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# How addictive frames can undermine perceived control

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BOSTON UNIVERSITY  
QUESTROM SCHOOL OF BUSINESS

Dissertation

HOW ADDICTIVE FRAMES CAN  
UNDERMINE PERCEIVED CONTROL

by

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Submitted in partial fulfillment of the  
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## DEDICATION

For the four most important women in my life: my wife Becky, my daughter Charlotte, my mother Elizabeth, and my sister Fern. You inspire me.

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CAN UNDERMINE PERCEIVED CONTROL  
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**ABSTRACT**

Many varieties of consumption are often mischaracterized as “addictive,” such as social media use, chocolate consumption, shopping, and viewing pornography, even though considerable evidence indicates that they are not intrinsically addictive. This research examines whether labeling everyday products and activities as “addictive,” a common occurrence in modern media, popular culture, and marketing, can actually influence consumption. Given the consistent use of warning-based interventions related to established addictions (e.g., cigarettes, drugs, gambling), there exists an implicit assumption that warning consumers about the addictiveness of freely available products and generally socially acceptable activities will reduce the behavior. However, the potentially negative consequences of labeling non-addictive behaviors as addictive remain unclear.

It was predicted and found that explicitly framing everyday consumption behavior as being addictive reduces consumers’ perceived

control over the focal behavior resulting in increased consumption. Specifically, across twelve studies, consumers led to believe that consumption activities including eating chocolate and granola, shopping, using social media, and viewing pornography are addictive increases that behavior due to a decrease in perceived control. The effect of the addictive frame was not found to occur for purely virtuous and arguably less desirable and enjoyable foods (e.g., peas). Further, the effect does not spillover to other similar foods (e.g., M&Ms versus Skittles), meaning the effect is not simply a result of inducing a general lack of perceived control over all activities. Finally, boosting control by reminding consumers of situations where they had control over their own food consumption attenuated the effect of existing addictive beliefs. Alternative explanations such as the influence of a diminished sense of personal responsibility (via guilt), the forbidden fruit effect (via desire and excitement), affect regulation, and descriptive social norms were also tested and ruled out. This research has implications for how these behaviors are portrayed in marketing communications, the media, and public policy, and can be used to develop more effective interventions for at-risk consumers.

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## LIST OF ABBREVIATIONS

A.P.A.	American Psychiatric Association
B.U.	Boston University
C.I.	Confidence Interval
D.S.M.	Diagnostic and Statistical Manual of Mental Disorders
S.D.	Standard Deviation
S.E.	Standard Error
S.E.M.	Standard Error of the Mean
U.S.	United States
V.S.S.	Visual Sexual Stimuli

## INTRODUCTION

The contention that some everyday products and activities are addictive is often found in popular press articles and marketing communications that leverage the addiction metaphor in describing many common behaviors. Examples of behaviors that have often been erroneously described as addictive include social media use, chocolate consumption, shopping, watching television, exercising, playing video games, and viewing pornography (Ablow 2013; Ainslie 1999; Bernheim and Rangel 2004; Carroll 2013; Ferdman 2014; Griffiths 1997; Kubey and Csikszentmihalyi 2002; Lewis 1992; Orford 2001; Steiner-Adair 2015; Vallerand et al. 2003; Wise 2002). Even some researchers have begun explicitly framing certain everyday behaviors as “addictions” (e.g., Hartston 2012) and have argued that labeling certain foods as being addictive could potentially decrease levels of obesity (e.g., Rogers 2017).

Overconsumption of everyday products can appear to fit under some simplistic and outdated definitions of addiction (e.g., “Addiction thus applies to the initiation of use and then being unable to stop using;” Wade 1994: 118), so it is understandable why some are quick to assign the “addictive” label to certain behaviors. However, these products and activities are not inherently addictive and have not been officially recognized as being addictive by the

American Psychiatric Association (A.P.A.), a body that is considered the official authority on addictive behaviors.

Given the consistent use of warning-based interventions related to established addictions (e.g., drugs, gambling; Andrews et al. 2014; Bettman, Payne, and Staelin 1986), there exists an implicit assumption that warning consumers about the “addictiveness” of freely available products and socially acceptable activities should reduce the behavior. It is assumed that through an increased awareness of the addictive capacity of a product or activity, consumers are reminded of the potential risks they face in consumption and should therefore adjust their behaviors. In the case of many everyday behaviors, they are sometimes required (e.g., shopping for food in order to survive, using the internet for work purposes) and arguably the majority of society has already undertaken many of these behaviors, with many regularly partaking in the behavior. The ubiquity of these behaviors, and their necessity for many people, mean it is important to understand how consumers are influenced by this addictive frame.

The stereotypical image of addiction is bolstered in the minds of consumers through film and television (Cape 2003), where addicts are often portrayed as being “deranged by uncontrollable cravings” (Vohs and Baumeister 2009: 234). Presumably, this consistent image of addiction forms the basis of the lay-theory regarding emblematic addictive behaviors. By

labeling an everyday product or activity as being addictive, this may decrease consumers' subsequent ability to deal with the conflict. Such language frames can act as a feedback mechanism, whereby consumers' perceptions of control are either bolstered or undermined, which can directly influence their ability to avoid temptation. For example, Patrick and Hagtvedt (2012) showed that framing the refusal of a tempting item as "I don't" versus "I can't" empowers an individual to say "no" and enhances goal-directed behavior. Therefore, increasingly stronger beliefs in the addictiveness of an everyday product or behavior may make consumers feel they lack control over their actions where they may abandon any impetus for restraint resulting in self-regulation failure.

This dissertation is the first to examine the impact of framing everyday products and activities as addictive. It is theorized that the addictive frame will reduce perceived control over the behavior, meaning the frame could paradoxically increase consumption. In the twelve studies undertaken, consumers led to believe that consumption activities including eating chocolate and granola, shopping, using social media, and viewing pornography are addictive react by increasing the behavior. Specifically, participants informed that chocolate is addictive, subsequently ate more chocolate than did controls, due to a decrease in perceived control over their chocolate consumption. Similar effects were found in relation to granola

consumption. Furthermore, participants informed that shopping is addictive paid more for the same products than did those who were not led to believe in its addictiveness, also due to a decrease in perceived control. This effect consistently occurs when the addictive frame is provided either through informational means (e.g., as a news article) or as an explicit warning (e.g., placed on packaging). Further, the frame was found to not significantly influence virtuous consumption behaviors, and can be attenuated by priming a sense of control during a desirable consumption episode. Finally, alternative explanations such as the influence of a diminished sense of personal responsibility, the forbidden fruit effect, affect regulation, and descriptive social norms were also tested and ruled out. In combination, these results provide robust evidence that the addictive frame decreases perceptions of control, which leads to an increase in the focal behavior.

The following section reviews relevant literature on the addiction frame, other health-related messages, and the concept of perceived control. This dissertation will then describe twelve studies performed to examine the influence of the addictive frame, discuss the implications of the findings, and consider the contributions made to the field.

## LITERATURE REVIEW

### Addictions

Examining the recognized symptoms of traditional addictions such as gambling, alcohol, and drugs can provide an insight into how these behaviors can pervade an individual's life when one is clinically addicted. Further, this examination may also provide insight into why some media outlets are quick to assign the "addictive" label to everyday products and activities. Consumers who display four to five out of the listed "behaviors" related to their focal addiction over a one year period are considered to have a mild to moderate disorder (D.S.M.-5; A.P.A. 2013). Those who exhibit six or more of the behaviors over the same time span are considered to have a severe addiction. Generally speaking, such behaviors can include consistently consuming more than intended, trying to cut back but being unable to, consumption interfering with other aspects of life, continuing consumption despite the awareness of the problems it is causing, experiencing withdrawal symptoms (e.g., anxiety, fevers, palpitations, elevated blood pressure), and the need to increase consumption to feel the same effect. The list of 11 specific behaviors used to diagnose an Opioid Use Disorder (i.e., addiction to drugs that act on the nervous system such as heroin) is shown in Table 1.

Opioid Use Disorder Criteria
------------------------------

1. Taking the opioid in larger amounts and for longer than intended
2. Wanting to cut down or quit but not being able to do it
3. Spending a lot of time obtaining the opioid
4. Craving or a strong desire to use opioids
5. Repeatedly unable to carry out major obligations at work, school, or home due to opioid use
6. Continued use despite persistent recurring social or interpersonal problems caused or made worse by opioid use
7. Stopping or reducing important social, occupational, or recreational activities due to opioid use
8. Recurrent use of opioids in physically hazardous situations
9. Consistent use of opioids despite acknowledgment of persistent or recurrent physical or psychological difficulties from using opioids
10. \*Tolerance as defined by either a need for markedly increased amounts to achieve intoxication or desired effect or markedly diminished effect with continued use of the same amount
11. \*Withdrawal manifesting as either characteristic syndrome or the substance is used to avoid withdrawal

\*Does not apply when used appropriately under medical supervision.

**Table 1.** Criteria used to diagnose Opioid Use Disorder.

Generally speaking, addiction manifests in an all-consuming sense of purpose and focus derived through the service of the relationship, engagement of self-defeating behaviors and suffering associated with attending to the relationship, and negative effects on, and damage to, well-being (Morgan 1991). The addictive relationship between an individual and

their vice can progress despite their awareness of the harm that it inflicts on their lives and the lives of others around them (Faber, O'Guinn, and Krych 1987; Hirschman 1992; Krych 1989; Miller 1991). Addicts find themselves “engaging in compulsive, repeated, and unwanted use despite clearly harmful consequences, and often despite a strong desire to quit unconditionally” (Bernheim and Rangel 2004: 1).

Within the medical community, there has been consistent debate about what is and is not addictive. Although gambling is now recognized as an addictive behavior according to the D.S.M.-5, it was originally considered an “impulse control disorder,” along with other disorders such as kleptomania, pyromania, and trichotillomania. However, as new evidence was uncovered, it was found that the body responds to gambling similarly to drug addictions, meaning labeling it as an impulse control disorder was insufficient (Jabr 2013). As of the time of writing this dissertation, gambling is the only disorder in the D.S.M.-5 that does not involve the ingestion of substances. Antidepressants alleviate the symptoms of some impulse control disorders, but have never worked as well for pathological gambling. Medications that are used for opioid addiction (e.g., naltrexone) indirectly inhibit brain cells from producing dopamine, thereby reducing cravings (Jabr 2013), are also found to be effective in minimizing pathological gambling, further supporting the recent addiction classification.

Addictive drugs and behaviors stimulate reward systems to produce considerably more dopamine than usual, where the brain is kept so awash with dopamine that it eventually adapts by producing less of the molecule and becoming less responsive to its effect (Jabr 2013). This is why addicts require more and more of the same drug in order to get the equivalent effect, and also why addicts experience withdrawals when they restrict consumption. Further, the prefrontal cortex (the area of the brain that inhibits or regulates impulsive behavior) becomes less equipped to tame impulses after continual drug use, making it harder to cease the behavior. Similarly, compulsive gamblers require increasingly riskier ventures to get the same “high” and they also experience withdrawals and the same brain circuitry alteration. So the “high” of addictive drugs and the thrill of doubling one’s money at the casino are physiologically similar. Addiction is about pathologically pursuing a rewarding experience despite serious repercussions. Although dopamine is an integral part of addiction, it is a far more complex chemical. Dopamine also plays a role in desire, love, motivation, movement, and attention (Brookshire 2013). Hugs, for example, cause the body to release oxytocin which acts through the dopamine reward system (NIH 2007), but experts are not arguing that hugs are addictive. Collectively, this all suggests that avoiding products or activities that cause

dopamine release is an overly simplistic and impossible solution to the addiction dilemma.

### **“Everyday Addictions”**

Support for extending the definition of addiction to include enjoyable everyday substances such as sugars and fats, and common pleasurable activities such as using the internet and social media, watching television or pornography, and going shopping has been registered (e.g., Ablow 2013; Ainslie 1999; Bernheim and Rangel 2004; Kubey and Csikszentmihalyi 2002; Lewis 1992; Orford 2001; Steiner-Adair 2015; Wise 2002). Similar manifestations of overconsumption being labeled as “addictions” can also be seen in other facets of everyday life such as playing sport, video games, and music, as well as cooking (e.g., Griffiths 1997; Vallerand et al. 2003). More recently, some have even suggested the existence of “flying addiction” and excessive consumption of tourism (Cohen, Higham, and Cavaliere 2011). This dissertation will focus on four of the most commonly discussed “everyday addictions:” chocolate, shopping, social media, and pornography.

Chocolate is one of the most common everyday consumable products investigated as being “addictive.” Although chocolate is the most often craved food (Weingarten and Elston 1991; Hill and Heaton-Brown 1994) and people have reported feeling “compelled” to eat an entire box of chocolate once it is

open (Hetherington and MacDiarmid 1993), this does not necessarily mean that chocolate is an inherently addictive product. There are some trace amounts of active chemicals contained in chocolate that could be considered similar to addictive drugs (Bruinsma and Taren 1999), but research has not definitively labeled chocolate as addictive. Some argue that the presence of chemicals such as phenylalanine, tryptophan, and theobromine (i.e., known stimulants) supports the contention that chocolate is an addictive product; however, these chemicals themselves are weak-acting and not addictive (Hammersley and Reid 1997; Hetherington and MacDiarmid 1993; Rogers and Smit 2000), with any mood benefits from consuming chocolate being only momentary at best (Parker, Parker, and Brotchie 2006). This argues against the pharmacological basis of chocolate “addiction,” but if framing it as such increases consumption, then this could prove disastrous for the health and well-being for all consumers. More likely, it seems that the hedonic and sensory nature of chocolate make it harder to resist and more likely to be craved (Bruinsma and Taren 1999; Rozin, Levine, and Stoess 1991), rather than being a chemically addictive product. During traditional addictive episodes, consumers can substitute drugs that have similar psychoactive properties; however, during chocolate cravings consumers feel there is no substitute (Hetherington and MacDiarmid 1993; Weingarten and Elston 1991). There are obvious consequences related to excessive consumption of

chocolate and other sugary and fatty foods, namely obesity, and so far, attempts to address obesity have failed (Roberto, Pomeranz, and Fisher 2014). Currently, over two thirds of U.S. adults are considered overweight or obese (NIH 2012), and obesity is the second leading cause of preventable death in the U.S. (behind cigarette smoking, which is declining; Aydinoglu and Krishna 2011) as it can cause health complications such as heart disease, high blood pressure, arthritis, stroke, diabetes, and cancer (NIH 2012).

Relatedly, compulsive purchasing of products has been consistently referred to as an “addiction.” This is a well-researched area with many different labels being applied, such as “compulsive buying” (O’Guinn and Faber 1989; Workman and Paper 2010) and the more literal “shopping addiction” (Sussman, Lisha, and Griffiths 2011). With the ubiquity of online shopping and pre-saved credit card details, buying compulsions can be acted on much faster (Hartston 2012), which can result in insurmountable debt, financial instability, and the accumulation of unneeded or unwanted merchandise (Clark and Calleja 2008; van Wormer and Davis 2003). Though rather than being an inherently addictive behavior, it appears that compulsive purchasing is often related to affect regulation (e.g., to counteract depression or anxiety, increase excitement), whereby the heightened mood state, although sometimes fleeting, appears to be the main motivating factor driving the shopping “addiction” cycle (Clark and Calleja 2008; Faber and

Christenson 1996). In these situations, consumers buy products to make themselves feel better (Tice, Bratslavsky, and Baumeister 2001), and consistently overpay for products due to a lack of self-control. Compulsive shoppers, who inherently have less self-control, have been shown to be less budget-conscious and overspend (Lo and Harvey 2012; Mowen 2000) and higher amounts paid (or willing to pay) reflects the likelihood that individual will give in to buying temptations (Kivetz and Zheng 2006; Vohs and Faber 2007).

Much like traditional addictions, deleterious effects of excessive internet use have also been recognized across all aspects of life such as plummeting grades, adverse reactions from withdrawals, and even death (Williams 2008). Relatedly, Wilcox and Stephen (2013) link excessive social media use with diminished quality of life in areas of food consumption, social engagement, and financial health. In countries such as the Netherlands, South Korea, and China, this issue has become so prevalent that specific “internet addiction” treatment centers are appearing. Even a simple online search for “Facebook addiction” reveals forums and communities set up to support those whose use of Facebook has had harmful effects on their lives. Through websites such as Social Anxiety Support, College Confidential, and CollegeNET, users discuss reasons they wish to minimize Facebook use (e.g., lack of face-to-face interaction, impacting and interrupting other aspects of

life), helpful methods to reach these goals (e.g., use programs that only allow access to certain websites during set times, minimize notifications, block browser access, create difficult-to-remember passwords), and how they feel after ‘cutting back’ (e.g., “pretty amazing so far”, “it’s a good feeling to not feel that anxiety”). Although, some users indicated they had swapped their “addiction” from social media to the forum website itself, and some simply moved to other internet-capable devices after blocking computer access. Regardless, the A.P.A. contemplated adding internet and social media addiction to the updated D.S.M.-5 list of mental disorders but found there was insufficient evidence supporting its inclusion (Reilly and Smith 2013).

Similarly, pornography “addiction” is a commonly discussed behavior (e.g., Love et al. 2015) that was also excluded from the updated D.S.M.-5 due to a lack of any strong scientific evidence. More likely, high frequency users of visual sexual stimuli (V.S.S.) do so for, for example, sexual orientation exploration, desire for sensation, religious conflicts, and/or desire discrepancy (Ley, Prause, and Finn 2014). From a recent review, many of the claims, such as pornography being connected to erectile dysfunction or that pornography alters the brains of users, appear to be unfounded; many of the positive benefits of pornography use (e.g., the improvement of sexuality-based attitudes, increased variety of sexual behaviors), however, are substantiated (Ley et al. 2014). It is clear that the media has recognized the popularity and

lucrative nature of the “addiction” frame related to everyday products and activities, yet framing them as such is not only incorrect, but potentially irresponsible.

The contention that everyday products and activities are addictive is most often spread through popular press articles that leverage the addiction metaphor in describing chocolate consumption (e.g., “Your Chocolate Addiction is Only Going to Get More (and More, and More) Expensive;” Ferdman 2014), shopping (e.g., “The Women Who Hid Their Shopping Addiction from Their Husbands...and Nearly Wrecked Their Marriage;” Carroll 2013), online behaviors (e.g., “Are You Addicted to the Internet?” Steiner-Adair 2015), and pornography (e.g., “Addicted to Porn: Compulsion, Shame, and Anxiety;” Olds 2017). Here, these articles tell stories of how consumers battle with their “addictions.” However, the implications of some of these articles have clearly been inflated to attract readers (i.e., “clickbait”), as the media is known to bias reported information to cater to reader demands (Burke 2008). For example, numerous news sources treated certain researchers’ findings as definitive evidence social media is more addictive than alcohol and cigarettes (e.g., Meikle 2012). On closer inspection, the original researchers (Hofmann, Vohs, and Baumeister 2012) used self-report measures to examine respondents’ desires and desire regulation over the course of seven days. The authors operationalized “media use” to include

social media as well as general internet use and television watching, meaning it cannot be assumed that the results are due only to social media as suggested by popular press. Further, the actual findings were that people desired to use media during the week more than they desired to consume alcohol and tobacco (but still less than they desired other behaviors such as sleep and sex), which is far from the extreme addictiveness of social media some news outlets led readers to believe.

As another example, many news outlets reported that Oreos® (chocolate cookies with crème filling) were as addictive as cocaine (e.g., Walton 2013), however, the actual study (Levy et al. 2013) reported that the brains of the mice responded to palatable food similarly to cocaine, and mice were more likely to choose the “drug” (either cocaine or Oreos®) over bland rice cakes. The actual conclusion was that co-morbid food-drug addictions may stem from similar vulnerabilities to strong desires, which is vastly dissimilar from the message “Oreos® are as addictive as cocaine” espoused by media outlets. Similar co-morbidity has been found between eating disorders and compulsive shopping (Faber et al. 1995), supporting the notion that related issues may stem from an individual’s lack of control, rather than a physiological issue as found with traditional addiction.

Overconsumption of everyday products fits under some simplistic and outdated definitions of addiction (e.g., “Addiction thus applies to the

initiation of use and then being unable to stop using;" Wade 1994: 118), so it is understandable why the media and others are quick to assign the "addictive" label to certain behaviors. However, the point of this research is not to debate the literal addictiveness of certain everyday products and activities, or argue that the addictive frame transforms consumers into addicts, but rather highlight the influence of explicitly framing these products/activities as being addictive and the effects it can have on the beliefs and behavior of regular consumers. With the zealous and arguably irresponsible increase in media coverage given to labeling everyday activities and products as "addictive," more and more consumers may begin to actually believe in the addictiveness of such products and activities, where the problem seems more permanent (Wade 1994). Language frames can act as a feedback mechanism, whereby consumers' perceptions of control can be either bolstered or undermined, which can directly influence their ability to avoid temptation (Patrick and Hagtvedt 2012). Therefore, it is important to avoid using the label "addiction" in such cases so that individuals can retain an internal sense of control (Tsukayama 2016).

## **Control**

Consumer control is a well-researched area and there are many different manifestations of control (Skinner 1996). The most relevant

construct to the current research is that of *perceived* control, which is defined as “the expectation of having the power to participate in making decisions in order to obtain desirable consequences” (Rodin 1990: 4) or more simply “an individual’s beliefs about how much control is available” (Skinner 1996: 551). Perceived control is an antecedent to both intentions to behave and the behavior itself (Notani 1998). Those with low perceived control feel more helpless, whereas those with high perceived control feel more dominant (Diener and Bisas-Diener 2005; Russell and Mehrabian 1976; Seligman 1975). Even when there is no objective control available, only a belief in the availability of control is needed for an individual to act (Averill 1973; Burger, McWard, and LaTorre 1989; Taylor and Brown 1988). On the other hand, in situations that allow complete control, a lack of perceived control is enough to induce feelings of helplessness (Abramson, Seligman, and Teasdale 1978) resulting in inaction.

The first step of the popular Twelve Step programs for combating addiction implicates this control philosophy by requiring members to first admit they are powerless over their behavior (Alcoholics Anonymous 2013; Lobsinger 1997). Internet and social media “addiction” sufferers also begin their treatment with the same admission (Rauh 2010). Elizabeth Hirschman’s (1992) recount of her own battle with addiction explicitly mentions feelings of powerlessness. The concept of powerlessness and

perceptions of control (Thompson and Spacapan 1991) in relation to addiction is pervasive in popular culture due to the extensive exposure of support groups (Lobsinger 1997), which have become more prevalent outside of the U.S. (Monterosso and Ainslie 2007). Although the activation of a powerless mindset seems contradictory when attempting to coerce a change in behavior, the intention is to convince the addict that change is needed by allowing them to see their life from a different perspective (Bateson 1971; Lobsinger 1997), to ward off overconfidence (Monterosso and Ainslie 2007), and to “deflate over-inflated egos” (Lobsinger 1997: 213). This obligation to admit they are powerless can potentially cause users to begin believing they have little or no control at all over their drug consumption (Foddy and Savulescu 2006). When people believe they have little free will, they are more likely to behave in an untoward manner (e.g., cheat; Vohs and Schooler 2008), and peoples’ beliefs about the malleability of their own fate can also directly impact subsequent behaviors (e.g., choose an indulgent option; Kim, Kulow, and Kramer 2014). Although warning users of the addictiveness of drugs such as heroin (which is unequivocally addictive) could potentially decrease the perceived control the user has over their behavior, this would mean that the perceived control is now more aligned with the objective control the user has (i.e., very little, if any at all). When perceived control is high, but objective control is low, overconfidence can occur (e.g., “I can stop whenever I want!”). Explicitly

warning users about the addictiveness of the drug could result in users realizing they have no control and seeking help. In the case of everyday “addictions” objective control is relatively higher (as the products and activities themselves are not inherently addictive), meaning framing it as addictive it is unnecessary.

Perceived control is a highly accurate predictor of actual behavior (e.g., Averill 1973; Burger 1989), meaning any influence on perceived control can have a tremendous influence on subsequent behavior. Marketing cues such as advertising and availability can increase the frequency of addictive behavior over time, and those with chronically lower self-regulatory capacity are more susceptible to this influence (Martin et al. 2013). Those who infer they are powerless, or ‘out of control,’ have less strength to overcome challenges (Loewenstein 1996; Parker and Farmer 1990). Participants in a weight-loss program who believed they had less control over their behavior were more likely to fail to lose weight and often gained weight (Chambliss and Murray 1979).

In contrast, higher perceived control exerts a strong positive influence on behaviors (Bandura 1997; Schifter and Ajzen 1985) and grants a general feeling of being ‘in charge’ (Keltner, Gruenfel and Anderson 2003). Indeed, those primed as being powerful and to have greater control have the strength to say “no” to temptations (Carney, Cuddy, and Yap 2010). Increased control

and the feeling of empowerment is also positively associated with mental and physical health (Bandura 1989; Lachman and Burack 1993; LaVeist 1992; Schulz 1980; Schulz et al. 1995; Strickland 1989; Thompson and Spacapan 1991), and other aspects of everyday life such as higher grades, higher self-esteem, less binge eating, and less drug/alcohol abuse (Tangney, Baumeister, and Boone 2004). Similarly, the more people feel in control, the more effective they are at pursuing their goals (Patrick and Hagtvedt 2012).

It is clear that the “out-of-control addict” image is persistent in society. The relationship between addiction and perceived control, and the accompanying stigma, are further bolstered in the minds of consumers through film and television (Cape 2003), where addicts are often portrayed as being “deranged by uncontrollable cravings” (Vohs and Baumeister 2009: 234). Some support the argument that addictive behavior is learned through media, popular culture, and those around us (e.g., Clark and Calleja 2008). For example, cable channel TLC’s show *My Strange Addiction* labels behaviors such as drinking air freshener, lengthening necks, and eating bricks as being “addictions.” As another example, the 2014 comedy movie *Friended to Death* tells the story of a Facebook “addict” who fakes their own death to see who will show up to his funeral. Terms such as “chocoholic,” “shopaholic,” “social media addict,” and “porn addict” are commonly used in

popular culture, further reinforcing the link between these consumables and addiction, which to reiterate, is a link that has not been officially established.

### **Public Health Messages**

The potential for public health messages to backfire has previously been raised, though this is more often due to exposure to triggers and increasing awareness of other addictive substances (e.g., Martin et al. 2013; Redish, Jensen, and Johnson 2008; Wilkes, Bell, and Kravitz 2000), rather than reducing perceived control as propositioned in the current research. Relatedly, certain anti-smoking appeals can be ineffective, and in some cases have the opposite effect by increasing the use of cigarettes (Martin and Kamins 2010). However, these messages are often examined through the lens of Terror Management Theory (i.e., when an individual's mortality is made salient; Greenberg et al. 1996) and the use of health appeals such as graphic images on cigarette packets (Kees et al. 2010). When alcohol and cigarette warning labels were introduced in the US, there was very little market impact, where it seems the information fell on 'blind eyes' and 'deaf ears' (Andrews, Netemeyer, and Durvasula 1990; Pollay 1989).

Previous research examining the ineffectiveness of warnings and similar appeals related to a variety of areas (e.g., smoking, sunscreen use, risky sexual behavior) show that other negative responses to these messages

can involve ignoring the message, mentally minimizing the seriousness of the threat, feeling the threat is not relevant, or producing counterarguments (Blumberg 2000; Hillhouse, Stair, and Adler 1996; Keller 1999; Stewart and Martin 1994; Wolburg 2006). Those acting out these behaviors can miss or bias important health information (Belch, Belch, and Jones 1995; Ruiter, Abraham, and Kok 2001), which minimizes the perceptions of the threat without minimizing the actual danger (Schoenbachler and Whittler 1996). These messages are even less effective at curtailing certain behaviors for those who have a positive attitude toward the vice (Andrews, Netemeyer, and Durvasula 1991). Further, the believability of these warnings is an important predictor of behavior change (Andrews et al. 1990; Beltramini 1988), indicating that there may be a limit to an addictive frame's negative influence (e.g., consumers may not believe that less desirable, virtuous foods are "addictive").

Health messages such as those that frame obesity as a "disease" implicitly link unhealthy behaviors with a physiological malfunction, bolstering beliefs that the unhealthy behavior is uncontrollable (Hoyt, Burnette and Auster-Gussman 2014). Encouraging obese individuals to eat healthier can have lasting health and economic benefits (Oster et al. 1999), but Hoyt et al. (2014) found that a disease frame, compared to a frame that specifically rejected the disease rubric, failed at steering obese individuals

away from unhealthy and calorie-laden food choices. These health messages appear to have a negative effect whereby self-regulatory processes are destabilized. Physiological factors are considered less controllable compared to situational or behavioral factors and can influence how we think and behave (e.g., Dar-Nimrod and Heine 2006; Monterosso, Royzman and Schwartz 2005; Plaks et al. 2012).

Given the known physiological aspects of addiction, referring to an everyday product or activity as addictive may make consumers believe that the control is beyond them. Therefore, if an addictive frame has a similar effect to that of an obesity “disease” messages, this could prove disastrous for many consumers. Messages related to everyday addictions would be aimed at a greater proportion of the population than the obesity messages due to the acceptance and prevalence of these products and activities. However, the study by Hoyt et al. (2014) frames the issue as being an internal property of the consumers (i.e., having the “disease” of obesity), which is different to the current research that frames the issue as being an external property related to the activity or product (e.g., the “addictiveness” of chocolate). Therefore, by warning consumers about the “addictiveness” of everyday products and activities, it is predicted that consumers will show an increase in the behavior, rather than just a continuation or the ideal decrease in the behavior, due to a decrease in perceived control.

## Hypotheses

This research is the first to examine the negative impact of framing everyday products and activities as addictive. The current literature, reviewed in this section, appears to suggest that consumers associate traditional addiction with being “out-of-control,” and with the increase in media coverage of “everyday addictions” related to social media, chocolate, shopping, and pornography, consumers may believe that these products and activities are also addictive (even though they are not). It is predicted that those who believe, or are explicitly told, that an everyday product or activity is addictive will perceive themselves to have less control over that behavior, which will result in an increase in the behavior. Formally, the following hypotheses are offered and will be tested across the subsequent twelve studies:

**H<sub>1</sub>:** The addition of an addictive frame to everyday consumption behaviors will increase consumption in those behaviors.

**H<sub>2</sub>:** The increase in consumption as a result of the addictive frame is domain specific (i.e., only influences the focal behavior).

**H<sub>3</sub>:** The effect of the addictive frame on increased consumption will be mediated by a decrease in perceived control.

**H<sub>4</sub>:** The addictive frame will have no effect on subsequent consumption of purely virtuous products.

This dissertation reveals the potential downside to the implicit assumption that consumers should be warned about the (incorrectly attributed) addictiveness of freely available products and socially acceptable activities. Given increasing consumption rates is precisely what these frames are designed to attenuate, policies to address these issues may need to be reformed. By recognizing this negative impact we can steer clear of such language and refocus our attention on developing more suitable intervention methods that do not adversely affect perceived control. In the subsequent sections, twelve studies to test the offered hypotheses are outlined.

## STUDY 1 – ADDICTION LAY BELIEFS

The aim of the Study 1 is to ascertain whether consumers have existing beliefs regarding the addictiveness of certain products and activities (some officially categorized as addictive, some not).

### Method

*Participants and Design.* A total of 107 participants ( $M_{Age} = 36.29$ ,  $S.D. = 12.46$ , 41% female) were recruited through Amazon's Mechanical Turk website to participate in the within-subjects design.

*Procedure.* After reading the introduction and giving consent to participate, participants were told that they will be shown 25 products and activities (a random subset of the following 50 products and activities: alcohol, apples, books, bread, Brussels sprouts, caffeine, candy, carrots, cauliflower, chips, chocolate, cigarettes, cocaine, coffee, e-cigarettes, cooking, eggs, email, exercise, fast food, gambling, granola, grapes, heroin, the internet, jelly beans, junk food, M&Ms, milk, music, peanuts, peas, [smart] phones, pizza, plastic surgery, pornography, running, sex, shopping, Skittles, social media, soda, sugar, tanning, tattoos, tea, television, travelling/flying, video games, walking). Specifically, participants are asked "How addictive is \_\_\_\_?" for each of the 25 products and activities, and are instructed to

indicate how addictive they believe that product or behavior is from 1 (Not at all addictive) to 9 (Highly addictive). The survey concluded with participants answering demographic questions related to their age and gender.

## **Results and Discussion**

In order to examine whether participants have lay-beliefs about the addictiveness of certain products and activities, the average addictiveness rating for each product/activity was compared to the mid-point of the scale (i.e., 5). If participants rated products/activities on average significantly above the mid-point, this indicated an agreement that it is more addictive (“High Addictiveness”). If participants rated products/activities on average significantly below the mid-point, this indicated an agreement that it is less addictive (“Low Addictiveness”). If participants rated the products/activities on average as being statistically similar to the mid-point, then this indicated that there were equal numbers of participants who considered it to be addictive as not addictive (“Medium Addictiveness”).

From Table 1 it can be seen that all of the recognized addictive products and activities in the survey were rated as being addictive (e.g., cigarettes, alcohol, cocaine, heroin, gambling). Furthermore, the most commonly discussed “everyday addictions” were also rated as being addictive (e.g., shopping, chocolate, social media/internet, pornography), which

suggests that the continual framing of these products and activities as addictive has altered the beliefs of consumers. Some of the more obscure “everyday addictions” were either rated as medium addictiveness (e.g., exercise, getting tattoos) or low addictiveness (e.g., travelling, tanning). This could indicate that there needs to be a level of believability in the addictive frame. Not surprisingly, most of the products and activities rated as low in addictiveness were made up of vegetables, fruit, and other virtuous products.

Low Addictiveness			Medium Addictiveness			High Addictiveness		
Activity	Mean	SD	Activity	Mean	SD	Activity	Mean	SD
Cauliflower	1.80	1.31	M&Ms	4.72	2.58	Candy	5.81	2.21
Peas	1.83	1.21	Running	4.83	2.13	Shopping	5.87	1.93
Sprouts	1.89	1.40	Tattoos	4.87	2.32	Music	5.94	2.24
Apples	2.09	1.53	Books	4.92	2.52	Chocolate	6.35	2.14
Carrots	2.33	1.82	Exercise	5.11	2.06	Television	6.35	1.92
Milk	2.53	1.90	Chips	5.25	2.34	E-Cigarettes	6.45	2.38
Granola	2.56	1.91	Pizza	5.50	2.48	Soda	6.54	2.29
Eggs	2.62	1.76				Fast Food	6.72	2.18
Grapes	2.85	2.00				Pornography	6.89	2.25
Peanuts	3.33	2.12				Junk Food	6.93	2.22
Bread	3.65	2.32				Sex	7.06	1.99
Cooking	3.79	2.13				Social Media	7.08	2.03
Travelling	3.85	2.26				Sugar	7.17	2.14
Jelly Beans	3.85	2.26				Video Games	7.20	1.46
Walking	3.87	1.92				Phones	7.37	1.45
Email	4.23	2.63				Coffee	7.57	1.49
Skittles	4.26	2.32				Alcohol	7.72	1.29
Surgery	4.30	2.25				Gambling	7.81	1.23
Tanning	4.30	2.10				Caffeine	7.85	1.31
Tea	4.30	2.23				Internet	7.89	1.44
						Cigarettes	8.44	1.30
						Cocaine	8.45	1.07
						Heroin	8.83	.64

**Table 2.** Products and activities that are considered to have low, medium or high addictiveness by an online panel.

These results reveal there are some lay theories regarding the addictiveness of everyday products and activities, where even some everyday products and activities (e.g., the internet) were rated as being more addictive than some officially recognized addictions (e.g., gambling, alcohol). The link between these everyday products/activities and addiction may have been learned through the media as well as the consumers' own experiences with self-control successes and failures. Therefore, this research will focus on four of the most commonly believed "everyday addictions:" chocolate, shopping, social media, and pornography, which as demonstrated in this initial study, are mistakenly believed to be highly addictive.

## STUDY 2A – CHOCOLATE CONSUMPTION

Chocolate is one of the most common everyday consumable products investigated as being “addictive,” and is considered the most craved food (Weingarten and Elston 1991; Hill and Heaton-Brown 1994). Consumers have reported feeling “compelled” to eat an entire box of chocolate once it is open (Hetherington and MacDiarmid 1993). Despite these perceptions no official link with addiction has been established, making chocolate an excellent product to examine the influence of addiction beliefs on consumption. Specifically, the aim of Study 2A is to test the prediction that consumers led to believe that chocolate is addictive will subsequently eat more chocolate (Hypothesis 1). However, an opposing prediction could be offered where those who are told that chocolate is *not* addictive may increase the amount they consume due to a diminished level of apparent risk (Pechmann and Slater 2005).

### Method

*Participants and Design.* A total of 102 undergraduates at Boston University (B.U.;  $M_{\text{Age}} = 19.48$ ,  $S.D. = .86$ , 53% female) participated in the computer laboratory-based experiment. The experiment included a single

factorial, between-subjects design with two randomly assigned conditions (Frame: Addictive, Not Addictive).

*Procedure.* After being seated at individual computer stations, participants were first asked to read an article excerpt under the guise of assessing the alternative of self-publishing online. Participants were randomly assigned to read one of two chocolate-related articles. Those in the Addictive condition read an article stating that chocolate can be addictive. Those in the Not Addictive condition read an article stating that chocolate cannot be addictive (see Appendix A). Similar to the approach of Hoyt et al. (2014) examining obesity framing, this study examines the impact of explicitly framing chocolate as being addictive compared to explicitly framing chocolate as being *not* addictive. As a manipulation check, participants were asked to indicate how addictive they believed chocolate can be (1 = Not at all; 5 = Extremely). This section of the study concluded with questions consistent with the cover story (e.g., “How often do you read the news online?”). Participants then completed an unrelated study. Finally, on each desk was a small opaque cup (3 fl. oz.) containing 70 individual chocolate M&Ms, and in an ostensibly unrelated study, participants were asked to taste test the candy. They were told they would be making judgments on the attributes of the candy and were to taste as many as they wanted. Participants were asked filler questions consistent with the cover story (e.g., “Please rate the quality

of the chocolate;" 1 = Poor, 5 = Excellent) and allowed to continue eating. The dependent variable was the number of individual chocolate M&Ms consumed.

## Results and Discussion

*Pretest.* To ensure the articles were not influencing affect, they were pretested using a separate pool of 113 B.U. undergraduates. Each participant was randomly assigned to read one of the two articles and then completed the PANAS scale (Watson, Clark, and Tellegen 1988). After comparing the two article conditions, there were no differences found in positive affect ( $M_{\text{NotAdd}} = 2.70$  vs.  $M_{\text{Add}} = 2.73$ ,  $t(111) = -.16$ ,  $p = .88$ ) or negative affect ( $M_{\text{NotAdd}} = 1.87$  vs.  $M_{\text{Add}} = 1.88$ ,  $t(111) = -.07$ ,  $p = .94$ ).

*Manipulation Check.* To ensure that the articles used in the consumption study actually influenced beliefs in the addictiveness of chocolate, an independent samples  $t$ -test was performed. It was found that those who read that chocolate is addictive reported a belief that chocolate is more addictive ( $M = 5.51$ ,  $S.D. = 2.29$ ,  $n = 49$ ) compared to those who read that chocolate was not addictive ( $M = 3.47$ ,  $S.D. = 2.42$ ,  $n = 53$ ,  $t(100) = 4.35$ ,  $p < .001$ ). This indicates that the manipulation of addiction beliefs was successful.

*Taste Ratings.* Although the taste rating questions were included to boost the believability of the cover story, these results were examined to see

whether there were any changes in taste perceptions due to the frame condition. Participants did not report any significant difference in quality perceptions ( $M_{\text{Add}} = 3.06$  vs.  $M_{\text{NotAdd}} = 3.25$ ,  $t(100) = 1.00$ ,  $p = .32$ ). This reveals that the frames did not alter the quality perceptions of the chocolate, ruling this out as an alternative explanation driving the increased consumption results.

*Chocolate Consumption.* A Poisson regression was run to predict the number of chocolate M&Ms consumed based on the article read by the participants. Those who read that chocolate is addictive consumed 1.61 times more chocolate M&Ms, a statistically significant result ( $\beta = .48$ ,  $S.E. = .04$ ;  $\theta = 148.52$ ,  $p < .001$ ). For ease of reporting, however, for all subsequent analyses ANOVA and/or  $t$ -tests will be reported (though all relevant Poisson regressions are significant).

An independent-samples  $t$ -test was performed to examine the impact of the addictive frame on subsequent chocolate consumption. Using the number of chocolate M&Ms consumed as the dependent variable, as predicted, those who read that chocolate is addictive consumed significantly more chocolate M&Ms ( $M = 33.14$  individual chocolate M&Ms;  $S.D. = 26.54$ ) than did participants who read that chocolate is not addictive ( $M = 20.57$  individual chocolate M&Ms;  $S.D. = 20.57$ ;  $t(100) = 2.68$ ;  $p < .01$ ). Rather than protecting consumers, this study reveals that explicitly framing chocolate as

being addictive resulted in more chocolate being consumed compared to framing chocolate as not addictive.

The overall skewness statistic was calculated ( $\gamma = .68$ ,  $S.E. = .24$ ), revealing the overall distribution of consumption frequency is statistically symmetrical, as the value is less than 1.0. Regardless, the main analysis was rerun with the square root of the dependent variable (chocolates consumed), and the result remained significant ( $t(100) = 2.47$ ;  $p = .02$ ). Also, controlling for gender, whether they were currently on a diet (Yes/No), and how often the participants usually ate chocolate M&Ms (1 = Never, 5 = All the time) by including these variables as covariates did not alter the significant influence of the addictive frame ( $F(1,97) = 10.75$ ,  $p < .001$ ). These results confirm that frames regarding chocolate addiction directly influence actual chocolate consumption (Hypothesis 1).

## STUDY 2B – CHOCOLATE CONSUMPTION INTENT

The aim of Study 2B is to extend the findings of Study 2A by also including a control condition to ascertain the whether the addictive frame increases consumption, or the not addictive frame decreases consumption, from the baseline. It is predicted that those led to believe that chocolate is addictive will report a greater number of chocolates intended to consume compared to those told that chocolate is not addictive or those in a control condition (Hypothesis 1). Further, this study tests two alternative explanations: social norms and guilt. For social norms (Larimer et al. 2004; Reno, Cialdini, and Kallgren 1993), does framing chocolate as “addictive” make it appear to be more popular, resulting in consumers eating more to be in line with others? This is addressed by including a reference point for the number of chocolates consumed by the average consumer. For guilt, does framing chocolate as being addictive diminish personal responsibility for their consumption resulting in an increase in amount consumed (Hagen, Krishna, and McFerran 2016; Hur, Koo, and Hofmann 2015)? This is addressed by including subsequent guilt ratings.

## Method

*Participants and Design.* A total of 118 undergraduates at B.U. ( $M_{Age} = 19.76$ ,  $S.D. = .86$ , 47% female) participated in the computer laboratory-based experiment. The experiment included a single factor, between-subjects design with three randomly assigned conditions (Frame: Addictive, Not Addictive, Control).

*Procedure.* After being seated at individual computer stations, participants were randomly assigned to one of three conditions. Those in the Addictive condition read “Today we’re going to ask you some questions about chocolate consumption. Given the focus of this study, we are required to provide you with the following warning: Above is the label from a bag of chocolate M&Ms. Given the presence of substantial scientific evidence related to the addictiveness of chocolate (‘chocoholics’), there is a push by policy makers to include warning labels like the one above that states that chocolate is addictive.” Accompanying this paragraph was a picture of a bag of chocolate M&Ms that had been doctored to include the following: “GOVERNMENT WARNING: According to the Surgeon General, chocolate is a drug and can be addictive” (Appendix B), which adds credibility and increases the persuasiveness of the message (Andrews et al. 1990; Petty and Cacioppo 1986; Sternthal, Dholakia, and Leavitt 1978). Those in the Not Addictive condition read “Today we’re going to ask you some questions about

chocolate consumption. Above is the label from a bag of M&Ms. Despite some claims, chocolate is not addictive” and were shown a chocolate M&Ms bag without the warning label. Those in the Control condition were simply shown the chocolate M&Ms bag with the statement “Today we’re going to ask you some questions related to chocolate. Above is the label from a bag of M&Ms.” All participants were then shown a picture of loose chocolate M&Ms and told “Out of the 100 M&Ms shown above, the average person eats about 20-30 in one sitting.” This reference point was included to rule out the alternative explanation of social norms and any differential perceptions of how many chocolate M&Ms the average person consumes. On a ten-point scale, participants were asked to indicate how many they would consume in one sitting (1 = 0-10, 10 = 90-100). Using scenario-based food consumption questions as a proxy for actual consumption has been well established and validated in the literature (e.g., Hur et al. 2015). To address the issue of varying levels of guilt potentially driving the results, participants were asked “How much guilt would you feel if you ate the whole bowl of M&Ms?” (1 = None at all, 7 = Extreme amount). Participants concluded the survey by answering demographic questions related to their age and gender, and questions related to their own chocolate consumption. Specifically, there was a Yes/No question: “Do you consider yourself a ‘chocolate eater?’”

## Results and Discussion

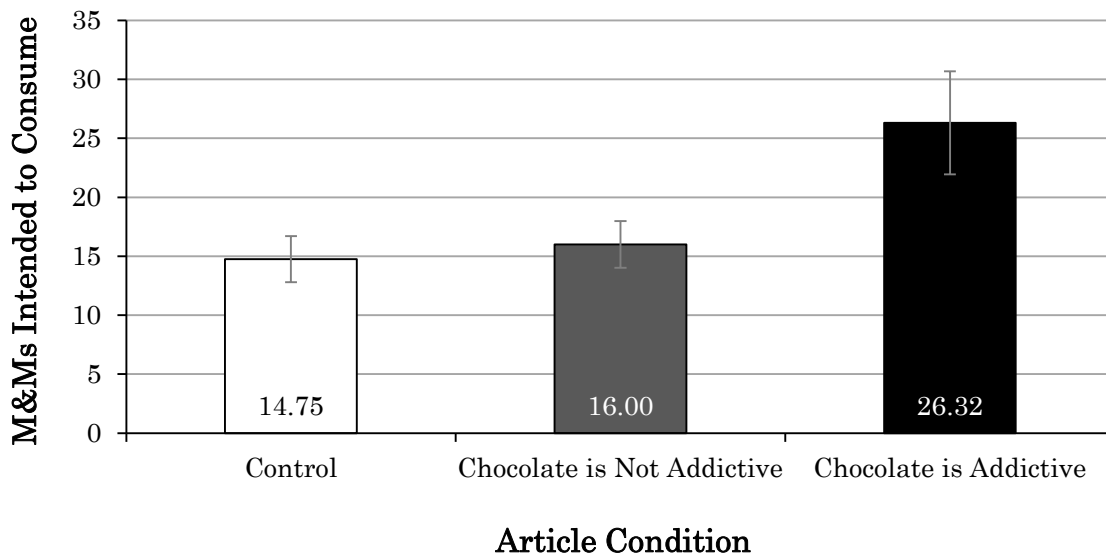
*Pretest.* To ensure plausibility, the warning label was pretested on participants similar to the experimental sample ( $N = 43$ ,  $M_{\text{Age}} = 19.49$ ,  $S.D. = .85$ , 74% females). Participants were shown the chocolate M&Ms warning label and asked to indicate on a 7-point bipolar scale (1 = Unbelievable, 7 = Believable) to indicate how much they believed the label and the warning. Using a single sample  $t$ -test, participants rated the plausibility to be significantly greater than the mid-point of 4 ( $M = 4.53$ ,  $S.D. = 1.55$ ,  $t = 2.27$ ,  $p = .03$ ), supporting the use of the label in the main study.

*Guilt Ratings.* To examine the potential alternative explanation of a decrease in guilt driving the results, a one-way ANOVA was revealed there were no significant differences across the conditions in level of guilt ( $F(2,115) = 1.15$ ,  $p = .32$ ). Planned contrasts revealed no differences across pairs (all  $p$ 's  $> .15$ ). This suggests that a diminished sense of personal responsibility (internal attribution; Hagen et al. 2016; Hur et al. 2015) due to the “addictiveness” of chocolate cannot explain the increase in consumption.

*Intentions to Consume.* A one-way ANOVA revealed there was a significant effect of condition on number of chocolates intended to consume ( $F(2,115) = 4.61$ ,  $p = .01$ ). Planned contrasts revealed that those who read that chocolate is addictive reported a significantly greater amount of chocolate M&Ms intended to consume ( $M = 26.32$ ,  $S.D. = 26.93$ ,  $n = 38$ )

compared to those who read that chocolate is not addictive ( $M = 16.00$ ,  $S.D. = 12.57$ ,  $n = 40$ ,  $t(115) = 2.48$ ,  $p = .02$ ) and those who read an unrelated article ( $M = 14.75$ ,  $S.D. = 12.57$ ,  $n = 40$ ,  $t(115) = 2.78$ ,  $p < .01$ ). There was no significant difference between the Not Addictive and Control conditions ( $t(115) = .30$ ,  $p > .75$ ), revealing that the Not Addictive frame has no differential influence on intentions to consume beyond the baseline, supporting the theory that the addictive frame increases the focal behavior. This result also rules out the alternative explanation of social norms. Given a reference point was provided and yet the effect was still found, this means that the addictive frame is not altering how much chocolate participants are assuming that others consume. Results are graphed in Figure 1.

It should be noted that these analyses were also run with gender and whether they consider themselves a “chocolate eater” included as covariates, and the effect of the warning condition remained statistically significant ( $F(2,113) = 3.43$ ,  $p = .04$ ). Further, the overall skewness statistic was calculated ( $\gamma = 2.21$ ,  $S.E. = .22$ ), revealing the overall distribution of consumption frequency is positively skewed, as the value is greater than 1.0. Therefore, the main analysis was rerun with the square root of the dependent variable, and the results also remained statistically significant ( $F(2,115) = 3.54$ ,  $p = .03$ ).



Error bars represent  $\pm 1$  S.E.M..

**Figure 1.** Participants intended to eat more chocolates after learning of the addictive properties of chocolate compared the non-addictive or control conditions.

In sum, after reading that chocolate is addictive participants reported they would eat more chocolate compared to those who read that chocolate was not addictive, or read nothing related to addiction. These results provide further support for the theory (and Hypothesis 1) that when consumers are informed that an everyday product, such as chocolate, is addictive, this can encourage greater consumption, even if the addiction information is provided in the form of an explicit warning. Further, it can be seen that such frames increase consumption beyond the baseline and not due to any influence of social norms or a diminished sense of personal responsibility.

### STUDY 3 –WILLINGNESS TO PAY

The aim of Study 3 is to demonstrate the applicability of the initial findings to another “everyday addiction:” shopping. Shopping “addiction” is a commonly discussed affliction (e.g., Clark and Calleja 2008; Hartston 2012; Lo and Harvey 2012; Rose and Dhandayudham 2014) but has not been confirmed as a recognized addiction, making this an important area to examine. Willingness to pay has often been used to assess self-control, as a higher willingness to pay reflects the likelihood that an individual will give in to temptations (Kivetz and Zheng 2006; Vohs and Faber 2007), and is established as an accurate predictor of actual paying behavior (Carson et al. 1996). Compulsive shoppers, who inherently have less self-control, have been shown to be less budget-conscious and overspend (Lo and Harvey 2012; Mowen 2000). Therefore, it is predicted that those who read that shopping is addictive will report a greater willingness to pay for the same items compared to those who read that shopping is not addictive or read a neutral shopping article (Hypothesis 1).

#### Method

*Participants and Design.* A total of 128 undergraduates at B.U. participated in the computer laboratory-based experiment. Demographics

(i.e., age, gender) were not collected for this study. The experiment included a single factorial, between-subjects design with three conditions (Frame: Addictive, Not Addictive, Control).

*Procedure.* Similar to Study 2A, participants were randomly assigned to read an article under the guise of assessing the alternative of self-publishing online. Those in the Addictive condition read that shopping can be addictive, those in the Not Addictive condition read that shopping cannot be addictive, and those in the Control condition read an article that neutrally describes the act of shopping (Appendix C). After reading the assigned article, participants were asked questions consistent with the cover story. Next, under the guise of a shopping task, participants were asked to assess color pictures of five different products (i.e., blender, bicycle, stove, watch, refrigerator; Appendix D) and to state the amount they would be willing to pay for each of them. Products were chosen to be similar to those used by Vohs and Faber (2007), as the college-aged participants should arguably have little knowledge of the exact prices of these products, and therefore responses should accurately indicate valuation. Participants were specifically asked to be as realistic as possible. The dependent variable was the total amount willing to pay for the five items.

## Results and Discussion

As predicted, a one-way ANOVA revealed there was a significant effect of condition on amount willing to pay ( $F(2,125) = 5.31, p < .01$ ). Planned contrasts revealed that those who read that shopping is addictive reported a significantly greater amount willing to pay ( $M = \$2,501.70, S.D. = 2042.40, n = 43$ ) compared to those who read that shopping is not addictive ( $M = \$1844.62, S.D. = 1191.44, n = 42, t(125) = 2.08, p = .04$ ) and those who read a neutral description of shopping ( $M = \$1492.51, S.D. = 877.29, n = 43, t(125) = 3.21, p < .01$ ). There was no significant difference between the Not Addictive and Control conditions ( $t(125) = 1.11, p > .25$ ), revealing that the Not Addictive frame has no differential influence on willingness to pay beyond the baseline, further supporting the theory that addictive frames increase the focal behavior. These results are summarized in Table 3 and graphed in Figure 3.

The skewness statistic of the overall willingness to pay was calculated ( $\gamma = 2.75, S.E. = .21$ ), revealing the distribution was not statistically symmetrical, as the value is greater than 1.0. To examine whether the positively skewed responses were influencing the results, the main analysis was rerun. Specifically, square root values were created at the item-level and then these values were totaled to create a new, non-skewed dependent variable ( $\gamma = .58, S.E. = .21$ ). The effect of frame condition remained

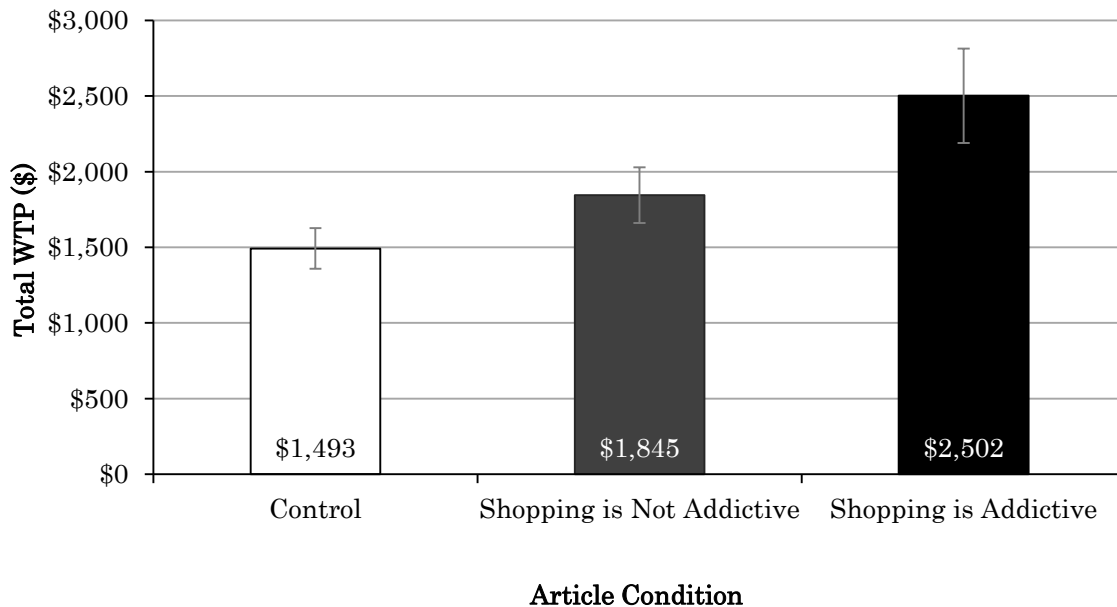
significant ( $F(2,125) = 5.16, p < .01$ ), meaning the skewness did not influence the results. That is, both those in the Not Addictive condition ( $\beta = -10.40, S.E. = 5.52, t(125) = -1.88, p = .06$ ) and the Control condition ( $\beta = -17.53, S.E. = 5.49, t(125) = -3.19, p < .01$ ) reported a lower amount willing to pay compared to those in the Addictive condition. There was still no difference between the Control and Not Addictive conditions ( $\beta = 7.13, S.E. = 5.52, t(125) = 1.29, p = .20$ ). Similarly, amount willing to pay was also standardized at the item level and totaled to create a standardized overall willingness to pay. A one-way ANOVA revealed that the results remained marginally significant ( $F(2,125) = 2.78, p = .07$ ).

It was also important to examine the results at the item level. First, for the blender, a one-way ANOVA revealed there was no significant effect of condition on amount willing to pay for the blender across the conditions ( $F(2,125) = 1.93, p < .15$ ). Second, for the bicycle, there was also no significant effect of condition on amount willing to pay for the bicycle across the conditions ( $F(2,125) = .97, p < .82$ ). Third, for the stove, there was a significant effect of condition on amount willing to pay for the stove across the conditions ( $F(2,125) = 4.78, p < .01$ ). Planned contrasts revealed that those who read that shopping is addictive reported a marginally significantly greater amount willing to pay for the stove ( $M = \$972.79, S.D. = 908.22$ ) compared to those who read that shopping is not addictive ( $M = \$705.90, S.D.$

= 649.71,  $t(125) = 1.82$ ,  $p = .07$ ) and significantly greater amount than those who read a neutral description of shopping ( $M = \$524.19$ ,  $S.D. = 357.16$ ,  $t(125) = 3.07$ ,  $p < .01$ ). There was no significant difference between the Not Addictive and Control conditions ( $t(125) = 1.24$ ,  $p = .22$ ). Fourth, for the watch, there was no significant effect of condition on amount willing to pay for the watch across the conditions ( $F(2,125) = 1.79$ ,  $p = .17$ ). Finally, for the refrigerator, there was a significant effect of condition on amount willing to pay for the refrigerator across the conditions ( $F(2,125) = 6.07$ ,  $p < .01$ ). Planned contrasts revealed that those who read that shopping is addictive reported a significantly greater amount willing to pay ( $M = \$1163.93$ ,  $S.D. = 1115.50$ ) compared to those who read that shopping is not addictive ( $M = \$753.05$ ,  $S.D. = 571.91$ ,  $t(125) = 2.49$ ,  $p = .01$ ) and those who read a neutral description of shopping ( $M = \$614.19$ ,  $S.D. = 395.16$ ,  $t(125) = 3.35$ ,  $p < .001$ ). There was no significant difference between the Not Addictive and Control conditions ( $t(125) = .84$ ,  $p = .40$ ).

	Control	Not Addictive	Addictive
Blender	\$56.67	\$69.52	\$83.58
Bicycle	\$205.58	\$184.12	\$202.70
Stove	\$524.19	\$705.90	\$972.79
Watch	\$91.88	\$132.02	\$78.70
Refrigerator	\$614.19	\$753.05	\$1163.93
<i>Total</i>	\$1492.51	\$1844.62	\$2501.70

**Table 3.** The average amount willing to pay for each product across different frame conditions.



Error bars represent +/- 1 S.E.M.

**Figure 3.** Participants were willing to pay more for five consumer goods after learning of the addictive, rather than non-addictive or no addictive, properties of shopping in Study 3.

These results provide evidence that the addictive frame can also negatively impact shopping behavior. Specifically, when consumers are informed that shopping is addictive, they are more likely to pay more for the same products as someone who is not given this information (Hypothesis 1).

## STUDY 4 – PORNOGRAPHY USE

Pornography has often been referred to as addictive (e.g., Love et al. 2015) even though the A.P.A. has not explicitly labeled it as such. Therefore, the aim of Study 4 is to extend the findings by examining the effect of the addictive frame on pornography use. Further, in contrast to previous studies, Study 4 gives participants the opportunity to abstain after exposure to the addictive frame to examine whether the frame can deter the initial uptake of the activity. It is predicted that those told that pornography is addictive will voluntarily view more explicit images than those not told that pornography is addictive (Hypothesis 1).

### Method

*Participants and Design.* A total of 230 participants ( $M_{\text{Age}} = 36.02$ ,  $S.D. = 11.72$ , 33% female) were recruited through Amazon's Mechanical Turk website. The experiment included a single-factorial, between subjects design with two randomly assigned conditions (Frame: Addictive, Control).

*Procedure.* After reading the introduction, giving consent to participate, and answering questions related to their own pornography use (e.g., "How often do you watch/view pornography?; 1 = Never, 7 = Daily), participants were randomly assigned to one of the article conditions. Those in the Addictive condition read a short article stating that pornography is

addictive, and those in the Control condition read a short article neutrally describing pornography (Appendix E), and all participants answered the question “In the literal use of the term (i.e., as used for drugs and alcohol), how addictive can pornography be?” (1 = Not at all addictive, 9 = Highly addictive), which was used as a manipulation check.

The cover story of the study was that the present researcher was interested in peoples’ perceptions of “softcore” versus “hardcore” pornography. That is, in their mind, what do they consider to be softcore and hardcore. After a brief description of both softcore and hardcore, and instructions related to the rating task (Appendix E), all participants were asked whether they agree to view the first image. If the participant clicks “no” they are sent to the end of the survey; if the participant clicks “yes” they are shown the first pornographic image and asked to rate the image on a nine-point scale (1 = Softcore, 9 = Hardcore). This differs from previous studies as participants have to option of abstaining from initiating the behavior.

Next, participants were asked if they wished to view the next image. Again, if the participant clicked “no” they are sent to the end of the survey; if the participant clicks “yes” they are shown the next pornographic image. This time, participants were asked to rate how “hardcore” they considered the current image relative to the previous image (1 = Much less, 7 = Much more). Again, participants were asked if they wished to view the next image and if

they clicked “no” they were sent to the end of the survey; if the participant clicks “yes” they were shown the next pornographic image. This process was repeated so that each participant had the possibility to view and assess up to 100 images. Participants were allowed to cease participation at any point with no financial penalties imposed. The number of images each participant viewed was used as the dependent variable. The survey concluded with participants answering demographic questions related to their age and gender.

## Results and Discussion

*Manipulation Check.* To ensure that the articles used in the consumption study actually influenced beliefs in the addictiveness of pornography, an independent samples *t*-test was performed. It was found that those who read that pornography is addictive reported a belief that pornography is more addictive ( $M = 7.85$ ,  $S.D. = 1.49$ ,  $n = 115$ ) compared to those who read a neutral description of pornography ( $M = 5.92$ ,  $S.D. = 2.40$ ,  $n = 115$ ,  $t(280) = -7.33$ ,  $p < .001$ ). This indicates that the manipulation of addiction beliefs was successful.

*Images Viewed.* An independent-samples *t*-test was performed to examine the impact of the frame on the number of pornographic images voluntarily viewed. Using the number of images viewed as the dependent

variable, as predicted, those who read that pornography is addictive viewed more images ( $M = 67.10$ ,  $S.D. = 36.92$ ) than did participants who read a neutral description of pornography ( $M = 58.29$ ,  $S.D. = 39.74$ ;  $t(228) = -1.74$ ;  $p = .08$ ), though this difference was only marginally significant. The analysis was also run (all together as well as separately) using participants' current pornography usage (within the last 5 years [Yes/No], within the last year [Yes/No], within the last month [Yes/No], and generally how often [1 = Never, 7 = Daily]) and attitudes towards pornography (1 = Extremely negative, 7 = Extremely positive) as covariates, and the result remained statistically unchanged ( $F(1,223) = 2.96$ ,  $p = .09$ ). Similarly, after using a nonparametric Mann-Whitney test the result also remained marginally significant ( $U = 5827.50$ ,  $z = -1.61$ ,  $p = .10$ ). This result confirms that frames regarding pornography addiction directly influence pornography viewing behavior.

The overall skewness statistic was calculated ( $\gamma = -.37$ ,  $S.E. = .16$ ), revealing the overall distribution of consumption frequency is statistically symmetrical, as the magnitude is less than 1.0. Regardless, the main analysis was rerun with the square root of the dependent variable, and the result became significant ( $M_{\text{Addictive}} = 7.70$  vs.  $M_{\text{Control}} = 6.89$ ;  $t(228) = -2.01$ ,  $p = .05$ ).

Interestingly, out of the 230 participants, only 5 opted not to view any images, and these participants were all in the Control condition. That is, all of those who read that pornography is addictive viewed at least one

pornographic image. This finding provides evidence to refute the suggestion that if given the opportunity to abstain, there may be some individuals who are more likely to avoid a behavior that has been framed as being addictive. In turn, this implies that the addictive frame encourages both the uptake and continuation of a behavior. That said, the low number of individuals who abstained from viewing any images may have been because Mechanical Turk participants are “working” towards a task for money so they feel compelled to view at least one image. Alternatively, there may have been a self-selection bias, where those who interested in pornography may have been more likely to register for the study after viewing the study description posted online resulting in the low abstinence rates and the high average number of images viewed.

## STUDY 5 – SOCIAL MEDIA USE

The aim of Study 5 is to extend the application of the theory by examining the influence of the addictive frame on another common everyday “addiction:” social media. Social media “addiction” has become a prevalent issue in recent years due to the increasing ubiquity of the platforms in everyday life. In countries such as the Netherlands, China, and South Korea the issue has become so ubiquitous that social media and internet addiction rehabilitation centers have been established. However, the A.P.A. thus far found there is insufficient evidence to classify excessive social media and internet use as an addiction. With the increase in coverage in the media related to this affliction, it is important to examine the influence of the addictive frame on subsequent social media use. This study examines the effect of the addictive frame in a realistic usage situation over a more extended period of time. It is predicted that those who are warned that social media is addictive will use social media more over the course of a week compared to those who were not warned (Hypothesis 1).

### Method

*Participants and Design.* A total of 146 participants (screened to only include Android and social media users) were initially recruited online

through Qualtrics. Of these 146, 41 fully and correctly completed both first and last stages of the experiment. The resulting analysis used these 41 participants ( $M_{\text{Age}} = 39.38$ ;  $S.D. = 10.94$ , 71% female). The experiment included a single factor, between-subjects design with two randomly assigned conditions (Frame: Addictive, Control).

*Procedure.* Participants were recruited under the guise of downloading, using, and assessing an online tracking application on their smart phone for seven days. Participants were prescreened by the recruiting company to be social media and Android (Google-developed mobile operating system) users. The application (*RescueTime*) was described as “(a) personal analytics service that shows you how you spend your time and provides tools to help you be more productive.” The actual purpose of the study was to examine the amount of time each participant spent using social media during the week. The experiment was divided into two parts.

In Part 1, participants were told that they will be asked to download the *RescueTime* application to their smartphone (the application is only available for use on Android phones) that will track their application use. Participants randomly assigned to the Addictive condition first read “Soon we’re going to ask you to download and assess a specific online time management application. Given the focus of this study, we are first required by our university’s Institutional Review Board to provide you with the

following warning regarding the addictiveness of social media,” which was followed by a brief article (Appendix F) and concluded with the statement “Next, please answer the questions on subsequent pages.” Participants randomly assigned to the Control condition first read “Soon, we’re going to ask you to download and assess a specific online time management application. But first, please answer the questions on subsequent pages” without receiving any warning. After completing demographic-based questions (age, gender) and indicating the ratio which they use their devices (i.e., computer vs. handheld devices such as smartphones/tablets) to access social media (1 = 100% Computer, 5 = 50% Computer/50% Handheld, 9 = 100% Handled), participants were given step-by-step instructions on how to download and activate the application (Appendix G). Once successfully installed, participants were asked to use their handheld device as normal and to expect a follow-up survey in seven days under the guise of assessing their experience with the application.

Part 2 of the study occurred seven days after the initial installation of the application when the application would have automatically generated a weekly summary of their device usage. After receiving this weekly summary, participants were instructed to click on the link contained in the email from *RescueTime* in order to access their account and report specific usage information. The dependent variable was the total time (hours) spent using

social media during the week. The amount of time spent using social media on each of the seven days was also collected.

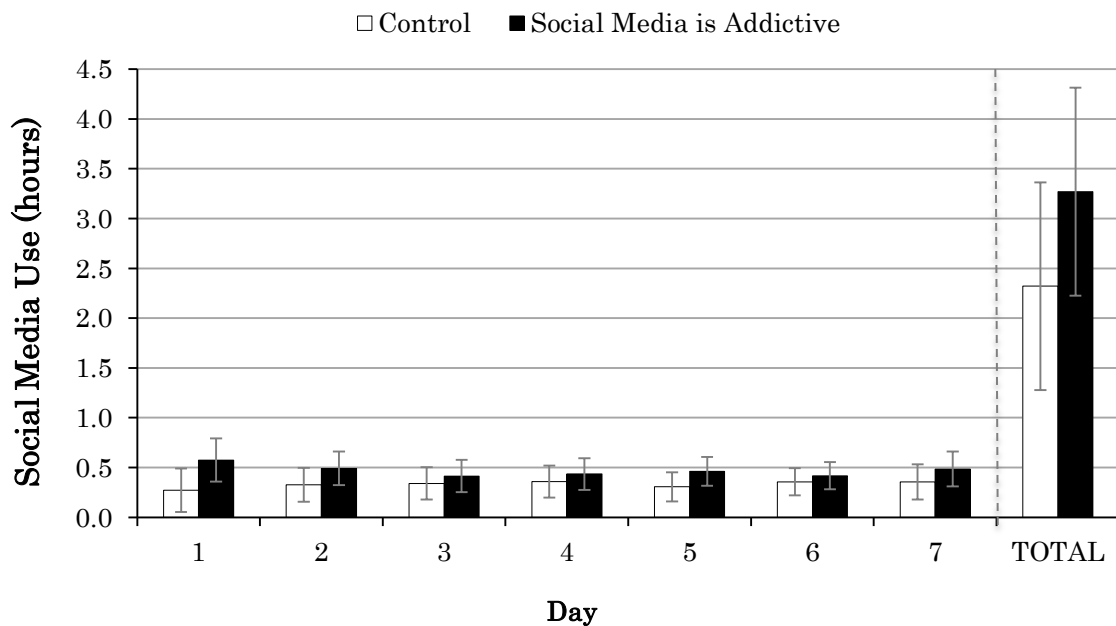
## Results and Discussion

An independent-samples *t*-test was performed to examine the impact of the addiction warning on social media use. Using the total hours of social media used over the seven day period as the dependent variable, as predicted, those who were warned that social media was addictive used social media more ( $M = 3.27$  hours,  $S.D. = 4.55$ ,  $n = 19$ ) than did participants who were not given any warning ( $M = 2.32$  hours,  $S.D. = 2.93$ ;  $n = 22$ ,  $t(39) = -.81$ ;  $p = .43$ ), though this difference was not statistically significant. This may be due to the small sample size resulting in a lack of statistical power. Including the ratio that the participants use their handheld devices versus computers to access social media as a covariate did not statistically change the result ( $F(1,38) = .47$ ;  $p = .50$ ). Although this result was not statistically significant, it was in the predicted direction. Further research using a larger sample size is required to confirm that the addictive frame increases social media use.

The participants' per day social media use was also collected. Social media use throughout the week and overall is shown in Figure 4. Examining the differences between conditions on each day, there were no days where the difference across conditions was statistically significant (all  $p$ 's  $> .15$ ). Though

as with the average weekly use, participants in the Addictive condition reported a higher social media use on each of the seven days compared to those in the Control condition.

The overall skewness statistic was calculated ( $\gamma = 1.76$ ,  $S.E. = .37$ ), revealing the overall distribution of social media use was skewed. Therefore, the main analysis was rerun with the square root of dependent variable, and the result also remained statistically unchanged ( $t(39) = -.54$ ,  $p = .59$ ).



Error bars represent +/- 1 S.E.M..

**Figure 4.** Consumers use social media more when told that social media is addictive compared to the control group.

## STUDY 6 – DOMAIN-SPECIFIC CONSUMPTION

The aim of Study 6 is to test the domain specificity of the addictive frame. That is, does framing chocolate, for example, as being addictive influence the consumption of all food or just the consumption of chocolate? Given that a decrease in perceived control over the focal behavior is theorized to be the mediating factor, it is assumed that the effect is local (Hypothesis 2). Specifically, it is predicted that the “chocolate is addictive” frame will only have an effect on consumption of chocolate (e.g., chocolate M&Ms) and not on the consumption of other similar candy (e.g., Skittles). However, if the “chocolate is addictive” frame is inducing a general lack of perceived control over all consumption, this should be reflected in an increased consumption of both candies.

### Method

*Participants and Design.* A total of 173 undergraduates at B.U. ( $M_{\text{Age}} = 19.72$ ;  $S.D. = 1.01$ , 48% female) participated in the computer laboratory-based experiment. The experiment included a 2(Frame: Addictive, Control) by 2(Candy: M&Ms, Skittles) between-subjects design resulting in four conditions.

*Procedure.* After being seated at individual computer stations, participants were first asked to read an article excerpt under the guise of

assessing the comprehension and retention of written material. Participants were randomly assigned to read one of two articles. Those in the Addictive condition read an article stating that chocolate can be addictive. Those in the Control condition read an unrelated article (Appendix A). As a manipulation check participants were asked to indicate how addictive they believed chocolate can be (1 = Not at all addictive; 9 = Highly addictive). This section of the study concluded with questions consistent with the cover story.

Next, participants moved on to what they thought was the next study and were assigned to one of two candy conditions based on the session they were attending. On each desk was a small opaque cup (3 fl. oz.) containing either 70 grams of chocolate M&Ms or 70 grams of Skittles, and in this ostensibly unrelated study, participants were asked to taste and assess the candy. They were told they would be making judgments on the attributes of the candy and were allowed to eat as much as they wanted. Participants were asked filler questions consistent with the cover story and after completing the focal study, the participants moved on to complete several other unrelated studies. The cup of candy was left on the desks throughout the experimental session and the participants were allowed to continue eating. After the conclusion of the session, each cup was collected and weighed. The amount of food consumed was calculated by subtracting the post-survey weight from the pre-survey weight. This amount (grams) was used as the dependent variable.

## Results and Discussion

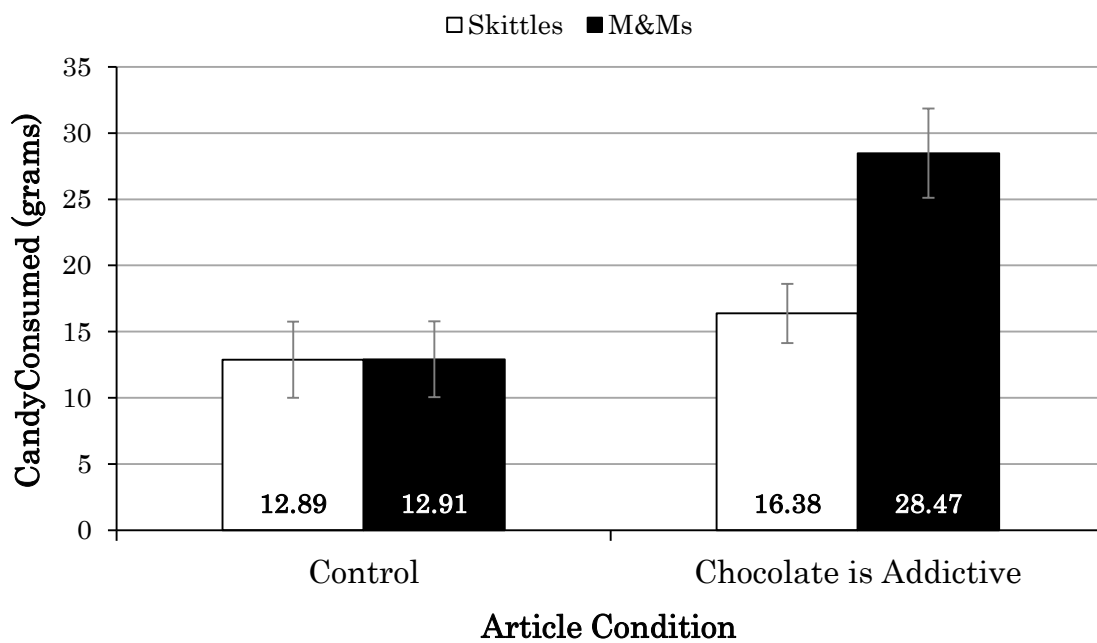
*Manipulation Check.* To test the assumption that reading the article related to chocolate addiction actually influences addiction beliefs, an independent samples  $t$ -test was used. It was revealed that those who read that chocolate is addictive reported a higher subsequent belief in chocolate addiction ( $M = 7.21$ ,  $S.D. = 1.85$ ) compared to those who read an unrelated article ( $M = 5.39$ ,  $S.D. = 2.02$ ,  $t(171) = -6.17$ ,  $p < .001$ ). This indicates the manipulation was successful.

*Interaction with Candy Type.* To examine the domain specificity of the “chocolate is addictive” frame, and whether it influences only chocolate consumption or also that of other foods as well, the interaction between these factors was explored. A regression was run by including the frame condition (coded: Addictive = 1, Control = -1) and candy condition (coded: M&Ms = 1, Skittles = -1) as the independent variables, their respective interaction term, and amount of candy consumed (in grams) as the dependent variable. The results revealed significant effect of the frame condition ( $\beta = 4.76$ ,  $S.E. = 1.43$ ,  $t(169) = 3.33$ ,  $p < .01$ ), candy condition ( $\beta = 3.03$ ,  $S.E. = 1.43$ ,  $t(169) = 2.12$ ,  $p = .04$ ), and their interaction ( $\beta = 3.02$ ,  $S.E. = 1.43$ ,  $t(169) = 2.11$ ,  $p = .04$ ). This relationship is graphed in Figure 5.

Looking at the conditional effects, for those in the chocolate M&Ms condition, participants who were told that chocolate is addictive ate

significantly more chocolate M&Ms ( $M = 28.47$  grams of chocolate M&Ms consumed,  $S.D. = 20.22$ ,  $n = 36$ ) compared to those who read the control article ( $M = 12.91$  grams of chocolate M&Ms consumed,  $S.D. = 14.71$ ,  $n = 43$ ;  $\beta = 7.78$ ,  $S.E. = 2.11$ ,  $t(1,169) = 3.69$ ,  $p < .001$ ). This result replicates previous results (Hypothesis 1). For those in the Skittles condition, participants who were told that chocolate is addictive ate an equivalent amount of Skittles ( $M = 16.38$  grams of Skittles consumed,  $S.D. = 19.84$ ,  $n = 48$ ) as compared to those who read the control article ( $M = 12.89$  grams of Skittles consumed,  $S.D. = 19.51$ ,  $n = 46$ ;  $\beta = 1.74$ ,  $S.E. = 1.93$ ,  $t(169) = .90$ ,  $p = .37$ ). This suggests that the effect of the addictive frame is domain specific (Hypothesis 2), and does not simply induce a lack of general control.

Similarly, there was no statistical difference between the consumption of chocolate M&Ms and Skittles for those in the Control condition ( $\beta = .01$ ,  $S.E. = 1.98$ ,  $t(169) = .01$ ,  $p = .99$ ), but there was a significant difference across candy conditions (i.e., participants ate more M&Ms than Skittles) for those in the Addictive condition ( $\beta = 6.05$ ,  $S.E. = 2.06$ ,  $t(169) = 2.94$ ,  $p < .01$ ), further supporting Hypothesis 2.



Error bars represent +/- 1 S.E.M..

**Figure 5.** Reading that chocolate is addictive increased consumption of chocolate M&Ms but not Skittles.

## STUDY 7 – PERCEIVED CONTROL & CHOCOLATE CONSUMPTION

Study 7 aims to explicitly test perceived control as a mediator of the relationship between chocolate addiction beliefs and subsequent intentions to consume chocolate. Further, the alternative explanations of increasing desirability of, and excitement related to, chocolate will be tested (i.e., the forbidden fruit effect; Pechmann and Shih 1999)? This is addressed by including related assessment measures. It is predicted that participants who read that chocolate is addictive will report decreased perceived control over their own chocolate consumption, which will in turn increase the amount of chocolate they intend to consume relative to a control condition (Hypothesis 3). No differences in desirability and excitement ratings are expected.

### Method

*Participants and Design.* A total of 164 undergraduates at B.U. ( $M_{Age} = 19.40$ ,  $S.D. = 1.00$ , 50% female) participated in the computer laboratory-based experiment. The experiment included a single factorial, between-subjects design with two randomly assigned conditions (Frame: Addictive, Control). Perceived control was also measured and included as a mediating variable.

*Procedure.* After being seated at individual computer stations, participants were told they were going to be taste testing chocolate M&Ms.

Those in the Addictive condition were warned that chocolate is addictive and read an article related to chocolate addiction (Appendix A). Those in the Control condition moved directly onto the next section of the survey, which was to answer four perceived control items adapted from Povey et al. (2000) to examine perceived control over chocolate consumption (“How much do you agree or disagree with the following statement?: It is mostly up to me whether or not I eat chocolate from now on.” 1 = Strongly disagree, 7 = Strongly agree; “How much control do you have over your chocolate consumption from now on?” 1 = Absolutely no control, 7 = Complete control; “How much personal control do you feel you would have over whether or not you eat chocolate from now on?” 1 = No control, 7 = Complete control; “How much control do you have over whether you do, or do not, eat chocolate from now on?” 1 = Very little control, 7 = Complete control).

On each desk was a small opaque cup (3 fl. oz.) containing 70 grams of chocolate M&Ms (approximately 1.5 servings). Participants were instructed to taste the M&Ms and answer filler questions related to the product (e.g., based on the taste, desirability, excitement) to increase the believability of the cover story.

After completing the focal study, the participants moved on to complete several other unrelated studies. The chocolate M&Ms were left on the desks throughout the experimental session and the participants were allowed to

continue eating. After the conclusion of the session, each cup was collected and weighed. The amount of chocolate M&Ms (in grams) consumed by each participant was calculated by subtracting the post-survey weight from the pre-survey weight. This amount was used as the dependent variable.

## Results and Discussion

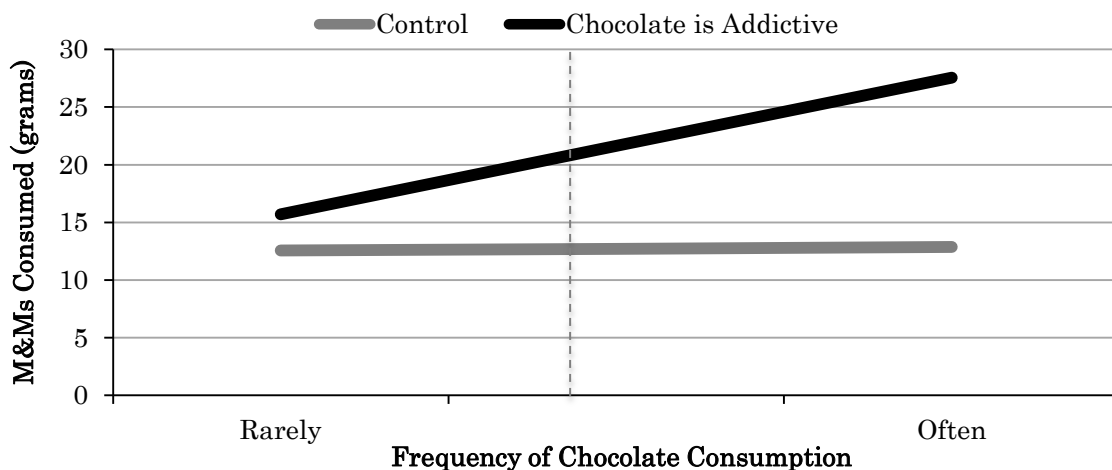
*Chocolate Consumption.* An independent samples *t*-test was used with condition (coded: Addictive = 1, Control = -1) as the independent variable and amount of chocolate M&Ms consumed (grams) as the dependent variable. The results revealed a significant main effect of condition, where those who read that chocolate is addictive consumed more chocolate M&Ms ( $M = 21.66$ ,  $S.D. = 23.93$ ,  $n = 80$ ) than did those in the control condition ( $M = 12.71$ ,  $S.D. = 15.67$ ,  $n = 84$ ,  $t(162) = -2.83$ ,  $p < .01$ ). The overall skewness statistic was calculated ( $\gamma = 1.33$ ,  $S.E. = .19$ ), revealing the distribution of consumption frequency is positively skewed, as the value is greater than 1.0. Therefore, the main analysis was rerun with the square root of the dependent variable (grams of chocolate M&Ms consumed), and the result remained statistically unchanged ( $t(162) = -2.48$ ;  $p = .01$ ).

*Taste Ratings.* Although the taste rating questions were included to boost the believability of the cover story, these results were examined to see whether there were any changes in taste perceptions due to the frame

condition. Participants did not report any significant difference in any of the assessment measures, but particularly noteworthy were those of taste perceptions (1 = Terrible, 5 = Excellent;  $M_{\text{Add}} = 4.06$  vs.  $M_{\text{Control}} = 3.96$ ,  $t(162) = -.68$ ,  $p = .50$ ), or any differences in the polar scales (1-10 scale) of undesirable—desirable ( $M_{\text{Add}} = 7.34$  vs.  $M_{\text{Control}} = 7.01$ ,  $t(162) = -.98$ ,  $p = .33$ ), or boring—exciting ( $M_{\text{Add}} = 6.59$  vs.  $M_{\text{Control}} = 6.70$ ,  $t(162) = .32$ ,  $p = .75$ ). This reveals that the frames did not alter the desirability of the chocolate, ruling this out as an alternative explanation.

*Interaction with Favorable Attitude towards Chocolate.* To examine whether those who already eat more or less chocolate (as a proxy for favorable attitudes towards chocolate) are differentially influenced by the addictive frame, a regression was performed including frame condition (coded: Addictive = 1, Control = -1), how often the participants usually consume chocolate, and their interaction term as independent variables, and amount of chocolate consumed (grams) as the dependent variable. The results revealed marginally significant effects of how often participants consume chocolate ( $\beta = 2.57$ ,  $S.E. = 1.33$ ,  $t(162) = 1.94$ ,  $p = .05$ ) and the interaction term ( $\beta = 2.45$ ,  $S.E. = 1.33$ ,  $t(162) = 1.85$ ,  $p = .07$ ). The effect of the frame condition was not statistically significant ( $p > .30$ ). The Johnson-Neyman technique was employed to show where across frequency of chocolate consumption the effect of the addictive frame becomes significant (Hayes and

Matthes 2009; Johnson and Neyman 1936). The mean consumption frequency value was 3.95 ( $S.D. = 1.18$ ) and the Johnson-Neyman point where the amount of chocolate consumed becomes significantly different across frame conditions occurs at the consumption frequency value of 3.48 ( $t(162) = 1.97, p = .05$ ). These frames are most likely decreasing the amount of perceived control consumers have over their own behavior, resulting in increased consumption. In contrast to traditional addiction warnings that are sometimes ineffective at decreasing a behavior for those with a favorable attitude towards, this result further suggests warnings related to everyday addictions actually *increase* the behavior, *especially* for those with a positive attitude. This relationship is graphed in Figure 6.

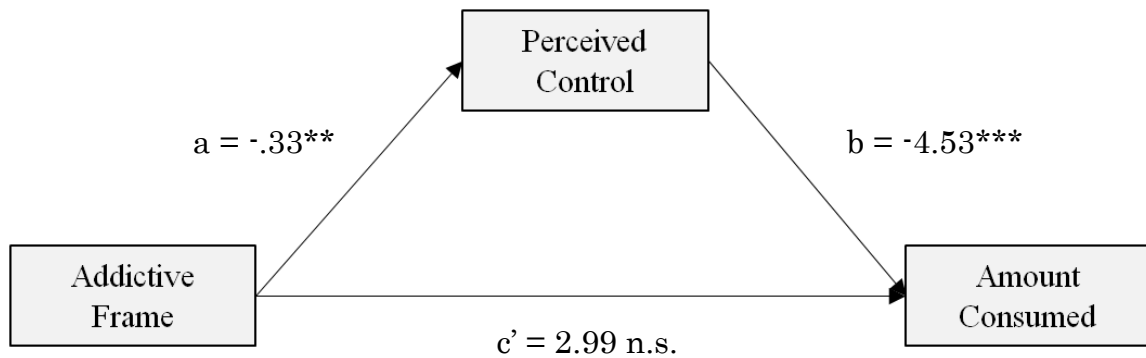


The Johnson-Neyman region of significance is when consumption frequency is greater than 3.48.

**Figure 6.** Those with a favorable attitude towards chocolate are more affected by the addictive frame than those with a less favorable attitude towards chocolate.

*Perceived Control.* An independent samples *t*-test was conducted to examine whether the frame condition influenced subsequent perceptions of control over participants' chocolate consumption. It was found that those who were told that chocolate is addictive reported lower levels of perceived control over their chocolate consumption ( $M = 5.24$ ,  $S.D. = 1.42$ ) compared to those in the control condition ( $M = 5.90$ ,  $S.D. = 1.16$ ,  $t(162) = 3.24$ ,  $p = .001$ ).

*Mediating Role of Perceived Control.* It was predicted that perceived control should mediate the effect of the addictive frame on chocolate consumption. Therefore, the PROCESS macro for SPSS (Model 4, Hayes 2013) was used with the condition as the independent variable (coded: Addictive = 1; Control = -1), average of the four perceived control items ( $\alpha = .85$ ) as the mediating variable, and grams of chocolate M&Ms consumed as the dependent variable. The results indicated that perceived control is predicted by the frame condition ( $\beta = -.33$ ,  $S.E. = .10$ ,  $t(162) = -3.24$ ,  $p < .01$ ). Using bias-corrected bootstrapping ( $n = 1000$ ; Hayes 2013) to generate 95% confidence intervals (C.I.), the indirect effect of condition on intentions to consume through perceived control was positive and significant (95% C.I. excluding zero = .37, 3.24). The direct effect of condition was not significant (95% C.I. = -.10, 6.08). The conceptual model is shown in Figure 7.



*Indirect Effect:* 95% C.I. = [.37, 3.24]; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Figure 7.** Perceived control fully mediates the relationship between the addictive frame and subsequent consumption intentions.

Study 7 reveals that, as predicted, those who read that chocolate was addictive reported lower perceived control over their own chocolate consumption, which in turn increased the amount of chocolate M&Ms they consumed (Hypothesis 3). Further, these results rule out the alternative explanation of increasing desire or excitement for chocolate.

## STUDY 8 – PERCEIVED CONTROL & SHOPPING

The aim of Study 8 is to show that perceived control also mediates the relationship between shopping addiction beliefs and subsequent shopping behavior. Further, this study examines actual purchasing behavior, rather than willingness to pay as seen in Study 3. It is predicted that participants who read that shopping is addictive will report decreased perceived control over their own shopping behavior, which will in turn increase the amount they pay for a product compared to those who were not told that shopping is addictive (Hypothesis 3).

### Method

*Participants and Design.* A total of 206 participants ( $M_{Age} = 36.61$ ,  $S.D. = 12.39$ , 50% female) were recruited through Amazon's Mechanical Turk website. The experiment included a single-factorial, between subjects design with two randomly assigned conditions (Frame: Addictive, Control).

*Procedure.* After reading the introduction and giving consent to participate, participants completed demographic-based questions on their age and gender. All participants were told that they would be participating in a shopping task. Those in the Addictive condition were warned that shopping is addictive and read a short article describing the addictiveness of shopping.

Those in the Control condition read a short article neutrally describing shopping (Appendix C). After reading their assigned article, and answering the manipulation check related to their belief in how addictive shopping can be (1 = Not at all addictive, 9 = Highly addictive), participants completed four items adapted from Povey et al. (2000) related to their perceived control over their own shopping behavior (“How much do you agree or disagree with the following statement?: It is mostly up to me whether or not I buy something from now on.” 1 = Strongly disagree, 7 = Strongly agree; “How much control do you have over your shopping behavior from now on?” 1 = Absolutely no control, 7 = Complete control; “How much personal control do you feel you would have over whether or not you buy something from now on?” 1 = No control, 7 = Complete control; “How much control do you have over whether you do, or do not, buy something from now on?” 1 = Very little control, 7 = Complete control).

Next, participants were told to imagine they had entered a grocery store with \$35. They were then tasked to choose seven products from seven different product categories (each category had six product options) commonly found in grocery stores (grapes, milk, eggs, pizza, snacks, soda, bread), where participants would be randomly selected to receive their “change.” All choice combinations were purposely arranged to total \$25, meaning they would have \$10 remaining. Participants were then told that at the checkout counter

there was a display of \$10 Amazon Gift Cards on sale (i.e., were being sold at less than the face value) but there was no indication of the specific discount. Then, using an incentive compatible BDM approach (Becker, DeGroot, and Marschak 1964), participants were asked to indicate how much they would pay for the gift card out of their remaining \$10. Specifically, participants read “For each of the prices below, please indicate whether you would like to buy or not buy the \$10 Amazon Gift Card. The experimenter will randomly generate a price. If selected and your highest price is equal to or above the randomly generated reserve price, you will receive the difference (i.e., \$10 minus what you pay for the gift card) plus the \$10 Gift Card.” Then participants were given a list prices from \$.50 to \$10 in \$.50 increments and asked to select either “I will buy the \$10 Gift Card” or “I will not buy the \$10 Gift Card” for each of the prices listed. The price point that the participant changes between the two options (i.e., from buying to not buying) is considered the maximum amount they are willing to pay for the gift card and was used as the dependent variable.

## **Results and Discussion**

*Manipulation Check.* To test the assumption that reading the article related to shopping addiction actually influences addiction beliefs, an independent samples *t*-test was used. It was revealed that those who read

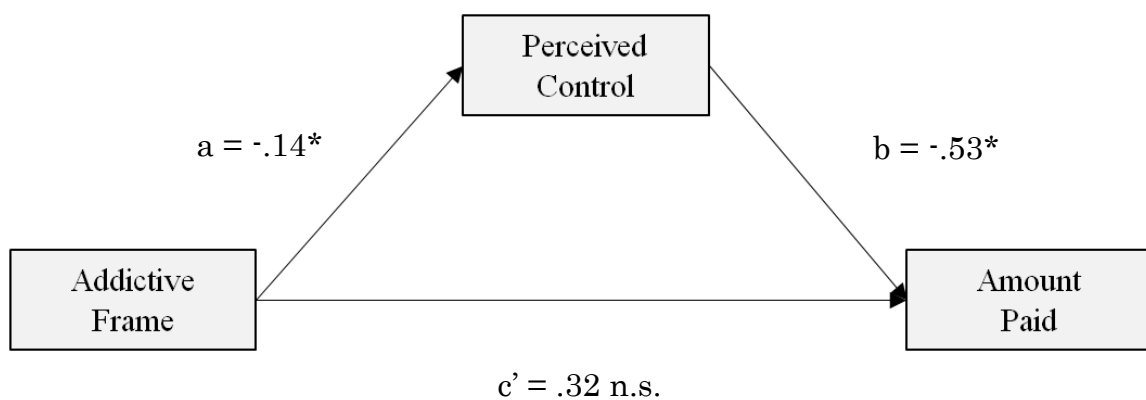
that shopping is addictive reported a higher subsequent belief in shopping addiction ( $M = 7.47$ ,  $S.D. = 1.66$ ,  $n = 107$ ) compared to those who read an unrelated article ( $M = 6.56$ ,  $S.D. = 2.07$ ,  $n = 99$ ,  $t(204) = -3.50$ ,  $p = .001$ ). This indicates the manipulation was successful.

*Amount Paid.* An independent samples  $t$ -test was used with the condition (coded: Addictive = 1, Control = -1) as the independent variable and the amount paid for the gift card as the dependent variable. The results reveal a significant main effect of condition, where those who read that shopping is addictive paid more for the gift card ( $M = \$7.64$ ,  $S.D. = 2.31$ ) than did controls ( $M = \$6.85$ ,  $S.D. = 2.96$ ,  $t(204) = -2.14$ ,  $p = .03$ ).

The overall skewness statistic was calculated ( $\gamma = -1.27$ ,  $S.E. = .17$ ), revealing the overall distribution of consumption frequency is negatively skewed, as the magnitude is greater than 1.0. Therefore, the main analysis was rerun with the square root of amount paid as the dependent variable, and the result remained significant ( $t(204) = -2.35$ ;  $p = .02$ ).

*Perceived Control.* An independent samples  $t$ -test was conducted to examine whether the frame condition influenced subsequent perceptions of control over participants' shopping behavior. It was found that those who were told that shopping is addictive reported lower levels of perceived control over their shopping behavior ( $M = 6.09$ ,  $S.D. = .84$ ) compared to those in the control condition ( $M = 6.36$ ,  $S.D. = .68$ ,  $t(204) = 2.55$ ,  $p = .01$ ).

*Mediating Role of Perceived Control.* It was predicted that perceived control should mediate the effect of the addictive frame on amount paid. Therefore, the PROCESS macro for SPSS (Model 4, Hayes 2013) was used with the condition as the independent variable (coded: Addictive = 1; Control = -1), average of the four perceived control items ( $\alpha = .87$ ) as the mediating variable, and the amount paid for the gift card as the dependent variable. The results indicated that perceived control is predicted by the condition ( $\beta = -.14$ ,  $S.E. = .05$ ,  $t(204) = -2.55$ ,  $p = .01$ ). Using bias-corrected bootstrapping ( $n = 1000$ ; Hayes 2013) to generate 95% confidence intervals, the indirect effect of condition on amount paid through perceived control was positive and significant (95% C.I. excluding zero = .01, .18). The direct effect of condition was not significant (95% C.I. = -.04, .69). The conceptual model is shown in Figure 8.



*Indirect Effect:* 95% C.I. = [.01, .18]; \* $p < .05$

**Figure 8.** Perceived control fully mediates the relationship between the addictive frame and subsequent amount paid.

This reveals that, as predicted, those who read that shopping was addictive reported lower perceived control over their own shopping/buying behavior, which in turn increased the amount they paid for a product compared to controls (Hypothesis 3).

## STUDY 9 – PERCEIVED CONTROL & GRANOLA CONSUMPTION

Study 9 aims to extend the findings into a new area: granola “addiction.” Although granola has been traditionally considered a “health food” and has often been used as a healthy alternative to chocolate in self-control experiments (e.g., Laran 2010; Redden and Haws 2013; Vohs and Faber 2007; Wang et al. 2010; Wilcox and Stephen 2013) instances of the granola “addiction” frame is appearing online in blogs and discussion boards (e.g., Cutright 2010). This could arguably be due to the inherent sweetness (high sugar content; Pombo-Rodrigues et al. 2017) and desirability of granola, where consumers may have experienced a lack of self-control in this consumption situation. However, in Study 1, granola was rated as having low addictiveness, meaning many consumers may not have been exposed to an addictive frame in this context. In line with the current theory, it is predicted that, if believed, framing granola as being addictive will increase consumption due to a decrease in perceived control over granola consumption (Hypothesis 3).

### Method

*Participants and Design.* A total of 152 undergraduates at B.U. ( $M_{Age} = 19.53$ ;  $S.D. = 1.05$ , 55% female) participated in the computer laboratory-

based experiment. The experiment included a single factor, between-subjects design with two randomly assigned conditions (Frame: Addictive, Control). Perceived control was also measured and included as a mediating variable.

*Procedure.* After being seated at individual computer stations, participants were told they were going to be taste testing a new brand of granola. Those in the Addictive condition were warned that granola is addictive and read an article related to granola addiction (Appendix H). Those in the Control condition moved directly onto the next section of the survey, which was to answer four perceived control items similar to Study 7 and Study 8, but adapted from Povey et al. (2000) to examine perceived control over granola consumption (“How much do you agree or disagree with the following statement?: It is mostly up to me whether or not I eat granola from now on.” 1 = Strongly disagree, 7 = Strongly agree; “How much control do you have over your granola consumption from now on?” 1 = Absolutely no control, 7 = Complete control; “How much personal control do you feel you would have over whether or not you eat granola from now on?” 1 = No control, 7 = Complete control; “How much control do you have over whether you do, or do not, eat granola from now on?” 1 = Very little control, 7 = Complete control).

On each desk was a small opaque cup (3 fl. oz.) containing 30 grams of granola. Participants were instructed to taste the granola and answer filler

questions related to the product (e.g., based on the taste, desirability, excitement) to increase the believability of the cover story and to test the alternative explanation of increasing desirability of granola.

After completing the focal survey, the participants moved on to complete several other unrelated studies. The granola was left on the desks throughout the experimental session and the participants were allowed to continue eating. After the conclusion of the session, each cup was collected and weighed. The amount of granola (in grams) consumed by each participant was calculated by subtracting the post-survey weight from the pre-survey weight. This amount (grams) was used as the dependent variable.

## Results and Discussion

*Manipulation Check.* To ensure that the articles used in the consumption study actually influenced beliefs in the addictiveness of granola, an independent samples *t*-test was performed. It was found that those who read that granola is addictive reported a belief that granola is more addictive ( $M = 6.83$ ,  $S.D. = 2.30$ ,  $n = 77$ ) compared to those who read that a neutral description of granola ( $M = 3.24$ ,  $S.D. = 2.08$ ,  $n = 75$ ,  $t(150) = -10.09$ ,  $p < .001$ ). This indicates that the manipulation of addiction beliefs was successful and that participants did indeed believe that granola is addictive.

*Taste Ratings.* Although the taste rating questions were included to boost the believability of the cover story, these results were examined to see whether there were any changes in taste perceptions due to the frame condition. Similar to Study 7, participants did not report any significant difference in any of the assessment measures, but particularly noteworthy were those of taste perceptions (1 = Terrible, 5 = Excellent;  $M_{\text{Add}} = 3.76$  vs.  $M_{\text{Control}} = 3.68$ ,  $t(150) = -.52$ ,  $p = .61$ ), or any differences in the polar scales (1-10 scale) of undesirable—desirable ( $M_{\text{Add}} = 6.66$  vs.  $M_{\text{Control}} = 7.05$ ,  $t(150) = 1.19$ ,  $p = .23$ ) and boring—exciting ( $M_{\text{Add}} = 5.42$  vs.  $M_{\text{Control}} = 5.71$ ,  $t(150) = .77$ ,  $p = .44$ ). This reveals that the frames did not alter the desirability or excitement of the granola, further ruling this out as an alternative explanation driving the increased consumption results.

*Granola Consumption.* An independent samples  $t$ -test was performed to examine the impact of the addictive frame on subsequent granola consumption. Using the amount of granola consumed as the dependent variable, as predicted, those who read that granola is addictive consumed significantly more granola ( $M = 10.68$  grams of granola;  $S.D. = 11.03$ ) than did control participants ( $M = 7.33$  grams of granola,  $S.D. = 8.26$ ;  $t(150) = -2.12$ ;  $p = .04$ ). This is an increase of 46%, revealing that even explicitly framing a generally regarded healthy (but very sweet and desirable) food such as granola as being addictive can increase consumption.

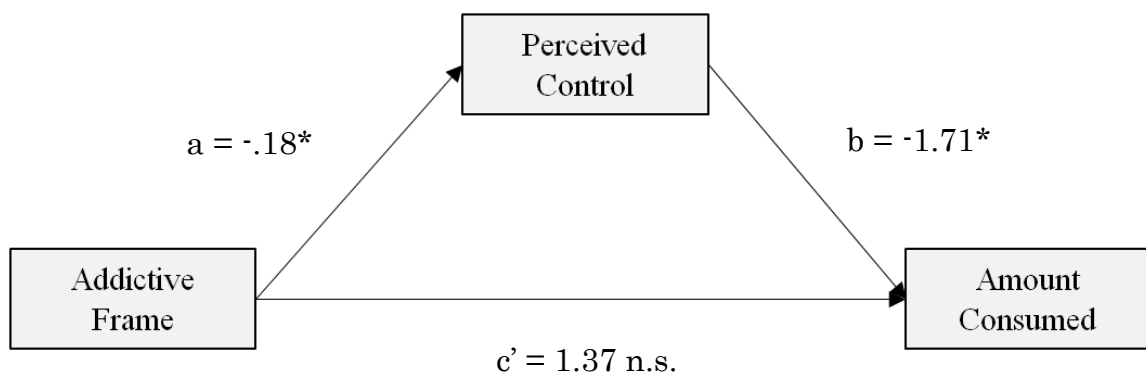
The overall skewness statistic was calculated ( $\gamma = 1.18$ ,  $S.E. = .20$ ), revealing the overall distribution of consumption frequency is positively skewed, as the value is greater than 1.0. Therefore, the main analysis was rerun with the square root of the dependent variable (grams of granola consumed), and the result remained statistically unchanged ( $t(150) = -1.94$ ;  $p = .05$ ).

*Perceived Control.* An independent samples  $t$ -test was conducted to examine whether the frame condition influenced subsequent perceptions of control over participants' granola consumption. It was found that those who were told that granola is addictive reported lower levels of perceived control over their granola consumption ( $M = 5.99$ ,  $S.D. = 1.18$ ) compared to those in the control condition ( $M = 6.35$ ,  $S.D. = .75$ ,  $t(150) = 2.23$ ,  $p = .03$ ).

*Mediating Role of Perceived Control.* It was predicted that perceived control should mediate the effect of the addictive frame on subsequent consumption. Therefore, the PROCESS macro for SPSS (Model 4, Hayes 2013) was used with the condition as the independent variable (coded: Addictive = 1; Control = -1), average of the four perceived control items ( $\alpha = .77$ ) as the mediating variable, and the amount of granola consumed (in grams) as the dependent variable. The results indicated that perceived control is predicted by the condition ( $\beta = -.18$ ,  $S.E. = .08$ ,  $t(150) = -2.23$ ,  $p = .03$ ). Using bias-corrected bootstrapping ( $n = 1000$ ; Hayes 2013) to generate

95% confidence intervals (C.I.), the indirect effect of condition on intentions to consume through perceived control was positive and significant (95% C.I. excluding zero = .01, .87). The direct effect of condition was not significant (95% C.I. = -.20, 2.94). The conceptual model is shown in Figure 9.

This reveals that, as predicted, those who read that granola was addictive reported lower perceived control over their own granola consumption, which in turn increased the amount of granola they consumed. This is especially interesting given that granola has been traditionally considered a “health food” though it often contains more sugar than soda and more fat than some fast food (Smellie 2010). Arguably, many individuals enjoy consuming granola and may have experienced a lack of self-control when faced with granola consumption, meaning they are more likely to believe the addictive frame in this context.



*Indirect Effect:* 95% C.I. = [.01, .87]; \* $p < .05$

**Figure 9.** Perceived control fully mediates the relationship between the addictive frame and subsequent granola consumption.

## STUDY 10 – VIRTUOUS FOOD CONSUMPTION

The aim of Study 10 is to extend the findings in two ways: to further rule out desirability as an alternative explanation and to show a boundary condition to the effect. Although desirability was ruled out in Study 7 and Study 9, there may have been a ceiling effect related to desirability (i.e., chocolate and granola are inherently desirable). However, in Study 10, peas were used as the focal food, which had the second lowest addictive rating in the initial pretest (behind cauliflower). Peas are surely less “exciting” and “desirable” than chocolate and granola meaning the addictive frame may have more opportunity to increase how exciting and desirable peas appear. Arguably, consumers have rarely, if at all, experienced a lack of control when faced with a purely virtuous product or been exposed to the addictive frame in this context. Therefore, the addictive frame is predicted to have no effect on subsequent consumption (Hypothesis 4) because consumers remain aware of the control they have.

### Method

*Participants and Design.* A total of 155 undergraduates at B.U. ( $M_{Age} = 19.28$ ;  $S.D. = .98$ , 63% female) participated in the computer laboratory-

based experiment. The experiment included a single factor, between-subjects design with two randomly assigned conditions (Frame: Addictive, Control).

*Procedure.* After being seated at individual computer stations, participants were told they were going to be taste testing a new brand of peas. Those in the Addictive condition were warned that peas are addictive and read an article related to pea addiction (Appendix I). Those in the Control condition moved directly onto the next section of the survey. On each desk was a small opaque cup (3 fl. oz.) containing 40 grams of peas. Participants were instructed to taste the peas and answer filler questions related to the product (e.g., taste, desirability, excitement) to increase the believability of the cover story and to test the alternative explanation of increasing desirability of, and excitement for, peas (i.e., the forbidden fruit effect; Pechmann and Shih 1999).

After completing the focal survey, the participants moved on to complete several other unrelated studies. The peas were left on the desks throughout the experimental session and the participants were allowed to continue eating. After the conclusion of the session, each cup was collected and weighed. The amount of peas (in grams) consumed by each participant was calculated by subtracting the post-survey weight from the pre-survey weight. This amount was used as the dependent variable.

## Results and Discussion

*Taste Ratings.* Although the taste rating questions were included to boost the believability of the cover story, these results were examined to see whether there were any changes in taste perceptions due to the frame condition. Participants did not report any significant difference in taste perceptions (1 = Terrible, 5 = Excellent;  $M_{\text{Add}} = 3.50$  vs.  $M_{\text{Control}} = 3.22$ ,  $t(153) = -1.63$ ,  $p = .11$ ), or any differences in the polar scales (1-10 scale) of undesirable—desirable ( $M_{\text{Add}} = 5.58$  vs.  $M_{\text{Control}} = 5.57$ ,  $t(153) = -.01$ ,  $p = .99$ ), or boring—exciting ( $M_{\text{Add}} = 4.41$  vs.  $M_{\text{Control}} = 4.36$ ,  $t(153) = -.12$ ,  $p = .90$ ). This reveals that the frames did not alter the assessment of the peas.

*Pea Consumption.* An independent-samples  $t$ -test was performed to examine the impact of the addictive frame on subsequent pea consumption. Using the amount of peas consumed as the dependent variable, those who read that peas are addictive consumed more peas ( $M = 5.10$  grams of peas;  $S.D. = 9.07$ ,  $n = 78$ ) than did control participants ( $M = 4.38$  grams of peas,  $S.D. = 8.18$ ,  $n = 77$ ), however this difference was not statistically significant ( $t(153) = -.52$ ;  $p = .60$ ), providing support for Hypothesis 4.

The overall skewness statistic was calculated ( $\gamma = 2.88$ ,  $S.E. = .20$ ), revealing the overall distribution of consumption frequency is positively skewed, as the value is greater than 1.0. Therefore, the main analysis was rerun with the square root of the dependent variable (grams of peas

consumed), and the result remained statistically unchanged ( $t(153) = -.55$ ;  $p = .58$ ).

This result shows that framing a virtuous product as being addictive (with the implicit or explicit purpose of increasing consumption) does not have the effect of altering subsequent behavior. This may be due to the lack of believability in the addictive frames as applied to peas. Unlike granola, which is still considered “healthier” than chocolate yet is more sweet and arguably a more desirable snack than peas. Given the presence of sugar in granola, and the prevalence of the “sugar is addictive” frame (e.g., Payton 2016), consumers may be more likely to believe that granola is addictive compared to peas. Although granola was rated as low addictive in the pretest, there was an increase in consumption after exposure to the addictive frame. Possibly it was the first time the participants had been exposed to the granola addiction frame, and because granola is an enjoyable and desirable food participants were more likely to believe the claim. In contrast, peas are arguably less enjoyable and desirable, so participants may be more likely to feel they have complete control over consumption of peas and other purely virtuous foods. This suggests the proposal to (deceptively) frame healthy foods and behaviors as addictive with the aim to increase consumption/behavior will have little to no effect on consumers due to the lack of believability or desirability of the product or activity.

## STUDY 11 – BOOSTING CONTROL

The aim of Study 11 is to attenuate the negative influence of addiction beliefs. Given the increase in consumption is explained by a decrease in perceived control, then theoretically the effect of addiction beliefs could be attenuated by boosting an individual's sense of control. Manipulating control has been consistently shown to enable self-regulation during a consumption episode (e.g., Houben 2011; Knight, Tobin, and Hornsey 2014; Rotenberg et al. 2005; van Koningsbruggen et al. 2011). Therefore, it is predicted that those who believe that chocolate is addictive, will consume less chocolate after completing a control boosting task compared to those who do not complete the task (testing Hypothesis 3 through moderation). Those who do not believe in the addictiveness of chocolate are predicted to show similar behavior across both task conditions due to their existing sense of control over their chocolate consumption.

### Method

*Participants and Design.* A total of 163 undergraduates at B.U. ( $M_{\text{Age}} = 19.72$ ,  $S.D. = .85$ , 42% female) participated in the computer laboratory-based experiment. The experiment used a single-factorial, between subjects design with two randomly assigned conditions (Writing Task: Control Boost,

Neutral). Existing beliefs in chocolate addiction was measured and used as an individual difference variable. Rather than manipulating beliefs in the addictiveness of chocolate as performed in previous studies, this approach is more of a direct test of an alternative method to help consumers minimize overconsumption in the presence of existing incorrect addiction beliefs.

*Procedure.* After being seated at individual computer stations, participants were told they were going to be taste testing candy. On each desk was a small opaque cup (3 fl. oz.) containing 70 grams of chocolate M&Ms (approximately 1.5 servings). Initially, participants were asked a question related to their chocolate addiction beliefs (“In the literal use of the term (i.e., as used for drugs like cocaine), how addictive can chocolate be?”; 1 = Not at all addictive, 9 = Highly addictive). Next, participants were randomly assigned to one of two conditions. Those in the Control Boost condition were instructed to write a minimum of 200 characters describing a time where they had control over their own food consumption (task adapted from Knight, et al. 2014). Those in the Neutral condition were instructed to write a minimum of 200 characters describing the university classes they were currently enrolled in. Next, in an ostensibly unrelated study, participants were instructed to taste the chocolate M&Ms and answer filler questions related to the product to increase the believability of the cover story. After completing the focal surveys, the participants moved on to

complete several other unrelated studies. The chocolate M&Ms were left on the desks throughout the experimental session and the participants were allowed to continue eating. At the conclusion of the session, each cup was collected and weighed. The amount of chocolate M&Ms (in grams) consumed was calculated by subtracting the post-survey weight from the pre-survey weight. This amount was used as the dependent variable.

## Results and Discussion

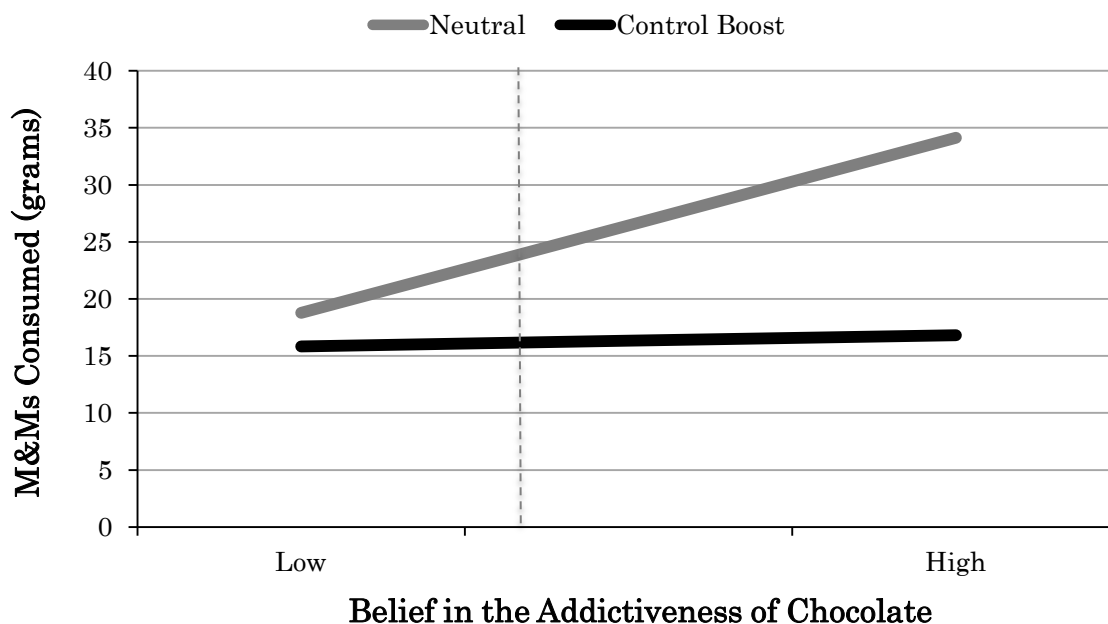
*Writing Task.* An independent-samples *t*-test was performed to examine the influence of the control prime on subsequent chocolate consumption. Using the amount of chocolate M&Ms consumed (in grams) as the dependent variable, as predicted, those who wrote about their classes (Neutral condition) consumed more chocolate ( $M = 27.23$  grams of chocolate M&Ms;  $S.D. = 25.07$ ,  $n = 74$ ) than did those who wrote about being in control of their food consumption (Control Boost condition;  $M = 16.29$  grams of chocolate M&Ms,  $S.D. = 17.87$ ,  $n = 89$ ,  $t(161) = 3.24$ ;  $p < .001$ ).

The overall skewness statistic was calculated ( $\gamma = -.40$ ,  $S.E. = .19$ ), revealing the overall distribution of chocolate consumption was statistically symmetrical, as the magnitude is less than 1.0. Regardless, the analysis was rerun using the square root of the dependent variable and the results remained statistically unchanged ( $t(161) = 2.88$ ,  $p < .01$ ).

*Interaction with Addictive Beliefs.* The aim of this analysis is to examine whether boosting the perception of control (by reminding participants of a time they had control over their own food consumption) attenuates the negative effect of an existing belief in the addictiveness of chocolate. A regression was run by including the reported belief in the addictiveness of chocolate and the writing task (coded: Control Boost = 1, Neutral = -1) as the independent variables, their interaction term, and weight of chocolates consumed as the dependent variable.

The results revealed a significant main effect of a belief in the addictiveness of chocolate ( $\beta = 1.75$ ,  $S.E. = .74$ ,  $t(159) = 2.37$ ,  $p = .02$ ) but the main effect of the writing task was not significant ( $\beta = 3.06$ ,  $S.E. = 4.29$ ,  $t(159) = .71$ ,  $p = .48$ ). The belief by writing task interaction was significant ( $\beta = -1.54$ ,  $S.E. = .74$ ,  $t(159) = -2.08$ ,  $p = .04$ ).

The Johnson-Neyman technique was employed to show where across the strength of addictive beliefs the effect of writing task condition becomes significant (Hayes and Matthes 2009; Johnson and Neyman 1936). The mean addictive belief value was 5.29 ( $S.D. = 2.34$ ) and the Johnson-Neyman point where the amount of chocolate consumed becomes significantly different across conditions occurs at the addictive belief value of 4.34 ( $t(159) = -3.61$ ,  $p = .05$ ). This relationship is graphed in Figure 10.



Johnson-Neyman region of significance is when addictive belief is greater than 4.23.

**Figure 10.** The negative influence of belief in the addictiveness of chocolate is attenuated when consumers' perceptions of control is boosted.

Looking at the conditional effects, when participants completed the neutral writing task, the effect of addictiveness beliefs was significant ( $\beta = 3.28$ ,  $S.E. = 1.17$ ,  $t(159) = 2.80$ ,  $p < .01$ ). Conversely, when participants completed the control boost writing task, the effect of the addictiveness beliefs was not significant ( $\beta = .21$ ,  $S.E. = .89$ ,  $t(159) = .24$ ,  $p = .81$ ).

Similarly, those who have a stronger belief in the addictiveness of chocolate (one standard deviation above the mean of 5.29), the effectiveness of the control prime was significant ( $M_{\text{Boost}} = 34.12$  grams of chocolate M&Ms consumed vs.  $M_{\text{Neutral}} = 16.83$  grams of chocolate M&Ms consumed;  $\beta = -8.64$ ,

$S.E. = 2.35$ ,  $t(159) = -3.67$ ,  $p < .01$ ), but those with weaker beliefs in the addictiveness of chocolate (one standard deviation below the mean of 5.29) showed no statistical difference in chocolate consumption across writing task conditions ( $M_{\text{Boost}} = 18.78$  grams of chocolate M&Ms consumed vs.  $M_{\text{Neutral}} = 15.84$  grams of chocolate M&Ms consumed;  $\beta = -1.47$ ,  $S.E. = 2.44$ ,  $t(159) = -.60$ ,  $p = .55$ ).

These results illustrate that boosting control during a temptation episode can attenuate the negative effects of existing beliefs in the addictiveness of chocolate can have on subsequent consumption. By reminding consumers of the control that they have, this boosts perceptions of control, resulting in a greater ability to say “no” when tempted.

## GENERAL DISCUSSION

Addiction is real, which is why it is of the utmost importance to treat the term and the affliction with respect. With the increase in media coverage related to everyday “addictions” coupled with the existing knowledge related to traditional addictions, it appears that consumers’ could become less equipped during temptation episodes if the addiction label is too regularly applied. Marketing tools can be used to attenuate excessive consumption (Martin et al. 2013); however, attempting to warn consumers about the potential addictiveness of everyday products and actions may have a less than desirable effect by implying an incapability to control behavior (Rogers 2017). It was predicted that an increase in beliefs in the addictiveness of an everyday product or activity would result in an increase in consumption, due to a decrease in perceived control. Across twelve studies it was shown that when consumers believe or are explicitly informed that chocolate, granola, shopping, social media, and pornography are addictive, they are more likely to eat greater amounts, pay more for products, browse social media sites and applications more (though not significantly in this dissertation), and view more explicit images respectively. The negative effect of the addictive frame does not hold for purely virtuous foods. Further, it was found that this increase in behavior was due to a decrease in the amount of perceived control the consumer has over the focal behavior, not a general lack of perceived

control, and can be attenuate by priming a sense of control during the tempting consumption episode.

Specifically, Study 1 revealed the existence of lay-beliefs regarding the “addictiveness” of some everyday products and activities. Study 2A found that participants who read that chocolate is addictive subsequently ate more chocolates than those who were told that chocolate is not addictive. In Study 2B, framing chocolate as being addictive also resulted in an intent to consume a greater number of chocolates, even when the addiction information was provided in the form of an explicit warning. In Study 3, it was found that framing shopping as being addictive resulted in a greater amount willing to pay. Study 4 showed that framing pornography as being addictive increased the number of explicit images viewed, and did not deter the uptake of the behavior. Study 5 showed that warning users that social media is addictive increased the amount of time spent on social media platforms over a one week period (though the differences found were not statistically significant). Study 6 showed that framing chocolate as being addictive increased chocolate consumption but not the consumption of a similar sugary candy, revealing that the frame is domain specific and not simply due to inducing a general lack of perceived control. In Study 7, initial support for the process explanation was found where those who read that chocolate is addictive reported a decrease in perceived control over their own

chocolate consumption which resulted the consumption of more chocolate. Study 8 showed that people will pay more for the same product due to a decrease in perceived control when they believed that shopping is addictive. In Study 9, it was shown that framing granola as addictive increased subsequent granola consumption also due to a decrease in perceived control. Study 10 showed a limit to the addictive frame, whereby participants' consumption of a purely virtuous food (e.g., peas) was not significantly influenced by the addictive frame. Finally, in Study 11, the effect of the addictive frame was attenuated by boosting control. With the lack of evidence supporting the explicit classification of chocolate, shopping, social media, pornography, and granola being "addictive," these results directly argue against the frame, and suggest that efforts to boost control may prove more fruitful in helping those at risk to regulate their behavior.

### **Contributions**

This dissertation makes notable theoretical contributions related to how these everyday behaviors are portrayed in marketing communications, the media, and public policy. First, this dissertation extends the literature on perceived control, by showing that the increase in media coverage related to "everyday addictions" coupled with the existing knowledge of traditional addictions can result in consumers' increasing consumption in those areas.

Prior work in this area has often focused on high-level users and how environmental cues and other triggers can cause these consumers to overindulge (e.g., Martin et al. 2013; Redish et al. 2008; Wilkes et al. 2000). Further, overconsumption or overuse of everyday products is often related to affect regulation (e.g., to counteract depression or anxiety, increase excitement), where consumption is the apparent path to feeling better (e.g., Tice et al. 2001). This dissertation is unique in its investigation of increased consumption by showing that these addictive frames can also influence regular consumers not by inducing negative affect or desire and excitement (which were ruled out as alternative explanations), but by decreasing an individual's perceived control over the focal behavior. This directly argues against the implicit assumption that everyday addiction warnings will protect consumers.

Second, this research also advances the attitude and persuasion literature. Previous research examining the ineffectiveness of certain warning labels (e.g., alcohol), have found that if the warning is not convincing, then consumers discount the message and continue their behavior (Andrews 1995; Petty and Cacioppo 1986). Psychological reactance (Brehm 1966) can also occur whereby consumers who have favorable attitudes towards the activity (e.g., drinking alcohol) are more likely to disbelieve or discount certain warnings (Andrews 1995). Especially if the

warnings are in opposition to existing beliefs (i.e., perceptual defense; McGinnies 1949; Schuster and Powell 1987) as this often results in an unimpeded continuation of the behavior. In short, if consumers believe the warning, they will follow the recommendation and cease consumption, unless they have a favorable attitude towards the product. However, in the current research it is shown that when consumers believe the message (i.e., that the behavior is addictive) this actually results in an *increase* in the behavior, *especially* for those who have a favorable attitude.

This dissertation also makes a substantive practical contribution to the existing body of knowledge by suggesting that journalists, researchers, and public policy makers avoid using the addiction frame in such cases (i.e., when describing the overconsumption of everyday products and activities) so that individuals can retain an internal sense of control (Tsukayama 2016). Moreover, this dissertation complements previous research on framing (Tversky and Kahneman 1985) whereby consumers' perceptions can be altered by the addictive frame, which influences subsequent consumer decision-making. This dissertation also shows that even false and often baseless statements are also highly persuasive. Finally, traditional social marketing warnings can backfire by weakening protective risk-related beliefs (e.g., how dangerous the behavior is) or norm-related beliefs (e.g., how prevalent the behavior is; Pechmann and Slater 2005), however, this

dissertation suggests that strengthening, rather than weakening, everyday addiction beliefs causes the adverse effects.

Some may argue that the addictive frame could be used to encourage positive behaviors; however, as shown with peas, the effect of the addictive frame on consumption does not occur for purely virtuous products. Regardless, there are several issues with this approach. First, given that these products and activities are not intrinsically addictive this would mean knowingly deceiving consumers. Second, although for some products it could encourage the middle-band of consumers (those who already consume/act a moderate amount), it may also push high-level consumers towards overconsumption, where the actions can have a negative impact on their lives. A moderate amount of exercise is unquestionably beneficial; however, there are numerous instances of “excessive exercise” (e.g., Cook, Hausenblas, and Freimuth 2014; Formby et al., 2015), where runners keep seeking the euphoria that comes from strenuous exercise (Kanarek et al. 2009), which can result in dramatic, unhealthy, and even permanent changes. Even eating sweets in moderation is acceptable and enjoyable, but obesity is the second leading cause of preventable death in the U.S. (behind cigarette smoking; Aydinoglu and Krishna 2011), meaning any unintended increases in consumption rates can have dire consequences. Chocolate and shopping are also healthy in moderation and can be important sources of self-therapy or

self-expression (Lo and Harvey, 2012), and social media and internet use are valuable in learning and connecting with others; but these actions become an issue when consumption is detrimental to a consumer's well-being. Finally, the primary target segment of the "positive addiction" message is arguably those who do not exercise or eat healthily. However, this dissertation has shown that the addictive frame is not effective at increasing non/low-level users, regardless of believability, providing further evidence to discourage use of the addictive frame.

However, the findings of this research do have the potential to be misappropriated by marketing firms actively framing their product or offering as being "addictive." Currently within the marketing industry, the addictive frame is used either in the product name (e.g., fragrances such as "Dior Addict" and "Addiction by Johan B.," foods such as Lehi Valley Trading Company's "Addiction Granola<sup>TM</sup>"), to sell the product (e.g., Word Whizzle smart phone application whose advertisement states "this game is addictive and challenging" and have testimonials of players who say they are "addicted already"), or more subtle description of the behavior (e.g., Lays "You can't have just one!" and Pringles "Once you pop, you can't stop"). Fortunately, if the addictive frame becomes too commonplace consumers may uncover the true motivations behind its use (i.e., to increase consumption). Therefore, future research could examine whether an increase in persuasion knowledge

(Friestad and Wright 1994) regarding firms' motivations can also attenuate the negative influence of the addictive frame in non-addictive consumption situations.

Apart from mandating that the addictive frame not be used for non-addictive products and activities, uncovering a single "solution" is difficult as everyone consumes these everyday products for different reasons. One person might play online games for several hours a day because they are not being challenged at school or work and enjoy the mental stimulation; another person might play online games because they enjoy the personal connection with others online. Therefore, an approach wherein the individual's capacity to be in charge of life events is made salient in the consumer's mind may be more suitable. At-risk individuals undeniably need help in the form of effective interventions and support (Hartston 2012), but in these cases it may be more fruitful to focus on others drivers of compulsive and excessive behaviors such as a lack of self-control, low self-esteem, depression, and anxiety (Clark and Calleja 2008; DeSarbo and Edwards 1996; Elliott 1994; Roberts 1998; Rose and Dhandayudham 2014). Depending on the situation, boosting control can be accomplished through educating consumers about precommitment (Ariely and Wertenbroch 2002), mental budgets and self-control (Krishnamurthy and Prokopec 2010), self-control exercises (e.g., posture, mood-regulation, food diary; Muraven, Baumeister, and Tice 1999),

or even where we keep our tempting treats (Wansink, Painter, and Lee 2006). One example available currently in the market is a kitchen container that has a lock that will not open for a designated period of time.

It has been over six decades since it was suggested marketing principles can be used to promote health and welfare (Wiebe 1951). For example, the same marketing techniques that Philip Morris uses to sell cigarettes (e.g., the idea of “cool,” social influence) can be used to discourage smoking (Hastings and Soren 2003), though more research is needed to uncover which techniques translate to a prosocial context (Peattie and Peattie 2003). An important decision to consider is whether to focus on downstream behavior change (e.g., influence consumers to quit smoking, eat less) or upstream behavior change (e.g., influence policy makers to restrict access to cigarettes, improve food nutrition; Hastings, MacFadyen, and Anderson 2000). There are numerous examples of social marketing campaigns aimed at influencing downstream behavior in areas such as environmentalism (Thørgensen 1997), alcohol use (Black and Smith 1994), and cigarette smoking (Black et al. 1993). Although modern social marketing aims to increase the adoption of prosocial behaviors (Andreasen 1994; Kotler and Zaltman 1971) and is a key component of social change and health improvement (Gordon and Moodie 2009), there is still the potential for these messages to backfire.

### Alternative Explanations

Throughout this dissertation, there are mentions of alternative explanations that could theoretically explain the influence of the addictive frame on subsequent behavior. First, there are instances where the use of the “addiction” frame is used in a positive manner to describe a product or activity that consumers love (e.g., “The new podcast is so addictive! You have to listen it!”). Therefore, the use of the frame in these instances could arguably increase the desirability of the product, how exciting the product appears, or even the perceptions of how popular or prevalent that product is (i.e., descriptive social norms; Cialdini, Reno, and Kallgren 1990). These alternative explanations were tested and ruled out, in Study 7, 9, and 10, by asking participants to rate the desirability and how exciting the focal product or activity is to them, and there were no differences found across conditions. This means the forbidden fruit effect (Pechmann and Shih 1999) is not occurring, whereby framing something as being addictive doesn’t make it appear more desirable, exciting, dangerous, or “sexy.” Also, in Study 2B, a reference point was provided to participants to counteract any potential increase in the perceived prevalence of the behavior. The effect of the addictive frame was still found even in the presence of this reference point, ruling out the activation of descriptive social norms as an alternative

explanation. Finally, guilt was ruled out in Study 2B where participants did not report any changes in guilt ratings based on the condition they were assigned. This suggests that a diminished sense of personal responsibility (internal attribution; Hagen et al. 2016; Hur et al. 2015) due to the “addictiveness” of chocolate cannot explain the increase in consumption. Given there were no differences found in guilt, licensing (i.e., when consumers are given metaphorical “permission” to indulge; Khan and Dhar 2006; Merritt, Effron, and Monin 2010) can also be ruled out. That said, licensing occurs after an individual behaves in a positive or moral manner, which influences subsequent decision-making (e.g., drinking a diet soda “licenses” an individual to eat an extra piece of fatty pizza), but in the current research no such moral boost in the self-concept (Khan and Dhar 2006) was provided. Ruling out these several alternative explanations provides more credence to the theory that perceived control is the sole mediating mechanism.

Given the similarities between perceived control and several other constructs, it is also important to address each of these as well. First, personal power (Lammers, Stoker, and Stapel 2009) is more related to money, knowledge, and less dependency on others, rather than an internal sense of control over one’s own behavior. Second, self-efficacy (Bandura 1977) is related to the extent or strength of one’s belief in one’s own ability to

complete tasks and reach goals. In the context of dieting and exercise, self-efficacy is a relevant construct as it predicts how long someone will stick to a workout regimen or a diet. However, it is more related to, for example, whether an individual has the ability to afford healthy food, knows what foods to buy and how to prepare them, has access and the time to attend a gym. That is, whether the specific behavior is in the “repertoire” of the individual (e.g., “I could make something healthy but the ingredients cost too much”). Given individuals present in these studies would have arguably enacted self-control in similar situations previously, the behavior is already in their repertoire, but their perceptions of control have been weakened. Under the Theory of Planned Behavior (Ajzen 1988, 1991) perceived control and self-efficacy were considered synonyms; however, more recently, it is agreed that they are distinct constructs (Conner and Armitage 1998). Finally, the construct of agency (Bandura 1989) is more related to free-will and is more global, whereas perceived control is, as shown in Study 6, domain specific.

## CONCLUSION

In conclusion, this dissertation suggests that the use of addictive frames is a double-edged sword. They can sometimes illicit useful rehabilitation for established addictions, but when misapplied to everyday products and activities that are not inherently addictive they can diminish an individual's sense of control over a non-addictive, but potentially destructive, behavior. Our objective should not be to stop these everyday behaviors altogether, unlike with recognized addictions, because using social media, viewing pornography, going shopping, and eating chocolate and granola, are safe, enjoyable, and sometimes necessary. Although it appears alteration of the current policy is required in order to benefit society, this dissertation is the first step in uncovering how to do so more effectively. There is a need to protect high-level users without negatively influencing regular consumers, but using the addictive frame is not the solution. This research advocates for a different framing related to the overconsumption of everyday products and activities, but the current view of everyday addictions is strongly rooted in the minds of consumers meaning it will be difficult to change their impressions and associations.

## APPENDIX A – CHOCOLATE ADDICTION ARTICLES

### *Not Addictive Frame:*

#### **Can You Become Addicted to Chocolate? No!**

People often say they are addicted to chocolate, but few studies have ever shown any evidence for true addiction.

There is little evidence to support the idea that chocolate has mood-enhancing ingredients. Many people point to certain compounds found in chocolate that are said to produce a “buzz” as evidence chocolate is addictive.

But most of these compounds also exist in higher concentrations in other foods with less appeal, such as avocados or cheese, and do not cause addiction. Furthermore, even if they were present in large enough quantities, these chemicals cannot make you addicted to chocolate.

So even if the appetite for chocolate sometimes seems strong, this is not the same thing as an addiction. This reveals that people have much more control over their consumption of chocolate than they previously believed.

### *Addictive Frame:*

#### **Can You Become Addicted to Chocolate? Yes!**

Usually said jokingly, “chocoholic” actually nods to a potentially serious question: Can a person become addicted to chocolate? The answer is absolutely.

The three essential components of chocolate addiction, that are related to other forms of addiction, are intense craving for chocolate, loss of control over that craving, and continued consumption of chocolate.

Chocolate triggers reward pathways in the brain in the same way drugs and alcohol can. It is believed chocolate stimulates opioids, or “pleasure chemicals”, because chocolate contains several biologically active ingredients, all of which can cause psychological sensations like those of other addictive substances.

Restricting chocolate can induce a stress-like response consistent with the “withdrawals” seen in addiction, which drastically increases the desire for chocolate.

*Control:***Who is Sheila Dewey?**

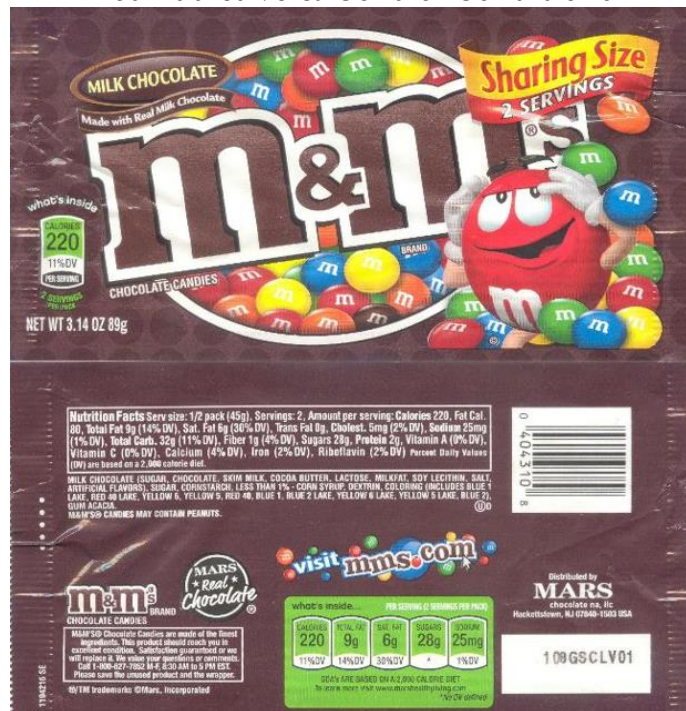
Sheila Dewey is a British playwright, writing for theatre since 1982. In 1991 she received the Thames Television Theatre Writers' Award, and in 1992 was awarded an Arts Council Bursary.

Her plays include a number of works produced at the Warehouse Theatre in Croydon, including *Turner's Crossing*, and the biographical play *Bumps*, on the relationship between Gertrude Jekyll and Edwin Lutyens.

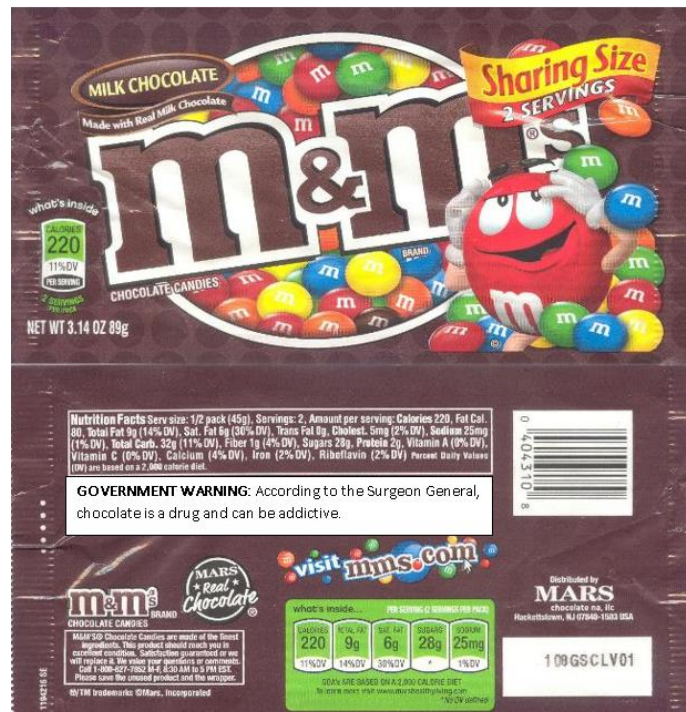
She was resident Playwright, Literary Manager and Associate Director at the Warehouse Theatre, where she ran the Writers' Workshop over a decade. Previous to this, Dewey was one of the founders of the Tabard Theatre.

## APPENDIX B – CHOCOLATE STIMULI

*Not Addictive & Control Conditions:*



*Addictive Condition:*



*All Conditions:*



**APPENDIX C – SHOPPING ADDICTION ARTICLES***Not Addictive Frame:***Can You Become Addicted to Shopping? No!**

People readily label themselves as "shopaholics," but few studies have ever shown any evidence for addiction or that shopping has mood-enhancing properties.

Shopping cannot be addictive because there are no physiologically addictive components to it. Furthermore, consumers will not experience withdrawal if they don't "give in" and shop.

So even if the desire for shopping sometimes seems strong, this is not the same thing as an addiction. This reveals that people have much more control over their shopping behavior than they previously believed.

*Addictive Frame:***Can You Become Addicted to Shopping? Yes!**

Usually said jokingly, "shopaholic" actually nods to a potentially serious question: Can a person become addicted to shopping? The answer is absolutely.

Shopping triggers reward pathways in the brain in the same way drugs and alcohol can by stimulating "pleasure chemicals."

Shopping addiction, officially called omniomania, is characterized by a widespread urge to shop and purchase items despite no need for such items or a necessary ability to afford such items.

Restricting shopping can induce a stress-like response consistent with the "withdrawals" seen in addiction, which drastically increases the "need" for shopping followed by uncontrollable desires.

*Control:***What is Shopping?**

A retailer, or shop, is a business that presents a selection of goods or services and offers to sell them to customers for money or other goods.

Shopping is an activity in which a customer browses the available goods or services presented by one or more retailers with the intent to purchase a suitable selection of them.

More recently, customers are focused towards online shopping, where customers can order products from different regions around the world.

Online shopping has grown in popularity over the years, mainly because people find it convenient and easy. Though, traditional shopping destinations such as malls are still popular.

APPENDIX D – SHOPPING PRODUCTS



## APPENDIX E – PORNOGRAPHY ADDICTION

### *Addictive Frame:*

#### **Can you become addicted to pornography? Yes!**

Usually said jokingly, "porn addict" actually nods to a potentially serious question: Can a person become *addicted* to pornography? The answer is absolutely.

Pornography triggers reward pathways in the brain in the same way drugs and alcohol can by stimulating "pleasure chemicals."

Pornography addiction is characterized by an extreme urge to view and continue to view pornography, often at the expense of other activities.

Restricting pornography can induce a stress-like response consistent with the "withdrawals" seen in addiction, which drastically increases the "need" for pornography followed by uncontrollable desires.

### *Control:*

#### **What is Pornography?**

Pornography is the portrayal of sexual subject matter for the purpose of sexual arousal.

Pornography may be presented in a variety of media, including books, magazines, postcards, photographs, sculpture, drawing, painting, animation, sound recording, film, video, and video games.

The term applies to the depiction of the act rather than the act itself, and so does not include live exhibitions like sex shows and striptease.

The primary subjects of pornographic depictions are pornographic models, who pose for still photographs, and pornographic actors or porn stars, who perform in pornographic films.

*Explanation of Softcore vs. Hardcore:*

We are interested in people's perceptions of "softcore" versus "hardcore" pornography. That is, in your mind what do you consider to be "softcore" and "hardcore?" There are no right or wrong answers. The terms are defined below.

**Softcore:** sexually suggestive images that do not show penetration, genitalia, or actual sexual activity.

**Hardcore:** sexually explicit images depicting sexual acts.

Although each term is clearly defined, there are many pornographic images that can fall somewhere in between the two definitions.

On the next page you will be shown a random image that we would like you to rate on a 7-point scale from "Softcore" to "Hardcore."

Then on subsequent pages, you will be randomly shown other images and asked to indicate how "hardcore" the new image is relative to the previous image you saw.

Viewing and rating the images is voluntary. You may stop at any time.

**APPENDIX F – SOCIAL MEDIA ADDICTION ARTICLE***Addictive Frame:***Can Social Media be Addictive? Yes!**

Usually said jokingly, "social media addict" actually nods to a potentially serious question: Can a person become addicted to social media? The answer is absolutely.

The three essential components of social media addiction, that are related to other forms of addiction such as with drugs (e.g., cocaine) and alcohol, are intense craving to use social media, loss of control over that craving, and continued use of social media.

Social media use triggers reward pathways in the brain in the same way drugs and alcohol can. It is believed social media stimulate "pleasure chemicals," which can cause psychological sensations like those of other addictive substances.

Restricting social media use can induce a stress-like response consistent with the "withdrawals" seen in addiction, which drastically increases the desire for social media.

## APPENDIX G – APP INSTALLATION INSTRUCTIONS

We would now like you to download, install, and use a time management app called *RescueTime* over a one week period. At the end of this period, it is up to you whether you keep or uninstall the app.

*RescueTime* is a personal analytics service that shows you how you spend your time on your smartphone/tablet and provides tools to help you be more productive.

We will now give you the instructions on how to download and install the *RescueTime* app.

We would like you to install the app on your smartphone/tablet (whichever you use most) and let it run in the background. At the end of the week, *RescueTime* will give you a detailed summary of your activity.

During the downloading process, if you accidentally close this survey window, you can return to the survey/instructions by clicking the link originally provided to you by Qualtrics.

Each page is a different stage of the downloading/installation process, so please don't move forward until all of the steps have been successfully completed.

### Creating a RescueTime Account

Follow the instructions below, and after completing each step check the corresponding box.

Once you have completed all of the steps, you can move to the next screen where you will be instructed to download the *RescueTime* app.

- 1) Using your primary device's (i.e., the smartphone/tablet that you use the most) web browser, visit [www.rescuetime.com](http://www.rescuetime.com).
- 2) Tap on the green "Sign Up" button.
- 3) Scroll down and under the "RescueTime Lite" section, tap on the green "Sign Up Now" button.
- 4) Scroll down to the "Account Info" section. Type in the email address you wish to use, and choose a password.
- 5) Under the "Choose a Plan" drop-down list, make sure that "Lite: Free Forever" is selected.

- 6) Tap “Sign Up!”
- 7) You will receive an automatic email if your registration was successful.
- 8) Follow the prompt/instructions to download the app to your smartphone/tablet.
- 9) You should be diverted to a “Welcome to RescueTime” screen. Tap on the “Finish setting up your account” button but do not change anything. Scroll to the bottom and tap “Finish up.”
- 10) RescueTime will also suggest downloading the desktop applications as well. Do not do this. We are only interested in the smartphone app. If you wish to also install it to your computer, you may do so at the end of the week.
- 11) Click the arrow below to view the instructions on the next page on how to install the RescueTime app to your smartphone/tablet (if you have not already done so).

### **Installing RescueTime to Portable Devices**

The last step is to install the RescueTime application to your [Android only] smartphone/tablet (whichever is your primary device). After completing each stage, move to the next screen to complete the rest of the survey.

- 1) Access the Google Play store on your smartphone/tablet and search for the “RescueTime Time Management” application.
- 2) Tap install and follow the instructions given.
- 3) After opening the app, enter the email address (and password if asked) you used to create your RescueTime account to log in when prompted. This ensures that all usage is linked to your account.

Now that you’ve successfully installed the RescueTime program to your smartphone/tablet, please do not open the RescueTime application or website for the first week (but make sure you remain logged in).

The program will run in the background, and at the end of the week we will show you how to sort through the information.

This period is going to act as the baseline and will allow you to learn more about your current device usage. Please use your device as you normally would.

We will send you a follow-up survey at the end of the week. You may now click the arrow to conclude this survey.

## APPENDIX H – GRANOLA ARTICLE

*Addictive Frame:***Can you become addicted to granola? Yes!**

Usually said jokingly, "granola addict" actually nods to a potentially serious question: Can a person become addicted to granola? The answer is absolutely.

The three essential components of granola addiction, that are related to other forms of addiction such as with drugs (e.g., cocaine) and alcohol, are intense craving for granola, loss of control over that craving, and continued consumption of granola.

Granola triggers reward pathways in the brain in the same way drugs and alcohol can. It is believed granola stimulates "pleasure chemicals" because granola contains several biologically active ingredients, all of which can cause psychological sensations like those of other addictive substances.

Restricting granola consumption can induce a stress-like response consistent with the "withdrawals" seen in addiction, which drastically increases the desire for granola.

**APPENDIX I – PEAS ARTICLE***Addictive Frame:***Can you become addicted to peas? Yes!**

Usually said jokingly, "pea addict" actually nods to a potentially serious question: Can a person become addicted to peas? The answer is absolutely.

The three essential components of pea addiction, that are related to other forms of addiction such as with drugs (e.g., cocaine) and alcohol, are intense craving for peas, loss of control over that craving, and continued consumption of peas.

Peas trigger reward pathways in the brain in the same way drugs and alcohol can. It is believed peas stimulate "pleasure chemicals" because they contain several biologically active ingredients, all of which can cause psychological sensations like those of other addictive substances.

Restricting pea consumption can induce a stress-like response consistent with the "withdrawals" seen in addiction, which drastically increases the desire for peas.

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