Media Use and Diet: A Dynamic Uses and Gratifications Approach

Thesis

Presented in Partial Fulfillment of the Requirements for the Degree Master of Arts in the Graduate School of The Ohio State University

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2014

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Abstract

This study extends previous research on motivated uses and gratifications associated with media use to include dietary behavior. It specifies dynamic uses and gratifications for media use and diet based on emotional needs using experience sampling data across 4 weeks. The study tests and quantifies moderation effects of emotional eating on the interaction between emotional needs and media use on predicting diet, on the interaction between emotional needs, media use, and diet on predicting emotional gratifications, and then on emotional gratifications predicting future emotional needs. The moderation effects of emotional eating in the first two cases were found to be significant, but not in the last. These findings have implications for the role of media in health life style intervention.
Dedicated to Emily, for all of her love and support; to my advisor Dr. Zheng Joyce Wang, for her patience, guidance, brilliance, and inspiration; to Dr. Michael Slater, for your support, encouragement, and advice; to the CAPLab, for your advice, troubleshooting, helping cover when needed, and for your endless support; to my cohort, for helping me through this process; to Mom, Dad, and Andrew, for everything (everything) over the years; to the Hoffman’s, for not being too upset when I would work instead of interact; to my friends, for being there when I didn’t want to work on my thesis; to my acquaintances on Facebook who kept me distracted; to my computer, for not crashing again; and to everyone else whom I may have forgotten, but I appreciate nonetheless.
Acknowledgments

Joyce, you’ve been a fountain of knowledge and an endless source of energy for me during this process. I sincerely appreciate all that you have done, all of the time you have taken, all of the emails you have answered, and all of the drafts you’ve revised. I look forward to working with you for the next four years and beyond. Zhengjie, you were simply irreplaceable in during this project. Your assistance and input was valued highly, and I hope that wherever you end up, that you are recognized for both your hard work and intelligence. Matt, you worked for much more than I am sure you will get out of the study, but all of your help was greatly appreciated.
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Fields of Study

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Chapter 1: Media Use and Diet: A Dynamic Uses and Gratifications Approach

As of 2009-2010, around 69.2% of U.S. adults over the age of 20 are overweight (Health, 2012). Recent surveys have shown that during the past 50 years, rates of obesity have grown in both men and women (Flegal, Carroll, Ogden, & Curtin, 2010). It is paradoxical to note: On the one hand, the majority of people know the life and health threatening nature of obesity—for example, that obesity is linked to many severe diseases, such as heart disease and diabetes (Tompson, Benz, Agiesta, et al., 2013; National Institutes of Health [NIH], 2012); however, on the other hand, a lack of motivation to change life style behaviors to reduce obesity seems persistent. Life style behavior changes, including sedentary activities (watching TV, using a computer, etc.), over-eating, and a reduction in leisure time physical activity, have led to increases in obesity (Dietz, 1996; Manson, Skerrett, Greenland, & VanItallie, 2004). Only one in five US adults over the age of 18 meet the recommended guidelines for aerobic and muscle strengthening exercise (Exercise, 2013). In contrast to the lack of exercise, media use is at an all-time high, with young people (ages 8-18) spending an average of 8.5 hours a day with media, when accounting for multitasking (Rideout, Foehr, & Roberts, 2010).

Can we take advantage of the ubiquitous media use to promote life style behavior change? Many communication researchers have contributed to this endeavor and much research has focused on designing media campaigns and messages to promote healthy
behaviors (Atkin & Freimuth, 2001; Derzon & Lipsey, 2002; Farrelly, Healton, Davis, et al., 2002; Hornik, 2002; Nederkoorn, Braet, Van Eijs, et al., 2006; Palmgreen, Donohew, Lorch, et al., 2001; Palmgreen, Lorch, Stephenson, et al., 2005; Slater, 2007; Snyder, & Hamilton, 2002; Vaughan & Rogers, 2000). This study takes a different route by placing media, along with diet, as an important life style behavior in order to explore the common underlying motivations that drive these behaviors. In particular, this study examines the mutual dynamic influences of these life style behaviors and the underlying motivations across time in daily life experience in an attempt to identify critical time points for media interventions: What are the reasons for unhealthy diet? And when does this happen? Why does their motivation increase or drop? Based on the longitudinal experience sampling method and dynamic panel modeling, this study aims to develop a predictive model of these critical time moments for providing media intervention. This will contribute to our ultimate goal of developing optimal health-intervention media techniques and provide personalized health messages through personalized technology (e.g., smart phone applications) to promote healthy behaviors.

In particular, this study seeks formative insight into the role that dynamic motivational systems have in our life style behaviors. This study is looking to find evidence that our motivational systems dynamically predict our health choice behavior, diet in this case, in daily life. In this study, media use and diet are viewed as motivated activities whose use dynamically changes future behavior via the interplay between
personal needs and gratifications. Theoretically, this article is looking to combine dynamic and mutually reinforcing motivations with the uses and gratifications perspective to examine the underlying motivations of this key lifestyle behavior variable, diet, in relation to media use. Specifically, a longitudinal experience sampling method (Kubey, Larson, & Csikszentmihalyi, 1996; Wang & Tchernev, 2012; Wang, Tchernev, and Solloway, 2012) will be used together with dynamic panel models to examine the dynamic reciprocal relationship between media use and diet in daily life, and in particular, to test the moderation effects of individuals’ emotional eating trait on these daily activities.
Motivation is defined as a psychological feature that prompts a person to act towards a specific goal (Schacter, Daniel, & Wenger, 2009). This study takes the dimensional approach, which is organized around appetitive (positive affect; approach) and aversive (negative affect; avoid) motivational systems, designed through evolution to promote survival (Larsen, Norris, & Cacioppo, 2003). This dimensional approach (e.g., Cacioppo, Gardner, & Berntson, 1999; Lang, Bradley, & Cuthbert, 1997; Williams, 2006) emphasizes motivation as fundamental to information processing and, importantly, choice behavior. Positive stimuli tend to induce appetitive responses, while negative stimuli tend to induce aversive responses (Cacioppo, et al., 1999).

Research has found that media use and effects are mutually reinforcing (Slater, Henry, Swaim, & Anderson, 2003; Slater, 2007; Slater & Hayes, 2010). Specifically, media use and its effects on motivations that drive the behavior have been examined longitudinally and found to be dynamic and mutually influencing each other over time, in-line with the Dynamical Motivation Activation model (DMA; Wang, Busemeyer, & Lang, 2006; 2011; Wang & Tchernev, 2012; Wang, et al., 2012; Wang, in press). This means that as a person uses media, their following behavior has been able to be predicted based on the motivations which lead to the initial behavior and now has changed by the
behavior. This “reciprocal causality” (Wang, et al., 2012, p.1830), or mutual influence across media use and motivations shows that media effects are not strictly one-way. The current study will examine the dynamic interplay between uses and motivations by expanding them from solely media to include another motivated daily activity, diet, and examine their interactions.

Motivations in this study are being operationalized via the use of needs and gratifications. Needs are taken as motivating the use of media and food. Needs, from the uses and gratifications perspective, are defined as “the combined product of psychological dispositions, sociological factors, and environmental conditions” (Katz, Haas, & Gurevitch, 1973, pp. 516–517) that motivates media use. In this study, food consumption will be examined in the same way; the same needs and gratifications that drive media use will be taken as motivating eating. This assumption will be explained further, below. Gratifications, for this study, are defined as the perceived fulfillment of a need through an activity (Palmgreen, 1984).

The four motivational categories for this study are being taken from research done previously in this area (Wang & Tchernev, 2012; Wang, et al., 2012), and are defined as: (1) social needs, “needs related to strengthening contact with family, friends, and the world” (Katz, et al., 1973, p. 167), for example, things done for personal or professional social reasons; (2) emotional needs, “related to strengthening aesthetic, pleasurable, and emotional experience” (Katz et al., 1973, p. 166), for example, things done for fun or
entertainment, or to kill time or relax; (3) informational (or cognitive) needs, “related to strengthening information, knowledge, and understanding’’ (Katz et al., 1973, p. 166), for example, things done to gain information, to study, or to get work completed; and (4) habitual needs, which are ritualized and help bring some structure to one’s day (Katz et al., 1973), for example, things that are done out of habit or for background noise. Both of the activities have been studied in respect to the motivations driving their use.
II. Media Motivations

The uses and gratifications perspective in communication research has long looked at the function of media for an audience (Fisher, 1978; Lasswell, 1948; Rosengren, 1974; Rubin, 2002). These studies have identified a plethora of uses and gratifications, which have been categorized above. Old and new media is continually being researched from this perspective (Ruggiero, 2000), with the internet (Lin, 2001; Maddox, 1998), user-generated media (Shao, 2009), and social media (Wang, et al., 2012) being fairly recent additions. Each study tends to find that similar needs and gratifications are met, though how they are met differs. Social needs for media were originally researched via shared experience through a medium resulting in social utility (i.e., talking about what was on TV last night, listening to a new song together, etc…) (Katz, et al., 1973; McQuail, Blumler, & Brown, 1972), while recent research has looked at social needs as being gratified via the internet’s ability to connect to others (i.e., message boards, social media sites, etc…) (Ferguson & Perse, 2000; James, Wotring, & Forrest, 1995; Lin, 1999) in various ways. Emotional needs for media have been conceptualized as release (McQuail, 1983; McQuail, et al., 1972) and stability, either emotional growth or preservation (McGuire, 1974), and have been demonstrated to contribute primarily to the use of entertainment media (McQuail, 1994; Luo, 2002) via both traditional and new mediums. Informational uses for media have been found across
nearly all researched media such from television (Rubin & Windahl, 1983) to the internet (Maddox, 1998), wherein media is used to learn by watching news, interviews, reading articles, etc… Habitual uses for media have been noted as ones that are ritualized and help bring some structure to one’s day (Katz, et al., 1973), though more research needs to be completed.
III. Diet Motivations

For diets, there is some recent work on its uses & gratifications. Recently, a study used twitter to record motivations for food consumption, as the food was being consumed (Hingle, et al., 2013). The purpose of this study was to test the feasibility of Twitter to record diet behavior and reasons for eating in order to investigate if increasing awareness of ones’ diet and reasons for that diet may help facility positive dietary change. In this study, participants used Twitter to report their diet over three consecutive days. They were given a list of 24 hashtags for food groups and reasons for eating. The study found that from the many reasons that people reported for food consumption, the three most prevalent reasons were for socialization (#social in the study), taste (#taste in the study), and convenience (#convenience in the study). To put this in terms of Uses and Gratifications, to satisfy emotional, habitual, and social needs respectively. This study paints a picture of food being used less for health and sustenance than for hedonic and emotional reasons. Another study found five “orientations” for food consumption were found, including hedonistic, social/environmental, personal health, peer-supported health, and parent-support health (Contento, Michela, & Goldberg, 1988). This study looked to find subgroups of adolescents base on their “food-choice motivations”. The researchers had students provide ratings and frequency of consumption of 20 foods by 8 attributes including taste, health, and social aspects of food. Six distinct subgroups were found,
with 5 having distinct orientations as mentioned above. Again, looking at these in terms of Uses and Gratifications we can see emotional and social reasons, with health being a new motivation unique to diet.
Chapter 3: Motivation Comparisons

As shown, emotional gratifications can be found across both of these activities under study. Emotional motivations for media are centered around regulation, whether it be releasing or decreasing pent up emotions (McQuail, 1983; McQuail, et al., 1972), preserving their state and keeping them stable, or growing/enhancing them in some way (McGuire, 1974). One recent study showed that for patients with eating disorders such as bulimia nervosa, while emotional regulation is normally resistant to change, the use of targeted media such as video games can increase emotional regulation (Fagundo, et al., 2013). This study looked at treating this eating disorder by having participants play a video game designed to treat impulse control mental disorders. They found that this use of media had significant effects with increased emotional regulation, heart rate variability increased after treatment, and respiratory rate and impulsivity decreased. For diet, emotional motivations arise in response to the need for tasty food (Hingle, et al., 2013) as described prior, or emotional regulation for some eaters (Macht, 2008). In Macht (2008), the argument is made that while emotion plays a large role in diet, it is difficult to predict just how emotions will have an effect on ones’ diet. Macht introduced a five-way model of how emotions affect eating. The five ways were shown to be: “(1) emotional control of food choice, (2) emotional suppression of food intake, (3) impairment of cognitive eating controls, (4) eating to regulate emotions, and (5) emotion-congruent modulation of
eating.” (p. 1) Thus, we can see that both media use and diet overlap in the emotional domain, especially in emotional regulation.

Another theoretically interesting question for emotional motivations involves moderation effects. Research has looked at media as a distractor for not just dieting, but also working out. One example is that the use of music during exercise increases the efficiency of the workout (Edworthy & Waring, 2006), meaning that less time is needed since greater sustained effort is exerted. There is also evidence that preferred music increases workout time (Nakamura, P., Pereira, Papini, Nakamura, F., & Kokubun, 2010). Similar to media use and exercise, studies and a meta-analysis showed that watching TV while eating has been shown to increase food intake (Blass, et al., 2006; Robinson, et al., 2013). Robinson and colleagues examined 24 studies covering the effects of manipulating various mediators on food intake, including memory, distraction, awareness, and attention related to the food being consumed. The results of the meta-analysis showed that eating when distracted resulted in a moderate increase in intake over a short time scale, then increased intake even more over a longer time scale. The researchers suggest that increasing attention to what is being eaten will likely influence food intake. While many explanations have been looked at, it is clear that the use of more than one activity for emotional needs may act in a moderating manner, in this case media use increasing caloric intake.
Similar to how Fagundo, et al., (2013) showed that media can be used to overcome emotional regulation problems related to diet, this study will examine the moderation effects of media on diet. As shown in Figure 1, media use should moderate the process how diet is affected by emotional needs as well as how diet fulfills emotional gratifications.

Figure 1. Model of Emotional Needs and Gratifications, Diet, Media Use, and Emotional Eating.

The model in Figure 1 can be understood in three parts: (1) How dietary behavior is predicted by its feedback effect, emotional needs, media use, and emotional eating tendencies; (2) how dietary behavior interacts with media use and emotional eating to
fulfill the emotional needs, and lead to emotional gratification; and (3) how emotional gratification may determine subsequent emotional needs. The literature reviewed up to this point has illustrated the process leading to dietary behavior by examining the connections between emotional needs and dietary behavior (e.g., Contento, et al., 1988; Hingle, et al., 2013), as well as between emotional needs and media use behavior (e.g., McQuail, 1983; McQuail, et al., 1972; Wang, et al., 2012). Similarly, the moderation of emotional needs by media use on dietary behavior has been stated by the research showing that increasing media use will typically increase caloric intake (e.g., Robinson, et al., 2013). Next, the dynamic nature of the motivations behind the uses and gratifications of dietary behavior will be looked at in terms of emotional needs sought and emotional needs gratified before exploring emotional eating as a moderator of the main interactions in this system.
Chapter 4: Dynamic Uses and Gratifications

Recent research has examined the role of media in our complex world by conceptualizing media use (the behavior) and media effects (on motivation, emotion, and cognition) as dynamic, mutually influencing systems (Slater, 2007; Wang, et al., 2006, 2011; Wang & Tchernev, 2012). This study explores the possibility that beyond media, key lifestyle behavioral variables such as diet are able to be included in this dynamic reciprocal system due to their shared motivational underpinnings. To do this, this study will examine the dynamic interplay of needs sought and gratifications obtained. Theoretically, while extending uses and gratifications to further provide evidence for the dynamic nature of needs sought and gratifications obtained, this study hopes to make clearer the motivational underpinnings that drive the dynamic interplay between media use and diet.

Examining the needs sought and gratifications obtained as dynamic, via the uses and gratifications perspective is not new. Recent research has shown that media uses and future behavior can be formally modeled by dynamic motivational activation (Wang & Tchernev, 2012). This research, grounded in motivational and dynamic systems theories, provides a cross-level analytic approach to understanding the dynamic reciprocal causal influences between media use and effects cross time, and how these influences are moderated by individual differences. Simply put, this research has shown that media
choice and use behavior can predict media effects as based on dynamically updating motivations in relation to previous needs gratification fulfilled by the behavior. This perspective allows for clear differentiation between gratifications sought versus gratifications received (e.g., Palmgreen, 1984), and shows that gratifications sought may not be received and vice versa (e.g., someone watching TV out of habit may catch important news and thus be more informed, rather than satiating their habitual need). This approach helps parse out (1) what needs drive the behaviors under study, (2) to what extent the needs are gratified, and (3) how the gratified—or ungratified—needs motivate subsequent behaviors. In the context of media multitasking, Wang and Tchernev (2012) showed that while the behavior of the participants was driven by what they termed “cognitive” motivations (the same category as informational used in this study), they did not receive the gratification; instead, participants obtained emotional gratifications despite the fact that those were not what they were not actively seeking. In addition, habitual needs drive multitasking, which in turn, reinforces the needs. This motivation was shown to be part of the mechanism by which media multitasking was reinforced, leading to further multitasking behaviors. This study will further investigate this mechanism by examining how motivations attributed to the use of media may bleed over to motivations that drive diet and exercise.

Research shows that at any given time we have multiple needs of varying strength, something that influences the choices we make (Busemeyer, Townsend, &...
Stout, 2001). This article is taking a functional approach in-line with uses and gratifications and applying it dynamically to media use and diet. As mentioned before, the functions of an activity will be examined based on the needs sought and the gratifications obtained, which we assume will vary depending on some individual differences.

The lines of research discussed above imply that any time, the needs a person perceives as most salient, or most needed to be gratified at that moment, will motivate actions by that individual to that satisfy that need. Though, one does not always know how to satisfy a given need. As demonstrated by Wang, et al., (2012), participants attempted to gratify social needs through social media and ended up finding their social needs were not fully satisfied, and instead satisfied informational needs. This drove them to then seek out additional social gratification through social media, resulting in further “mis-use” of social media for this need. Thus, a dynamic interplay of needs and gratifications can be seen to exist; however, this has only been established with media (Slater, 2007; Wang et al., 2006; Wang et al., 2012; Wang & Tchernev, 2012). The research suggests that needs left ungratified after a gratification attempt will predict future behavior by focusing efforts in the individual to gratify the ungratified needs.

A key idea underlying the examination of dynamic systems is the system’s feedback effects (Wang, et al., 2006; 2011). Feedback refers to the effect of the accumulation of the subject’s earlier responses to gratifying needs being incorporated
back into the system, thereby affecting future needs. These feedback effects are then endogenous, as they come from the internal monitoring of external, or exogenous, influences (from media, diet, or exercise in this case). This means that the feedback is generated by the system itself, and is fed back into the system, affecting its future states. Feedback, or autoregressive, effects are essential to the operation of complex dynamic systems (Buzsaki, 2006), and must be present to allow us to make the claim that the lifestyle behavioral variables under study in fact interact in a dynamic manner.

Aside from being a hallmark of a dynamic system, feedback effects are important to this investigation because the lifestyle behaviors being examined are important portions of everyday life. Media is ubiquitous, and food is essential; their dynamic interplay with our emotional needs and gratifications will allow us to understand more about what shapes our lives. These feedback terms may be small on the scale proposed in this study, but over the course of a lifetime, they have the potential to accumulate into massive effects that can shape our health and life satisfaction.

In Figure 1, these feedback effects are represented by the loops attached to emotional needs, diet, media use, and emotional gratification. For each term, at every point in time, the accumulation of the past expressions of those terms should be incorporated into the future iterations of the system in order to influence their subsequent outcomes. Similarly, the dynamics of the system is shown through the feedback loop
between the emotional gratifications and emotional needs, implying that past emotional gratifications should influence future emotional needs.
Chapter 5: Emotional Eating

Emotional eating tendencies of individuals affect food choice behaviors and emotional gratifications from the diet. Emotional eating, as a concept, comes from psychosomatic theory which posits that emotional eating is due to dysfunction in the emotional regulation portion of the brain (e.g., Kaplan & Kaplan, 1957). It is proposed that emotional eating is caused by a confusion of arousal states and hunger starting at an early age, and is considered a learned response (Bruch, 1961; 1973), with connections being drawn between parental emotional eating and adolescent emotional eating (Snoek, Engels, Janssens, & van Strien, 2007). Emotional eating is not restricted purely to “overweight” or “obese” individuals, as it is known that some people will begin to restrict food intake when weight gain is apparent (Rodin, 1978). Emotional eaters are typically poor at judging their own hunger and satiety, and will eat in response to emotional arousal rather than a hunger state (van Strien, Herman, Anschutz, Engels, & de Weerth, 2012).

Recent research on emotional eating consistently shows that regardless of the emotional trigger, when emotionally aroused (usually through stress), emotional eaters will consume food. One study found that stressed emotional eaters ate sugary, fatty foods and more calorie-dense meals than unstressed and non-emotional eaters (Oliver, Wardle, & Gibson, 2000). Another study done on children showed that stressful events led to an
increase in consumption of sweet and fatty food consumption, and a decrease in fruit and vegetable consumption (Michels, et al., 2012).

For the purposes of this study, emotional eating will be examined as a moderator that changes the way a person will attempt to gratify emotional needs by tending to eat, rather than use media, exercise, or any other number of alternative activities. In Figure 1, emotional eating is depicted as moderating three key places; first, the interaction of emotional needs and media use on caloric intake; second, at the interaction of emotional needs, media use, and caloric intake on emotional gratifications; and third, on the feedback of emotional gratifications on emotional needs. Based on the review and the proposed model depicted in Figure 1, a series of hypotheses are proposed.
Chapter 6: Hypotheses

A time-series model will be used to base the following hypotheses on, a traditional meditational analysis is inappropriate for the analysis of this data due to the unique data structure and nature of questions being asked of the model.

As reviewed, dietary behavior itself is dynamic and should show a feedback effect. Intuitively, if a preceding meal was larger than normal, under regular circumstance, the following meal should be smaller. Ideally, one would not want to keep a schedule of increased caloric intake so as to prevent unwanted weight gain and health consequences. Therefore one would expect a regulation of caloric intake would proceed a larger than average meal. It is proposed,

Hypothesis 1: Previous caloric intake will have an effect on following caloric intake.

This is represented as the feedback loop attached to the dietary behavioral term in Figure 1. This feedback loop incorporates past dietary behavior into future iterations of the system. Through this feedback effect, the effects of previous emotional needs and media use on diet were integrated and accumulated in the diet system over time.

Second, emotional needs are predicted to interact with media use to influence diet, which is further moderated by individual differences in emotional eating. If for “normal” eaters, media use increases caloric intake, emotional eaters should see that use of media
will help to regulate their needs for increased calories. This means that the three-way interaction will show how emotional eating affects the moderation. For emotional eaters scoring high on the individual difference scale, they are predicted to replace some of their emotionally gratification attempts with media over food, reducing caloric intake. In contrast, for emotional eaters scoring low on the individual difference scale, they are predicted to use media as a distraction and to thus increase their caloric intake. To this end, it is posited that:

*Hypothesis 2:* There should be a three-way interaction of emotional needs, media use, and emotional eating tendencies on caloric intake in that emotional needs increases caloric intake, but for those with higher emotional eating tendencies, media use reduces the rate of this increase in caloric intake.

This is represented in Figure 1, where media use and emotional eating are moderators on emotional needs that drive caloric intake.

Third, similar to the feedback effect proposed for dietary behavior, emotional gratifications also feed past gratifications into the system:

*Hypothesis 3:* Previous emotional gratification should have an effect on future emotional gratification.

This is represented in Figure 1 by the feedback loop on the emotional gratification term. This feedback loop incorporates the previous emotional needs, dietary behavior,
and media use, all as moderated by emotional eating, back into the system for future emotional gratification.

In addition, as reviewed, emotional gratifications should be determined by emotional needs, media use, and caloric intake, which is further moderated by emotional eating tendencies. As seen in the literature (Bruch, 1961; 1973), emotional eating is seen as a learned behavior and will tend to reinforce itself. As it is driven by emotional needs, a connection to the “misuse” of social media for social needs (Wang & Tchernev, 2012) would suggest that emotional eating may lead to an emotional gratification deficit. The reinforcement of the behavior is due to additional seeking of emotional needs through misuse of the behavior used to attempt emotional gratification in the first place. This results in a predicted four-way interaction between emotional needs, diet, and media use, all being moderated by emotional eating tendencies, which together predict emotional gratifications. As defined, emotional needs are a prerequisite for satisfying any emotional gratifications and thus must be included. Emotional needs will drive diet, as predicted prior. Diet will be both the accumulation of the first step in the model, and the behavioral outcome for diet. Media use, as shown in the literature and predicted prior, is predicted to both play a role in expressing the emotional needs, but also in moderating diet. Finally, emotional eating tendencies are predicted to moderate those three variables which all are predicted to together predict emotional gratification. This suggests a four-way interaction effect on emotional gratifications:
Hypothesis 4: There should be a four-way interaction of emotional needs, media use, caloric intake, and emotional eating tendencies on emotional gratifications. This is represented on Figure 1 by the four interaction terms converging to influence emotional gratifications.

Finally, we predicted feedback of emotional gratifications on emotional needs. As shown in Figure 1, prior gratification should reduce emotional needs, and emotional eating can moderate this process.

Hypothesis 5: Prior emotional gratifications should negatively predict emotional needs, which should be moderated by emotional eating tendencies.

This is represented in Figure 1 by the moderation of emotional eating on the causal arrow that links prior emotional gratifications to current emotional needs.
Chapter 7: Methods

I. Participants

Undergraduate students (N = 18) from a large Midwestern University in the United States were recruited through advertising fliers and in-class announcements to participate in the study for monetary reward. On average, they were 21.38 (SD = 2.55) years old. Eleven participants were female (61.1%), and the majority were White/Caucasian (67%), with Black (11%), Asian (17%), and Pacific Islander (6%) comprising the rest of the sample.
II. Design

Before data collection began, the participants were pre-screened via questionnaires that looked for a range of personality traits and media-life characteristics. The survey took approximately 1-hour and the participants were compensated for their time. Participants with a relatively large range of emotional eating tendencies were selected for the experience sampling study. They were trained for about 2-hours on the daily activity reporting system. At the training session, participants were introduced to the reporting mobile device that was preconfigured to only be able to report data to the research website.

Using a slightly modified experience sampling method (Wang & Tchernev, 2012; Wang, et al., 2012), participants reported their daily activities, media and non-media related, three times a day for four weeks, for a total of 28 days of reporting. To make reporting easier and less intrusive, locked-down tablet devices were given to the participants. The device only received messages on a participant specific account (associated with a numeric identity to ensure confidentiality), had the ability to manage the wireless internet connection, and had access to Qualtrics.com for reporting via the study questionnaire (described below). Participants were given 1.5-hour windows throughout the day, and an 8-hour window at night (from 12pm-1:30pm, 5pm-6:30pm, and from 8pm-4am to account for the general period of time before the participant goes
to bed) to submit their reports. These windows were open at midday, in the afternoon, and in the night. The bed-time window was extended to allow for the participants to go to bed as they normally would, but still allow for the response regardless of when that might have occurred. They were given one-day of real-world practice and test to ensure each of them could use the method accurately.

The questionnaire was based on the experience sampling method designed by Wang and Tchernev (2012). The method was created based on content analysis of college students’ daily behavioral dairies (N = 78; Wang & Tchernev 2012). It focuses on media use behaviors, work-related activities, study/learning activities, and other non-media social activities. New questions were added, including items for assessing a rough dietary log, exercise log, and various filler-items to distract the participants from the true nature of the study.
Chapter 8: Measures

I. Media Use Behavior

To measure media use behavior, a three times a day response journal was incorporated into the experiential sampling questionnaire to accurately record the media use behavior of the subject. The questionnaire included options for selecting media such as: television/movie, radio, print, computer, and phone/portable, including the use of internet and social media as subgroups for both computer and phone choices. Follow-up questions asked about length of time spent consuming media among other things.

Television/movie use included genre sub-topics of comedy, drama, news, sports, reality tv/competition, movie, and other (where they could specify another genre if they feel what they watched was not included in the original list). Radio use included genre sub-topics of music or non-music to simply cover the spectrum of radio broadcasts. Phone/portable use included genre sub-topics of talk, text, iPod/music, gaming, videos (Netflix, etc…), online (browsing), shopping (online), social media (Facebook, email, chat, Youtube, etc…), finance/banking/bills, and other. Print use included genre sub-topics of books, magazines, newspapers, or other to be selected. Computer use included genre sub-topics of offline use, browsing (online), iTunes/music, finance/banking/bills, gaming (online), shopping (online), social media, TV/movie (Hulu, Netflix, etc…), or other. Social media was able to selected from either the phone/portable use, or the
computer use selection menu, and its use included genre sub-topics of blog, email, facebook/renren, IM, linkedIn, myspace, forum/chat, skype, twitter/weibo, wiki, YouTube, reddit, or other. For anything else, an “other media” category was created with three slots to fill out any other mediated activity they were engaging in that they did not feel fell into any of the media activities listed above. The full questionnaire options are included in Appendix A.

In addition, participants reported non-mediated activities, such as study/learning/in-class, exercise, their diet, work, personal activities, and a space for other non-media activities to be reported.

For each activity reported, participants also indicated the duration of the activity in minutes, split into divisions of: 1, 5, 10, 15, 30, 45, 1 hour, then 15 minute increments up to 5 hours. They were also asked about the following information:
i. Needs and Gratifications

The participants were asked about their needs and gratifications relating to the activity that they indicated prior. They were asked about what needs they sought and how much they ended up being gratified. The categories were emotional needs (fun/entertainment, to relax/kill time), cognitive needs (information, studying/work), social needs (personal, professional), and habitual needs (habits/background noise). They were told that more than one category can be selected for an activity. The participant was able to rate their needs sought and gratifications on those categories using a 0-100 sliding scale; 0 – (“none”) and 100 – (“fully”).
ii. Diet Behavior

To measure diet behavior, a self-report list of items was included in the experiential sampling questionnaire to record the dietary behavior of the subject during the time windows. The questionnaire asked the subject to select which meal was eaten in the previous response window, or if there was a snack or nothing consumed, then asked them to list briefly what those items were. They were given up to 15 items to respond with, the 15th item included the option to list more items separated by commas. No one needed all 15 items for any meal. Follow-up questions mirrored the ones used in the media use behavior measure as a way to compare needs and gratifications obtained through eating to the media use behavior.

Three coders coded each diet entry on several pertinent categories, including estimated amount of calories in the meal (Cronbach’s $\alpha = .86$). The “calories” variable is coded to estimate the amount of calories the participant ate in a given time period. Due to the variable nature of calories needed for a person with regards to lifestyle and demographic factors, we used a rough estimation for whether the amount of calories fell into a recommended amount. The categories were based on the demographics of our sample and were defined as follows: for females 19 – 30 years old, 2000 calories are needed if they are sedentary, 2000-2200 calories if they are moderately active, and 2400 calories if they are active; for males 19 – 30 years old, 2400 calories are needed if they
are sedentary, 2600-2800 calories if they are moderately active during the day, and 3000 calories if they are active. These figures were taken from WebMD, “Estimated Calorie Requirement” (2014). The meals were coded on a 4-point scale; 1 – “Definitely < 600 calories for the meal; definitely less than 1/3 of the amount needed by a sedentary female”, 2 – “Probably around 600-800 calories for the meal”, 3 – “Probably around 801-1000 calories for the meal”, 4 – “definitely > 1000 calories for time period, definitely more than 1/3 of the amount needed by an active male”. After coding, each time window had the calorie estimations added up for later analysis.
iii. Individual Differences in Emotional Eating

The Dutch Eating Behavior Questionnaire (DEBQ; van Strien, Frijters, Bergers, & Defares, 1986) provides sub-scales for restrained, emotional (clearly labeled and diffuse), and external eating (van Strien, et al., 1986). For this study, the emotional and diffuse subscales were combined to provide a total score indicating emotional eating tendencies. This questionnaire has high internal consistency and factorial validity (van Strien, et al., 1986).

The full DEBQ is a summed score 33-item 5-point likert-style questionnaire that takes about 10 minutes to finish. The scale asks questions regarding eating behaviors in the form of statements which the participants respond to including, for example, “Do you have the desire to eat when you are irritated?”, “Do you have a desire to eat when you are emotionally upset?”, and “Do you have a desire to eat when you are feeling lonely?” In response to the statements shown, the choices for the participants are 1 – “never”, 2 – “seldom”, 3 – “sometimes”, 4 – “often”, and 5 – “very often”. Higher scores indicate a higher ranking on the sub-scale. For emotional eaters, higher scores indicate a higher propensity for emotional eating, with the range of possible scores for emotional eating being 13 – 65. The DEBQ emotional eating scores (Cronbach’s α = .94) ranged from 13 to 59, with a raw average of 36.67 (SD = 15.48). Additionally, to compare these scores to previous norms, we have to look at the male and female scores separately. In this sample,
females had an average score of 42 ($SD = 13.79$, Range from 15 to 55), while males had an average score of 28.29 ($SD = 15.10$, Range from 13 to 52). These scores by sex are close to the norms of the DEBQ (Wardle, 1987) calculated from 188 higher education students aged 18-60 (females: $M = 34.45$, $SD = 9.36$; males: $M = 29.12$, $SD = 10.01$). While not exactly the same, the scores obtained for this study’s sample were selected from a pre-screen to increase the range and variability of scores obtained. Additionally, the characteristics of the norm sample, with females having a higher average score, but lower variability than males, was found in this study’s sample.

There are versions of the DEBQ for adults, adolescents, and children, available in multiple languages. This experiment used the adult-English version. The questionnaire is in Appendix E.
II. Data Reduction and Time Series Data

For each reporting window of each participant, the total duration of media use was computed by adding up the minutes reported in the media categories, then divided by the total duration of all activities during that interval. This proportion of time spent on media was used as the measure for media use during that window and ranged in proportion from 0 to 1 ($M = .40$, $SD = .34$), that is from 0% to 100% of the total time reported. The four needs and gratifications categories during each interval for each person were computed by averaging their needs and gratifications reports for the window. Emotional eating scores, as mentioned before, came from the additive combination of the diffuse and clearly labeled emotional eating scores obtained from the DEBQ. Calories, also mentioned before, came from the coding and additive combination of the diet log obtained from the survey. Thus, for each individual, time series of 84-observations were created for media use, needs and gratifications, emotional eating scores, and calories consumed.
Chapter 9: Results

The descriptive statistics of the key variables in the study are summarized in Table 1. As shown, the participants were 21.34 years old on average ($SD = 2.48$), 11 (61%) are females, and 12 (66.6%) are Caucasian. On average, they have a reasonable amount of caloric intake each meal ($M = 1.62$, $SD = 1.46$). They spend, on average, a large portion of their time consuming media (40%), and as a group, have a slightly higher tendency of emotional eating than the norm ($M = 36.69$, $SD = 15.05$).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
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<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
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<td>19</td>
<td>30</td>
</tr>
<tr>
<td>Calories</td>
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<td>1.62 (1.46)</td>
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<td>8</td>
</tr>
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<td>Emotional Need</td>
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<td>99.75</td>
</tr>
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<td>Cognitive Need</td>
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<td>100</td>
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<tr>
<td>Media Use</td>
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<td>.40 (.34)</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Emotional Eating</td>
<td>1512</td>
<td>36.69 (15.05)</td>
<td>13</td>
<td>59</td>
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</table>

Table 1. Descriptive Statistics of the Key Variables

To test the hypotheses specified prior, three dynamic panel models were formed based on the hypotheses and estimated for calories consumed, emotional gratifications, and
emotional needs. The generalized method of moments (GMM) was used to fit the model using the xtdpdsys command in STATA (Arelland & Bolver, 1995; Blundell & Bond, 1998). The estimated models were summarized in Tables 2-4.

<table>
<thead>
<tr>
<th></th>
<th>Calories&lt;sub&gt;_{i,t}&lt;/sub&gt;</th>
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<td>Calories&lt;sub&gt;_{i,t-3}&lt;/sub&gt;</td>
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</tr>
<tr>
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<td>.02(.01)†</td>
</tr>
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<tr>
<td>Wald χ&lt;sup&gt;2&lt;/sup&gt;</td>
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Table 2. The Estimated Model of Calories Intake
### Table 3. The Estimated Model of Emotional Gratification

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<td>Intercept</td>
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<td>.02(.01)†</td>
</tr>
<tr>
<td>Emotional Gratification$_{i,t-2}$</td>
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</tr>
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<td>Emotional Gratification$_{i,t-3}$</td>
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<td>Media Use$_{i,t}$</td>
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<td>Calories$_{i,t}$</td>
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<tr>
<td>Media Use$<em>{i,t} \times$ Calories$</em>{i,t}$</td>
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<tr>
<td>Emotional Eating$<em>{i} \times$ Media Use$</em>{i,t}$</td>
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</tr>
<tr>
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</tr>
<tr>
<td>Emotional Eating$<em>{i} \times$ Media Use$</em>{i,t} \times$ Calories$_{i,t}$</td>
<td>.04(.02)*</td>
</tr>
<tr>
<td>Emotional Eating$<em>{i} \times$ Emotional Need$</em>{i,t} \times$ Media Use$<em>{i,t} \times$ Calories$</em>{i,t}$</td>
<td>-.01(.002)*</td>
</tr>
<tr>
<td>Gender$_{i}$</td>
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<tr>
<td>Race$_{i}$</td>
<td>1.63(.36)*</td>
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<tr>
<td>Wald $\chi^2$</td>
<td>10049.64*</td>
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Emotional Needs

<table>
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<tr>
<td>Intercept</td>
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<td>Emotional Needs&lt;sub&gt;i,t-3&lt;/sub&gt;</td>
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<td>2.43(.82)*</td>
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<tr>
<td>Wald χ²</td>
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Table 4. The Estimated Model of Emotional Needs

What predicts caloric intake?

Our Hypotheses 1 and 2 are relevant to this question. Hypothesis 1 stated that previous caloric intake would have a feedback effect on subsequent caloric intake. Hypothesis 2 predicted a three-way interaction of emotional needs, media use, and emotional eating tendencies on caloric intake in that emotional needs would increase caloric intake, but for those with higher emotional eating tendencies, media use would reduce the rate of this increase in caloric intake.

To test the hypotheses, a dynamic panel model was constructed and the estimated coefficients are summarized in Table 2. It needs to be noted that coefficients in dynamic
panel models can be interpreted similarly to coefficients in linear regression models, but they are estimated effects per time unit—in our case, about 1/3 of a day.

*Hypotheses 1* is supported. As shown in Table 2, all three feedback terms of caloric intake were significant. Since people seem to tend to eat at a healthy level, the slightly negative effect of lag 1 ($M = -.19, SE = .02, p < .05$) suggests that people will compensate for eating more than average in the preceding time window. Similar small but significant effects were found for lags 2 and 3. This suggests that while the amount of food may change, there seems to be at least a daily pattern of eating that is established in the participants. One window has a slightly higher amount of food consumed in it than the rest (lag 3), but that overall people eat a little more than 600-800 calories a window. There may indeed be some homeostatic factor that keeps the consumption patterns constrained to a random overall caloric intake, but this will need more information to tease out.

*Hypothesis 2* is also supported. As shown in Table 2, there was a significant three-way interaction between emotional eating, emotional needs, and media use on diet ($M = -.002, SE = .001, p < .05$). This is illustrated in Figure 2. Each panel in Figure 2 shows a level of emotional eating; in each panel, each line shows how caloric intake changes as emotional needs increases with different proportion of media use during the time window (0, .4, .74, and .9).
**Low-level (average level – SD) emotional eating.** As can be seen, when emotional eating is low, and emotional needs are low, media use does not appear to change caloric intake. Rather, under these conditions, it appears that a person who does not emotionally eat, and has no emotional needs, will consume generally the same amount of food regardless of how much media they also consumed. Though, as emotional needs increase, media use becomes a major factor in determining the caloric intake, with increased caloric intake being associated with increased media usage. When the emotional need is around 45, the difference between those high in media usage, and low in media usage, is a little over 1 full caloric interval. This is to be expected with the literature mentioned prior looking at media use and caloric intake has consistently shown that with increased media use, there will be an increase in eating.

**Mid-level (average level) emotional eating.** Again, media does not change someone with low emotional needs, though here media also does not drastically change those with high emotional needs. When emotional eating is in the mid-range, media use is not as heavily influential in caloric intake. There is an overall positive trend, though here we see that regardless of how much media is used, the emotional needs predict higher caloric intake. This is interesting as it shows that in the mid-range of emotional eaters, media does not play a major role in moderating caloric intake. There are small effects and, while in the opposite direction as low-level emotional eaters, overall we see that media simply does not matter as much. This suggests that mid-level emotional eaters are
able to balance their caloric intake and their media use. While a problem, they are able to somewhat control how much they eat, regardless of the media. The low variability of the outcomes based on media use also suggests that media is simply not as important in this case.

**High-level (average level + SD) emotional eating.** When emotional eating is at the high end of the spectrum, and there are no emotional needs, media does not change the caloric intake. As emotional needs increase, there is a drastic effect of media on caloric intake. For these high-level emotional eaters, media acts almost symmetrically, but opposite, to low-level eaters. With no media use, high-emotional eaters will eat almost 1.5 calorie intervals more than those with the highest level of media use at a level of media use at a level of 45 on the emotional needs scale. These numbers will scale as the emotional needs increase. This directly supports Hypothesis 2, as we can see that media is playing a role to reduce the amount of caloric intake for high-level emotional eaters with increasing emotional needs.

Overall, as emotional eating and media use increase, fewer calories will be consumed by those most likely to emotionally eat as emotional needs increase, while the lack of media use shows a strong increase in calories consumed as emotional eating increases due to emotional needs. This supports the idea that media use and food consumption can be considered functional moderators in gratifying certain needs, in this case, emotional needs.
Figure 2. The Three-Way Interaction of Emotional Eating$_{i,t}$ × Emotional Need$_{i,t}$ × Media Use$_{i,t}$ on Calories$_{i,t}$
Do emotional gratifications decrease in response to the moderating effect of emotional eating on diet, media use, and emotional needs?

To examine this question, Hypotheses 3 and 4 were posited. Hypothesis 3 stated that previous emotional gratification should have an effect on future emotional gratification. This hypothesis was stated to show that emotional gratifications are dynamic, similar to dietary behavior. The support of this hypothesis will show that emotional gratifications do indeed feedback into themselves, thereby affecting the future of the system. Hypothesis 4 stated that for emotional eaters under increasing emotional needs, increased media use and increased caloric intake will positively predict emotional gratifications. To test these hypotheses, a time-series model was constructed to fit the data gathered from this sample. The full model (Table 3) predicts the emotional gratification of an individual \( i \) at time point \( t \) using: (1) the autoregressive lag 1, lag 2, and lag 3 feedback effects of emotional gratifications, (2) emotional needs of an individual \( i \) at time \( t \), (3) media use, and media use with emotional needs of an individual \( i \) at time \( t \), (4) caloric intake, and caloric intake with emotional needs of an individual \( i \) at time \( t \), (5) media use and caloric intake, and emotional needs, media use, and caloric intake of an individual \( i \) at time \( t \), and (6) trait emotional eating, and its interactions with emotional needs, media use, caloric intake, emotional needs and media use, emotional needs and caloric intake, media use and caloric intake, and finally emotional needs,
To test *Hypothesis 3*, the intercept and lag terms were first entered. The intercept and lag terms were all found to be significant in Table 3 (or approaching significance in the case of lag 1). With the intercept being as low as it is ($M = -6.50$, $SD = 2.27$, $p < .05$), this suggests that the sample had a negative emotional offset. This result cannot be compared to previous studies due to the updated method by which the gratification scores were collected (ratio 0-100 scale as versus an interval 1-4 scale). Previous scored indicated low, but positive emotional gratifications at baseline (Wang, et al., 2012), whereas here we are seeing that this sample of participants tends to fall into the negative at baseline. This suggests that at any time, they are in need of a low level of emotional gratification. With relatively much smaller, though still significant, findings for the lag terms, it appears that prior gratifications do indeed play a small part in predicting future gratifications at 8-hours, 16-hours, and 24-hours approximately. Thus, it can be said that hypothesis 3 was supported.

To test *Hypothesis 4*, the moderation of emotional eating on emotional needs, media use, and dietary behavior in predicting emotional gratification, all of the factors were entered into the time series model presented in Table 3. A four-way interaction between trait emotional eating, emotional needs, media use, and caloric intake was put forth and found to be negative, but significant ($M = -.01$, $SD = .002$, $p < .05$). This
supports hypothesis 2 in that the four-way interaction was shown to negatively predict emotional gratifications.

The four-way interaction between trait emotional eating, emotional need, media use, and caloric intake on predicting emotional gratifications is shown in the charts of Figure 3 below.

For Figure 3, the big changes take place not between the levels of emotional eating, rather between the levels of caloric intake. This is not to say that the trait emotional eating is not important, rather in the chart, there is no visible difference. The effects of trait emotional eating would be clearer if we could see this play out over months and years, rather than over a single time window. This next section will describe this graph in terms of the caloric intake segments to understand just how media use, more than emotional eating, immediately effects diet through this four-way interaction.

**No caloric intake.** Under conditions of no caloric intake and no emotional needs, regardless of media use and trait emotional eating, the general baseline is around -6.50, as predicted in the model. For no caloric intake, as emotional needs increase, emotional gratification is obtained. The amount obtained is speculated to be moderated by the amount of media used, with low usage showing the highest amount of emotional gratifications and high media usage showing the lowest amount of emotional gratifications. The spread is around 10 emotional gratification points at emotional need of
around 45. According to the model, this will scale and become greater with increased emotional need.

**Mean caloric intake.** When caloric intake is at the sample mean (1.62), the intercept conditions (no emotional needs, regardless of media use) still predict negative emotional gratification near the emotional gratification mean of -6.50. As emotional needs increase, the effect of media use becomes more apparent with a similar pattern as no caloric intake. This time, however, even with no media use, the increased caloric intake decreases emotional needs from around 50 in the no caloric intake condition, to around 35 emotional gratification points at 45 points of emotional need. Again, increased media use shows a trend of decreasing the emotional gratifications with a spread of around 10 yet again present. Again this will scale with increased emotional needs.

**Caloric intake of 3.** A caloric intake of 3 can be interpreted in a number of ways due to both the nature of the coding scheme used to rate meals caloric content, the fact that participants could enter more than one meal a window, and finally the additive process used to sum up the calories consumed during the window. For our purposes, we can interpret a caloric intake of 3 as being slightly more than healthy, though not all together unhealthy. This change in caloric intake, while not changing the intercept conditions, does again decrease the maximum emotional gratifications obtained in all of the media use conditions. No media use is now only able to achieve about 25 points of emotional gratification at 45 points of emotional need. The spread between the no media
and high media conditions has increased slightly too, ending up around 12 or 13 points (though clear figures here are not straight forward, we could easily argue it is around 10).

Clearly, as caloric intake increases, less emotional gratification is to be had by the participant while using media, regardless of trait emotional eating.

**Caloric intake of 5.** A caloric intake of 5 can be interpreted as unhealthy eating for a window. This could be thought of as having a large fast food meal with a large sugary drink, or something similar in unhealthy, high caloric nature. Here we see changes in all facets of the chart, though again the trait emotional eating is not as major of a component. The intercept has fallen to around -9. This indicates that as more food is being consumed, there is a greater need for emotional gratification. Again we can see that emotional gratifications are also much harder to come by, as with increased emotional needs and no media use, the maximum emotional gratification able to be obtained at 45 points of emotional need is around 7 emotional gratification points. This is a large decrease from the 25 maximum able to be obtained at the same point with less food intake.

With the highest level of media use the maximum obtainable emotional gratification drops to around -4, meaning the spread is still increasing slightly too, ending up around 14 points. Again, the effect of higher caloric intake is that overall maximum gratifications are falling.
**Caloric intake of 7.** A caloric intake of 7 can be interpreted as severely unhealthy. With the mean intake being 1.62, and healthy being around 2, 7 is more than triple the recommended amount of food for a window, as defined. This means that someone is getting all of the calories they need for a day, and possibly then some, in one short time period. This might be like eating an entire large pepperoni pizza with some soda. Here we see the biggest shift in the chart. The intercept again drops, this time to -10. The interactions now see the biggest change too, with the no media condition left alone as the only positive increase and almost flat-lining, gaining maybe 1 point of emotional gratification after 45 points of emotional need. The rest of the media conditions become negative trends, decreasing emotional gratification as emotional need increases. The highest media use category now ends up decreasing gratification by 10 points after 45 points of emotional needs. The spread between no media and the highest media category is now around 11, though never getting out of the negative emotional gratification.

Overall, this caloric intake category shows that at the high extreme, increased media use will make emotional needs increase in intensity, while no media use will, over time and with increased emotional needs, slowly get the person back to around baseline.
Figure 3. The Four-Way Interaction of Emotional Eating, Emotional Need, Media Use, and Calories on Emotional Gratifications
Overall, the trend in this four-way interaction is that with increasing caloric intake, the maximum possible emotional gratifications to be obtained over increasing emotional needs, tend to decrease. Adding in media use, no media keeps the maximum emotional gratification as high as possible, while increasing media use brings the maximum emotional gratification possible down by around 10 points consistently.

This shows that emotional gratifications are a much more complex problem than caloric intake for emotional eaters. As shown with Figure 2, caloric intake will decrease with increased media use and emotional needs for highly emotional eaters. Here, we can see that emotional gratifications may not necessarily follow as caloric intake increases. The cause and solution to this discrepancy is unable to be sorted out with these models. More data and more sophisticated techniques will be needed to tease out just why emotional gratifications are not obtained in the same pattern that caloric intake is reduced due to media. Though, thus far, the results are encouraging. We are seeing clear significant trends between dependent variables when including similar factors with the data provided.

*Do emotional gratifications, moderated by emotional eating, predict future emotional needs?*

Finally, to test *Hypothesis 5* that subsequent emotional needs would be affected by previous emotional gratifications moderated by emotional eating, the model in Table 4 was constructed and estimated. The full model predicts the emotional needs of an
individual $i$ at time point $t$ using: (1) the autoregressive lag 1, lag 2, and lag 3 feedback effects of emotional needs, (2) emotional gratification, emotional eating, and emotional gratification and eating together. Gender and race are entered as control variables.

This hypothesis is not supported. It was found that emotional eating and emotional gratifications from the previous time window did not, together, significantly predict emotional needs.
Chapter 10: Discussion

This study shows that media use and diet are linked in more nuanced ways than the research has already demonstrated (e.g. Robinson, et al., 2013). It was found that emotional eaters will not consume as many calories when they use media, and while co-occurrence was not able to be properly tested, the method used to reach this conclusion ended up being more conservative due to the length of the time windows. Finding these effects will help to shape future research into using media as a functional alternative to unhealthy behavior, especially when looking at emotional eaters. It may be that for most, functional alternatives may not be complementary, while for some people with strong biases in motivational drive, they may benefit from more of this motivationally targeted treatment. Similarly, these findings point to a new framework by which to understand the motivated choices made in diet and media consumption situations.

This study tests and quantifies the relationship between emotional gratifications and emotional eating, emotional need, media use, and caloric intake. Specifying these effects showed that heavy eaters will gain less emotional gratification regardless of emotional eating tendencies. This is important because it shows another route to mis-use of media and diet for a specific population. This research specifies one way in which emotional eaters are pushed to continue the trend of their dietary consumption. It is not so much control over portions, rather the deleterious effects of the motivational deficit they
accrue. Similarly to how it was shown that social media may promote reinforcing usage by seeming like a good place to gratify social needs, but resulting in less than desired social gratifications (Wang & Tchernev, 2012), emotional eating provides a lack of emotional gratification that only grows as more food is consumed. The mechanisms behind this are yet to be specified, but the data illustrate this major point. Similarly, this finding could be pointing to a more complex understanding of what emotional gratifications may be. If the satisfaction of a need does not increase the amount of gratification, then by definition it may not be a gratification at all. Rather, in this case, we may have been measuring the amount of distraction from the emotional need taking place, which may be negatively correlated to the amount of gratification gained. Finally, this study tests and quantifies the relationship between emotional needs, and emotional eating and emotional gratifications. Specifying these effects showed two big outcomes. One, emotional gratifications did not predict future emotional needs. This went against our hypothesis and hints at the possibility of emotional needs and emotional gratifications being more dynamic than previously thought. This does fit in with previous research done in this area (Wang & Tchernev, 2012), and seems consistent with their findings. This suggests that there may be many more contextual influences at play when determining emotional needs. In line with the suggestion made prior, if the gratification attempts assumed to be occurring were actually distraction attempts, this could help understand why emotional needs are not being significantly predicted by the outcome of the first two
pieces of this model. Two, being an emotional eater seems to predict that you will have emotional needs. This makes sense, but is important to realize that for this population, they are constantly in search of emotional gratification. This bolsters the importance of this research by showing a true need for functional alternatives in order to promote healthier lifestyles. Similarly, this may point to emotional eating being a trait linked not only to eating, but to an overall propensity for emotionally motivated activity consumption. If emotional eaters are able to moderate their caloric intake by consuming media, investigation of what media they are choosing, and whether certain other emotionally driven phenomena such as binge eating may occur with other preferred activities such as media consumption.

So are emotional motivations shared across activities, namely media use and diet? All signs point to yes, though with some caveats as explained above. It appears that in certain situations, for certain people, media can help to control the amount of caloric intake, not increase emotional gratification as expected, and certainly not predict the future emotional needs state.
Chapter 11: Limitations and Future Directions

This study was limited in several ways. First, the small number of participants (N=18), while of sufficient power to find effects, is skewed towards the extremes on the values of emotional eaters. Larger sample sizes will help to more precisely understand just how the results work out across the spectrum of emotional eaters, as we may be losing nuance. Second, better measures of diet intake and the caloric estimation should be used in future studies. More work can be done to fine tune the estimations and allow for better estimates both within and between time windows. More fine-grained coding would allow us to also go further with the analysis and test various properties of the foods consumed, rather than just the amount of calories. Similarly, for the media consumed, more fine-grain data might reveal that certain media may in fact produce emotional gratifications, with or without emotional need, as well as helping to specify which media was chosen for the gratification attempts.

Future studies should address the problems found in the model. Why are emotional gratifications not increasing after gratification attempts? Are the gratifications defined and measured here really a measure of gratification, or is there some other process happening? It was suggested earlier that the gratification attempts may be better considered as distraction attempts in order to cope with the emotional need for which the emotional eaters are not capable of addressing, this should be investigated. Similarly, for
emotional eaters, it appears that food and media are both able to be used for attempts at emotional gratification. Though not fully successful, the linkage between the two needs to be more fully explored. It appears that emotional eaters are not simply consuming food for their emotional needs, but media as well. This suggests that an underlying trait may need to be discovered to link emotional consumers to these behaviors.
References


Manson, J. E., Skerrett, P. J., Greenland, P., & VanItallie, T. B. (January 01, 2004). The escalating pandemics of obesity and sedentary lifestyle. A call to action for clinicians. *Archives of Internal Medicine, 164*(3), 249-58.


Appendix A: Media Use Behavior Questions

Instructions: Please select all of the following activities you have done since you last reported. (Please select all that apply)
Activities:
TV/Movie
  Comedy
  Drama
  News
  Sports
  Reality TV/Competition
  Movie
  Other (Specify)
Radio
  Music
  Non-music
Phone/Portable Device (e.g., iPod, Kindle, Tablet, etc…)
  Talk
  Text
  iPod/Music
  Gaming
  Videos (Netflix, etc…)
  Online (Browsing)
  Shopping (Online)
Social Media (Facebook, email, chat, youtube, etc…)
  Blog
  Email
  Facebook/RenRen
  IM
  LinkedIn
  Myspace
  Forum/Chat
  Skype
  Twitter/Weibo
  Wiki
  Youtube
  Reddit
  Other (specify)
Finance/Banking/Bills
Other (Specify)

Print

Book
Magazine
Newspaper
Other (specify)

Computer (desktop/laptop)
Offline Use
Browsing (online)
iTunes/music
Finance/banking/bills
Gaming (online)
Shopping (online)

Social Media
Blog
Email
Facebook/RenRen
IM
LinkedIn
Myspace
Forum/Chat
Skype
Twitter/Weibo
Wiki
Youtube
Reddit
Other (specify)

TV/Movie (Hulu, Netflix, etc…)
Other (specify)

Other Media Activities
Please Specify
Appendix B: Dutch Eating Behavior Questionnaire

Instructions: We all have different reasons for eating and times when we feel like eating. Please respond to the following questions by accurately marking the frequency you feel best represents your eating style in the situation asked by the question. If the question does not apply to you, skip it and go on to the next question.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
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</thead>
<tbody>
<tr>
<td>1. If you have put on weight, do you eat less than you usually do?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>2. Do you try to eat less at mealtimes than you would like to eat?</td>
<td>1</td>
<td>2</td>
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<td>3. How often do you refuse food or drink offered because you are concerned about your weight?</td>
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<td>2</td>
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<tr>
<td>Question</td>
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<td>4. Do you watch exactly what you eat?</td>
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<td>5. Do you deliberately eat foods that are slimming?</td>
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<td>6. When you have eaten too much, do you eat less than usual the following days?</td>
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<td>7. Do you deliberately eat less in order not to become heavier?</td>
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<td>8. How often do you try not to eat between meals because you are watching your weight?</td>
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<td>2</td>
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<tr>
<td>9. How often in the evening do you try not to eat because you are watching your weight?</td>
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<td>10. Do you take into account your weight with what you eat?</td>
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<td>11. Do you have the desire to eat when you are irritated?</td>
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<td>12. Do you have a desire to eat when things are going against you or when things have gone wrong?</td>
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<td>13. Do you have a desire to eat when you are frightened?</td>
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<td>14. Do you have a desire to eat when you are disappointed?</td>
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<td>15. Do you have a desire to eat when you are emotionally upset?</td>
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<td>Question</td>
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<td>16. Do you have a desire to eat when you are depressed or discouraged?</td>
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<td>2</td>
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<td>17. Do you have a desire to eat when you are cross?</td>
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<td>18. Do you have a desire to eat when you are approaching something unpleasant to happen?</td>
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<td>2</td>
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<tr>
<td>19. Do you get the desire to eat when you are anxious, worried or tense?</td>
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<td>2</td>
<td>3</td>
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<td>5</td>
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<tr>
<td>20. Do you have a desire to eat when you have nothing to do?</td>
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<td>2</td>
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<tr>
<td>21. Do you have a desire to eat when you are feeling lonely?</td>
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<tr>
<td>Question</td>
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<tr>
<td>22. Do you have a desire to eat when somebody lets you down?</td>
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<td>23. Do you have a desire to eat when you are bored or restless?</td>
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<td>2</td>
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<tr>
<td>24. If food tastes good to you, do you eat more than usual?</td>
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<td>2</td>
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<td>5</td>
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<tr>
<td>25. If food smells and looks good, do you eat more than usual?</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>26. If you have something delicious to eat, do you eat it straight away?</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>27. If you walk past the baker do you have the desire to buy something delicious?</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
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<tr>
<td>Question</td>
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<tr>
<td>28. If you walk past a snack-bar or a cafe, do you have the desire</td>
<td>1</td>
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<tr>
<td>to buy something delicious?</td>
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<tr>
<td>29. If you see others eating, do you also have the desire to eat?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>30. Can you resist eating delicious foods?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>31. Do you eat more than usual, when you see others eating?</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
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<tr>
<td>32. When preparing a meal are you inclined to eat something?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>33. If you see or smell something delicious, do you have a desire to eat it?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Please Check: Make sure you have marked a frequency for each question that applies to you.

Thank you!