

12-13-2016

The Effects of Message Virality and Message Source on Facebook Users' Perceptions of Source Credibility, Norms, Attitudes, Emotional Responses, and Behavioral Intentions

Anne M. Borsai

University of Connecticut, anne.borsai@uconn.edu

Follow this and additional works at: <https://opencommons.uconn.edu/dissertations>

Recommended Citation

Borsai, Anne M., "The Effects of Message Virality and Message Source on Facebook Users' Perceptions of Source Credibility, Norms, Attitudes, Emotional Responses, and Behavioral Intentions" (2016). *Doctoral Dissertations*. 1305.
<https://opencommons.uconn.edu/dissertations/1305>

The Effects of Message Virality and Message Source on Facebook Users' Perceptions of Source Credibility, Norms, Attitudes, Emotional Responses, and Behavioral Intentions

Anne M. Borsai, PhD

University of Connecticut, 2016

The present study explored the effectiveness of an anti-alcohol PSA in the context of Facebook. The study analyzed the effects of message source and message virality (i.e., high shares and likes vs. low shares and likes) on user's perceived trustworthiness of the post, depth of processing, social norms, attitudes, emotional responses, and behavioral intentions regarding alcohol consumption. Participants viewed an anti-binge drinking PSA developed by the Center for Disease Control and Prevention (CDC) posted on a mock Facebook profile page in a 2 (message source: CDC post vs. peer-repost) x 2 (virality: high likes and shares vs. low likes and shares) between subjects experimental design. Although, results suggested that message source and message virality were not related to trustworthiness of the post, perceived virality mediated the relationship between virality and Facebook user norms, highlighting the role of virality in raising awareness about the importance of a post. Trustworthiness of the post had an indirect effect on depth of processing, social norms, and attitudes, and these relationships were mediated by message believability. Moreover, message believability was found to positively predict Facebook user norms, peer descriptive norms, attitudes toward binge drinking, and engagement with the post. Depth of processing predicted negative emotional responses and online engagement with the post. Based on these findings, implications for future research are discussed, as well as recommendations for running promotions using PSAs on Facebook.

Keywords: message virality, social media, Facebook, source credibility, norms, attitudes, emotional responses, behavioral intentions, binge drinking, alcohol consumption, engagement

The Effects of Message Virality and Message Source on Facebook Users' Perceptions of Source
Credibility, Norms, Attitudes, Emotional Responses, and Behavioral Intentions

Anne M. Borsai

B.A., "Babes-Bolyai" University, Cluj-Napoca, **2002**

M.A., University of Hartford, West Hartford, **2009**

A Dissertation

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Philosophy

at the

University of Connecticut

2016

Copyright by
Anne M. Borsai

2016

APPROVAL PAGE

Doctor of Philosophy Dissertation

The Effects of Message Virality and Message Source on Facebook Users' Perceptions of Source
Credibility, Norms, Attitudes, Emotional Responses, and Behavioral Intentions

Presented by

Anne M. Borsai, B.A., M.A.

Major Advisor_____

Leslie Snyder

Associate Advisor_____

John Christensen

Associate Advisor_____

Mark Hamilton

Associate Advisor_____

Anne Oeldorf-Hirsch

Associate Advisor_____

Kenneth Lachlan

University of Connecticut
2016

Acknowledgements

First and foremost, I would especially like to thank my major advisor and mentor, Dr. Leslie Snyder for her continuous support and encouragement throughout my doctoral studies. She believed in me and challenged me to become the best version of myself. Thank you from the bottom of my heart.

I would also like to thank Dr. John Christensen for always having an open door and for providing continuous guidance and advice on the research projects completed during my graduate years. I also wish to thank Dr. Mark Hamilton for his consistent help and feedback on this project. Lastly, I would like to thank Dr. Anne Oeldorf-Hirsch and Dr. Kenneth Lachlan for agreeing to work on this project and providing me with valuable and much appreciated feedback.

In addition, I would like to recognize the wonderful support of my friends and colleagues at UConn who have made my graduate life a little bit less stressful. I especially would like to thank Sara Picklesimer for always making time to pick up my phone calls and having words of support, and Linda Dam for her persistent encouragement during moments of high anxiety.

Last, I would like to thank my family and my husband for believing in me and supporting me on this journey. This degree would have not been possible without their relentless support and encouragement.

This dissertation is dedicated to my mother and my sister – Ana and Nusi.

University of Connecticut
2016

TABLE OF CONTENTS

CHAPTER I: INTRODUCTION.....	1
A. Purpose of Study.....	1
CHAPTER II: REVIEW OF LITERATURE.....	3
A. Social Networking Sites and Source Credibility	4
a. Social Networking Sites.....	4
b. Virality.....	5
c. Source Credibility.....	6
B. Depth of Processing.....	9
C. The Theory of Planned Behavior.....	10
a. Attitudes Regarding Alcohol Consumption.....	10
b. Engagement and Intentions to Binge Drink.....	12
D. The Role of Social Norms in Influencing Behavioral Outcomes	13
a. Facebook and Social Norms.....	14
E. Emotional Responses.....	16
F. The Behavioral Change Model	17
CHAPTER III: METHODS.....	19
A. Participants.....	19
B. Procedure.....	19
C. Stimuli.....	20
D. Measures.....	22
E. Analyses.....	30
CHAPTER IV: RESULTS.....	32
A. Manipulation Checks.....	32
B. Homogeneity of Experimental Conditions.....	32
C. Model Testing.....	33
D. Hypotheses Testing.....	36
CHAPTER V: DISCUSSION.....	42
A. Limitations.....	54
B. Future Research.....	54
C. Implications.....	57
REFERENCES.....	59
APPENDIX A: Research Stimulus.....	75

LIST OF TABLES

Table 1. Predicted Model Pearson Correlations.....	77
Table 2. Revised Model Pearson Correlations.....	79

CHAPTER I

INTRODUCTION

Alcohol use and abuse among young adults, especially college students, remains a problem in the U.S. According to the National Institute on Alcohol Abuse and Alcoholism (NIAAA), in 2014 59.8% of full-time college students between the ages of 18-22 reported drinking alcohol in the past month, compared with 51.5% of other persons the same age. Moreover, 37.9% of college students aged 18-22 reported engaging in binge drinking compared with 33.5% of other persons of the same age (NIAAA, 2014). Binge drinking is defined as “a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 gram percent or above. For the typical adult, this pattern corresponds to consuming 5 or more drinks (male), or 4 or more drinks (female), in about 2 hours” (NIAAA, 2004, p. 3). Researchers have found that binge drinking has serious undesirable consequences for college students, such as motor-vehicle crashes, campus violence, sexual assaults and date rape, as well as academic difficulties and psychological problems (Blanco et al., 2008; Hingson, Zha, & Weitzman, 2009; Wechsler, Lee, Kuo, & Lee, 2000). Moreover, heavy alcohol consumption during adolescence was associated with selective long-term cognitive impairments, such as deficits in retrieval of verbal and nonverbal information, and visuospatial functioning (Brown, Tapert, Granholm, & Delis, 2000; Croom et al., 2015). Therefore, the need to reduce the prevalence of alcohol consumption and binge drinking among young adults is very clear.

The present study explored the effectiveness of an anti-alcohol PSA in the context of social media, specifically Facebook. The study analyzed the effects of message source

(institution post vs. peer repost) and message virality (i.e., high shares and likes vs. low shares and likes) on user's perceived credibility of the source, depth of processing, social norms, attitudes, emotional responses, and behavioral intentions to binge drink.

The present study contributed to the mediated health messages literature by studying the effectiveness of PSAs posted on Facebook in changing young adults' norms, attitudes, and behaviors regarding binge drinking. The study informs health agencies and educational institutions about ways in which social media platforms, like Facebook, can be used in promoting healthy behaviors and behavior change among college students. In 2015 Facebook reported over 1 billion active users worldwide (Company Info, 2015), while in the U.S. 71% of online adults (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015) and 88.6% of college aged adults (18-24 year-olds) (McDermott, 2014) were using it. Over 96% of U.S. students reported using Facebook in year 2010 (Junco, 2012; Smith & Caruso, 2010). Moreover, college students reported spending most of their social media time with Facebook (College students still spend most social time with Facebook, 2015).

The following chapter will emphasize the importance of PSAs in curbing alcohol consumption on college campuses and will discuss the theoretical perspectives driving the present study. Chapter three will discuss the methodology used in the current study. Chapter five will present the results of the hypotheses testing and chapter six will present a discussion of the findings.

CHAPTER II

REVIEW OF LITERATURE

Public service announcements have been used by educational institutions and advocacy organizations to curb alcohol consumption among young adults. However, very few studies have analyzed the media context within which anti-drinking PSAs are viewed and the impact of contextual factors on the effectiveness of the message. One contextual factor that has been examined is interpersonal conversations regarding alcohol and tobacco consumption after watching anti-alcohol and anti-tobacco messages, which was found to have a strong impact on students' attitudes and intentions (Hendriks, van den Putte, & de Bruijn, 2014a; Hendriks, van den Putte, de Bruijn, & de Vreese, 2014b; Samu & Bhatnagar, 2008). A study of Facebook users found that those viewing a pro-alcohol status update with a high number of shares and likes reported more behavioral intentions to consume alcohol than users who viewed the same post with low shares and likes (Alhabash, McAlister, Quilliam, Richards, & Lou, 2015). Given the growth in social media, it is important to understand how the effectiveness of anti-drinking PSAs can be altered by the context in which they are viewed.

The following sections will review the theoretical concepts and theoretical framework that guided the present study. This review will discuss the theoretical concept of source credibility and empirical findings relating to source credibility judgements on social media. Next, the theoretical concept of depth of processing will be discussed and its role in information processing models. Employing the theory of planned behavior, the study will attempt to analyze the processes through which contextual factors on Facebook (i.e. message source and virality) and depth of processing influence individuals' attitudes, norms, and behavioral intentions. Lastly,

the present study will discuss the theoretical concept of discrete emotions, specifically how negative emotional responses to health messages influence individuals' attitudes and intentions.

Social Networking Sites and Source Credibility

Social Networking Sites

Social networking sites (SNSs) are seen as an important facet of social media (Carr & Hayes, 2015). Carr and Hayes (2015) defined social media as “Internet-based channels that allow users to opportunistically interact and selectively self-present, either in real-time or asynchronously, with both broad and narrow audiences who derive value from user-generated content and the perception of interaction with others” (p. 50).

Facebook enables its users to share not only personal information with their network, but also external content (Oeldorf-Hirsch & Sundar, 2015). On average, Facebook users are linked to 130 friends and are connected to approximately 80 pages, groups, and events (Facebook Statistics, 2015). Moreover, Facebook users can see the pages and groups their friends are connected to and the type of information their friends share, like, and comment on.

One interesting aspect of content sharing on Facebook is that individuals who share content and information act as opinion leaders by drawing their social networks' attention to publically available information (Oeldorf-Hirsch & Sundar, 2015). Therefore, these individuals make the information personally relevant to their social network (Oeldorf-Hirsch & Sundar, 2015) and oftentimes express their opinion towards the content in the form of comments and likes. While the individuals sharing the content are not the original source of the information, they can still be viewed as sources by their network (Oeldorf-Hirsch & Sundar, 2015).

In the context of content sharing on Facebook, the current study attempted to parse out the effects of Facebook's sharing affordances on source credibility and message effectiveness.

According to Oeldorf-Hirsch and Sundar (2015) “affordances refer to an object’s ‘action possibilities’ or the opportunities that an interface has provided for interaction” (p. 241). When posting a news story on Facebook, the three primary affordances refer to “(1) the level of broadcasting used for disseminating content to one’s network, (2) comments added to the content shared in the post, and (3) tagging friends in a post” (Oeldorf-Hirsch & Sundar, 2015, p. 241).

There are three levels of broadcasting content on Facebook: the users’ own profile, in which case the post will appear in their news feed and can be seen by their network; a friends’ wall, in which case the post will become visible to mutual friends and individuals who have access to that wall, and private message which can be sent to one individual or a select group of people (Oeldorf-Hirsch & Sundar, 2015).

The present study analyzed the first level of broadcasting, which is one’s own wall. Facebook users can view other users’ wall without being friends; therefore it is important to understand the potential impact of messages viewed on other’s wall on users’ behavioral intentions.

Virality

SNSs can serve as electronic forums for “word-of-mouth” (eWOM) (Alhabash et al., 2015; Cheung, Lee, & Rabjohn, 2008; Subramani & Rajagopalan, 2003) and the development and growth of the Internet created unlimited opportunities for electronic word-of-mouth communication (Cheung et al., 2008). Electronic word-of-mouth has been defined as “any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet” (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004, p. 39). Examples of eWOM communication include the use of social networking sites, chat rooms, instant messaging,

webpages, listserves, and blogs (Crutzen, deNooijer, Brouwer, Oenema, Brug, & deVries, 2009; Golan & Zaidner, 2008). In order to measure the effectiveness of this type of marketing effort researchers coined the term “virality” (Alhabash et al., 2015).

Viral reach was defined as the extent to which the message was viewed, shared, and forwarded on SNSs (Alhabash et al., 2015). For example, users can view videos on YouTube and share them on Facebook, Twitter, or Pinterest (Alhabash et al., 2015; Alhabash, McAlister, Hagerstorm, Quilliam, Rifon, & Richards, 2013). SNSs give users the possibility to publicly indicate their affective responses to online messages by allowing them to like a message on Facebook, like or dislike a video on YouTube, or mark a Tweet as a favorite (Alhabash et al., 2015; Alhabash et al., 2013).

Most research on message virality focused on users’ motivations to interact with messages online (e. g. Hennig-Thurau et al., 2004; Strutton, Taylor, & Thompson, 2011), but very little is known about the effects of message virality on users’ perceptions toward the message and behavioral intentions. Alhabash et al. (2015) found that SNS users were more likely to discuss and redistribute messages with high virality and messages that made them feel positively toward the message. The present study explored the effects of message virality on users’ perceptions toward the message and behavioral intentions to binge drink. Messages with a large number of shares and likes are considered as having high virality, while messages that received a low number of shares and likes are considered as having low virality.

Source Credibility

The diffusion of the Internet and the development of new media technologies allow individuals to access health and medical information at their own convenience. Researchers have explored how individuals make credibility judgments about health information posted on

websites, bulletin boards, personal pages, and online discussion boards (Hu & Sundar, 2010; Sundar & Nass, 2001; Spence, Lachlan, Westerman, & Spates, 2013; Wang, Walther, Pingree, & Hawkins, 2008), but very few studies have researched the ways in which individuals make credibility judgments about health information found on social media (Spence et al., 2013; Lin, Spence, & Lachlan, 2016).

Perceived source credibility is defined as “judgments made by a perceiver (e.g., message recipient) concerning the believability of a communicator” (O’Keefe, 1990, p. 131). Persuasion research identified two dimensions of perceived source credibility: trustworthiness or the perception that the communicator will tell the truth as he or she sees it and expertise or the perception that the communicator it is in a position to know the truth (McCroskey, 1966). The present study focused on the trustworthiness dimension of the post. The rationale is based on the fact that although the CDC is generally viewed as a credible source (Jones & Saad, 2013), the post will be perceived as more trustworthy when the original source is a health organization and the most recent source is a person belonging to the user’s in-group (Spence et al., 2013), in this case University of Connecticut (UConn). Although institutions play on expertise, the repost should still have expertise, but also have greater trust.

Moreover, very few studies have analyzed the relationship between quantitative indicators of online popularity of Facebook posts (i.e., videos, pictures, and links to articles) and status updates (e.g., number of likes, shares, views, and comments), and perceived source credibility in the context of persuasive health information. Studying the impact of Facebook user generated content on young women’s attitudes toward breastfeeding, Jin, Phua, and Lee (2015) found that status updates and messages with high Facebook virality were rated higher on perceived source credibility. Moreover, compared to viewing breastfeeding pages with low

popularity, breastfeeding pages with high popularity resulted in significantly higher breastfeeding intentions, positive attitudes toward breastfeeding, and higher self-efficacy to breastfeed (Jin et al., 2015).

Drawing from research on virality and source credibility, the present study explored the effects of *message source*, that is the original source of the message (PSA), in this case the CDC, and the secondary source, who is a peer Facebook user sharing the CDC message (PSA), and *message virality* on Facebook users' evaluation of the message and behavioral intentions. The CDC is generally viewed as a trustworthy source (Jones & Saad, 2013). We proposed that Facebook users' assessment of the credibility of a post will increase when the post is shared by an individual in their in-group. It is important to highlight that both, the Facebook profile owner and the peer sharing the post belong to the same in-group, in this case UConn. Due to the fact that high virality has been associated with higher behavioral intentions in at least one study (Jin et al., 2015), we also proposed that individuals will be more likely to pay greater attention when the posts have a high number of shares and likes.

The following hypotheses are proposed (Figure 1):

Main effect of peer repost:

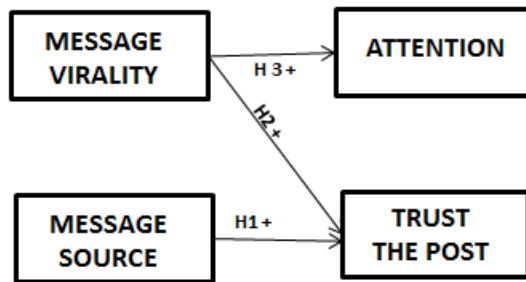
H1: Peer-reposted message will have higher trustworthiness than institution-posted message.

Main effect of virality:

H2: The anti-binge drinking PSA with high virality (high likes and shares) will be perceived as more trustworthy compared to the anti-binge drinking PSA with low virality (low likes and shares).

H3: The anti-binge drinking PSA with high virality (high likes and shares) will lead to greater attention compared to the anti-binge drinking PSA with low virality (low likes and shares).

Figure 1. Message Source and Message Virality as Predictors of Attention and Post Trustworthiness



Depth of Processing

The present study also explored the theoretical concept of depth of processing. Depth of processing has been conceptualized as the degree to which individuals read, attend, reflect, and elaborate on messages (Hammond, Fong, McDonald, Brown, & Cameron, 2004; Hammond, Fong, McDonald, Cameron, & Brown, 2003). It has been proposed as a surrogate for physiological and response time measures, which are often impractical to use when conducting survey research. For example, scholars studying the effectiveness of cigarette graphic warning labels proposed *depth of processing* as a measure of the extent to which individuals were aware of and processed the labels displayed on cigarette packs and helped explain variance in quitting and intentions to quit (Hammond et al., 2003; White, Webster, & Wakefield, 2008). The current study contributes to message processing literature by extending the use of the concept to media messages.

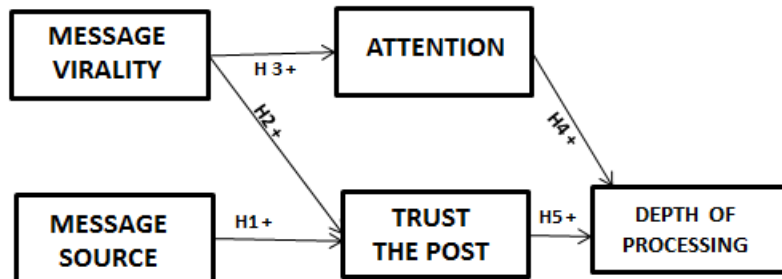
Depth of processing should be contingent on paying attention to a message (Borland et al., 2009; Hassan, Shiu, Thrasher, Fong, & Hastings, 2008). Furthermore, based on research on heuristic processing, if people discount a message source as being untrustworthy, then they should not process it deeply (Chaiken, 1980).

The following hypotheses are proposed (Figure 2):

H4: Attention will have a direct positive effect on depth of processing.

H5: Perceived source trustworthiness will have a direct positive effect on depth of processing.

Figure 2. Attention and Post Trustworthiness as Predictors of Depth of Processing



The Theory of Planned Behavior

The theory of planned behavior was developed as an extension of the theory of reasoned action and assumed that individuals' decision to participate in a specific behavior was a function of attitudes and social norms toward the behavior, and volitional control (Ajzen, 1991). The main proposition of the theory of planned behavior was that the greater an individual's attitudes, subjective norms, and perceived behavioral control toward a behavior, the greater the intention to perform that behavior (Ajzen, 1991). Drawing from the theory of planned behavior, the present study explored the processes through which message source and message virality influence user's attitudes, social norms, and behavioral intentions to binge drink.

Attitudes Regarding Alcohol Consumption

The theory of planned behavior conceptualized attitudes as "the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (Ajzen, 1991, p.188). Researchers found support for the relationship between attitudes toward alcohol consumption and binge drinking, and behavioral intentions (Huchting, Lac, & LaBrie, 2008; Johnston & White, 2010; Norman, Armitage, & Quigley, 2007). Moreover, researchers suggested that attitudes toward a behavior were stronger predictors of intentions to consume

alcohol than other constructs of the theory of planned behavior (Norman et al., 2007; Johnston & White, 2010; Snyder & Fleming-Milici, 2005). The following hypothesis is proposed (Figure 3):

H6: Attitudes toward binge drinking will have a positive direct effect on behavioral intentions to binge drink.

Another useful concept is participants' attitudes toward the message. Marketing models predict that attitudes toward messages mediate the effect of exposure to a message and attitudes towards the object or behavior in the message (MacKenzie, Lutz, & Belch, 1986; Spears & Singh, 2004). In the past, studies have shown that attitudes towards the ad influenced intentions to use marijuana and consume alcohol (Alvaro, Crano, Siegel, Hohman, Johnson, & Nakawaki, 2013; Anderson, deBruijn, Angus, Gordon, & Hastings, 2008; D'Amico, Miles, & Tucker, 2015). For example, research has found that adolescents who reported more positive attitudes toward anti-marijuana TV ads were less likely to report intentions to use marijuana one year later (Alvaro et al., 2013). Therefore, we suggest that attitudes toward the PSA will have a direct effect on behavioral intentions to binge drink, and logically we suggest that attitudes toward the PSA will have a direct effect on engagement with the post (Figure 3). To our knowledge, there is limited research that explored the relationship between attitudes toward a message and engagement with posts on Facebook. Alhabash et al. (2015) found that, participants' attitudes toward an alcohol marketing Facebook status update and their intentions to share the alcohol marketing status update were predictive of intentions to consume alcohol.

H7: Attitudes toward the PSA will have a negative direct effect on behavioral intentions to binge drink.

H8: Attitudes toward the PSA will have a positive direct effect on engagement.

Eagly and Chaiken (1993) proposed that systematic processing of information can lead to more permanent and intensely held attitudes, while attitudes based on heuristic processing are more volatile. Moreover, Ajzen and Sexton (1999) discussed the role of depth of processing as antecedent to attitudes, stating that “the number of accessible beliefs is likely to increase with processing depth, and the strength and evaluative implications of accessible beliefs may also change as a result of continued deliberation” (p.122-123). Griffin, Neuwirth, Giese, and Dunwoody (2002) found that systematic processing of risk messages was associated with greater attitude strength. Based on past research, we propose that, the more participants will think about the PSA, the more likely they are to change their attitudes towards the behavior and message. Therefore, we propose that depth of processing will influence attitudes towards binge drinking and attitudes towards the message (Figure 3).

H9: Depth of processing will have a direct negative effect on attitudes toward binge drinking.

H10: Depth of processing will have a direct positive effect on attitudes toward the PSA.

Engagement and Intentions to Binge Drink

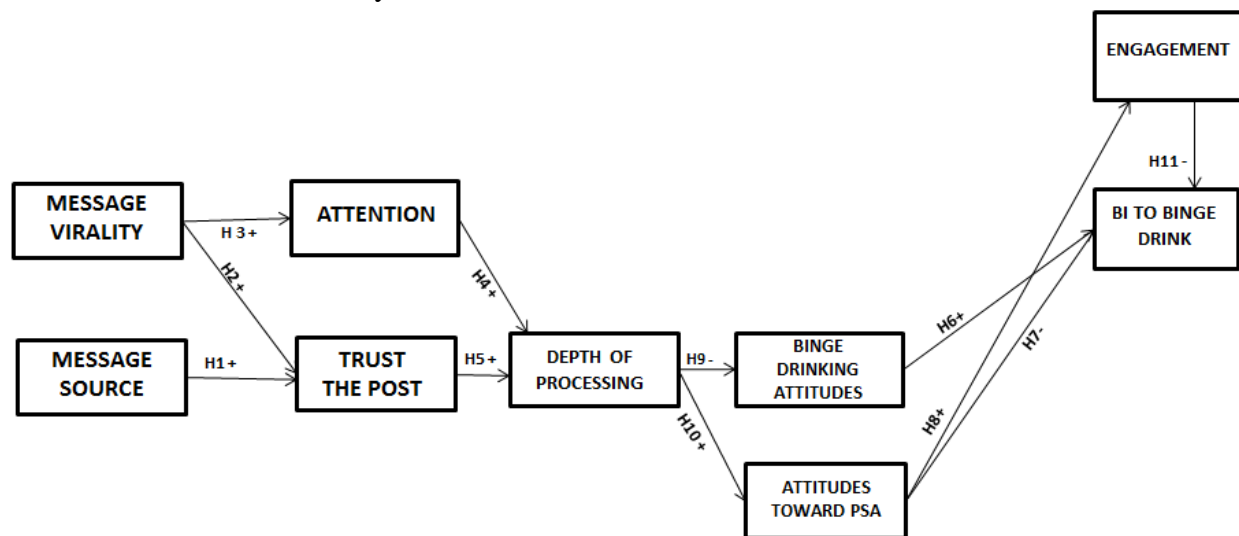
Fishbein and Ajzen (1975) suggested that the stronger an individual’s intention to engage in a behavior, the more likely is he or she to perform the behavior. Meta-analyses have shown this to be true (Albarracin, Fishbein, Blair, & Muellerleile, 2001; Andrew, Mullan, Wit, Monds, Todd, & Kothe, 2016; Kim & Hunter, 1993). In the present study we focused on participants’ intentions to binge drink.

Studying Facebook users’ engagement with the content posted on the platform, Alhabash et al. (2015) introduced the concept of *viral behavioral intentions* or *intentions to share* on Facebook. For the purpose of this study, we used the term *engagement*. Engagement refers to Facebook users’ intentions to like, share, and comment on a message (e.g., status update, video,

or picture) (Alhabash et al., 2015). Alhabash et al. (2015) found that Facebook users who developed favorable attitudes toward an alcohol marketing status update also developed favorable intentions to like, share, and comment on it, and were more likely to increase their alcohol consumption intentions. Engagement may work in two ways – wanting others to see valued content, and as a public commitment of liking either the message or the meaning of the message. The act of sharing may therefore reinforce or increase behavioral commitments.

H11: Engagement with the PSA will negatively influence behavioral intentions to binge drink.

Figure 3. Proposed Predictors of Behavioral Intentions to Binge Drink and Engagement Using Tenets of the Theory of Planned Behavior



The Role of Social Norms in Influencing Behavioral Outcomes

Researchers found that social norms influence an individual's decision to engage in a specific health behavior (Ajzen, 1991; Hagman, Clifford, & Noel, 2007; Rimal & Real, 2003). Ajzen (1991) defined subjective norms as "the perceived social pressure to perform or not to perform the behavior" (p.188). The theory of planned behavior conceptualized subjective norms as an individual's beliefs about the likelihood that referent individuals or significant others approved or did not support the decision of engaging in a specific behavior (Ajzen, 1991). Cialdini, Reno and Kallgren (1990) considered that it is crucial to differentiate between

descriptive norms and subjective norms. Ciladini (2007) defined descriptive social norms as “one’s perception of what most others actually do” (p. 264).

Norms-based researchers studied extensively the role of descriptive and subjective norms in predicting individuals’ behavioral intentions (Cialdini et al., 1990; Montano & Kasprzyk, 2008; Rimal & Real, 2005; Sieverding, Ciccarello, & Mattern, 2010). College students who perceived that drinking and smoking were acceptable activities at their college, and perceived that everybody else on their campus was drinking and smoking were more likely to consume more alcohol and increase their smoking behaviors (Halim, Hasking, & Allen, 2012; LaBrie, Hummer, Huchting & Neighbors, 2009; Rimal & Real, 2005; Terry & Terry, 2012). Research has also shown that close peer injunctive norms are more influential for drinking behaviors than parents or peer acquaintances (LaBrie, Hummer, Neighbors, & Larimer, 2010; Neighbors, O’Conner, Lewis, Chawla, Lee, & Fossos, 2008). Therefore the present study focused on peer norms. To indicate that the process is not coercive the present study used the term peer approval norms (Rimal & Real, 2005; Snyder & Fleming-Milici, 2005). Based on social norms research, the following hypotheses are proposed (Figure 4):

H12: Peer approval norms will positively influence behavioral intentions to binge drink.

H13: Peer descriptive norms will positively influence behavioral intentions to binge drink.

Facebook and Social Norms

Studies have showed that young adults who viewed alcohol-related content on Facebook (i.e., pictures portraying people drinking alcohol and comments regarding alcohol consumption) perceived greater descriptive norms of alcohol use, had more favorable attitudes toward alcohol consumption, and were more likely to report intentions to drink (Fournier, Hall, Riche, & Storey, 2013; Litt & Stock, 2011; Loss, Lindacher, & Curbach, 2014; Miller, Prichard, Hutchinson, &

Wilson, 2014; Moreno, Briner, Williams, Brockman, Walker, & Christakis, 2010). Moreover, Alhabash et al. (2015) found that virality can be perceived as a message feature that might influence individuals' social norms regarding a behavior. Message virality could be seen as an indicator of social norms surrounding an issue or behavior, and can signal the level of acceptance and prevalence of a behavior (Alhabash et al., 2015). Based on these findings we suggested that message virality, which is a characteristic of the message, will influence Facebook users' descriptive norms. Based on the same logic, we explored the effects of message virality on users' perceived norms regarding the need to be aware of what messages are viral and considered important by fellow Facebook users. The present study introduced the concept of *Facebook user norms* which are defined as users' perceptions of what other Facebook users think it is important, popular, trending, and viral at a specific time based on the message's number of likes, shares, and recommendations. Moreover, we proposed that if users perceive a post to be important and popular, they are more likely to engage with the post.

Drawing from normative research, the following hypotheses are proposed (Figure 4):

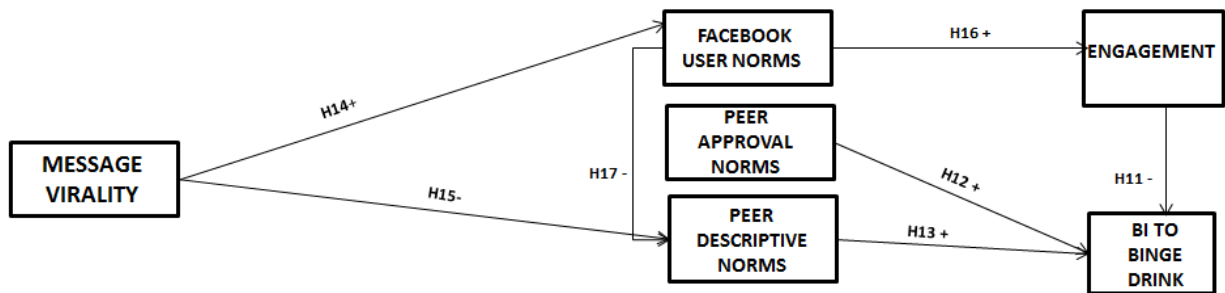
H14: Message virality will positively influence participants' Facebook user norms.

H15: Message virality will negatively influence binge drinking peer descriptive norms.

H16: Facebook user norms will have a positive effect on engagement.

H17: Facebook user norms will negatively influence binge drinking peer descriptive norms.

Figure 4. Message Virality and Social Norms as Proposed Predictors of Behavioral Intentions to Binge Drink and Engagement



Emotional Responses

The present study examined not only the cognitive routes to persuasion, but also the emotional pathways through which mediated health messages influence individuals' beliefs and promote behavioral change. Dual-process models of persuasion acknowledged the effects of affect, such as moods and emotions, on cognition, but did not address the possible direct effects of emotions on perceived message effectiveness and behavioral intentions (Dillard & Nabi, 2006). Employing structural equation modeling, Dillard and Peck (2000) found that, after accounting for cognitive responses, discrete emotions, such as surprise, fear, anger, and sadness explained additional variance in perceived message effectiveness in the context of health PSAs (Dillard & Peck, 2000). Moreover, studies have shown that cigarette graphic warning labels can induce fear, disgust, and negative affect in smokers and nonsmokers, predicting smoking cessation (Hammond et al. 2004; Kees, Burton, Andrews, & Kozup, 2010; O'Hegarty, Pederson, Nelson, Mowery, Gable, & Wortley, 2006; Vardavas, Connolly, Karamanolis, Kafatos, 2009; Volchan et al., 2013). Logically, we expected that negative emotional responses will influence individuals' behavioral intentions to binge drink, as well as their attitudes toward the behavior. Moreover, we proposed that the stronger the emotional impact of the PSA the more likely

participants will be to have positive attitudes towards the PSA and more likely to engage with the post.

Drawing from previous research, the following hypotheses and research question are proposed:

H18: Attention and emotional processing will be positively related.

H19: Participants experiencing greater negative emotional responses to the content of the PSA will be less likely to report intentions to binge drink.

H20: Participants experiencing greater negative emotional responses to the content of the PSA will be more likely to engage with the post.

H21: Negative emotional responses will have a negative effect on attitudes toward binge drinking.

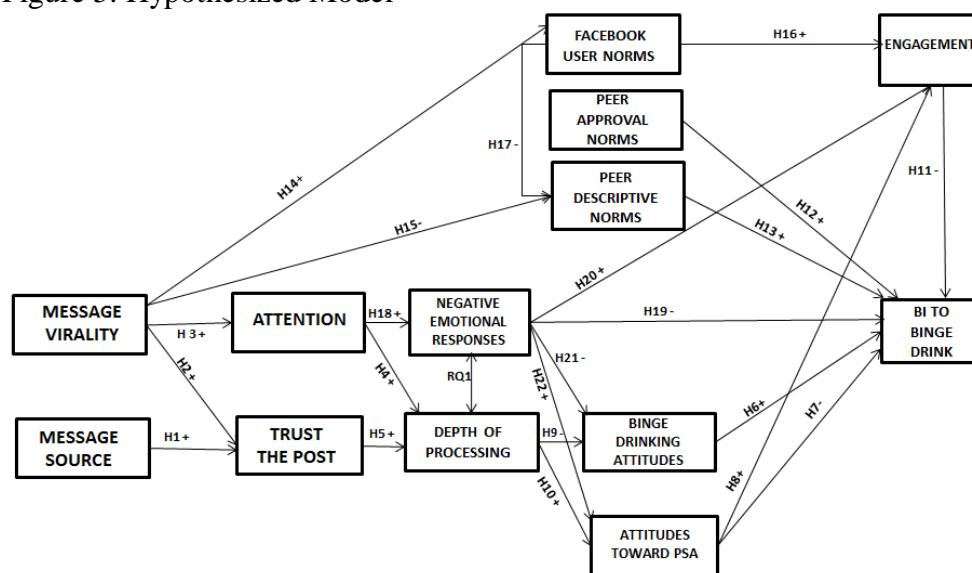
H22: Negative emotional responses will have a positive effect on attitudes toward the PSA.

RQ1: What is the relationship between negative emotional responses and depth of processing?

The Behavior Change Model

Based on the hypotheses proposed above, the following model of behavioral change is proposed (Figure 5).

Figure 5. Hypothesized Model



CHAPTER III

METHODS

To test the hypotheses, participants viewed an anti-binge drinking PSA developed by the CDC posted on a mock Facebook profile page in a 2 x 2 between subjects experimental design. The experiment crossed message source (CDC post vs. CDC post shared by a peer Facebook user) with virality (high likes and shares vs. low likes and shares). The data was collected using the Internet survey service www.qualtrics.com. This procedure was selected due to cost effectiveness and convenience. Participants were able to take the questionnaire at their most convenient time.

Participants

Participants were recruited from a large northeastern university and received credit for their participation. Initially we had a sample of 406 students, however 131 participants were eliminated from the analyses after failing to correctly answer the two survey control items added to ensure that participants actively paid attention to the survey questions. The two questions were: “Please select the Strongly Agree option below” and “Please select the Extremely Unlikely option below”. The final sample consisted of 275 participants (36.7% males, 63.3% females) with ages ranging from 18-29 ($M = 20.1$, $SD = 1.53$). The majority of participants were juniors (30.2%), followed by sophomores (28.4%), freshmen (24%), and seniors (17.5%), with 29.1% being members of Greek organizations.

Procedure

Participants were recruited through announcements made during their class time. Before starting the study, participants read the consent form and were informed about the purpose of the

study, which is “to understand how people interact with video clips and advertisements on Facebook”. After giving consent, participants were randomly assigned by the computer program to view one of the four mock Facebook pages. Before viewing the mock Facebook pages, participants were informed that on the next page they will see a portion of a UConn student’s Facebook profile page. They were instructed to take their time in examining the students’ profile page and make sure that they watch the videos posted on the page because they will be asked questions about the videos.

Stimuli. Stimuli were specifically created for this experiment. The mock Facebook page was created in HTML and is designed to mimic the profile page of a student who attends UConn. The profile picture of the owner and the profile’s cover photo contain UConn related symbols and images. The last names of the Facebook page owner and friend who shared the PSA, who is also a UConn student, were chosen based on statistics regarding the most common last names in the United States (Hartman, 2013). Also, the first names were chosen based on statistics regarding the most common unisex names in the U. S. (Flowers, 2015). To increase the ecological validity of the study, the different sections of the profile page (i.e., About, Friends, Photos, etc.) were designed based on UConn students’ actual Facebook profile pages which can be accessed through *Buy or Sell UConn Tickets* group. For example, at the top of the mock Facebook page it is implied that the participant and the owner of the profile page have a mutual friend. This feature is meant to create a sense of community, highlighting the fact that the profile owner is a UConn student. Also, the number of friends was decided by asking 25 UConn students how many friends they have on Facebook and averaging their responses. Based on this sample, a UConn student has an average of 803 Facebook friends.

In order to simulate a more natural Facebook experience, in addition to the PSA, participants were able to watch a second video and see a picture that were not related to the topic of the PSA. The reasoning behind this decision was that often Facebook users view more than one post on a screen at a time. The video was a short clip featuring the UConn campus, while the picture depicted the owner of the page. The design of the Facebook pages was identical for all four conditions, with the exception of the manipulated variables (message source and virality) (See Appendix A for stimuli).

Manipulation of message source was achieved by varying the source level of the anti-binge drinking PSA: in one condition the PSA was posted by the CDC (the original source of the PSA) on the Facebook owner's wall, while in the second condition the anti-binge drinking PSA was shared by a friend, who is also a UConn student, on the Facebook owner's wall. Virality was manipulated through the number of likes and shares accompanying the anti-binge drinking PSA. The PSA with high virality had 97,689 likes, 3,009 shares, and 237 comments, while the PSA with low virality had 6 likes, 1 share, and 2 comments. In order to enhance participants' identification with the Facebook profile owner and the peer who reposted the PSA, both UConn students, the UConn video was displayed first in all four conditions followed by the PSA. After viewing the page and watching the videos, participants were instructed to click on another link that sent them to the questionnaire.

All participants completed the questionnaire immediately following exposure to the manipulation. The first set of questions included message evaluation measure as well as attention, engagement, and emotional responses toward each of the posts seen. This strategy was adopted in order to make sure that participants were not sensitized to the purpose of the study.

Manipulation check items were included in order to make sure that participants watched the videos and behaved according to the condition they were in.

Measures

Manipulation Checks. Manipulation checks were conducted in order to ensure that participants behaved according to the condition they were in. The first manipulation check question assessed the virality condition: “The anti-binge drinking video had a high number of shares and likes”. Responses were recorded on a 7-point scale with answers ranging from *Strongly disagree* to *Strongly agree*. The second manipulation check question tested for the source of the PSA: “Who posted the anti-binge drinking video?”. Participants chose among the following responses: (1) the CDC, (2) Sam Johnson, the friend who shared the CDC video, (3) I don’t know.

Dependent Variables

Behavioral intentions to binge drink. Behavioral intentions to binge drink were assessed using a modified version of Baek, Shen, & Reid’s (2013) scale. The items included were: “How likely would you be to drink 4 or more alcoholic beverages in a single session in the upcoming week?”, “How likely would you be to drink 4 or more alcoholic beverages in a single session in the upcoming month?”, “How likely would you be to drink 5 or more alcoholic beverages in a single session in the upcoming week?”, “How likely would you be to drink 5 or more alcoholic beverages in a single session in the upcoming month?”, “How likely would you be to drink 8 or more alcoholic beverages in a single session in the upcoming week?”, “How likely would you be to drink 8 or more alcoholic beverages in a single session in the upcoming month?”, “How likely do you think you would be to avoid binge drinking in the upcoming week?”, “How likely do you think you would be to avoid binge drinking in the upcoming

month?”. At the beginning of the questions “session” was defined as “within a couple of hours when you are out, at a party, or hanging out at somebody’s apartment”. Responses were recorded on a 7-point scale ranging from *Extremely unlikely* to *Extremely likely* and averaged across items (*Cronbach’s alpha* = .93, *M* = 3.75, *SD* = 1.8).

Engagement. Engagement with the video on Facebook was assessed using a modified version of Alhabash et al.’s (2015) measure. The items were: “This video is worth sharing with my friends on Facebook”, “I would recommend this video to my friends on Facebook”, “I would “like” this video on Facebook”, “I would “share” this video on Facebook”, and “I would comment on this video on Facebook”. Responses were recorded on a 7-point scale with answers ranging from *Strongly disagree* to *Strongly agree* and averaged across items (*Cronbach’s alpha* = .92, *M* = 3.63, *SD* = 1.5)

Mediating Variables

Trustworthiness of post. Trustworthiness of the post was assessed using a modified version of McCroskey and Teven’s (1999) measure. Responses were measured using six 7-point separate semantic differential type items: honest/dishonest, untrustworthy/trustworthy, unethical/ethical, phony/genuine, accurate/inaccurate, and informative/uninformative, and averaged across items (*Cronbach’s alpha* = .81, *M* = 5.05, *SD* = 1.04).

Depth of processing. Depth of processing was assessed using a modified version of Hammond et al.’s (2003) scale. The four items were: “At some points, the video made me think about the dangers and health risks of binge drinking”, “I am likely to talk to a friend about some points in the videos”, “The video made me think about avoiding drinking alcoholic beverages”, and “The video made me think about avoiding binge drinking”. Responses were recorded on a

7-point scale ranging from *Strongly disagree* to *Strongly agree* and averaged across items (*Cronbach's alpha* = .72, *M* = 4.66, *SD* = 1.19).

Attitudes toward the post. Attitudes toward the posts were assessed using Snyder and Fleming-Milici's (2005) five items 7-point scale ranging from *Strongly disagree* to *Strongly agree*. Items included: "I like this video", "The video was boring", "The video was enjoyable", "The video was helpful", "The video was interesting". Responses were averaged across items (*Cronbach's alpha* = .83, *M* = 4.69, *SD* = 1.06).

Attitudes toward binge drinking. Attitudes toward binge drinking were measured using a modified version of van der Zwaluw, Kleinjan, Lemmers, Spijkerman, & Engels's (2013) scale. Participants were asked how they felt about binge drinking on five evaluative semantic differential scales: bad/good; unhealthy/healthy; foolish/wise; unpleasant/pleasant; boring/fun. Participants were instructed to answer the questions even if they never had alcohol before. Responses were averaged across items (*Cronbach's alpha* = .83, *M* = 2.58, *SD* = 0.98).

Facebook user norms. Facebook user norms were assessed with five items. Respondents answered on a 7-point scale ranging from *Strongly disagree* to *Strongly agree* to the following items: "Facebook users think the anti-binge drinking video is important", "Facebook users think the anti-binge drinking video is worth watching", "Facebook users think the anti-binge drinking video is popular", "Facebook users think the anti-binge drinking video is not interesting", and "Facebook users think the anti-binge drinking video is something I should be aware of". A principal components factor analysis with varimax rotation yielded one factor with an eigenvalue of 3.31 and accounted for 66.10% of the variance (*KMO* = .85, *Bartlett's X*² (10) = 689.16, *p* = .000). Responses were averaged across items (*Cronbach's alpha* = 0.87, *M* = 4.78, *SD* = 1.07).

Peer approval norms. Peer approval norms regarding binge drinking were assessed by using a modified version of Snyder and Fleming-Milici's (2005) scale. Respondents answered on a 7-point scale ranging from *Strongly disagree* to *Strongly agree* to the following items: "It is OK in the group I hang out most with to have a drink or two when we're together", "It is OK in the group I hang out most with to have 4 or more drinks or beers in a single session", "It is OK in the group I hang out most with to have 5 or more drinks or beers in a single session", "It is OK in the group I hang out most with to have 8 or more drinks or beers in a single session", "It is OK in the group I hang out most with to get buzzed", "It is OK in the group I hang out most with to get drunk", and "It is OK in the group I hang out most with to get really drunk". At the beginning of the questions "session" was defined as "within a couple of hours when you are out, at a party, or hanging out at somebody's apartment". Responses were averaged across items (*Cronbach's alpha* = .91, *M* = 5.16, *SD* = 1.35).

Peer descriptive norms. Peer descriptive binge drinking norms were assessed using a modified version of Cooke, Sniehotta, and Schuz (2007) scale and included the following items: "How many people your age drink alcohol?", "How many people your age drink alcohol until they get drunk?", "How many people your age have 4 or more drinks or beers in a single session?", "How many people your age have 5 or more drinks or beers in a single session?", "How many people your age have 8 or more drinks or beers in a single session?", "How many people your age get "buzzed" when at a party?", "How many people your age get drunk when at a party?", "How many people your age get really drunk when at a party?". Responses to these items were measured on a 6-point scale ranging from *Almost all* to *Hardly any* and averaged across items (*Cronbach's alpha* = .91, *M* = 4.48, *SD* = 0.79).

We also measured drinking descriptive quantity norms using a modified version of Rimal and Real's (2005) scale. Due to the fact that men and women process alcohol differently (NIAAA, 2004), we measured drinking descriptive norms for males and females separately. The items were: "When a typical UConn female/male student goes to a bar, about how many drinks do you think she/he consumes?", "When a typical UConn female/male student has friends over to her/his dorm room or apartment for drinks, about how many drinks do you think she/he consumes?", and "On the average, about how many drinks do you think a typical UConn female/male student consumes during the weekend (Friday evening through Saturday evening)?" Responses to these questions were averaged across items (*Cronbach's alpha* = .73, $M = 6.30$, $SD = 2.69$). The two descriptive norms scales were not highly correlated ($r = .31$, $p < .01$), therefore, two separate variables were created -- **peer descriptive binge drinking norms** and **descriptive drink quantity norms** -- and included in the predicted path model.

Negative emotional responses. Negative emotional responses were assessed using a modified version of Gibson, Brennan, Momjian, Shapiro-Luft, Seitz, and Cappella's (2015) (*Cronbach's alpha* = .91), Strizhakova, Kang, & Buck's (2007), and Picklesimer's (2015) (*Cronbach's alpha* = .94) negative emotion measure. Participants were asked to indicate how strongly they experienced the following emotions regarding their own drinking behavior while watching the PSA: worry, guilt, disgust, sadness, regret, anger, embarrassed, anxious, nervous, ashamed, scornful, resentful, justified (reverse coded), relieved (reverse coded). The answers were recorded on a 7-point scale ranging from *Not at all* to *Very much* (*Cronbach's alpha* = .90, $M = 2.71$, $SD = 1.23$).

Attention. Attention to the PSA was measured using a modified version of Slater, Goodall, & Hayes (2009) and Slater & Rasinski (2005) self-reported measure. One item

measured how much attention participants paid to the video. Responses were recorded on a 7-point scale ranging from *I did not pay attention at all* to *Paid a lot of attention*. In addition we also measured recognition of information contained in the PSA as a measure of message encoding (Bergen, Grimes, & Potter, 2005; Lang & Newhagen, 1996). It is assumed that individuals who attend to the media message allocate the available cognitive resources to the message and are able to retrieve the information (Miller, 2006). After interacting with the page, participants answered 4 multiple choice information recall questions regarding the content of the PSA. The 4 recall items were averaged and then combined with the self-reported attention item.

Control Variables

Past drinking behavior. Past drinking behavior was assessed using modified versions of Engels, Wiers, Lemmers, and Overbeek's (2005) and Carcioppolo and Jensen's (2012) measures. At the beginning of the questions participants were given a picture to exemplify what one drink means. The items included questions regarding alcohol consumption and binge drinking in the past 30 days, past 2 weeks, and past 7 days. The items were: "During the past 30 days, on how many occasions did you have at least one drink of alcohol?", "During the past 30 days, on how many occasions did you have 4 or more drinks of alcohol in a row, that is, within a couple of hours?", "During the past 30 days, on how many occasions did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?", "During the past 30 days, on how many occasions did you have 8 or more drinks of alcohol in a row, that is, within a couple of hours?", "During the past 2 weeks, on how many days did you have at least one drink of alcohol?", "During the past 2 weeks, on how many days did you have 4 or more drinks of alcohol in a row, that is, within a couple of hours?", "During the past 2 weeks, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?",

“During the past 2 weeks, on how many days did you have 8 or more drinks of alcohol in a row, that is, within a couple of hours?”, “Think of the occasion you drank the most this past month. How much did you drink?”, “What is the average number of drinks you consume in a week?”, “When you party, how many drinks do you usually have?”, “Think about the past 7 days. How many drinks did you consume each day?”. The scale had good reliability (*Cronbach’s alpha* = .94, $M = 2.54$, $SD = 2.20$).

Trustworthiness. Trustworthiness dimension of source credibility was assessed using McCroskey and Teven’s (1999) measure for each of the three sources: the CDC (*Cronbach’s alpha* = .93, $M = 5.89$, $SD = 1.11$), the owner of the mock Facebook page (*Cronbach’s alpha* = .90, $M = 5.26$, $SD = 1.02$), and of the friend who shared the CDC PSA (*Cronbach’s alpha* = .92, $M = 5.27$, $SD = 1.05$, $N = 132$). Responses were measured using 7-point semantic differential type items: honest/dishonest, untrustworthy/trustworthy, honorable/dishonorable, moral/immoral, unethical/ethical, and phony/genuine and averaged across items.

Expertise. Another dimension of source credibility – expertise – was assessed as a control variable. McCroskey and Teven’s (1999) measure was used for each of the three sources: the CDC (*Cronbach’s alpha* = .94, $M = 6.12$, $SD = 1.02$), the owner of the mock Facebook page (*Cronbach’s alpha* = .84, $M = 4.94$, $SD = 0.86$), and of the friend who shared the CDC PSA (*Cronbach’s alpha* = .89, $M = 4.96$, $SD = 0.95$, $N = 132$). Responses were measured using six separate 7-point semantic differential type items: intelligent/unintelligent, untrained/trained, inexperienced/expert, informed/uninformed, incompetent/competent, and bright/stupid and averaged across items.

Message clarity. Message clarity was measured as a control variable using Hamilton, Hunter and Burgoon’s (1990) scale. Responses were measured using 7-point semantic

differential type items: confused/organized, disorderly/orderly, confusing/understandable, and clear/unclear and averaged across items (*Cronbach's alpha* = .85, $M = 5.21$, $SD = 1.13$).

Message believability. Message believability was measured using Hamilton (2015) and Hamilton & Chokpitakkul's (under review) measure. The message content was broken down into the particular arguments that it contains (Hamilton, 2015; Hamilton & Chokpitakkul, under review). For each argument, participants were asked the subjective probability that the argument is true on a scale of 0 to 100. Then for each attribute, participants were asked the consequences if that argument is true on a scale of 0 to 1. In order to create the variable each subjective probability was multiplied by its evaluative consequences and then summed across the attributes (Hamilton, 2015; Hamilton & Chokpitakkul, under review). The message arguments are: "When done excessively, binge drinking may eventually lead to memory loss", "When done excessively, binge drinking may eventually lead to alcohol poisoning", "When done excessively, binge drinking may eventually lead to possibly death", "When done excessively, binge drinking may eventually lead to cancer", "When done excessively, binge drinking may eventually lead to excessive vomiting", "When done excessively, binge drinking may eventually lead to unwanted pregnancy". The scale had good reliability (*Cronbach's alpha* = .85, $M = 349.65$, $SD = 186.63$).

Identification. Identification with the owner of the Facebook profile page and the friend who shared the PSA was measured as a control variable using Cameron's (2004) three-dimensional strength of identification measure. The items were: "I often think about being a UCONN student", "Being a UCONN student has little to do with how I feel about myself in general", "Being a UCONN student is an important part of my self-image", "The fact I am a UCONN student rarely enters my mind", "In general I'm glad to be a UCONN student", "I often regret being a UCONN student", "Generally I feel good about myself when I think about being a

UConn student”, “I don’t feel good about being a UConn student”, “I have a lot in common with other UConn students”, “I feel strong ties to other UConn students”, “I find it difficult to form a bond with other UConn students”, “I don’t feel a strong sense of being connected to UConn students”. Responses were measured on a 7-point scale ranging from *Strongly disagree* to *Strongly agree* and averaged across items (*Cronbach’s alpha* = .88, *M* = 5.47, *SD* = 0.90).

Facebook use. Facebook use was assessed using a modified version of Oeldorf-Hirsch & Sundar’s (2015) measure. The items were: “Do you have an active Facebook account?”, “How often do you post status updates on Facebook?”, “How often do you comment of Facebook posts?”, “How often do you like Facebook posts?”, “How often do you share posts others have posted on Facebook?”. For the first question responses were dichotomous: *Yes* and *No*. Participants who reported not having a Facebook account were excluded from the analyses. For the remaining questions, respondents answered on a 7-point scale: *Never*, *Once per year or less*, *Several times per year*, *Several times per month*, *Several times per week*, *Once per day*, *Several times per day*. Responses were averaged across items (*Cronbach’s alpha* = .82, *M* = 3.49, *SD* = 1.27).

Analyses

Manipulation checks. Message source and message virality were manipulated in the present study. To check for the effectiveness of the message source manipulation (institution post vs peer repost) a chi-square test was conducted comparing their assigned condition to their perceptions of the source of the message. To check for the effectiveness of the message virality manipulation a *t* test was conducted comparing levels of perceived virality by whether or not the participants viewed the high virality message. Additionally, to ensure homogeneity of

demographic variables (e.g. participant sex, year in college, Greek organization membership, familiarity with the PSA) a one-way analysis of variance test for homogeneity was conducted.

Model testing. All the proposed hypotheses and the research question were tested using path modeling techniques in AMOS 22. In order to conclude that there is a relatively good fit between the hypothesized model and the observed data, a Chi-square value close to 0, a Comparative Fit Index (CFI) value of 0.9 or greater, and a Root Mean Square Error of Approximation (RMSEA) value of 0.07 or less are needed (Hu & Bentler, 1999). First, the hypothesized model was tested. Based on the modification indices provided by AMOS 22, the model was revised to obtain a better fit. The following chapter presents the results for the individual hypotheses proposed.

CHAPTER IV

RESULTS

Manipulation Checks

Manipulation checks were conducted in order to ensure that participants behaved according to the condition they were in. An independent samples t test demonstrated that participants in the high virality condition ($M = 5$, $SD = 1.16$) perceived the PSA as having higher virality [$t(273) = 2.98$, $p < .01$] compared to the participants in the low virality condition ($M = 4.55$, $SD = 1.36$).

The second manipulation check question tested the source of the PSA. The results showed that among the participants who viewed the institution-posted message, 57.3% chose the correct answer (the CDC), 7.7% incorrectly chose the friend who shared the CDC video, and 35% chose “I don’t know” ($n = 143$). Among the participants viewing the peer-repost of the PSA, 29.5% chose the correct answer (the friend who shared the CDC video), 33.3% incorrectly chose the CDC, and 37.1% did not know the source ($n = 132$). Thus, only 44% of participants correctly identified who posted the PSA, $\chi^2(2, n = 275) = 26.75$, $p = .000$, suggesting that the message source manipulation failed. Furthermore, people in the repost condition were more likely to fail the manipulation. Therefore, perceived source was included in the analysis. In order to include perceived source as a predictor variable in the proposed model two dummy variables were created: CDC post and Peer repost.

Homogeneity of Experimental Conditions

A one-way analysis of variance was conducted to ensure homogeneity across experimental conditions on sex, age, year in college, Greek membership, and previously seeing

the PSA. No significant differences were found for sex, $F(3, 271) = .34, p = n.s.$; year in college, $F(3, 271) = 1.84, p = n.s.$; Greek membership, $F(3, 271) = 1.18, p = n.s.$, and previously seeing the PSA, $F(3, 271) = .57, p = n.s.$ between the experimental conditions. However, there was a significant difference on age, $F(3, 271) = 3.07, p = .03$, between the experimental conditions. Further analyses identified three outliers between the ages of 27 and 28, and two of these individuals were randomly assigned by the computer program to the same condition. A one-way analysis of variance was conducted without the three outliers in the data, and no significant differences were found for age, $F(3, 268) = 2.47, p = n.s.$ Analyses were run with and without the outliers in data and the path estimates did not change significantly. Therefore, a decision was made to keep the three outliers in the data.

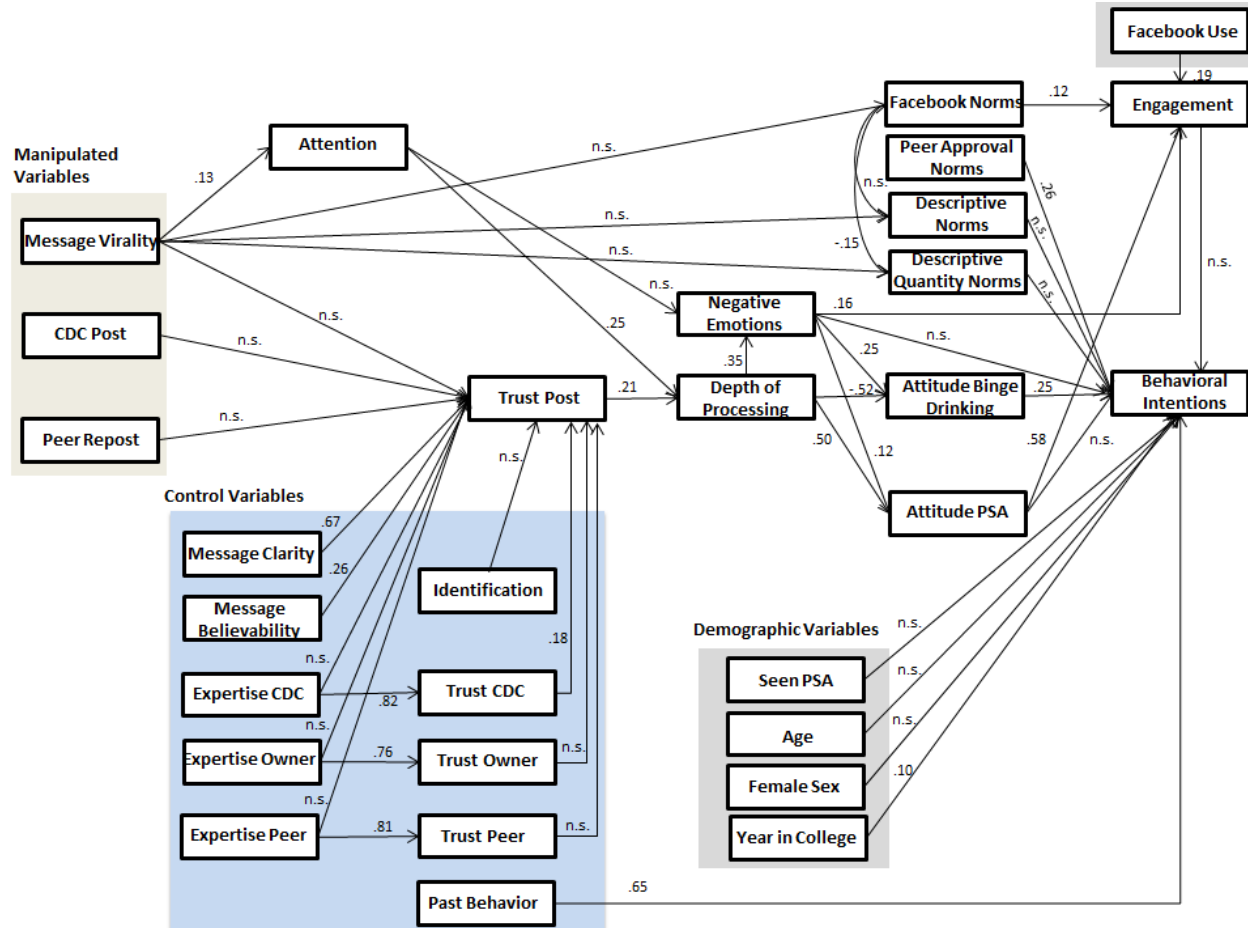
All demographic variables – sex, age, year in college, and Greek membership – were included in the model as control variables. Participants were also asked if they have seen the anti-binge drinking PSA prior to the experiment. The results indicated that 13.8% of participants reported seeing the PSA, while 5.5% answered *maybe*. Therefore, seeing the PSA variable was entered as a control in the model.

Model Testing

The Pearson correlations of variables included in the predicted model are presented in Table 1. For easier interpretation of the model, the virality condition variable was effect coded, such that high virality = 1 and low virality = -1.

The predicted model (see Figure 6) was not a good fit ($\chi^2 = 2116.71, df = 418, p < .001$; $RMSE = .12, CFI = .52$).

Figure 6. Predicted Path Model



Note. Path estimates are significant at the 0.05 level or less.

Starting with the modification indices provided by AMOS 22, a series of post-hoc analyses were conducted to improve the fit of the model. Although virality had a direct effect on attention, it did not have a direct effect on the other variables proposed; therefore we decided to examine *perceived virality* as a possible mediator between the virality condition and factors we predicted to be affected by virality: trustworthiness of the post, Facebook user norms, peer descriptive norms, and peer descriptive quantity norms. The amount of time participants spent on the stimuli – measured by the computer program – was included in the revised model as a predictor variable. Time spent on the stimulus page was coded as following: scores between

3.56 – 9.01 seconds were coded as 1, scores between 11.11 – 58.01 seconds were coded as 2, and scores between 61.12 – 4305.67 seconds were coded as 3. The PSA was approximately 10 seconds long. According to the predicted path model (see Figure 1.) several control variables (expertise and trustworthiness owner of Facebook page, expertise and trustworthiness friend who shared the PSA, identification with the UCONN community) did not have a significant effect on trustworthiness of the post; therefore we eliminated those control variables from the model. Similarly, demographic variables, previously seeing the PSA, age, year in college, and Greek membership, did not have a significant effect on behavioral intentions to binge drink and therefore were eliminated from the model. Although sex did not predict the outcome variable, it was related to past binge drinking behavior and time spent on the stimulus page and therefore it was retained in the model.

The Pearson correlations of variables included in the revised model are presented in Table 2. The revised model presented in Figure 7 had an improved fit ($\chi^2 = 366.34$, $df = 171$, $p < .001$; $RMSE = .065$, $CFI = .911$).

Hypothesis 3 predicted that the anti-binge drinking PSA with high virality would lead to greater attention compared to the anti-binge drinking PSA with low virality. The predicted model indicated a significant relationship between virality and attention ($b = .13, p < .05$). However, after including time spent on the stimulus in the revised model, the relationship was not present anymore. It seems that attention was a function of time spent on the mock Facebook page and not of post virality. Therefore, the hypothesis was not supported.

As predicted by hypothesis 4, attention had a direct positive effect on depth of processing ($b = .25, p < .05$). Hypothesis 5 predicted that perceived trustworthiness of the post would have a direct positive effect on depth of processing. Although the predicted model indicated a significant relationship between trustworthiness of the post and depth of processing ($b = .21, p < .05$), the revised model indicated that message believability mediated the relationship between trustworthiness of the post and depth of processing. Trustworthiness of the post had a direct positive effect on message believability ($b = .39, p < .05$), and message believability had a direct positive effect on depth of processing ($b = .23, p < .05$).

As predicted by hypothesis 6, attitudes toward binge drinking had a positive direct effect on behavioral intentions to bingedrink ($b = .19, p < .05$). Hypothesis 7 predicted that attitudes toward the PSA would have a negative direct effect on behavioral intentions to binge drink. The hypothesis was not supported; the original and revised models indicate a non-significant link between attitudes toward the PSA and behavioral intentions to binge drink. Hypothesis 8 predicted that attitudes toward the PSA will have a positive direct effect on engagement. Attitudes toward the PSA were strongly associated with engagement ($b = .39, p < .05$), lending support for hypothesis 8.

As predicted by hypotheses 9 and 10, depth of processing had a direct negative effect on attitudes toward binge drinking ($b = -.29, p < .05$), and a direct positive effect on attitudes toward the PSA ($b = .42, p < .05$). Hypothesis 11 predicted that engagement with the PSA will negatively influence behavioral intentions to binge drink. The original and revised models indicated a non-significant relationship between engagement with the PSA and behavioral intentions to binge drink. Hence, hypothesis 11 was not supported.

As predicted by hypothesis 12, peer approval norms had a direct positive impact on intentions to binge drink ($b = .22, p < .05$). On the other hand, there was a non-significant path between peer descriptive norms and intentions to binge drink in both original and revised models; therefore, hypothesis 13 was not supported.

Hypothesis 14 predicted that message virality will positively influence participants' Facebook user norms. The path model indicated a non-significant relationship between message virality and Facebook user norms in both the original and revised models. However, the relationship was mediated by perceived virality; manipulated message virality had a positive effect on perceived virality ($b = .18, p < .05$), which in turn had a strong positive effect on Facebook user norms ($b = .49, p < .05$). Hypothesis 15 stated that message virality would negatively influence peer descriptive norms. The original and revised path models indicated a non-significant path between message virality and peer descriptive norms; therefore hypothesis 15 was not supported. As stated by hypothesis 16, Facebook user norms had a positive effect on engagement ($b = .08, p < .05$). Hypothesis 17 predicted that Facebook user norms would negatively influence peer descriptive norms. The original path model indicated a non-significant relationship between Facebook user norms and peer descriptive norms, and a significant relationship between Facebook user norms and descriptive quantity norms ($b = -.15, p < .05$).

However, the revised model indicated a non-significant relationship between Facebook user norms and descriptive quantity norms. Hence, hypothesis 17 was not supported.

Hypothesis 18 predicted that attention and emotional processing would be positively related. The original and revised structural equation models indicated a non-significant relationship between attention and negative emotional responses; therefore, hypothesis 18 was not supported. Hypothesis 19 predicted that participants experiencing greater negative emotional responses to the content of the PSA would be less likely to report intentions to binge drink. The original and revised models indicated a non-significant relationship; hence hypothesis 19 was not supported. On the other hand, hypothesis 20 predicted that participants experiencing greater negative emotional responses to the content of the PSA would be more likely to engage with the post. There was a significant relationship between negative emotional responses and engagement ($b = .10, p < .05$), lending support for hypothesis 20. Hypotheses 21 predicted a negative relationship between negative emotional responses and attitudes toward binge drinking. Surprisingly, the path model indicated a *positive* relationship between negative emotional responses and attitudes toward binge drinking ($b = .16, p < .05$). Hence, hypothesis 21 was not supported. Hypothesis 22 predicted that negative emotional responses are positively related to attitudes toward the PSA. The predicted model indicated a significant relationship between negative emotional responses and attitudes toward the PSA ($b = .12, p < .05$). However, the revised model indicated a non-significant relationship between negative emotional responses and attitudes toward the PSA. Hence hypothesis 22 was not supported.

Research question 1 attempted to clarify the direction of the relationship between depth of processing and negative emotional responses. Based on the magnitude of the standardized

estimates and model fit indices, depth of processing had a strong direct positive effect on negative emotional responses ($b = .36, p < .05$).

Additionally, the revised model indicated paths that were not hypothesized. Results showed that time spent on the stimuli page predicted attention ($b = .53, p < .05$). Attention had a direct positive effect on message clarity ($b = .29, p < .05$), attitudes toward the PSA ($b = .19, p < .05$), trustworthiness of the post ($b = .11, p < .05$), and Facebook user norms ($b = .17, p < .05$). Furthermore, message clarity positively predicted trustworthiness of the post ($b = .67, p < .05$) and perceived expertise of the CDC ($b = .38, p < .05$). Perceived expertise of the CDC positively predicted perceived trustworthiness of the CDC ($b = .82, p < .05$), and perceived trustworthiness of the CDC had a direct positive effect on message believability ($b = .12, p < .05$). Trustworthiness of the post had a direct positive effect on attitudes toward the post ($b = .25, p < .05$).

Based on the revised path model, message believability had a direct negative effect on attitudes toward binge drinking ($b = -.18, p < .05$). Furthermore, message believability had a direct positive effect on Facebook user norms ($b = .14, p < .05$), descriptive norms ($b = .19, p < .05$), and engagement with the post ($b = .15, p < .05$). Peer descriptive norms had a direct positive effect on peer approval norms ($b = .27, p < .05$), which acted as a mediator between peer descriptive norms and behavioral intentions to binge drink. Peer approval norms had a direct positive effect on attitude toward binge drinking ($b = .20, p < .05$). Depth of processing had a direct positive effect on engagement ($b = .31, p < .05$).

Additionally, participants' biological sex predicted past drinking behavior ($b = -.25, p < .05$), such that females were less likely to report drinking in the past compared to males, and time with the stimulus ($b = -.13, p < .05$), such that females spent less time on the mock Facebook

page compared to males. This result might be an artifact of the stimulus design. The pictures of both, the owner of the page and friend who re-posted the PSA, were portraying females, which might have been more appealing to males. Past drinking behavior was positively related to behavioral intentions to binge drink ($b = .57, p < .05$), peer approval norms ($b = .51, p < .05$), descriptive norms ($b = .37, p < .05$) and attitudes toward binge drinking ($b = .33, p < .05$). Past drinking behavior was negatively related to depth of processing ($b = -.28, p < .05$). Facebook use predicted engagement with the post ($b = .15, p < .05$).

CHAPTER V

DISCUSSION

The present study set out to explore the effects of message virality and message source on Facebook users' perceived credibility of the post, depth of processing, emotional responses, attitudes, norms, and behavioral intentions to binge drink. College students still report spending most of their social media time on Facebook (*College students still spend most social time with Facebook*, 2015); therefore it is important to understand how this media platform can be used to promote behavioral change.

Very few studies have analyzed the effects of message virality and message source on users' perceived trustworthiness of the post. Alhabash, et al. (2015) found that SNS users were more likely to discuss and redistribute messages with high virality and messages that made them feel positively toward the message. Moreover, Jin, Phua, and Lee (2015) found that successful breastfeeding stories with high virality, such as likes, comments, and shares, were rated higher on perceived source credibility. The present study did not find significant relationships between message virality and perceived trustworthiness of the post. One explanation might be that past studies researched the effects of virality in the context of pro-alcohol status updates (Alhabash, et al., 2015), which portrayed good experiences and reinforced drinking behaviors among young adults, and breastfeeding success stories (Jin et al., 2015) which promoted positive feelings as well. The present results showed that, in the context of an educational message that portrayed the unwanted consequences of excessive drinking, virality was not related to post trustworthiness. Future research is necessary to understand the effects of message virality on

perceived trustworthiness of the post in the context of different types of message, such as ads, educational videos, PSAs, and entertainment videos, as well as different types of risky behaviors.

Similarly, very few studies have analyzed the effects of message source, such as institution-posted message versus peer-reposted message, on Facebook users' perceived trustworthiness of the post. In the present study the manipulation of message source failed. It appeared that participants had difficulty identifying the peer-repost. One explanation of the manipulation fail might be related to the design of the mock Facebook page. The peer's profile picture was relatively small and participants were not able to click on the peer's profile to learn more information about her. Moreover, the relationship between perceived source and trustworthiness of the post was not significant in both the predicted and revised model.

The present study also predicted that the high virality post will lead to greater attention to the PSA compared to the low virality post. However, after controlling for time spent on the stimulus page, virality was not related to attention, perhaps as a consequence of the type of message – designed to inform and persuade about health. It may be that the number of people liking and sharing an educational message may not matter to attention to the video as much as other factors that were not tapped in this study. At the same time, for other types of messages, such as funny videos, virality may have a greater impact on attention. Moreover, virality might be related to exposure and not attention. In this sense, source and virality might predict exposure, while other judgments about the video itself predict whether users continue to watch the video. To our knowledge, the relationship between message virality and attention has not been explored in other studies. Future studies should attempt to understand this relationship in the context of both educational and entertainment messages. The present study also validated the measure of attention, such that the more time participants spent on the stimuli page (as measured

by the computer program), more likely they were to self-report paying attention to the PSA and have greater knowledge of the details in the PSA.

Surprisingly, we found in post hoc analyses that attention predicted Facebook user norms, such that participants who reported paying attention to the message were more likely to perceive the message as being important, popular and trending among Facebook users. Participants who spent more time on the mock Facebook page were more likely to pay attention to the post, to perceive the post as important and trending, and finally, to report intentions to engage with the post. Although the step to engagement is a small effect, it is important because oftentimes opinion leaders are the ones who make judgements about which messages should be passed on to their networks (Oeldorf-Hirsch & Sundar, 2015). Furthermore, Facebook user norms were also predicted by virality and this relationship was fully mediated by perceived virality. Based on these results we can think of this process as a feedback loop, where real world post statistics increase by engagement with the post, which in turn can lead to the post being perceived as viral and important by fellow Facebook users. In the light of these findings, when using PSAs to promote public health on Facebook, public health promoters should focus on increasing Facebook norms by identifying opinion leaders in different communities who can engage with the post online.

The present study also explored the influence of message virality on participants' Facebook norms and peer descriptive norms. Prior studies have found that viewing alcohol related content on Facebook was associated with greater norms regarding alcohol consumption and stronger intentions to drink among young adults (Fournier et al., 2013; Loss et al., 2014; Miller et al., 2014; Moreno et al., 2010; Litt & Stock, 2011). In the current study, though, neither message virality nor perceptions of the importance and trendiness of the message

influenced participants' peer descriptive norms. Although, Alhabash et al. (2015) suggested that message virality can be perceived as an indicator of social norms surrounding an issue and can signal the level of acceptance of a behavior, the non-significant relationship found in this study could be attributed to the type of message used. Studies that found a relationship between alcohol related posts on social media and users' alcohol related norms, portrayed positive experiences one can have while drinking. For a better understanding of this relationship, future research should study the effects of message virality on social media users' norms in the context of both positive and negative portrayals of alcohol use. An important take-away point is that message virality is important in raising awareness about the importance and trendiness of a message.

Although not hypothesized, attention positively influenced message clarity and trustworthiness of the post, such that higher attention to the PSA led to a more clear perception of the message and higher trustworthiness of the post. These findings are in line with past research, which found a positive relationship between attention and message clarity (Hamilton, 1998). Moreover, past research has found that attention to media messages had a direct positive effect on message believability (Berry, Jones, McLeod, & Spence, 2011; O'Cass & Griffin, 2006). O'Cass and Griffin (2006) found that increased attention to anti-smoking and anti-binge drinking messages led to higher message believability. Similarly, Berry et al. (2011) found that participants who reported paying more attention to exercise-related messages were more likely to perceive the messages as more believable. In the present study attention had a direct effect on attitudes toward the PSA and an indirect effect on message believability through two pathways: (1) attention influenced message clarity, which in turn increased trustworthiness of the post, and trustworthiness of the post led to increased believability of the message, and (2) attention influenced trustworthiness of the post, which in turn increased message believability. These

results show that attention is an important variable in health message promotion. Therefore, in the context of PSAs, increasing individuals' attention to the message could lead to higher trustworthiness and message believability, as well more positive attitudes toward the message.

Message clarity had a significant strong positive effect on trustworthiness of the post. This finding is in line with previous research, which found that message clarity mediated the relationship between language intensity and perceived credibility (Hamilton et al., 1990). Moreover, perceived expertise and trustworthiness of the CDC mediated the relationship between message clarity and message believability. It appears that message clarity influenced message believability through two routes: (1) message clarity predicted perceived trustworthiness of the post, which in turn predicted message believability, and (2) message clarity predicted perceived expertise of the CDC, which in turn increased perceived trustworthiness of the CDC, and perceived trustworthiness of the CDC led to increased message believability. These findings are in line with previous research on dual information processing models (Petty & Cacioppo, 1986) suggesting the need to consider both, the source and the message, when promoting stopping binge drinking through PSAs on Facebook.

Attention was also related to depth of processing, such that participants who paid more attention to the message were more likely to think deeply about the message. This finding is in line with previous research on depth of processing (Borland et al., 2009; Hassan et al., 2008). The concept of depth of processing has been mostly studied in the context of graphic cigarette warning labels (Hammond et al., 2004; Hammond et al., 2003), and the present study extended its use to the context of mediated messages. We tested the prediction from heuristic processing research that, if people discounted a message source as being untrustworthy, they would not process it deeply (Chaiken, 1980). The present study found an indirect link between

trustworthiness of the post and depth of processing, mediated by message believability.

Participants who perceived the post as trustworthy were more likely to believe that the negative outcomes mentioned in the post are true and, therefore, they were more likely to think about the post. This is an important finding because it shows that, when participants perceive a post as trustworthy, they are more likely to believe the statements in the message and start connecting the message to their own behavior.

Although not hypothesized, depth of processing had a strong direct positive effect on engagement with the post. This finding is in line with previous research which found that individuals who thought about the graphic cigarette warning labels were more likely to report intentions to quit smoking (Borland et al., 2009; Hammond et al., 2003). This finding is important because it highlights the cognitive pathways through which the Facebook post influenced users' intentions to engage with the post online.

The central role of believability in the information processing of the post was interesting, and mostly in line with prior research. It is important to mention that, as opposed to classic believability measures (Beltramini, 1982), the present study used a measure that captured how likely were the participants to believe that the negative outcomes mentioned in the PSA are true. The link between trustworthiness and believability (mentioned above) has been confirmed in prior studies (McCroskey & Teven, 1990; Teven, 2008). Believability in turn had a direct negative relationship with attitudes toward binge drinking. Advertising scholars have found that message believability is an important determinant of both ad and brand attitudes (Berry et al., 2011; O'Cass & Griffin, 2006). Message believability was found to positively predict Facebook user norms, peer descriptive norms, and engagement with the post. These findings may have implications for communication scholars and public health promoters. First, scholars studying

information processing models should consider message believability as an important antecedent to attitudes, social norms, and online behavioral intentions. Second, when measuring message believability it is important to assess the degree to which participants believe the specific arguments presented in the message. This measure provides us information on how the arguments of the message are evaluated and how participants connect the message to their own behavior by thinking about it. Lastly, public health promotes that target young adults should make sure that the messages they are promoting are perceived as believable by the targeted audiences.

Consistent with existing research (Eagly & Chaiken, 1993; Griffin et al., 2002), participants who reported thinking about the PSA were less likely to report favorable attitudes toward binge drinking and more likely to report positive attitudes toward the PSA. Furthermore, attitudes toward binge drinking predicted behavioral intentions to binge drink, which is in line with previous research on the theory of planned behavior (Huchting et al., 2008; Johnston & White, 2010; Norman et al., 2007).

The present study also explored the effect of attitudes toward the PSA on participants' behavioral intentions to binge drink and intentions to engage with the post. While marketing research found that attitudes toward an ad influenced behavioral intentions to consume alcohol and use marijuana (Anderson et al., 2008; Alvaro et al., 2013; D'Amico et al., 2015), the present study did *not* find a significant relationship between attitudes toward the PSA and behavioral intentions to binge drink. One explanation for the non-significant relationship might be that the exposure – viewing one anti-binge drinking PSA – was not strong enough. Although Alvaro et al. (2013) found that attitudes toward a PSA reduced intentions to consume marijuana, participants in their study evaluated between one and five TV PSAs, and the effects were linear,

such that viewing more PSAs resulted in higher evaluation scores. Future researchers should express caution when interpreting the relationship between message attitudes and behavioral intentions after only one exposure. It appears that, the relationship between attitudes toward the PSA and behavioral intentions might be contingent on the number of PSAs viewed.

Interestingly, attitudes toward the PSA influenced participants' intentions to share, like, and comment on the post. In order to understand these findings, one needs to take into consideration the different contexts in which the two behaviors (i.e. engagement with post and binge drinking) occur. Drinking is a social activity and usually is done among friends; therefore some of the strongest predictors of binge drinking are descriptive and peer norms (Halim et al., 2012; LaBrie et al., 2010; Neighbors et al., 2008; Rimal & Real, 2005) and attitudes toward binge drinking (Huchting et al., 2008; Johnston & White, 2010; Norman et al., 2007). Following this logic, a one-time exposure to an anti-binge drinking PSA might not be sufficient, among other predictors, to significantly affect participants' intentions to binge drink. On the other hand, engagement with a post is an activity that is performed in private, on personal electronic devices, and not necessarily contingent on participants' norms regarding the behavior, explaining the significant relationship between attitudes toward the post and engagement with the post. More research is needed to understand the conditions under which sympathetic views result in engaging with a message.

Furthermore, the present study also explored the relationship between engagement with the post and behavioral intentions to binge drink. Although very few studies researched the relationship between engagement on Facebook and behavioral intentions, Alhabash et al. (2015) found that Facebook users who reported intentions to like, share, and comment on an alcohol marketing status updates were also more likely to report intentions to consume alcohol. In the

present study, engagement with the PSA was not related to behavioral intentions to binge drink. Failure to support this hypothesis might be attributed to the fact that alcohol advertisements highlight the social aspect of drinking, encouraging Facebook users to engage with the post online and at the same time promote the behavior offline, while the anti-binge drinking PSA highlighted the unwanted consequences of excessive drinking and promoted drinking cessation. More research is needed to understand the health contexts in which engagement with the posts influenced behavioral intentions.

The present study also attempted to explore the emotional pathways through which mediated health messages influenced individuals' attitudes and promoted behavioral change. Contrary to prediction, the relationship between attention and emotional processing was not significant. In order to address this finding, it is important to discuss the research question investigating the relationship between emotions and depth of processing. Analyzing the magnitude of the standardized estimates and model fit indices, it appears that depth of processing influenced negative emotional responses. Participants who reported thinking about the PSA were more likely to report negative emotions. In this context, the non-significant relationship between attention and negative emotional responses might be attributed to the fact that participants shared feeling more negative emotions only *after* they processed the message. However, this is a cautious explanation and longitudinal research is needed to understand the relationship between emotions and depth of processing.

The current study also explored the effects of negative emotional responses on engagement with the post and behavioral intentions to binge drink. The results were surprising: negative emotional responses had a direct positive effect on engagement with the post, but a non-significant effect on behavioral intentions to binge drink. Although research has shown that

discrete emotions were related to perceived message effectiveness and behavioral intentions to quit smoking (Dillard & Peck, 2000; Hammond et al. 2004; Kees et al. 2010; O'Hegarty et al., 2006; Vardavas, et al., 2009; Volchan et al., 2013), scholars highlighted that, under different circumstances, some emotions might inhibit persuasion processes or might not be related to persuasive outcomes (Dillard & Anderson, 2004; Dillard & Nabi, 2006; Shi, Messaris, & Cappella, 2014). For example, Shi et al. (2014) found that negative emotions, such as fear, guilt, and anger, decreased perceived message effectiveness in the context of anti-smoking PSAs. Dillard and Peck (2000) found that, in different contexts, certain emotions influenced message effectiveness, while others didn't have predictive power. The authors found that, in the context of a PSA advocating "Don't drink and drive" viewed on TV, surprise, anger, sad, and contentment were associated with perceived message effectiveness, while fear and guilt did not have predictive power (Dillard & Peck, 2000). Therefore, the activation of an emotion does not always influence message effectiveness (Dillard & Peck, 2000). One implication for this finding is that, rather than looking at composite measures of negative emotions as predictors of behavioral intentions, it would be more important to identify emotions that might be more salient in different health contexts. Furthermore, constructing PSAs that evoke these particular emotions might strengthen the impact of the message on behavioral intentions. Another explanation might be that the context in which the PSA is viewed might influence the emotions evoked. One important question that needs to be answered by future research is: Does viewing the PSA on Facebook versus television have an influence on one's emotional responses?

The present study also hypothesized that, participants who experienced higher negative emotional responses were more likely to express positive attitudes toward the PSA and negative attitudes toward binge drinking. Findings demonstrated that negative emotional responses did

not predict participants' attitudes toward the PSA. It appears that attitudes toward the PSA are a function of cognitive variables, such as trustworthiness of the post and depth of processing, and less a function of emotional responses. Based on the revised path model, participants who perceived the post as trustworthy were more likely to believe the arguments presented in the message, connect these arguments with their own behavior, which increased their attitude toward the PSA and, lastly, predicted engagement with the PSA. These findings are important because they provide public health promoters insight into the pathways through which PSAs posted on Facebook can promote online engagement.

Interestingly, the relationship between negative emotional responses and attitudes toward binge drinking is in the *opposite* direction, such that higher levels of negative emotions led to more *positive* attitudes toward binge drinking. This finding might be explained through the lens of reactance theory. According to reactance theory, when individuals perceived that their free behavior was threatened by a proscribed message, they experienced motivation to reestablish the limited behavior (Burgoon, Alvaro, Grandpre, Voulodakis, 2002; Miller & Quick, 2010). For example, researchers cautioned that while public health communication campaigns represent an important tool for promoting behavioral change, health messages could have a boomerang effect (Burgoon et al., 2002; Richards & Banas, 2015). It is possible that, in the present study, participants who experienced higher levels of negative emotions toward their own drinking behavior were motivated to reestablish their limited behavior and consequently reinforced their attitudes toward binge drinking. Therefore, it appears that the effects of negative emotional responses on attitudes and behavioral intentions are not very consistent. More research is needed to understand the role of emotions in information processing models and the conditions under which evoking negative emotions impacts behavioral intentions.

Drawing from the theory of planned behavior and social norms research, the present study predicted that peer approval norms and peer descriptive norms will positively affect behavioral intentions to binge drink. Findings revealed that peer approval norms had a direct positive effect on behavioral intentions to binge drink, which is in line with previous research (LaBrie et al., 2010; Neighbors et al., 2008). Moreover, peer approval norms predicted attitudes toward binge drinking, such that participants who perceived that drinking is an acceptable activity among their peer were also more likely to have positive attitudes toward binge drinking. Past research supports this finding (Payne, Lee, & Giletta, 2016). In addition, peer descriptive norms did not have a direct effect on behavioral intentions. However, peer approval norms mediated the relationship between peer descriptive norms and behavioral intentions to binge drink. Specifically, participants, who perceived that most college students drink, were more likely to perceive that drinking is an acceptable behavior among their peers, and consequently were more likely to report intentions to binge drink. Although past research has found that both peer approval norms (Halim et al., 2012; LaBrie et al., 2009) and peer descriptive norms (Borsari & Carey, 2003; Halim, et al. 2012, Lewis & Neighbors, 2004) independently predict behavioral intentions to drink, studies have also shown that peer approval norms were more likely to predict intentions to drink compared to peer drinking norms (Borsari & Carey, 2003). Similarly, Rimal & Real (2005) suggested that peer approval norms moderated the relationship between peer descriptive norms and behavioral intentions. It is important to mention that the relationship proposed in this study is tentative; although both peer descriptive norms and peer approval norms are related to behavioral intentions, more research is needed to understand the specific pathways of normative influence.

Limitations

The present study has several limitations. First, participants did not actually log into their Facebook accounts to view the UConn student's profile page. The partial mock Facebook page was built into the questionnaire in order to increase the possibility that the participants will view the stimuli. Second, participants viewed only a portion of a Facebook profile page, and the only clickable links were those related to the PSA and the UConn video. Therefore, participants did not have the opportunity of finding more information about the owner of the profile page and the peer who reposted the PSA. Also, participants were not able to like, comment, or share the posts on the mock Facebook page, which might have influenced their perceptions regarding the virality of the posts. Third, the present study did not address how people interact on Facebook. The present experiment was based on the assumption that if people consider a post interesting and important they are more likely to interact with the post. However, this assumption might not hold true for all Facebook users. These limitations might affect the ecological validity of the experiment and the generalizability of findings to real and interactive Facebook pages. Forth, a convenience sample of undergraduate students was used from the University of Connecticut, however the selection of this population was intentional as binge drinking is a common health risk among college aged students. Also, this specific sample allowed the researchers to manipulate the peer repost. Future studies should also analyze the effects of virality and message source on Facebook in the context of different health contexts and populations.

Future Research

While the present study did not find significant relationships between message virality and post trustworthiness and message source and post trustworthiness, it demonstrated that Facebook users who perceived a post as having high virality were more likely to perceive the

post as important and trending, and more likely to engage with the post. This finding is valuable to public health promoters who use PSAs to promote public health on Facebook. Future research should further explore the effects of message virality and message source on post trustworthiness by analyzing these relationships in the context of PSAs, as well as entertainment videos and ads. In the present study the manipulation of the source failed; therefore future studies could improve on the stimulus design by allowing participants to access links on a Facebook stimulus page, as well as improve the questionnaire design by including open-ended manipulation check questions when asking about the source of a post. Moreover, future studies should improve on the definition and conceptualization of the concept of *Facebook post*. More research is needed to understand the differences in Facebook users' perceptions of original posts versus reposts.

Another important avenue for research is the relationship between message virality and attention to the post. While the present study did not find a direct relationship between message virality and attention, future research should differentiate between the effects of message source and virality on exposure and attention. As mentioned above, it might be that virality and source predict exposure to a post, but not attention. The present study also demonstrated that attention to the post predicted participants' perceptions about the importance of the post and, indirectly, behavioral intentions to engage with the post online. Future research should explore the Facebook features that predict attention to the post and how these features might vary as a consequence of the message type (i.e. educational messages versus entertainment messages).

Past studies found that exposure to alcohol related content on Facebook influenced users' norms regarding alcohol consumption (Fournier et al., 2013; Loss et al., 2014; Miller et al., 2014; Moreno et al., 2010). While the present study did not find support for this relationship, future research could study the effects of formal features of Facebook on users' norms in the

context of both positive and negative portrayals of alcohol. Moreover, future studies should also explore this relationship in the context of other risky health behaviors, such as smoking cigarettes and marijuana.

Past research has found a positive significant relationship between intentions to engage with the post and behavioral intentions to binge drink (Alhabash et al., 2015). While the present study did not find a significant relationship between engagement and binge drinking intentions, future research should explore this relationship in the context of positive and negative portrayals of a behavior. Moreover, the present study assumed that if users perceive a post as important and trending, they are more likely to engage with the post. More research is needed to understand the circumstances under which Facebook users engage with a post. One important question that should be answered is: Does online engagement vary as a function of message type (i. e. entertainment message versus PSAs)? Scholars should also study the relationship between online engagement with a post and actual behavior.

Lastly, the present study found that the effects of emotional responses on attitudes and behavioral intentions are not very consistent. In the present study negative emotional responses to the PSA predicted attitudes toward binge drinking and engagement with the post, but did not predict attitudes toward the post and behavioral intentions to binge drink. Future research should attempt to understand the role of emotions in information processing models, and, more specifically, the impact of emotions on attitudes and behavioral intentions in the context of social media. Moreover, these relationships should also be explored in the context of different health topics and populations. Longitudinal studies can also provide a better understanding of the relationships between emotional responses, attitudes, and behavioral intentions. In addition, one

important question that should be answered is: Does the context of social media alter or weaken our emotional responses to a message?

Implications for Public Health Promoters

Based on the current study, we recommend that, when using PSAs to promote public health on Facebook, public health promoters should focus on engaging opinion leaders who are willing to like, share, and comment on the post, which in turn will increase the real world statistics of the post. Our study showed that posts with high virality are perceived as important and trending by fellow Facebook users and indirectly influence engagement.

Regarding message design we recommend the following: first, public health promoters should focus on the relationship between trustworthiness and message believability. The present study found that, when participants perceived the post and the source as trustworthy, they were more likely to believe that the negative outcomes of binge drinking presented in the PSA were true and they were more likely to connect the message to their own behavior. Therefore public health promoters who are involved in the process of designing PSAs to promote stopping binge drinking on social media should conduct focus groups with the targeted population to ensure that the message and the source are perceived as trustworthy. Second, the current study highlighted the central role of message believability in the processing of the post. Message believability predicted depth of processing, attitudes toward binge drinking, Facebook user norms, peer descriptive norms, and engagement with the post. Based on these findings, we recommend that formative research should be conducted by public health promoters designing PSAs to ensure that the arguments presented in the message are perceived as believable by the targeted audiences. Third, it is important that public health promoters also target individuals' emotions

through PSAs, as emotional responses predict individuals' intentions to engage with the post online.

REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I., & Sexton, J. (1999). Depth of processing, belief congruence, and attitude-behavior correspondence. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 117-138). New York: Guilford.
- Albarracin, D., Blair, T. J., Fishbein, M., & Muellerleile, P. A. (2001). Theories of reasoned action and planned behaviors as models of condom use: A meta-analysis. *Psychological Bulletin*, 127, 142-161, Doi: 10.1037//0033-2909.127.1.142
- Alhabash, S., McAlister, A. R., Hagerstorm, A., Quilliam, E. T., Rifon, N. J., & Richards, J. I. (2013). Between likes and shares: effects of emotional appeal and virality on the persuasiveness of anticyberbullying messages on Facebook. *Cyberpsychology, Behavior, and Social Networking*, 16, 175-182, Doi: 10.1089/cyber.2012.0265
- Alhabash, S., McAlister, A.R., Quilliam, E. T., Richards, J. I., & Lou, C. (2015). Alcohol's getting a bit more social: When alcohol marketing messages on Facebook increase young adults' intentions to imbibe. *Mass Communication and Society*, 18, 350-375, Doi: 10.1080/15205436.2014.945651
- Alvaro, E. M., Crano, W. D., Siegel, J. T., Hohman, Z., Johnson, I., & Nakawaki, B. (2013). Adolescents' attitudes toward antimarijuana ads, usage intentions, and actual marijuana usage. *Psychology of Addictive Behaviors*, 27, 1027-1035, Doi: 10.1037/a0031960
- Anderson, P., deBruijn, A., Angus, K., Gordon, R., & Hastings, G. (2008). Impact of alcohol advertising and media exposure on adolescent alcohol use: A systematic review of longitudinal studies. *Alcohol & Alcoholism*, 44, 229-243, Doi: 10.1093/alcalc/agn115

- Andrew, B. J., Mullan, B. A., Wit, J. B. F., Monds, L. A., Todd, J., & Kothe, E. J. (2016). Does the theory of planned behavior explain condom use behavior among men who have sex with men? A meta-analytic review of literature. *AIDS and Behavior*, Doi: 10.1007/s10461-016-1314-0
- Baek, T. H., Shen, L., & Reid, L. N. (2013). Effects of message framing in anti-binge drinking PSAs: The moderating role of counterfactual thinking. *Journal of Health Communication*, 18, 442-458, Doi: 10.1080/10810730.2012.743621
- Beltramini, R. F. (1982). Advertising perceived believability scale. Proceedings: Southwestern Marketing Association Conference, 1-3.
- Bergen, L., Grimes, T., & Potter, D. (2005). How attention partitions itself during simultaneous message presentations. *Human Communication Research*, 31, 331-336.
- Berry, T. R., Jones, K. E., McLeod, N. C., & Spence, J. C. (2011). The relationship between implicit and explicit believability of exercise-related messages and intentions. *Health Psychology*, 30, 746-752. Doi: 0.1037/a0025082
- Blanco, C., Okuda, M., Wright, C., Hasin, D. S., Grant, B. F., Liu, S.-M., & Olfson, M. (2008). Mental health of college students and their non-college-attending peers: Results from the National Epidemiologic Study on alcohol and related conditions. *Archives of General Psychiatry*, 65, 1429-1437, Doi: 10.1001/archpsyc.65.12.1429.
- Borland, R., Yong, H.-H., Wilson, N., Fong, G. T., Hammond, D., Cummings, K. M. ...McNeill, A. (2009). Impact of graphic and text warnings on cigarette packs: findings from four countries over five years. *Tobacco Control*, 18, 669-675. Doi: 10.1111/j.1360-0443.2009.02508.x

- Borsari, B. & Carey, K.B. (2003). Descriptive and injunctive norms in college drinking: a meta-analytic integration. *Journal of Studies on Alcohol*, 64, 331-341.
- Brown, S. A., Tapert, S. F., Granholm, E., & Delis, D. C. (2000). Neurocognitive functioning of adolescents: Effects of protracted alcohol use. *Alcoholism: Clinical and Experimental Research*, 24, 164-171.
- Burgoon, M., Alvaro, E., Grandpre, J., & Voulodakis, M. (2002). Revisiting the theory of psychological reactance: Communicating threats to attitudinal freedom. In J. P. Dillard & M. Pfau (Eds.), *The persuasion handbook: Developments in theory and practice* (pp. 213-232). Thousand Oaks, CA: Sage.
- Cameron, J. E. (2004). A three-factor model of social identity. *Self and Identity*, 3, 239-262, Doi: 10.1080/13576500444000047
- Carcioppolo, N. & Jensen, J. D. (2012). Perceived historical drinking norms and current drinking behavior: using the theory of normative social behavior as a framework for assessment. *Health Communication*, 27, 766-775, doi: 10.1080/10410236.2011.640973.
- Carr, C. T. & Hayes, R. A. (2015). Social media: Defining, developing, and divining. *Atlantic Journal of Communication*, 23, 46-65, doi: 10.1080/15456870.2015.972282
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, 39, 752-766.
- Cheung, C. M. K., Lee, M. K. O., & Rabjohn, N. (2008). The impact of electronic word-of-mouth: The adoption of online opinions in online customer communities. *Internet Research*, 18, 229-247, Doi: 10.1108/10662240810883290

Cialdini, R. B. (2007). Descriptive social norms as underappreciated sources of social control.

Psychometrika, 72, 263-268, doi: 10.1007/s11336-006-1560-6

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct:

Recycling the concept of norms to reduce littering in public places. *Journal of*

Personality and Social Psychology, 58, 1015–1026, Doi:10.1037/0022-3514.58.6.1015

College students still spend most social time with Facebook (September 8, 2015). Retrieved from

<http://www.emarketer.com/Article/College-Students-Still-Spend-Most-Social-Time-with-Facebook/1012955>

Company Info (2014). *Facebook newsroom/Stats*. Retrieved from

<http://newsroom.fb.com/company-info/>

Cooke, R., Sniehotta, F., & Schuz, B. (2007). Predicting binge-drinking behavior using an

extended TPB: Examining the impact of anticipated regret and descriptive norms.

Alcohol & Alcoholism, 42,84-91, Doi: 10.1093/alcalc/agl115

Croom, K., Staiano-Coico, L., Lesser, M. L., Lewis, D. K., Reyna, V. F., Marchell, T. C., Frank,

J., & Ives, S. (2015). The glass is half full: Evidence for efficacy of Alcohol-Wise at one university but not the other. *Journal of Health Communication: International*

Perspectives, 20, 627-638, Doi: 10.1080/10810730.2015.1012239

Crutzen, R., deNooijer, J., Brouwer, W., Oenema, A., Brug, J., & deVries, N. (2009).

Effectiveness of online word of mouth on exposure to an Internet-delivered intervention.

Psychology and Health, 24, 651-661, Doi: 10.1080/08870440802521094

D'Amico, E. J., Miles, J. N. V., & Tucker, J. S. (2015). Gateway to curiosity: Medical marijuana

ads and intentions and use during middle school. *Psychology of Addictive Behaviors*, 29,

613-619, Doi: 10.1037/adb0000094

- Dillard, J. P., & Anderson, J. W. (2004). The role of fear in persuasion. *Psychology & Marketing*, 21, 909-926, Doi: 10.1002/mar.20041
- Dillard, J. P., & Nabi, R. L. (2006). The persuasive influence of emotion in cancer prevention and detection messages. *Journal of Communication*, 56, S123-S139, Doi: 10.1111/j.1460-2466.2006.00286.x
- Dillard, J. P., & Peck, E. (2000). Affect and persuasion: Emotional responses to public service announcements. *Communication Research*, 27, 461-495.
- Duggan, M., Ellison, N. B., Lampe, C., Lenhart, A., & Madden, M. (2015). Social media update 2014: Demographics of key social networking platforms. *Pew Research Center*, Retrieved from <http://www.pewinternet.org/2015/01/09/demographics-of-key-social-networking-platforms-2/>
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace and Jovanovich.
- Engels, R. C. M. E., Wiers, R., Lemmers, L., & Overbeek, G. J. (2005). Drinking motives, alcohol expectancies, self-efficacy, and drinking patterns. *Journal of Drug Education*, 35, 147-166.
- Facebook Statistics (2015). *Statistic Brain*, Retrieved from <http://www.statisticbrain.com/facebook-statistics/>
- Fishbein, M. & Ajzen, I. (1975) *Belief, attitude, intention, and behavior: an introduction to theory and research*, Reading, Mass.: Addison-Wesley Pub. Co.
- Flowers, A. (2015, June 10). The most common unisex names in America: Is yours one of them? *FiveThirtyEightLife*. Retrieved from <http://fivethirtyeight.com/features/there-are-922-unisex-names-in-america-is-yours-one-of-them/>

- Fournier, A. K., Hall, E., Rieke, P., & Storey, B. (2013). Alcohol and the social network: Online social networking sites and college students' perceived drinking norms. *Psychology of Popular Media Culture*, 2, 86-95, Doi: 10.1037/a0032097
- Golan, G. J., & Zaidner, L. (2008). Creative strategies in viral advertising: An application of Taylor's Six-Segment message strategy wheel. *Journal of Computer-Mediated Communication*, 13, 959-972, Doi: 10.1111/j.1083-6101.2008.00426.x
- Gibson, L., Brennan, E., Momjian, A., Shapiro-Luft, D., Seitz, H., & Cappella, J. N. (2015). Assessing the consequences of implementing graphic warning labels on cigarette packs for tobacco-related health disparities. *Nicotine & Tobacco Research*, 898-907, Doi: 10.1093/ntr/ntv082
- Griffin, R. J., Neuwirth, K., Giese, J., & Dunwoody, S. (2002). Linking the heuristic-systematic model and depth of processing. *Communication Research*, 29, 705-732, Doi: 10.1177/009365002237833
- Hagman, B. T., Clifford, P. R., & Noel, N. E. (2007). Social norms theory-based interventions: testing the feasibility of a purported mechanism of action. *Journal of American College Health*, 56, 293-298.
- Halim, A., Hasking, P. & Allen, F. (2012). The role of social drinking motives in the relationship between social norms and alcohol consumption. *Addictive Behaviors*, 37, 1335-1341, doi:10.1016/j.addbeh.2012.07.004
- Hamilton, M. A. (1998). Message variables that mediate and moderate the effect of equivocal language on source credibility. *Journal of Language and Social Psychology*, 17, 109-143.

- Hamilton, M. A. (2015). Language intensity as an expression of power in political messages. In R. Schulze and H. Pishwa (Eds.). *The exercise of power in communication*, (233-268). New York: Palgrave MacMillan.
- Hamilton, M. A. & Chokpitakkul, N. (under review). Product and social marketing campaigns to address the obesity crisis in Thailand: The clean food promotion. Communication and Social Cognition Division, National Communication Association.
- Hamilton, M. A., Hunter, J. E., & Burgoon, M. (1990). An empirical investigation of an axiomatic model of the relationship between language intensity and attitude change. *Journal of Language and Social Psychology*, 9, 171-195.
- Hammond, D., Fong, G. T., McDonald, P. W., Brown, K. S., & Cameron, R. (2004). Graphic Canadian cigarette warning labels and adverse outcomes: Evidence from Canadian smokers. *American Journal of Public Health*, 94(8), 1442-1445.
- Hammond, D., Fong, G. T., McDonald, P. W., Cameron, R., & Brown, K. S. (2003). Impact of graphic Canadian warning labels on adult smoking behavior. *Tobacco Control*, 12, 391-395.
- Hartman, L. (2013, November 3). Why aren't there more John Smiths in the U.S.? *Slate*. Retrieved from http://www.slate.com/articles/life/slate_labs/2013/11/john_smith_why_don_t_more_americans_have_this_most_common_name.html
- Hassan, L. M., Shiu, E., Thrasher, J. F., Fong, G. T., & Hastings, G. (2008). Exploring the effectiveness of cigarette warning labels: Findings from the United States and United Kingdom arms of the International Tobacco Control (ITC) Four Country Survey. *International Journal of Nonprofit and Voluntary Sector Marketing*, 13, 263-274. Doi: 10.1002/nvsm.328

- Hendriks, H., van den Putte, B., & de Bruijn, G. - J. (2014a). Changing the conversation: The influence of emotions on conversational valence and alcohol consumption. *Prevention Sciences*, 15, 684-693, Doi: 10.1007/s11121-013-0418-2
- Hendriks, H., van den Putte, B., de Bruijn, G.-J., & de Vreese, C. H. (2014b). Predicting health: The interplay between interpersonal communication and health campaigns. *Journal of Health Communication: International Perspectives*, 19, 625-636, Doi: 10.1080/10810730.2013.837552
- Hennig-Thurau, T., Gwinner, K. P., Walsh, G., & Gremler, D. D. (2004). Electronic word-of-mouth via consumer-opinion platforms: What motivates consumers to articulate themselves on the Internet? *Journal of Interactive Marketing*, 18, 38-52, Doi: 10.1002/dir.10073
- Hingson, R. W., Zha, W., & Weitzman, E. R. (2009). Magnitude of and Trends in Alcohol-Related Mortality and Morbidity Among U.S. College Students Ages 18-24, 1998-2005. *Journal of Studies on Alcohol and Drugs*, 16, 12-20.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1-55, Doi: 10.1080/10705519909540118
- Hu, Y., & Sundar, S. S. (2010). Effects of online health sources on credibility and behavioral intentions. *Communication Research*, 37, 105-132, Doi: 10.1177/0093650209351512
- Huchting, K., Lac, A., & LaBrie, J. W. (2008). An application of the theory of planned behavior to sorority alcohol consumption. *Addictive Behaviors*, 33, 538-551, Doi: 10.1016/j.addbeh.2007.11.002

- Jin, S. V., Phua, J., & Lee, K. M. (2015). Telling stories about breastfeeding through Facebook: The impact of user-generated content (UGC) on pro-breastfeeding attitudes. *Computers in Human Behavior*, 46, 6-17, Doi: 10.1016/j.chb.2014.12.046
- Johnston, K. L., & White, K. M. (2010). Binge-drinking: A test of the role of group norms in the theory of planned behavior. *Psychology & Health*, 18, 63-77, Doi: 10.1080/0887044021000037835
- Jones, J. M., & Saad, L. (2013, May 23). *Americans sour on IRS, rate CDC and FBI most positively*. Retrieved from <http://www.gallup.com/poll/162764/americans-views-irs-sharply-negative-2009.aspx>
- Junco, R. (2012). The relationship between frequency of Facebook use, participation in Facebook activities, and student engagement. *Computers & Education*, 58, 162-171, Doi: 10.1016/j.compedu.2011.08.004
- Kees, J., Burton, S., Andrews, J. C., & Kozup, J. (2010). Understanding how graphic pictorial warnings work on cigarette packaging. *Journal of Public Policy & Marketing*, 29, 265-276.
- Kim, M.-S., & Hunter, J. E. (1993). Relationships among attitudes, behavioral intentions, and behavior. *Communication Research*, 20, 331-364.
- Lang, A., & Newhagen, J. (1996). Negative video as structure: Emotion, attention, capacity, and memory. *Journal of Broadcasting & Electronic Media*, 40, 460-477.
- Labrie, J. W., Hummer, J. E., Huchting, K. K., & Neighbors, C. (2009). A brief live interactive normative group intervention using wireless keypads to reduce drinking and alcohol consequences in college student athletes. *Drug and Alcohol Review*, 28, 40-47, doi:10.1111/j.1465-3362.2008.00012.x

- LaBrie, J. W., Hummer, J. F., Neighbors, C., & Larimer, M. E. (2010). Whose opinion matters? The relationship between injunctive norms and alcohol consequences in college students. *Addictive Behaviors*, 35, 343-349, Doi: 10.1016/j.addbeh.2009.12.003
- Lin, X., Spence, P. R., Lachlan, K. A. (2016). Social media and credibility indicators: The effect of influence cues. *Computers in Human Behavior*, 63, 264-271. Doi: 10.1016/j.chb.2016.05.002
- Litt, D. M., & Stock, M. L. (2011). Adolescent alcohol-related risk cognitions: The roles of social norms and social networking sites. *Psychology of Addictive Behaviors*, 25, 708-713. Doi: 10.1037/a0024226
- Loss, J., Lindacher, V., & Curbach, J. (2014). Do social networking sites enhance the attractiveness of risky health behavior? Impression management in adolescents' communication on Facebook and its ethical implications, *Public Health Ethics*, 7, 5-16, Doi: 10.1093/phe/pht028
- MacKenzie, S. B., Lutz, R. J., & Belch, G. E. (1986). The role attitude toward the ad as a mediator of advertising effectiveness: A test of competing explanations. *Journal of Marketing Research*, 23, 130-143.
- McCroskey, J. C. (1966). Scales for the measurement of ethos. *Speech Monographs*, 33, 65-72.
- McCroskey, J. C., & Teven, J. J. (1999). Goodwill: A reexamination of the construct and its measurement. *Communication Monographs*, 66, 90-103.
- McDermott, J. (January 21, 2014). Facebook losing its edge among college-aged adults. Retrieved from <http://digiday.com/platforms/social-platforms-college-kids-now-prefer/>
- Miller, A. (2006). Watching viewers watch TV: Processing live, breaking, and emotional news in a naturalistic setting. *Journalism & Mass Communication Quarterly*, 3, 511-529.

- Miller, C. H., & Quick, B.L. (2010). Sensation seeking and psychological reactance as health risk predictions for an emerging adult population. *Health Communication*, 25, 266-275. Doi: 10.1080/10410231003698945
- Miller, J. M., Prichard, I., Hutchinson, A., & Wilson, C. (2014). The relationship between exposure to alcohol-related content on Facebook and predictors of alcohol consumption among female emerging adults. *Cyberpsychology, Behavior, and Social Networking*, 17, 735-741, Doi: 10.1089/cyber.2014.0337
- Montano, D.E. & Kasprzyk, D. (2008). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. In Glanz, K., Rimer, B.K., Viswanath, K. (Eds.). *Health Behavior & Health Education*. (4th Ed.). Jossey-Bass, p. 45-65.
- Moreno, M. A., Briner, L. R., Williams, A., Brockman, L., Walker, L., & Christakis, D. A. (2010). A content analysis of displayed alcohol references on a social networking web site. *Journal of Adolescent Health*, 47, 168-175, Doi: 10.1016/j.jadohealth.2010.01.001
- National Institute on Alcohol Abuse and Alcoholism (NIAAA) (2004). NIAA council approves definition of binge drinking. *NIAAA Newsletter*, 3. Retrieved from http://pubs.niaaa.nih.gov/publications/Newsletter/winter2004/Newsletter_Number3.pdf
- National Institute on Alcohol Abuse and Alcoholism (NIAAA). (2014). *Alcohol facts and statistics*. Retrieved from <https://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/alcohol-facts-and-statistics>
- Neighbors, C., O'Conner, R. M., Lewis, M. A., Chawla, N., Lee, C. M., & Fossos, N. (2008). The relative impact of injunctive norms on college student drinking: The role of reference group. *Psychology of Addictive Behaviors*, 22, 576-581, Doi: 10.1037/a0013043.

- Norman, P., Armitage, C. J., & Quigley, C. (2007). The theory of planned behavior and binge drinking: Assessing the impact of binge drinker prototypes. *Addictive Behaviors*, 32, 1753-1768, Doi: 10.1016/j.addbeh.2006.12.009
- O'Cass, A., & Griffin, D.(2006). Antecedents and consequences of social issue advertising believability. *Journal of Nonprofit & Public Sector Marketing*, 15, 87-104. Doi: 10.1300/J054v15n01_05
- Oeldorf-Hirsch, A., & Sundar, S. S. (2015). Posting, commenting, and tagging: Effects of sharing news stories on Facebook. *Computers in Human Behavior*, 44, 240-249, Doi: 10.1016/j.chb.2014.11.024
- O'Hegarty, M., Pederson, L. L., Nelson, D.E., Mowery, P., Gable, J. M., & Wortley, P. (2006). Reactions of young adult smokers to warning labels on cigarette packages. *American Journal of Preventive Medicine*, 30, 467-473. Doi:10.1016/j.amepre.2006.01.018
- O'Keefe, D. J. (1990). *Persuasion: Theory and research*. Thousand Oaks, CA: Sage.
- Paschall, M. J., Bersamin, M., Fearnow-Kenney, M., Wyrick, D., & Currey, D. (2006). Short-term evaluation of a web-based college alcohol misuse and harm prevention course (College Alc).
- Payne, B. K., Lee, K., M., Giletta, M., & Prinstein, M. J. (2016). Implicit attitudes predict onset in adolescents: Shaping by social norms. *Health Psychology*, 35, 8, 829-836, Doi: 0278-6133/16/
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In *Communication and persuasion* (pp. 1-24). Springer New York.

- Picklesimer, S. (2015). Examining the impact of valenced messages and normative expertise in emotional education safe sex interventions. Paper presented at the International Communication Association Conference, San Juan, Puerto Rico. May 2015.
- Richards, A. S., & Banas, J. A. (2015). Inoculating against reactance to persuasive health messages. *Health Communication*, 30, 451-460, Doi: 10.1080/10410236.2013.867005
- Rimal, R. N. & Real, K. (2003). Understanding the influence of perceived norms on behaviors. *Communication Theory*, 13,184-203, doi: 10.1111/j.1468-2885.2003.tb00288.x
- Rimal, R. N. & Real, K. (2005). How behaviors are influenced by perceived norms: a test of the theory of normative social behavior. *Communication Research*, 32, 389-414, doi: 10.1177/0093650205275385
- Samu, S., & Bhatnagar, N. (2008). The efficacy of anti-smoking advertisements: The role of source, message, and individual characteristics. *International Journal of Nonprofit and Voluntary Sector Marketing*, 13, 237-250, Doi: 10.1002/nvsm.326
- Shi, R., Messaris, P., & Cappella, J. N. (2014). Effects of online comments on smokers' perception of antismoking public service announcements. *Journal of Computer-Mediated Communication*, 19, 975-990, Doi: 10.1111/jcc4.12057
- Sieverding, M., Ciccarello, L., & Mattered, U. (2010). What role do social norms play in the context of men's cancer screening intention and behavior? Application of an extended theory of planned behavior. *Health Psychology*, 29, 72-81, Doi: 10.1037/a001694
- Slater, M. D., Goodall, C. E., & Hayes, A. F. (2009). Self-reported news attention does assess differential processing of media content: An experiment on risk perceptions utilizing a random sample of U.S. local crime and accident news. *Journal of Communication*, 59, 117-134, Doi: 10.1111/j.1460-2466.2008.01407.x

- Slater, M. D., & Rasinski, K. A. (2005). Media exposure and attention as mediating variables influencing social risk judgments. *Journal of Communication*, 4, 810-827, Doi: 10.1111/j.1460-2466.2005.tb03024.x
- Smith, S. D., & Caruso, J. B. (2010). ECAR study of undergraduate students and information technology. *Students and Information Technology*, 6. Retrieved from <http://net.educause.edu/ir/library/pdf/ers1006/rs/ers10061.pdf>
- Snyder, L. B., & Fleming-Milici, F. (2005, May). *Disentangling the influence of peer and parental norms, attitudes, and outcome expectancies on youth drinking behavior: A national longitudinal study*. Paper presented at the annual meeting of the International Communication Association, New York, NY.
- Soper, D. (2015)
- Spears, N., & Singh, S. N. (2004). Measuring attitude toward the brand and purchase intentions. *Journal of Current Issues and Research in Advertising*, 26, 53-66.
- Spence, P. S., Lachlan, K., Westerman, D., & Spates, S. A. (2013). Where the gates matter less: Ethnicity and perceived source credibility in social media health messages. *The Howard Journal of Communication*, 24, 1-16, Doi: 10.1080/10646175.2013.748593
- Strizhakova, Y., Kang, Y. & Buck, R. (2007). Assessment of emotional gratifications: Development of the EGRATS scale. *Media Psychology*.
- Strutton, D., Taylor, D. G., & Thompson, K. (2011). Investigating generational differences in e-WOM behaviors: For advertising purposes, does X = Y? *International Journal of Advertising*, 30, 559-586. Doi: 10.2501/IJA-30-4-559-586
- Subramani, M. R., & Rajagopalan, B. (2003). Knowledge-sharing and influence in online social networks via viral marketing. *Communications of the ACM*, 46, 300-307.

- Sundar, S. S., & Nass, C. (2001). Conceptualizing source in online news. *Journal of Communication*, xx, 52-72.
- Terry, C. P. & Terry, D. L. (2011). Exaggeration of perceived smoking norms among college students: does smoking status matter? *Addiction Research and Theory*, 20(4), 291-299, doi:10.3109/16066359.2011.625133.
- Teven, J. J. (2008). An examination of perceived credibility of the 2008 presidential candidates: Relationships with Believability, likeability, and deceptiveness. *Human Communication*, 11, 391-408.
- Vardavas, C. I., Connolly, G., Karamanolis, K., & Kafatos, A. (2009). Adolescents perceived effectiveness of the proposed European graphic tobacco warning labels. *European Journal of Public Health*, 19, 212-217.
- Volchan, E., David, I. A., Tavares, G., Nascimento, B. M., Oliveira, J. M., Gleiser, S., ...Oliviera, L. (2013). Implicit motivational impact of pictorial health warning on cigarette packs. *PLoS ONE*, 8, e72117. Doi: 10.1371/journal.pone.0072117
- Wang, Z., Walther, J. B., Pingree, S., & Hawkins, R. P. (2008). Health information, credibility, homophily, and influence via the Internet: Web sites versus discussion groups. *Health Communication*, 23, 358-368, Doi: 10.1080/10410230802229738
- Wechsler, H., Lee, J. E., Kuo, M., & Lee, H. (2000). College binge drinking in the 1990s: Results of the Harvard School of Public Health 1999 College Alcohol study. *Journal of American College Health*, 48, 199-210.
- White, V., Webster, B., & Wakefield, M. (2008). Do graphic warning labels have an impact on adolescents' smoking-related beliefs and behaviors? *Addiction*, 103, 1562-1571. Doi: 10.1111/j.1360-0443.2008.02294.x

Zwaluw, C. S., Kleinjan, M., Lemmers, L., Spijkerman, R., & Engels, R. C. M. E. (2013).

Longitudinal associations between attitudes towards binge drinking and alcohol-free drinks, and binge drinking behavior in adolescence. *Addictive Behaviors*, 38, 2110-2114,

Doi: 10.1016/j.addbeh.2013.01.012

APPENDIX A – Partial Screen Shots of the Research Stimulus

1. Institution Post with High Viarility.

Jessie Williams

Timeline About Friends 1 Mutual Photos More

DO YOU KNOW JESSIE?

To see what she shares with friends, send her a friend request.

1 Mutual Friend

Studies at UConn
Started in 2013

Lives in Storrs, Connecticut

803 friends

FRIENDS 803

PHOTOS

Centers for Disease Control and Prevention
November 9 at 4:06pm

Prevent binge drinking and its consequences, such as memory loss, sexually transmitted diseases, and alcohol poisoning. Check out CDC's PSA for more information. - with Casey Smith and 1000 others.

Binge Drinking PSA Commercial featuring Baylee Curran

100,176 Views

Centers for Disease Control and Prevention (CDC) - Anti-binge drinking PSA.

Like Comment Share


97,689 people like this.

3,009 shares

View 237 comments

Jessie Williams shared UConn's video.
November 9 at 4:08pm

2. Peer Repost with High Virality.



Jessie Williams

Add Friend

Message

Timeline

About

Friends 1 Mutual

Photos

More

DO YOU KNOW JESSIE?

To see what she shares with friends, send her a friend request.

1 Mutual Friend

Add Friend


Studies at UConn

Started in 2013


Lives in Storrs, Connecticut

803 friends


FRIENDS 803




Siobhan Boyle




Ben von Mayrhauser




Leslie Gawn




Nathaniel Chin




RUSH AEP
Evan Kroll




Jose Reyes



Ashley Peck









Megan Nicole






Amelia Maggio

PHOTOS








Sam Johnson shared CDC's video.

November 15 at 4:06pm

Hey, check this out!

Binge Drinking PSA Commercial featuring Baylee Curran



100,176 Views

Prevent binge drinking and its consequences, such as memory loss, sexually transmitted diseases, and alcohol poisoning. Check out Center for Disease Control and Prevention's PSA for more information.

Like

Comment

Share


97,689 people like this.

3,009 shares

View 237 comments

Jessie Williams shared UConn's video.

November 9 at 4:05pm



* $p < .05$

Note: CDCPost – Institution post; PeerPost – Peer repost; BInt – Behavioral intentions to binge-drink; Eng – Engagement; Attn – Attention; TrstPost – Trustworthiness of the post; NgEmtion – Negative emotional responses; DepthP – Depth of processing; AttPSA – Attitudes toward the PSA; AttBingeD – Attitudes toward binge-drinking; FBNorm – Facebook norms, PeerNrm – Peer approval norms; DscrNrm – Descriptive norms; DscrQNrm – Descriptive quantity norms; MsgClar – Message clarity; MsgBliev – Message believability; PastDrink – Past drinking behavior; IdUconn – Identification with the UConn community; FBUse – Facebook use; SeenPSA – Seeing the PSA before the experiment; Year – Year in college; GreekLife – Member of Greek organizations; TrustCDC – Perceived trustworthiness of the CDC; ExptCDC – Perceived expertise of the CDC; TrustOwner – Perceived trustworthiness of owner of Facebook profile page; ExptOwner – Perceived expertise owner of Facebook profile page; TrustPeer – Perceived trustworthiness of peer who shared the PSA; ExptPeer – Perceived expertise of peer who shared the PSA.

Table 2 – Revised Model Pearson Correlations Table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.Virality	1																			
2.PcvdVirality	.18*	1																		
3.TimePage	.10*	.01	1																	
4.BInt	-.04	.00	-.02	1																
5.Eng	-.05	.23*	.08	-.15*	1															
6.Attn	.13*	.10*	.55*	.01	.28*	1														
7.TrstPost	-.01	.05	.19*	-.10	.34*	.31*	1													
8.NegEmotion	-.03	.06	.08	.10	.34*	.13*	.16*	1												
9.DepthP	.02	.09	.09	-.36*	.63*	.32*	.29*	.36*	1											
10.AttPSA	.01	.22*	.17*	-.132*	.67*	.39*	.42*	.30*	.55*	1										
11.AttBingeD	-.06	-.07	.00	.61*	-.26*	-.08	-.17*	.05	-.44*	-.21*	1									
12.FBNorm	.10	.51*	.16*	-.05	.40*	.25*	.16*	.16*	.31*	.47*	-.13*	1								
13.PeerNorm	-.02	-.05	.08	.65*	-.21*	.05	-.03	.02	-.30*	-.10*	.49*	-.03	1							
14.DescrNorm	-.03	-.01	-.13*	.30*	-.05	.05	.13*	.07	-.11*	-.01	.17*	-.08	.44*	1						
15.MsgClar	-.04	.11*	.22*	-.01	.23*	.29*	.71*	.07	.19*	.38*	-.06	.19*	.06	.10	1					
16.MsgBelieve	.03	.04	.07	-.17*	.39*	.23*	.43*	.09	.32*	.31*	-.31*	.20*	-.09	.14*	.29*	1				
17.PastDrink	-.08	-.01	-.16*	.80*	-.18*	-.08	-.19*	.04	-.32*	-.19*	.55*	-.13*	.61*	.35*	-.07	-.13*	1			
18.FBUse	-.00	.06	.06	-.05	.22*	.08	.02	.01	.14*	.05	-.04	.07	-.04	.08	.05	.06	-.01	1		
19.FemaleSex	-.01	.00	-.13*	-.24*	.07	-.07	.11*	.07	.11*	.07	-.26*	.10*	-.19*	.08	-.00	.19*	-.25*	.22*		
20.TrustCDC	.11*	.18*	.19*	.04	.12*	.28*	.33*	.04	.13*	.31*	-.13*	.26*	.11*	.10	.36*	.25*	.04	.05	.07	1
21.ExptCDC	.13*	.11*	.17*	-.00	.08	.22*	.28*	-.04	.13*	.26*	-.15*	.21*	.11*	.12*	.38*	.20*	.02	.06	.03	.82*

* $p < .05$

Note: PcvdVirality – Perceived virality; TimePage – Time spent on the stimulus page; BInt – Behavioral intentions to binge-drink; Eng – Engagement; Attn – Attention; TrstPost – Trustworthiness of the post; InfoPost – Informativeness of the post; NgEmtion – Negative emotional responses; DepthP – Depth of processing; AttPSA – Attitudes toward the PSA; AttBingeD – Attitudes toward binge-drinking; FBNorm – Facebook norms; PeerNrm – Peer approval norms; DscrNrm – Descriptive norms; MsgClar – Message clarity; MsgBliev – Message believability;

PastDrink - Past drinking behavior; FBUse – Facebook use; TrustCDC – Perceived trustworthiness of the CDC; ExptCDC – Perceived expertise of the CDC.