STI/HIV prevention program to local adolescents (Levine et al., 2008.). SEXINFO was modeled after a program in England and was the first of its kind in the US. This project received over 4,500 text messages during the first six months of implementation, and more than half of those led to access to more information and additional referrals. Since SEXINFO, there have been more interventions specifically focused on using text messaging to promote sexual health. More recently, the Center for Disease Control (CDC) partnered with Verizon Wireless and the University of Georgia to launch a mobile telephone initiative to increase awareness and HIV testing among youth (Kaiser Family Foundation, 2007).

Community and college health clinics that have limited resources may have challenges providing regular testing, having staff provide timely notification of diagnosis, and providing STI/ HIV prevention services. If adopted, technology-based interventions may serve as a means to combat challenges associated with limited resources.

Research shows that Internet technology (e.g., sites such as Craigslist) can increase HIV cases in a region (Chan & Ghose, 2014). However, to date, few studies have explored the use of text-message based interventions to promote sexual health (Bobrow et al., 2014; Cornelius & St. Lawrence, 2009; Cole-Lewis & Kershaw, 2010; Reback, 2014). Bull et al. (2012) call for more research on technology-driven health interventions. In this study, we use Rogers' (2003) diffusion of innovation theory (DOI) to present a model of text-message based intervention (TMBI) adoption. Rogers' (2003) diffusion of innovation theory (DOI) is a generic explanation of adoption that can be applied to diverse fields. Scheirer (2013) posits that understanding technology alone is not sufficient for developing a sustainable health intervention. In light of the sensitive nature of sexual health information, we posit that perceived risk and privacy concerns will also be salient predictors of information technology adoption (Babel, 2012; Chiasson, Reddy, Kaplan, & Davidson, 2007; Schaupp, Carter, & McBride, 2010).

## 2 Background Literature

Technology adoption is a major facet in the information systems field. Adoption research is concerned with identifying the factors that influence user acceptance of technological innovations. Davis' (1989) technology acceptance model and Rogers' (1983) diffusion of innovation theory (DOI) are two models commonly used to study user adoption of information systems. Unlike TAM (and its subsequent variations such as TAM2, UTAUT, UTAUT2, etc.), which refers specifically to technology adoption, Rogers (2003) conceptualizes a generic theory of adoption: the diffusion of innovation theory. In this study, we use the broader theoretical lens provided by the diffusion of innovation theory. The diffusion of innovation theory is a robust, interdisciplinary tool that has been a reliable framework for exploring diverse technological and social advancements. In light of its predictive ability and parsimonious nature, we use it in this study to explore the potential of text-message based interventions.

### 2.1 Diffusion of Innovation Theory

An innovation refers to a new idea, concept, object, or, in this case, information system. Diffusion refers to disseminating an innovation into society. Rogers' theory identifies five constructs that influence a potential adopter's decision: relative advantage, complexity, compatibility, trialability, and observability. Relative advantage refers to the belief that a new system has benefits above and beyond the current system. Someone who believes that a text-message based intervention is more useful than existing interventions will be more likely to adopt this innovation. Complexity refers to perceptions of difficulty associated with adopting a system. Someone who believes that a text-message based intervention will be easy to use will be more likely to accept this technology. Compatibility posits that individuals will be more likely to adopt an innovation if it is consistent with their values, views, beliefs, and customs. Individuals who use their mobile phone to participate in other electronic services (view banking information, receive promotional notices) will

be more likely to adopt a TMBI. The remaining constructs—trialability and observability—are not as salient in electronic environments (Van Slyke, Belanger, & Comunale, 2004). Trialability posits that individuals will be more likely to adopt an innovation if they can try it out before actually committing to it. Observability suggests that one will be more likely to adopt an innovation if its benefits are visible and tangible (Rogers, 2003).

As we state above, the information systems literature posits that three DOI constructs—relative advantage, compatibility, and complexity—are among the most relevant constructs to technology adoption research (Carter & Bélanger, 2012; Tornatzky & Klein, 1982; Van Slyke et al., 2004). Hence, we include these three constructs in our research model.

Extant studies of electronic service adoption substantiate the importance of relative advantage and compatibility for electronic systems (Gefen & Straub, 2000; He, Duan, Fu, & Li, 2006; Schaupp & Carter, 2005; Wu & Wang, 2005). The literature suggests that complexity is task dependent for online systems (Fang, Chan, Brezezinski, & Xu, 2005; Gefen & Straub, 2000). Gefen and Straub (2000) posit that complexity (called ease of use in their study) is a dynamic construct with various effects depending on whether the task is intrinsic or extrinsic to information technology (IT). An intrinsic task refers to one in which the technology provides the primary end, while an extrinsic task refers to a task for which technology is merely the means to achieve the primary product or service (Gefen & Straub, 2005). Their results indicate that complexity impacts intention to use when a website is used for intrinsic tasks, such as information gathering and inquiry, but that it does not affect intended use when the site is used for purchasing (an extrinsic task). A text-message based intervention (TMBI) is intrinsic: its purpose is to provide information. A text-message based intervention does not represent a transaction (e.g., a purchase); it is simply a means for the recipient to obtain information.

## 2.2 Perceived Risk

In addition to technology-related factors, other individual concerns may impact user adoption of text-message based interventions. In light of the threats to electronic information in this digital age, we need to understand the impact that risk perceptions have on technology adoption. Perceived risk is defined as the individual's subjective expectation of suffering a loss in pursuit of a desired outcome (Warkentin, Gefen, Pavlou, & Rose, 2002). Perceived risk is composed of behavioral and environmental uncertainty.

Behavioral uncertainty exists because online service providers may behave in an opportunistic manner by taking advantage of the electronic environment's impersonal nature, while environmental uncertainty arises due to the unpredictable nature of Internet-based technology that is beyond the consumer's control (Pavlou, 2003).

In e-commerce, perceived risk reduces users' intentions to exchange information and complete transactions (Pavlou, 2003). According to Schaupp et al. (2010), perceived risk has a synonymous effect on how individual use electronic services provided by the public sector. With regards to mobile technology, studies indicate that malicious attacks against smartphones increased 155 percent in 2011 (Savitz, 2012). Savitz (2012) also states that, in a seven month period, the number of attacks against Android phones increased 3,325 percent in 2011. In light of the research findings and alarming statistics, we posit that perceived risk will reduce one's intention to use a text-message based intervention.

## 2.3 Privacy Concerns

Given the numerous threats to electronic transactions, many technology users are reluctant to disclose personal information electronically due to their concern for information privacy (Babel, 2012). These concerns are not without merit. In 2012, the Internet Crime Complaint Center (iC3) received over 300,000 complaints for a third year in a row. In 2011, the number of complaints rose by 3.4 percent compared with 2010. The dollar loss associated with these complaints was USD\$485.3 million (iC3, 2011). A study conducted by PEW Internet and American Life Project revealed that 47 percent of Internet users are aware of their digital footprint (Madden, Fox, Smith, & Vitak, 2007).

Clarke (1999) posits that individuals are interested in having an appreciable influence on how others use data about themselves. This desire highlights the importance of understanding the public's privacy concerns. Information privacy refers to individuals' ability to control information about themselves (Stone, Gardmer, Gueutal, & McClure, 1983). The electronic environment introduces new challenges to maintaining information privacy. In light of the inherent risks of transmitting sensitive information electronically, many

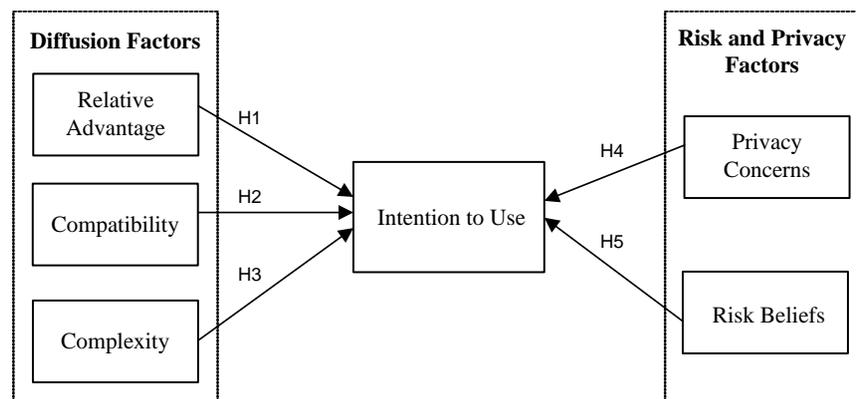
individuals want assurance that their personal information will not be made available to other individuals and organizations without their consent (Skinner, Han, & Chang, 2006). Laufer and Wolfe (1977) posit that the privacy calculus refers to a decision making process whereby citizens weigh the anticipated benefits and consequences before disclosing personal information. Culnan and Armstrong (1999) suggest that individuals are more likely to disclose personal information once they have been informed of the organization's privacy practices. Dinev and Hart (2006) extend the work of Culnan and Armstrong (1999) to account for Internet transactions. Our proposed research model incorporates privacy concerns associated with using a text-message based intervention. In particular, we posit that individuals with a high concern for their information privacy will be less likely to adopt a text-message based intervention than someone with minimal privacy concerns.

### 3 Research Model and Hypotheses

Based on the aforementioned literature, we propose the research model in Figure 1. Intention to use a text-message based intervention is influenced by relative advantage, compatibility, complexity, privacy concerns, and risk beliefs. Lack of complexity, compatibility, and relative advantage are all predicted to increase intention to use a text-message intervention. Privacy concerns and risk beliefs are predicted to decrease use intentions. Table 1 presents our research hypotheses.

**Table 1. Research Hypotheses**

<b>H1.</b>	Relative advantage (RA) will have a positive effect on intention to use.
<b>H2.</b>	Compatibility (CT) will have a positive effect on intention to use.
<b>H3.</b>	A lack of complexity (CX) will have a positive effect on intention to use.
<b>H4.</b>	Privacy concerns (PC) will have a negative effect on intention to use.
<b>H5.</b>	Risk beliefs (RB) will have a negative effect on intention to use.



**Figure 1. Proposed Research Model**

## 4 Methodology

To test our research model, we administered a survey to African American young adults attending one historically Black college/university (HBCU) in the Southeastern region of the US. We gave participants the option to complete the survey online or in person. All participants elected to complete the survey online. The study was approved by the institution's Internal Review Board. We used multiple linear regression analysis to examine the impact of technology-related and psychosocial factors on the acceptability of a technology intervention to promote healthy sexual behaviors.

### 4.1 Sample and participants

Given preliminary support for the efficacy of text messaging services as a means to promote sexual health, we need to determine barriers to the adoption of text messaging in interventions, particularly for groups experiencing the greatest burden of the STI / HIV epidemic, such as African Americans youth and young

adults. The current study focuses on an African American college population because few HIV/STI prevention efforts are designed specifically for this population (Adefuye, Abiona, Balogun, & Lukobo-Durrell, 2009). Similar to other populations, college students are inconsistent condom users and engage in risky behaviors that facilitate HIV/STI infection such as engaging in unprotected sex and using drugs or alcohol during sexual encounters (Lewis, Malow, & Ireland, 1997). Because opportunities to engage in high-risk behaviors during college are high (Adefuye et al., 2009), increased attention to this population is critical.

African American young adults are disproportionately impacted by sexually transmitted infections such as HIV, chlamydia, and herpes despite engaging in greater condom use and STI testing than their counterparts (CDC, 2012; Hallfors, Iritani, Miller, & Bauer, 2007; Hou, 2009). The paradox of greater sexual health promotion behaviors and higher STIs has led researchers to emphasize prevention measures that reach beyond individual risk behaviors (Hallfors et al., 2007) and include institutional and access-related issues. For example, access to quality care, poverty, and disparities in resources are critical structural factors that may explain STI disparities affecting African American populations (Adimora & Schoenbach, 2002). Moreover, for African American populations who have experienced a long history of medical maltreatment (e.g., Tuskegee experiment) (Washington, 2006), issues of medical technology abuse may be particularly salient.

We recruited participants from undergraduate psychology courses. We gave participants the opportunity to participate in any of five Institutional Review Board-approved research studies using the SONA website system. The SONA system is designed to anonymously manage research participation by allowing research participants to sign up for research studies and complete online or in-person surveys anonymously. We recruited approximately 500 students to participate in the study, which makes the response rate 24%.

In all, 120 participants completed the survey. The majority of the participants (91%) were in the 18-24 age group. Most participants (96.7%) described themselves as African-American. Most participants (91%) used their phone to search the Internet for information and nearly all (99%) had used their mobile phone to send a text message.

## 4.2 Instrument Development

We compiled the survey questions from validated instruments (Carter & Belanger, 2005; Dinev & Hart, 2006; Malhotra et al., 2004; Moore & Benbasat, 1991; Van Slyke et al., 2006). We adapted the items to assess user perceptions of a text message-based intervention. We adapted relative advantage, compatibility, and complexity items from Moore and Benbasat (1991). We adapted intention to use items from Van Slyke et al. (2006). We adapted risk beliefs items adapted from Malhotra et al. (2004). We adapted privacy concerns items from Dinev and Hart (2006). We measured questions using a seven-point Likert-type scale that ranged from 1 (strongly disagree) to 7 (strongly agree). The Appendix presents the survey.

## 4.3 Data Analysis

Preliminary analyses included reliability analysis and exploratory factor analysis. We tested items for reliability using Chronbach's alpha.

**Table 2. Reliability Analysis**

Construct	# items	Reliability
Relative advantage (RA)	5	.892
Compatibility (CT)	3	.903
Complexity (CX)	3	.844
Privacy concerns (PC)	4	.934
Risk beliefs (RB)	3	.840
Intention to use (USE)	3	.888

We conducted factor analysis using principal component analysis with promax rotation. Most items loaded on the proper factor. Relative advantage (RA), compatibility (CT), and intention to use (USE) items loaded together. Similar occurrences have been noted in other studies. For instance, RA and CT loaded together in other DOI research (Moore & Benbasat, 1991; Carter & Bélanger, 2005). Moore and Benbasat (1991) conducted a thorough study using several judges and sorting rounds to develop reliable measures of diffusion of innovation constructs. Although the items for RA and CT were identified separately by the judges

and sorters, they all loaded together. Moore and Benbasat (1991, p. 208) concluded that “this may mean that, while conceptually different, they are being viewed identically by respondents, or that there is a causal relationship between the two. For example, it is unlikely that respondents would perceive the various advantages of using [state e-government services], if its use were in fact not compatible with the respondents’ experience or [life] style” (Moore & Benbasat, 1991, p. 208).

**Table 3. Factor Analysis**

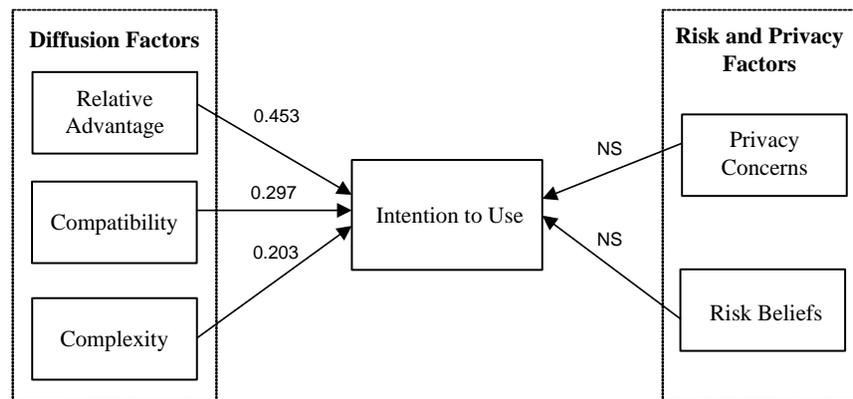
Factor	Loadings			
Relative advantage1	.807			
Relative advantage 2	.856			
Relative advantage 3	.823			
Relative advantage 4	.856			
Relative advantage 5	.675			
Compatibility1	.915			
Compatibility2	.830			
Compatibility3	.842			
Complexity1		.831		
Complexity2		.862		
Complexity3		.891		
Privacy concerns1			.857	
Privacy concerns2			.929	
Privacy concerns3			.954	
Privacy concerns4			.912	
Risk beliefs1				.807
Risk beliefs2				.885
Risk beliefs3				.912

Guided by Aulakh and Gencturk’s (2000), Greene and Organ’s (1973), and Podsakoff, Mackenzie, Lee, and Podsakoff’s (2003) recommendation, we performed Harman’s single-factor check to test for common method bias. Results revealed the first factor accounted for 39 percent of the variance in the model. This suggests that common method bias was an unlikely threat to the results because no single factor accounted for the greater percentage of the explained variance.

We tested the research model by using multiple linear regression analysis. In this study, we analyzed the relationship between use intentions (dependent variable) and participants’ perceptions of information technology adoption (independent variables). As such, the model includes five independent variables (relative advantage, compatibility, complexity, privacy concerns and risk beliefs) and one dependent variable (intention to use).

## 5 Results

The model explained a large percent of the variance in intention to use a text-message based intervention ( $\text{adj } R^2 = .731$ ). Since the overall model was significant ( $F=55.865$   $p < .0001$ ), we tested the significance of each variable.



**Figure 2. Significant Results with Path Coefficients (NS = Non Significant)**

Three of the five hypotheses were supported. Relative advantage, compatibility, and complexity all had a significant impact on intention to use a text-message based service (see Table 4).

**Table 4. Results of Hypotheses Testing**

Hypothesis	Coeff.	t-val.	Sig.	Supported
H1 (RA)	.453	4.981	.000	YES***
H2 (CT)	.297	3.024	.003	YES***
H3 (CX)	.203	3.001	.003	YES***
H4 (PC)	.023	.316	.753	NO
H5 (RB)	-.095	-1.324	.189	NO

Note: \*p < 0.10, \*\*p < 0.05, \*\*\*p<.001

## 6 Discussion

In 2010, Healthy People 2020 was released. It includes several healthcare target areas (U.S. Department of Health & Human Services, 2012). Four Healthy People 2020 objectives are to reduce the number of people who become infected with HIV, increase access to care and improve health outcomes for people living with HIV, reduce HIV-related health disparities, and reduce the proportion of adolescents and young adults with STIs. Text messaging has been found to be a useful intervention tool for health promotion (Gold et al 2011; Levine et al., 2008) and is becoming an increasingly common intervention component. However, less is known about barriers to using text messaging for health promotion. In this study, we examine variables that influence intention to use a text messaging service to receive sexual health information. Understanding barriers to text messaging may be useful in helping to reduce HIV and STDs and for understanding barriers to other CBTIs, such as social networking sites.

We found that technology factors, not privacy and risk concerns, had a salient impact on intention to use a text-message based intervention. This findings suggest that a mobile intervention would be more successful among people who perceive the benefits of a mobile intervention (relative advantage), who use mobile services to receive other types of information (compatibility), and who feel confident in their ability to easily learn how to use this service (complexity). Of these covariates (relative advantage, compatibility, and complexity), the most important factor was relative advantage followed by compatibility and complexity. Our findings are consistent with other studies (e.g., Ceccuci, Peslak, & Sendall, 2010; Lie, Van Slyke, Green, & Lou, 2005).

Similar to our study, Ke and Li (2009), Premkumar and Ramamurthy (1995), and Tan and Teo (2000) found that relative advantage is a significant predictor of intention to use a text-message based intervention. Further, Premkumar and Ramamurthy (1995) also found that the greater the complexity of a text messaging program, the slower the rate of adoption. Most recently, Ceccuci et al. (2010) used Rogers' diffusion of innovation theory, end user computer satisfaction, the theory of reasoned action, the theory of planned behavior, and the technology acceptance model to examine text message intention. They examined psychosocial factors associated with intention to text message and found that compatibility and ease of

use/complexity were significant predictors. Hence, ease of use/complexity is an important factor as is compatibility (e.g., text messaging fitting the respondents' communication style). Taken together, our findings, relative advantage, complexity, and compatibility suggest several elements need to be considered when designing health interventions with a text messaging component.

The variance explained in our study (73.1%) is similar to other studies that have used Rogers' diffusion of innovation theory to examine text message intention (Ceccuci, et al., 2010). Interestingly, we did not find support for our hypotheses that privacy concerns and risk beliefs would negatively affect intention to use text messages. This finding is consistent with previous research that has found that, although young adults are more likely to engage in behaviors such as posting online personal information than older adults, when asked about privacy concerns, younger adults described equivalent levels of privacy concerns as adults (Hoofnagle, King, Li, & Turow, 2010). Moreover, Hoofnagle et al. (2010) found that, even though all adults tend to have gaps in their knowledge about the extent to which the law protects online privacy, young adults (relative to older adults) were especially likely to overestimate the extent to which the law protects their offline and online privacy.

## 6.1 Future Directions

Future research should examine additional covariates (e.g., geographic locale, educational background) to determine if these variables impact risk perception and technology adoption. As technology-based interventions are diffused into society, future studies should assess individuals who have used a TMBI to determine if there are specific components in the intervention that are perceived as barriers to use. For example, Youn (2009) found that privacy-concerned young adults avoided online sites that required registration as a strategy to protect privacy. Thus, it may be that the specific procedures of a TMBI warrant investigation before widespread implementation.

## 6.2 Limitations

Our study has several limitations. First, we used a convenience sample, which suggests that its findings may not be generalized to the larger population. Second, we used cross-sectional data, which limits our ability to establish causality. Third, we used self-report data. As such, social desirability may be a potential threat to the validity of this study. In the future, subjects should brief participants on what kind of sensitive information they will have to share in a TMBI if privacy concerns and risk beliefs are included as constructs in the model.

## 6.3 Implications

Despite these caveats, this study helps to fill a gap in the knowledge base. Given African American young adults reported lack of barriers to technology adoption, high use of mobile technology, and disproportionate burden of the STI epidemic, m-health interventions designed to promote sexual health may be an avenue that warrants increased emphasis for African American young adults. M-health interventions that maximize user perceptions that the technology can be used easily and provides benefits beyond other avenues are most likely to be adopted. However, these interventions should seek to maximize privacy protections and communicate clearly about these protections.

## 7 Conclusion

Mobile services in general and text messaging in particular continue to be common methods of communication in the US. This form of communication is also becoming more prevalent in sexual health interventions. This study is one of the first to examine barriers to engaging in a text-message based intervention among African American young adults. In general, the findings (relative advantage, complexity, and compatibility) adhere to the proposed conceptual model and should be useful to researchers and interventionists as they develop strategies to design future m-health interventions. Program developers and intervention specialists should be aware that, for African American young adults, privacy and risk concerns may not deter use, but education regarding these issues may be necessary prior to implementation.

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## Appendix: Survey Items

### Relative advantage

1. Using a text-message service would enable me to obtain sexual health information more quickly.
2. Using a text-message service would improve the quality of the sexual health related decisions that I make.
3. Using a text-message service would make it easier for me to obtain sexual health information.
4. Using a text-message service would improve my sexual health.
5. Overall, I would find using a text-message service to be advantageous in my life.

### Compatibility

1. Using a text-message service for sexual health information would be compatible with all aspects of my life.
2. Using a text-message service for sexual health information would fit well with my current lifestyle.
3. I think that using a text-message service would fit well with the way I like to receive my sexual health information.

### Complexity

1. I believe my interaction with a text-message service would be clear and understandable.
2. Overall, I believe that a text-message service would be easy to use.
3. Learning to use a text-message service would be easy for me.

### Risk beliefs

1. There would be high potential for loss associated with giving my personal information to text-message services.
2. There would be too much uncertainty associated with giving my personal information to text-message services.
3. Providing text-message services with my personal information would involve many unexpected problems.

### Privacy concerns

1. I would be concerned that the information I submit to a text-message service could be misused.
2. I would be concerned about submitting information to a text-message service, because of what others might do with it.
3. I would be concerned about submitting information to a text-message service, because it could be used in a way I did not foresee.
4. I would be concerned that my private information can show up on the Internet.

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