Exploring the Relationship between Privacy Concerns and Social Media Use among College Students: A Communication Privacy Management Perspective

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Abstract: This study examined college students' privacy concerns and impacts on their Twitter usage behaviors. By employing an online questionnaire, this empirical research tested the predictive power of privacy management variables on Twitter usage among college students from a large public university in the United States. This research developed its research hypotheses from Communication Privacy Management Theory (CPM). Regression analyses concluded that *Control* and *Boundary Rules of Private Information* on Twitter significantly predict daily minutes spent on Twitter accounts. However, the same CPM variables did not predict college students' other Twitter usage behaviors (e.g., weekly inquiries and total months of using Twitter). The other two CPM variables, *Permeability Rules* and *Linkage Rules of Private Information on* Twitter, did not predict college students' Twitter usage behaviors. Theoretical implications were discussed.

Keywords: College Students, Communication Privacy Management Theory (CPM), Privacy, Online Questionnaire Survey, Regression Analysis, Social Media, Twitter, Usage Behaviors

1. Introduction

According to Twitter (2015), this popular social media platform has 303 million monthly active users. 80% of its active users also adopt mobile devices. Currently present in 33 languages, 77% of Twitter accounts are from outside the U.S. (Twitter, 2015). Over 500 million Tweets are sent daily worldwide (Twitter, 2015). As the numbers of Twitter users grow, it has affected the way information will be created, distributed, discussed, and shared online. The applications and usage behaviors of many Twitter users have increasingly drawn attention in recent years, ranging from political communication (Ekdale, Namkoong, Fung & Permultter, 2010; Larson & Moe, 2012), academic librarians (Kim & Abbas, 2010), to sports (Hambrick, Simmons, Greenhalgh, & Greenwell, 2010; Sanderson & Truax, 2014).

College students are heavy users of Twitter (Browning & Sanderson, 2012). Junco, Heiberger, and Loken (2010) reported that, on the basis of The Higher Education Research Institute (HERI 2007), 94% of college students use social media. Browning and Sanderson

(2012) shifted their focus to study 20 student athletes through a qualitative interview research and concluded that their motives to use Twitter include accessing information, keeping in contact and communicating with followers. Twitter as a rapidly rising social platform also enables college students to accomplish their communication needs to tweet about their personal and business lives (Pegoraro, 2010). As a result, it has become one of the fastest growing social network platforms on the Internet (Romero, Galuba, Asur & Huberman, 2011).

Several characteristics have made Twitter even more popular among college students. First, Twitter allows an individual to update their followers in 140 characters or less to actively create and share content they have generated. Its users can enter texts or shortened URLs that lead followers to elsewhere on the web (Twitter, 2013b). Second, this technology allows its users to maintain a steady flow of information from friends, journalists, and celebrities through sharing daily experiences, opinions, chatter, news, and entertaining commentary to a user's online community (Java, Song, Finn & Tseng, 2007). Third and lastly, Twitter allows college students to form their own identity (Browning & Sanderson, 2012).

1.1. Objectives of This Study

The objectives of this study intend to examine privacy concerns affecting college students' Twitter usage behaviors through a quantitative data collection method. Deriving from the Communication Privacy Management (CPM) Theory, this study focuses on what college students perceive as privacy-related issues on Twitter, how they perceive various privacy management rules, and whether these perceptions influence their Twitter usage behaviors. The purposes of this study also aim to address the methodological gap in current research that only used qualitative methods (such as a case study method or an interview method) to study college students' Twitter usage. We derived from the ample research of the same demographic segment in the collegiate sports context (Browning & Sanderson, 2012; Hambrick et al., 2010; Kassing & Sanderson, 2010; Sanderson, Browning & Schmittel, 2015; Sanderson & Truax, 2014). Although these qualitative methods offer insights into what college students use Twitter, these qualitative data do not allow researchers to develop a predictive behavioral model. This paper thus aims to contribute to the growing body of communication research that examines the impacts of Twitter and other social media on college students' behaviors.

2. Literature Review

One of the most prominent characteristics of this emerging social media platform is that Twitter has blurred the lines between the public and private domains when its users are allowed to publish personal thoughts quickly and easily (Gillen & Merchant, 2013; Qi & Nevil, 2011). In this study, we relied on the Communication Privacy Management (CPM) Theory to examine whether college students' privacy management strategies have any impacts on their Twitter usage.

2.1. Communication Privacy Management Theory (CPM): Theoretical Framework

The management of personal privacy in social media has been a topic that increasingly attracts

scholars' attention (Brandtzæg et al., 2010; Burkell et al., 2014; Chen & Kim, 2013; Oravec, 2012; Petronio, 2013; Tucker, 2014; Yuan, Feng & Danowski, 2013). The emphasis on personal information control is in line with recent scholars' interests in social media and privacy (O'Bien & Torres, 2012). It is also consistent with the user-centric approach of social media education programs to change student athletes' usage behaviors (FieldHouse Media, n.d.; Sanderson et al., 2015; Sanderson & Truax, 2014). Some empirical research has found that privacy concerns significantly affect the relationship between gratifications sought and social media use (Chen & Kim, 2013) and are likely to affect subsequent social media usage behaviors.

Communication Privacy Management Theory (henceforth, CPM Theory) also studies how people manage their own privacy in different communication contexts using various communication platforms (Petronio, 2002, 2013). Given that individual college students will make decisions about the ownership, collection, control, and boundary setting decisions of personal information, it is expected that CPM is applicable to study their Twitter usage behaviors.

On the basis of CPM Theory, this research proposes that individuals manage their own personal information through establishing privacy boundaries and setting up privacy rules derived from CPM theoretical constructs (Petronio, 2013). College students need to become aware that personal thoughts disclosed in tweets are related to their own privacy management strategies. Students' ability to define and redefine their privacy boundaries constitutes an important process to decide who owns or co-owns personal information (Petronio, 2013). If the control and negotiation of personal information break down, privacy turbulence occurs (Petronio, 2013) and is likely to lead to administrators' restrictive measures that will infringe on individual rights of privacy.

CPM Theory has been applied to study users' privacy management on different social media platforms (Child & Agyeman-Budu, 2010; Child, Petronio, Agyeman-Budu & Westermann, 2011; Petronio, 2013; Waters & Ackerman, 2011). For example, Waters and Ackerman (2011) found that users' ability to manage their own privacy after assessing positive and negative consequences of information disclosure affects their use experiences on Facebook. Browning and Sanderson (2012) found that Twitter enables college students to maintain contacts, seek for information, and share information with fan followers. Thompson (2011) also applied this theory to examine how college students disclose personal information when interacting with their athletic/academic advisers and found that dilemmas exist when privacy management variations affect interpersonal relationship. To better understand how college students make decisions about their privacy management, this study intends to explain the relationships among several CPM-derived variables and Twitter usage behavior variables below: *Privacy Control of Private Information on Twitter*, *Privacy Ownership Rules*, *Permeability Rules*, and *Linkage Rules of Private Information on Twitter*; and *Twitter Usage Behaviors*.

2.2. Operationalization of the Study Variables

The CPM theory assumes that college students are motivated to regulate the access and sharing of their personal information on Twitter because they believe they own the information and are justified to control how the information will be accessed, shared, and used (Petronio, 2013).

The fundamental belief that all personal information belongs to individual college students prompts the development of decision-making rules in terms of controlling, owning, and setting metaphorical boundaries of personal information in social media (Child et al., 2009).

2.3. Independent Variable 1: Control of Private Information on Twitter

Control of private information on Twitter is conceptually defined as users' beliefs that they can control their private information to allow only authorized others to access and use the information (Petronio, 2013; Thompson, Petronio & Braithwaite, 2012). College students are likely to learn a consistent set of privacy rules when tweeting their personal thoughts on Twitter to share with their followers. For example, existing literature on the usage behaviors of college students has found that social media educational programs developed for collegiate athletes succeed in cautioning them when tweeting very personal information (such as body features, medical records, and financial situation) or controversial comments (such as racial or sexual slurs) (Sanderson et al., 2015). Dwyer, Hilz, and Passerini (2007) confirmed when the level of privacy concerns is high, the share/disclose their personal information. Therefore, on the basis of CPM research (Petronio, 2013), this study proposes that college students' perceived control of personal thoughts on Twitter will lead to less frequent use of Twitter when perceived risks of the disclosure outcome may cause controversies.

Research Hypothesis 1: *College students' control of private information on Twitter will affect their Twitter usage behaviors.*

2.4. Independent Variable 2: Boundary Rules of Private Information on Twitter

This CPM variable refers to the process of establishing metaphorical boundaries to determine the sharing of personal information (Petronio, 2013; Thompson et al., 2012). Privacy boundaries are established "to delineate the context as well as the boundary lines of demarcation for information considered private" (Petronio, 2013, p. 9). Thus, if college students believe their personal tweets to be private and to lie within their own privacy boundary, they would need to understand all risks involved with disclosure decisions. When a privacy boundary is broken, boundary turbulence will occur (Kennedy-Lightsey et al., 2012). When college students post controversial tweets, it is evident that a clearly-set boundary between the private and public domain is not established because they are not capable of determining whether personal thoughts should become public, shared, and co-owned by others. Once boundary turbulence occurs, restrictive and disciplinary measures by university administrators are likely to reduce Twitter usage of college students. On the basis of the CPM theory, this study proposes that the establishment of college students' privacy boundary rules is also likely to reduce Twitter usage because more stringent privacy criteria prevent them from posting potentially controversial personal tweets.

Research Hypothesis 2: *College students' boundary rules of private information on Twitter will affect their Twitter usage behaviors.*

2.5. Independent Variable 3: Permeability Rules of Private Information on Twitter

Permeability rules of private information on Twitter is defined as being when college students determine the amount, breadth, and depth of private information disclosure on Twitter (Child et al., 2009). For example, when college students decide to tweet their personal thoughts, they demonstrate the control over the boundary permeability about their privacy (Caughlin, 2006). The decision to set boundary permeability rules will affect how college students use Twitter and other social media. Debatin et al. (2009) confirmed the effects of these rules and found that over 77% of the respondents had changed their Facebook setting to protect their own privacy by restricting personal information. Similarly, O'Bien and Torres (2012) studied Facebook users' privacy concerns and found that they adjusted their privacy settings to ensure the control of third party's access to personal information. Over 50% of the users in this study had a high level of privacy awareness that impacted on their social media usage behaviors. On the basis of the CPM theory, this study thus speculates that, when boundary permeability is high, college students are more likely to disclose personal information to others on Twitter.

Research Hypothesis 3: *College students' permeability rules of private information on Twitter will affect their Twitter usage behaviors.*

2.6. Independent Variable 4: Linkage Rules of Private Information on Twitter

Linkage rules of private information on Twitter describes when college students make decisions about granting access to others for their private information (Child et al., 2009; Petronio, 2002; Thompson et al., 2012). Jin (2013) found that the amount of tweets positively correlates with the number of people a user follows and the number of people following a user. The management of linkage rules involves the negotiation of ownership and boundary of private information to be shared by others (Child et al., 2009). For example, college students need to determine who will be granted the access to their private information (Pegoraro, 2010). On the basis of the CPM theory, this study proposes that, when college students designate more stringent linkage rules to protect their private information on Twitter, it is likely that their usage behaviors will be affected.

Research Hypothesis 4: *College students' linkage rules of private information on Twitter will affect their Twitter usage behaviors.*

2.7. Dependent Variables: Twitter Usage Behaviors

Dwyer et al. (2007) confirmed that when privacy concerns are high, the users will be less likely to share/disclose their private information. Similarly, Child and Agyeman-Budu's (2010) empirical study confirmed that blogging frequency was related to the amount of time to use blogs as a result of self-monitoring behaviors to act in a socially appropriate way. Twitter usage behaviors were often measured by the intensity of Twitter use such as frequency of use and time spent on Twitter (Hughes, Rowes, Batey & Lee, 2012). By linking CPM and social media use literatures, this study proposes the four research hypotheses (RH1 to RH4) above to examine the relationships between college students' privacy management and their Twitter usage behaviors.

3. Research Method

3.1. Method Selection

A self-administered online questionnaire was used to collect empirical data for this project. An online questionnaire is appropriate for its ability to cover a wide range of topics among different samples, easy administration, and cost effectiveness (Wrench et al., 2008). Internet survey also has the benefits of protecting the anonymity of the participants (Joinson, 1999) when inquiring participants about sensitive issues such as privacy perceptions.

3.2. Sampling Method, Procedures, and Sample Characteristics

Student participants were recruited from a large public university in the Southwestern region of the United States. A convenience sampling method was used to survey 183 students on the campus where the student population was 23,003 in Fall 2013. A screening question was also used to exclude participants who have not used their Twitter account within the last 30 days and are not considered active users (valid N=151).

In terms of sample characteristics, average age of the sample was 20.26 years old (SD=4.05). Gender division among the participants was 52.7% male (N=79) and 47.3% female (N=71). The majority described themselves as Hispanics (N=63, 42.0%) while White (N=40, 26.7%), African-American (N=32, 21.3%), and Asian-American participants (N=4, 2.7%) accounted for the remaining ethnic groups. In terms of participants' Twitter usage behaviors, on average, participants had owned a Twitter account for 34.90 months (SD=18.65). In an ordinary week, participants checked their Twitter account 35.41 times per week (SD=38.08), while they spent about 40.89 minutes (SD=37.26) in an ordinary day to check their Twitter account.

3.3. Questionnaire Development

A group of 3 faculty experts served as reviewers of the questionnaire to ensure face and content validity and to remove any potential problems of wording and layout. The first part of the questionnaire includes an informed consent form approved by the Institutional Review Board. Participants must electronically sign the consent before the study. The beginning part of the questionnaire asks a screening question to determine whether a participant is an active Twitter user, using the criterion if he/she has logged on to it to navigate Twitter within the last 30 days (Waters & Ackerman, 2011).

Control of private information on Twitter variable was measured by eight 5-point Likert statements (adapted from Spiekermann, 2005). Some examples of the statements include the following statements: *I feel I can steer my Twitter activity in a way I feel is right; I determine who I follow; I have perfect control of my Twitter account; I determine for myself who I interact with; I have the choice to interact with other users; I have the choice to change my privacy settings; I tweet when I want; I have limited personal information on my Twitter.* Cronbach's alpha coefficient for this variable is .91.

Boundary rules of private information on Twitter variable was measured by four 5-point

Likert statements (adapted from Child et al., 2009): *If the information I posted looks too private, I delete it; I usually am slow to tweet about recent events because people might talk; I do not tweet about certain topics because people might talk; I do not tweet about certain topics because I worry who have access to my tweets.* Cronbach's alpha coefficient for this variable is .62.

Boundary permeability rules of private information on Twitter variable was measured by two 5-point Likert statements from Child et al. (2009): *I have the choice to accept followers; I determine who follows me.* Cronbach's alpha coefficient for this variable is .82.

The last independent variable, *Linkage rules of private information on Twitter* was measured by four 5-point Likert statements from Child et al. (2009). These items include *My Twitter entries are detailed; I try to let people know my best interest on my Twitter; I have criteria for who I follow on Twitter; I comment on a tweet to have others check out my Twitter.* Cronbach's alpha coefficient for this variable is .51.

Twitter usage behaviors were measured by self-reported use frequency and time: (1) *In an ordinary week, I check my Twitter account: ____ times (per week)*; (2) *In an ordinary day, I spend about ____ minutes on Twitter* (Debatin et al., 2009; Johnson & Yang, 2009). The last part of the questionnaire is related to participants' demographics such as gender, age, and race/ethnicity (Fogel & Nehmad, 2009; Jin, 2013).

Table 1 shows four extracted factors from an exploratory factor analysis with Varimax rotation. Cronbach's α coefficients were run to test scale reliability of these factors (See Table 1). Table 2 demonstrates factor loading of these extracted factors: *Control of Privacy Information on Twitter* (total variance accounted for=29.97%)*; Boundary Rules of Private Information on Twitter* (total variance accounted for=11.36%)*; Boundary Permeability Rules of Private Information on Twitter* (total variance accounted for=11.29%)*; Linkage Rules of Private Information on Twitter* (total variance accounted for=10.28%).

Table 1. Descriptive Statistics of Study Variables

Factor	**Mean**	**S.D.**
Control of Private Information on Twitter (Cronbach's alpha=.91)		
I feel I can steer my Twitter activity in a way I feel is right.	4.18	.92
I determine who I follow.	4.44	.83
I have perfect control of my Twitter account.	4.14	.94
I determine for myself who I interact with.	4.26	.91
I have the choice to interact with other users.	4.30	.84
I have the choice to change my privacy settings.	4.40	.83
I tweet when I want.	4.38	.92
I have limited personal information on my Twitter.	4.02	.89
Composite Index	4.27	.70
Boundary Rules of Private Information on Twitter (Cronbach's alpha=.62)		
If the information I posted looks too private, I delete it.	4.01	.89
I usually am slow to tweet about recent events because people might talk.	3.25	1.77

I do not tweet about certain topics because I worry who has access to my tweets.	3.61	1.28
Composite Index	3.62	.85
Boundary Permeability Rules of Private Information on Twitter (Cronbach's alpha=.82)		
I have the choice to accept followers.	3.50	1.46
I determine who follows me.	3.40	1.42
Composite Index	3.45	1.32
Linkage Rules of Private Information on Twitter (Cronbach's alpha=.51)		
My Twitter entries are detailed.	2.31	1.15
I try to let people know my best interest on my Twitter.	2.49	1.05
I have criteria for who I follow on Twitter.	3.20	1.16
I comment on a tweet to have others check out my Twitter.	3.73	.95
Composite Index	2.93	.69

Table 2. Factor Analysis

Factor	**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.28	31.08	31.08	5.10	29.97	29.97
2	2.00	11.82	42.90	1.93	11.36	41.33
3	1.79	10.54	53.44	1.92	11.29	52.62
4	1.61	9.46	62.90	1.75	10.28	62.90

Extraction Method: Principal Component Analysis.

4. Findings

First, preliminary data manipulations were required to create composite scores from multi-item scales for the independent variables of *Control of Privacy Information on Twitter* (Mean=4.27, SD=.70), *Boundary Rules of Private Information on Twitter* (Mean=3.62, SD=.85), *Linkage Rules of Private Information on Twitter* (Mean=2.93, SD=.69), and *Permeability Rules of Privacy* (Mean=3.45, SD=1.32) (Refer to Table 1).

Second, this study examined whether the four CPM independent variables predicted the Twitter usage behaviors of college students as measured by daily use (measured by minutes) and weekly inquiry frequency (measured by the times) of Twitter. These empirical results found that *Control of Privacy Information on Twitter* did predict college students' Twitter usage, as measured by minutes spent on Twitter each day (ß=.21, t=2.59*), but not weekly inquiries of their Twitter account (ß=.16, t=1.79) and total months of using their Twitter account (ß=.10, t=1.15). The positive ß coefficients indicated that the more college students perceive they have control over private information on Twitter, the more they will spend time on Twitter. In other words,

when college students feel that they have perfect control of their Twitter account and their Twitter activities, determine who they want to interact with and follow, and have the choice to change their own privacy settings, they were found to use Twitter more as demonstrated in total minutes spent. Therefore, RH1 was partially supported by our empirical data (See Table 3, 4, and 5).

Table 3. Impacts of Privacy Concerns on Daily Minutes Spent on Twitter

Multiple R: .34
R Square: .12
Adjusted R square: .10
Standard Error: 35.50
F Value:4.75***
Durbin-Watson= 1.27

	df	Sum of Squares	Mean Square
Regression	4	23935.49	5983.87
Residual	144	181489.6	1263.34
Total	148	205425.1	

Factor	**Unstandardized Coefficients β**	**Standardized Coefficients β**	**t**
Control of Private Information on Twitter	11.27	.21	2.59*
Boundary Rules of Private Information on Twitter	-10.00	-.22	2.85**
Permeability Rules of Private Information on Twitter	3.13	0.11	1.35
Linkage Rules of Private Information on Twitter	3.15	.06	.74

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

Table 4. Impacts of Privacy Concerns on Weekly Inquiries of Twitter Account

Multiple R: .25
R Square: .06
Adjusted R square: .04
Standard Error: 37.39
F Value: 2.29
Durbin-Watson= 1.96

	df	Sum of Squares	Mean Square
Regression	4	12794.62	3198.66
Residual	135	188717.3	1398.91
Total	139	201512.0	

Factor	Unstandardized Coefficients β	Standardized Coefficients β	t
Control of Private Information on Twitter	8.54	.16	1.79
Boundary Rules of Private Information on Twitter	-5.33	-.12	-1.39
Permeability Rules of Private Information on Twitter	-3.64	-.13	-1.45
Linkage Rules of Private Information on Twitter	8.80	.16	1.92

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

Table 5. Impacts of Privacy Concerns on Total Months of Using Twitter

Multiple R: .24
R Square: .06
Adjusted R square: .03
Standard Error: 18.41
F Value: 1.85
Durbin-Watson= 2.09

	df	Sum of Squares	Mean Square
Regression	4	2510.42	627.61
Residual	125	42343.28	338.75
Total	129	44853.70	

Factor	Unstandardized Coefficients β	Standardized Coefficients β	t
Control of Private Information on Twitter	2.66	.10	1.15
Boundary Rules of Private Information on Twitter	-1.80	-.08	-.93
Permeability Rules of Private Information on Twitter	-2.25	-.16	-1.73
Linkage Rules of Private Information on Twitter	4.12	.16	1.78

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

This study also found that *Boundary Rules of Private Information on Twitter* did predict college students' Twitter usage, as measured by how many minutes were spent on Twitter each day (ß=-22, t=2.85**), but not how many times they checked their Twitter account in an ordinary week (ß=-.12, t=-1.39) and total months of using Twitter (ß=-.08, t=-.93). Therefore, RH 2 was partially supported by our empirical data (See Table 3, 4, and 5). The negative ß coefficients also indicated that the more college students perceive they have complete ownership of information on Twitter, the more they will spend more time on Twitter.

Results also confirmed that *Linkage Rules of Private Information on Twitter* and *Boundary Permeability Rules of Private Information on Twitter* did not predict college students' Twitter usage behaviors. Therefore, both RH3 and RH4 were not supported by our empirical data (Refer to Table 3, 4, and 5).

5. Discussion

5.1. Managing Privacy and Twitter Usage among College Students

College students of various backgrounds have increasingly attracted scholars' attention to examine their Twitter usage behaviors (Browning & Sanderson, 2012; Hambrick et al., 2010; Kassing & Sanderson, 2010; Pegoraro, 2010; Sanderson & Traux, 2014). For example, due to the repercussions of their controversial tweets, collegiate student athletes particularly attract scholars' attention to examine whether learning privacy management strategies would affect their Twitter usage behaviors. Existing literature rarely provides quantitative empirical data to develop a predictive model about the relationship between privacy management strategies and social media usage behaviors.

Our empirical data showed that, college students' privacy control of private information on Twitter was found to be a statistically significant and the most consistent predictor of their Twitter usage behaviors, measured in daily minutes spent on their Twitter. College students' perceived control of private information was empirically found to be positively associated with their daily minutes spent on their Twitter account. The result means that college students are willing to spend more time using this online social media when they perceive they have full control of private information. Students' perceived boundary rules of private information on Twitter also affected their total minutes spent on Twitter. Unexpectedly, two other CPM variables, *Permeability Rules of Private Information on Twitter* and *Linkage Rules of Private Information on Twitter*, did not predict college students' Twitter usage behaviors. These empirical findings are consistent with recent studies showing that lack of awareness of privacy control mechanisms on existing social media is closely related to Twitter users' attitudes and privacy setting decision (Khazaei, Xiao, Mercer & Khan, 2016).

Twitter offers spontaneous communication capabilities and enables users to keep in contact, communicate with fans, and allow other users to access college students' personal thoughts, opinions, and information (Browning & Sanderson, 2012). The lack of privacy management to properly disclose personal information and regulate access to the information is likely to cause many controversial tweets as described in the media. Their choices to determine the privacy boundaries, disclosure, ownership, rules are likely to explain what causes many

controversial Twitter users discussed previously. Many CPM studies using different student samples (Browning & Sanderson, 2012; Hambrick et al., 2010; Pegoraro, 2010; Sanderson & Traux, 2014) have examined the relationship between privacy-related perceptions and decision-making rules, but did not extend their research to examine how these variables could cause Twitter misuses and subsequent controversies widely reported in the college sports area. Therefore, the current study provides an exploratory research on this important issue.

According to a PEW Research Center study in January 2015, 91% of American adults say that consumers have lost control over how personal information is collected and used by companies (Madden, 2015). Given the importance of this issue, this study examined how college students perceive privacy management issues, make privacy-related decisions, and subsequent impacts on their Twitter usage behaviors. One of the privacy management strategies is through managing their privacy setting to have control over the amount of information that can be accessed by authorized users only. The same strategy has been reported in other social media, due to the merging of public and private spaces in social media (Debatin et al., 2009). For example, Debatin et al. (2009) found that Facebook users were more likely to change their privacy settings when they reported a personal invasion of privacy. 80% of respondents changed their privacy settings when their privacy was breached, while only 42 % changed their privacy settings after hearing about others' experiences (Debatin et al., 2009). The ability to control users' privacy and regulate their private information was found to positively predict college students' Twitter usage as measured in total daily minutes. It is likely that, when college students believe they are in full control of their private information on Twitter, they are more likely to trust Twitter when they perceive their information disclosure to be less risky (Hollenbaugh & Egbert, 2009; Kennedy-Lightsey et al., 2012; O'Bien & Torres, 2012). Child and Agyeman-Budu (2010) offered a similar explanation by linking privacy management with social media usage. Their study of blogging (similar to Twitter) suggested when bloggers were confident with their self-image management online, they were consequently more willing to disclose more personal information.

Browning and Sanderson (2012) studied collegiate athletes and reported that they "fail to understand why there is a problem" after they were reprimanded for inappropriate tweets (p. 504). The lack of well-defined boundaries is likely to explain some controversial tweets by athletes and supports that a social media education on privacy management is much needed (Sanderson et al., 2015). This also seems to concur with the study by Burkell et al. (2014) that claimed a convergence or a confusion of public and private spaces on social media. It is likely that, as demonstrated in the sample, college students' inability to clearly distinguish these spatial constraints as conceptualized in these two CPM variables, boundary permeability and linkage rules, is likely to explain many unfortunate controversies.

Unexpectedly, the lack of predictive power of Twitter users' *Permeability Rules of Private Information on Twitter* and *Linkage Rules of Private Information on Twitter*, suggested that these two CPM variables are not good predictors of college students' Twitter usage behaviors in this study. The lack of statistically significant relationship implied that college students were not concerned about the permeability rules and linkage rules of private information on Twitter. The result may be explained by the young age of college students who consider personal privacy to be tradable information:

> Put it all together, and a picture emerges of young adults who are more willing than older Americans to let companies use their personal data for commercial purposes, in exchange for the social-networking functions they value, but are more skeptical about the government's implicit security-for-privacy bargain. (Desilver, 2013; PEW Research Survey)

Furthermore, the researchers also speculate that the lack of predictive power of these two CPM variables could be attributed to college students' motivations to use Twitter as a social media platform to see what is trending, to learn what their friends are talking about, and to share contents. These motives are less relevant to what constitute permeability and linkage rules that emphasize the decision to select followers and to express personal information such as interests (American Press Institute, 2015).

6. Conclusion

6.1. Theoretical Implications

Despite a recent surge of research on privacy management in social media, the majority of studies are qualitative and do not develop a predictive model between privacy management and subsequent social media usage behaviors (Debatin et al., 2009; Ellison, Steinfield & Lampe, 2007; Kennedy-Lightsey et al., 2012; Tufekci, 2008). Compared with other popular social media platforms such as Facebook, privacy issues related to Twitter are a rarely researched area in spite of scholars' interest in Twitter usage among college students in general, and collegiate athletes in particular (Browning & Sanderson, 2012; Hambrick et al., 2010; Kassing & Sanderson, 2010; Sanderson et al., 2015; Sanderson & Truax, 2014). This has presented a gap in the current CPM, social media, and sports communication literatures. As the numbers of Twitter users grow, this social media platform has been observed to affect the way personal information is created, distributed, and talked about online and justifies more research into this emerging application.

Solove (2012) believes that the control of information on social media can be best "viewed as an issue of informational privacy" (p.11). The main concern of privacy management is of the control and protection of private information such as a person's daily activities, lifestyle choices, finances, their whereabouts, or any information a person feels they need not disclose (Dolan, 2012). Thus, the CPM theory provides a better understanding of the importance of revealing and concealing information online. This theory also allows scholars to explain why people disclose information and the reasoning behind it. Its fundamental theoretical assumptions are that a system of rules is used by individuals to manage boundaries and control related to their own information disclosure and sharing decisions. Wu, Huang, Yen, and Popova (2012) concluded that individuals, "perform simple risk-benefit calculation when deciding whether or not to disclose their personal information," and "if the benefits of disclosure outweigh the risks," then people are more likely to disclose information (p. 891). Furthermore, the decision to manage college students' privacy is contingent on external environmental factors that shape their perceived benefits and risks of personal information disclosure. Therefore, future study

should examine the impacts of these external factors on the privacy management decision-making process by college students.

6.2. Limitations and Future Research Directions

Results of this study should be interpreted with caution due to several limitations in sampling and research design. The sample of college students in this study was relatively small and conveniently recruited from a public university in the United States. While attempts were made to recruit from other universities, the response rates were too small to include these participants for analysis. Therefore, future research should attempt a more representative national sample of college students from all other universities. A wider national sample will also allow for more assumptions concerning privacy perceptions of college students because they are heavy users of social media.

In addition, measures of college students' privacy management were based on a series of five-point Likert scales. Dichotomous questions should be included to solicit *Yes* or *No* responses in future research. Follow-up studies should be done by incorporating qualitative interview questions. Further, existing research suggests that the use of social media is related to motivations, consequences, crisis management, and self-monitoring (Child & Agyeman-Budu, 2010; Waters & Ackerman, 2011). Supplementary studies should incorporate these variables in developing a fuller model to explain other constructs from the CPM theory on Twitter usage behaviors. Understanding motivations of college students to use Twitter can better help grasp and interpret the management of privacy in social media.

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