NORMATIVE PORTIONS: ALIGNMENT OF DESCRIPTIVE AND INJUNCTIVE NORMS FOR PORTION SIZE REDUCTION

By

Svandis Unnur Giolitto

A Thesis Presented to

The Faculty of Humboldt State University

In Partial Fulfillment of the Requirements for the Degree

Master of Arts in Psychology: Academic Research

Committee Membership

Dr. Chris Aberson, Committee Chair

Dr. Gregg Gold, Committee Member

Dr. Ethan Gahtan, Committee Member

Cortney Koors, Program Graduate Coordinator

December 2015
Abstract

NORMATIVE PORTIONS: ALIGNMENT OF DESCRIPTIVE AND INJUNCTIVE NORMS FOR PORTION SIZE REDUCTION

Svandis Unnur Giolitto

The health conditions associated with overweight and obesity pose a considerable financial burden on the US healthcare system, and large portion sizes are partly responsible for the rise in the prevalence of overweight. Portion size legislation and sugar taxes have repeatedly been overturned, and public health efforts often utilize ineffective means of conveying their message, such as fat shaming. Social norms, when portrayed correctly, are strong stimulators of behavior. They consist of descriptive and injunctive norms. Descriptive norms tell us what others are actually doing, whereas injunctive norms tell us what is approved or disapproved of in a given setting. The error frequently made by communicators using social norms is to portray an undesirable behavior as unfortunately widespread, which pulls the target’s behavior in two opposing directions. The injunctive norm detracts from the behavior, but the descriptive norm increases it by portraying the behavior as common. This study aimed to reduce portion sizes of M&Ms among students by having them view a public service announcement (PSA) that contained agreeing descriptive and injunctive norms about portion size practices, compared with students who viewed a PSA with disagreeing norms. Contrary to my prediction, however, those who viewed the aligned norms PSA ate nearly twice as...
much as those who viewed the misaligned norms. The Deviance Regulation Theory can explain this result. It states that attempts to change a behavior should focus their appeals on those who deviate from the norm rather than those who comply with it.
Acknowledgements

Foremost, I would like to express my gratitude to my supervisor Dr. Chris Aberson for the constructive feedback and for the solid statistical foundation I gained in his courses that set me up to perform my own research. I would also like to thank the rest of my committee: Dr. Gregg Gold for going above and beyond his duties as a committee member and helping me to formulate my study in its early stages with patience and enthusiasm, and Dr. Ethan Gahtan for his insightful comments and hard questions during my proposal defense. Furthermore I would like to thank experimenters Ryan Lenhoff, Laura Kiewel, Raymond Alvarez, Katharine Earle, and Katherine Maxey for conscientiously running participants for the study. This thesis would not have been possible without your help. I am also grateful to Edwin Vasquez for organizing the lab in which this study ran and especially for his knowledgeable assistance with SPSS. Last but not least I want to thank my husband for his love, encouragement, motivation, and unwavering support throughout this process.
# Table of Contents

Abstract ......................................................................................................................................................... ii

Acknowledgements ........................................................................................................................................ iv

List of Figures .................................................................................................................................................. viii

Introduction ................................................................................................................................................... 1

Eating Behavior .............................................................................................................................................. 5
  Normative Model of Eating ....................................................................................................................... 7
  Social facilitation ....................................................................................................................................... 8
  Modeling .................................................................................................................................................... 8
  Impression management ............................................................................................................................ 9

Overweight: Causes and Consequences ....................................................................................................... 10

Normative Influence on Behavior ............................................................................................................. 12
  Descriptive Norms ................................................................................................................................. 12
  Injunctive Norms ................................................................................................................................... 13
  Alignment of Norms ............................................................................................................................... 15

Focus Theory of Normative Conduct ........................................................................................................ 16

Hypothesis .................................................................................................................................................... 19

Rationale ....................................................................................................................................................... 20

Method ......................................................................................................................................................... 22
  Participants ............................................................................................................................................... 22
  Procedure ............................................................................................................................................... 24
  Instrumentation and Materials ................................................................................................................ 25
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent variable</td>
<td>25</td>
</tr>
<tr>
<td>Dependent variable</td>
<td>25</td>
</tr>
<tr>
<td>Quiz and debriefing</td>
<td>26</td>
</tr>
<tr>
<td>Experimenters</td>
<td>26</td>
</tr>
<tr>
<td>Data Analyses</td>
<td>27</td>
</tr>
<tr>
<td>Benefits and Potential Risks</td>
<td>27</td>
</tr>
<tr>
<td>Results</td>
<td>28</td>
</tr>
<tr>
<td>Assumptions</td>
<td>28</td>
</tr>
<tr>
<td>Normal distribution of variables.</td>
<td>28</td>
</tr>
<tr>
<td>Homogeneity of variance</td>
<td>28</td>
</tr>
<tr>
<td>Research Hypothesis</td>
<td>28</td>
</tr>
<tr>
<td>Supplementary Analyses</td>
<td>29</td>
</tr>
<tr>
<td>Analysis excluding non-eaters</td>
<td>29</td>
</tr>
<tr>
<td>Analysis excluding those who did not pay attention to the manipulation</td>
<td>29</td>
</tr>
<tr>
<td>Difference between sexes</td>
<td>29</td>
</tr>
<tr>
<td>Regression with hunger as moderator</td>
<td>30</td>
</tr>
<tr>
<td>ANCOVA with hunger as covariate</td>
<td>31</td>
</tr>
<tr>
<td>Regression with persuasiveness as moderator</td>
<td>31</td>
</tr>
<tr>
<td>Discussion</td>
<td>33</td>
</tr>
<tr>
<td>References</td>
<td>37</td>
</tr>
<tr>
<td>Appendix A</td>
<td>48</td>
</tr>
<tr>
<td>Appendix B</td>
<td>50</td>
</tr>
<tr>
<td>Appendix C</td>
<td>52</td>
</tr>
</tbody>
</table>
Appendix D ................................................................................................................................. 59
Appendix E .................................................................................................................................. 61
Appendix F .................................................................................................................................... 64
Appendix G .................................................................................................................................... 65
Appendix H .................................................................................................................................... 67
List of Figures

Figure 1. Anti-Obesity poster from New York City Department of Health and Mental Hygiene .......................................................... 3

Figure 2. Georgia's "Stop Sugarcoating" campaign, aimed at fighting childhood obesity. 4
Introduction

City and state governments have the authority to prevent—or swiftly curtail—threats to food safety when short-term problems arise such as Salmonella or Listeria contamination. In recent years, some cities expanded their authority to address long term food safety concerns related to poor eating habits such as obesity, diabetes, heart disease, and some cancers. The Affordable Care Act, passed in 2010, required chain restaurants nationwide to publish calorie counts for menu items. In 2006, New York City became the first major city in the US to enact a ban on the use of trans fats in restaurants, followed by California, Philadelphia, and Seattle. Since then the FDA has followed suit, ordering food companies to phase out its use by 2018. Former New York City Mayor Michael Bloomberg along with the New York City Department of Health addressed portion size though a drink-size limit of 16 ounces for sugar-sweetened beverages sold by restaurants, movie theaters, and food vendors. The soda industry, however, strongly contested the legality of these regulations, and the drink-size cap has since been deemed unenforceable. Proposals for a soda tax have been defeated in Philadelphia, New York state, and San Francisco; only Berkeley, CA has succeeded in adopting such a tax despite strong industry objection. And the soda industry’s opposition understandable, given that a tax on sugared beverages would decrease consumption (Brownwell et al., 2009), threatening their bottom line. This is where the interests of the soda industry are in direct conflict with the interests of public health.
Obesity and childhood obesity are the focus of many public health efforts in the US. First Lady Michelle Obama has fought childhood obesity with her “Let’s Move” campaign that, along with the Healthy, Hunger-Free Kids Act, limits the amount of junk food available to school children and sets a maximum calorie amount for school lunches. However, that effort has been met with considerable backlash from both students and politicians claiming the regulations are too intrusive. Given the difficulty of passing legislation to decrease sugar consumption, it would behoove policy makers to have effective means of influencing consumers’ portion sizes without the use of legal force.

Public health policy makers do not regularly make use of established social influence strategies in their appeals to the public about healthier eating (Herman & Polivy, 2005). Instead they rely on information-intensive campaigns and scare tactics, modeled after anti-smoking campaigns whose aim was to shock viewers. An ad in New York City’s anti-obesity campaign, pictured in figure 1, below, depicts a diabetic amputee and warns about the dangers of supersized portions of fast food and sugared sodas.
Negative ads such as this one have received strong criticism for stigmatizing the overweight—especially when they depict overweight children (see Fig. 2). Indeed, in spite of their widespread use, scare tactics and shaming elicit lower levels of intention to comply than do positive messages encouraging healthy behavior (Puhl, Peterson, & Luedicke, 2012). Thus, the goal of this research is to help public health communicators effectively frame their messages in support of smaller portion sizes, without the use of shaming or stigmatization.
Figure 2. Georgia's "Stop Sugarcoating" campaign, aimed at fighting childhood obesity.
Eating Behavior

Eating behavior is made up of both what food is sought out as well as how much of it is consumed. The answer to the “what?” can be understood from an evolutionary standpoint. The behaviors and psychological traits that exist today were the ones that made humans more fit to survive and pass on their genes tens of thousands of years ago, in the environment of evolutionary adaptedness (Buss & Kenrick, 1998; Buss, 2004). During this time, sweet and fatty foods were rare and provided the concentrated energy essential for survival. The individuals who craved those foods and sought them out had a better chance of surviving, thus passed on the preference for high-sugar and high-fat foods to the next generation. These preferences persist in the current population even though they are no longer adaptive (because these food features are no longer scarce).

As to the amount consumed, growing portion sizes play a substantial role. Commonly eaten foods have increased considerably in portion size since they were introduced (Young & Nestle, 2003; Young, 2005). For example, when McDonald’s opened in the 1950’s, an order of French fries was 2.4 ounces. In 2002 the median portion size had nearly tripled at 7.1 oz. Additionally, the original Hershey bar was 0.6 ounces as compared to currently available bars ranging from 1.6 to 8.0 ounces (Young & Nestle, 2003). This “portion distortion” affects eaters in every realm of consumption. At restaurants, super-sized portions are reliably 250% larger than the regular portion (Schwartz & Byrd-Bredbenner, 2006), and in supermarkets the number of larger sized portions increased tenfold between 1970 and 2000 (Young, 2005). Portions have even
increased in the home—the serving sizes in cookbook recipes are larger today than in earlier editions, and the surface area of the average dinner plate has increased by 36% since 1960 (Wansink & van Ittersum, 2007).

Amount consumed is a direct function of both portion size (Diliberti, Bordi, Conklin, Roe, & Rolls, 2004; Rolls, Morris, & Roe, 2002; Rolls, Roe, Meengs, & Wall, 2004; Rozin, Kabnick, Pete, Fischler, & Shields, 2003) and serving vessel size (Wansink & Kim, 2005; Wansink & Park, 2001). This effect is not only robust, it is underestimated by those that it affects. In a series of four independent field studies testing this relationship, participants using larger packages and plates served themselves an average of 31% more than matched control groups (Wansink & Sobal, 2007). Interestingly, even when researchers made participants aware of the disparity, 98% insisted that the amount of food they ate was not influenced by the size of the package or plate they were using. When people consume more energy than they use, excess energy is stored as fat and can lead to overweight or obesity.

People eat more from bigger containers, even when they are not hungry and the food is not palatable. In a study of moviegoers, participants received either a medium or large bucket of stale popcorn. Although they were not hungry (having been instructed to eat dinner before the study began) and the popcorn was stale, those who had large buckets ate 51% more than those with medium-sized buckets (Wansink & Park, 2001). A replication of this study used 14-day-old popcorn. Moviegoers with the larger buckets ate 35% more than their counterparts with the medium-sized buckets (Wansink & Kim, 2005).
One proposed explanation for the effect of portion size on food intake is called unit bias (Geier, Rozin, & Doros, 2006). The unit bias is a heuristic—or mental shortcut—used to assess what is the appropriate amount of food to consume in one sitting. In three separate studies researchers offered Tootsie Rolls, soft pretzels, and M&Ms in high-traffic areas of offices or apartment buildings. They varied the unit of food by a factor of two to four, depending on the product. For example, soft pretzels were cut in half, and M&Ms had either a tablespoon or quarter-cup-sized serving utensil. At the end of each day researchers compared the mean weights of the food taken, and it was significantly greater for the larger units than for the smaller units. These studies serve as an example that portion size does indeed influence food intake.

**Normative Model of Eating**

The amount people eat is not only shaped by mental shortcuts about serving size; it is also shaped by social normative information. Among adolescents for example, consumption of snacks and soft drinks is associated with the descriptive norm of their peers’ intake (Wouters, Larsen, Kremers, Dagnelie, & Geenen, 2010), but it is even more strongly associated with the perceived norms of their peers than their peers’ actual behavior (Perkins, Perkins, & Craig, 2010). Unfortunately both adolescents (Lally, Bartle, Wardle, 2011) and adults (Perkins & Haines, 2005) misperceive the norms of their peers, believing them to behave in more unhealthy ways than they actually do. This indicates that by simply bringing attention to the real descriptive norm, people may increase their healthy eating habits.
Consumption can be explained from a normative standpoint, through the normative model of eating (Herman, Roth, & Polivy 2003). In the presence of palatable food, and in the absence of distinct signals of satiety, a person’s food intake is shaped by three social factors: social facilitation, modeling, and impression management. Each of these factors is explained in turn.

**Social facilitation.** When eating in groups, people tend to eat more than they do when eating alone (de Castro, 1990, 1991), as long as the group consists of friends or family members and not strangers (de Castro, 1994). This social facilitation is mediated by meal duration (Pliner, Bell, Hirsch, & Kinchla, 2006). That is, the longer the meal, the more people consume. Social facilitation of eating happens even when controlling for environmental variants that could disinhibit eating, such as increased likelihood of alcohol consumption when dining in groups (Feunekes, de Graaf, & van Staveren, 1995).

**Modeling.** According to the modeling explanation of eating, people look outward to social cues as a reference for how much to eat. Modeling effects have been studied both in controlled lab experiments and field studies. In these studies, participants ate up to as much as, but not more than the model (who was a confederate; Roth, Herman, Polivy, & Pliner 2001). The model had either a facilitating or inhibiting effect on the participant’s consumption, dependent upon whether the model ate a large or small amount (Nisbett & Storms, 1974). This inhibitory effect of the model’s consumption amount is strong enough to override hunger. Even after 24 hours of food-deprivation, participants conformed to a model that ate minimally (Goldman, Herman, & Polivy, 1991).
Somewhat related to the effects of modeling is the principle of social proof. People determine what is correct by finding out what others think is correct (Lun, Sinclair, Whitchurch, & Glenn, 2007). This principle is particularly relevant to the way people decide what constitutes correct eating behavior. In a study of fast food marketing targeted at Asian, Hispanic, African American, and White children ages 2-12 and their families, consumption of fast food increased in response to greater exposure to advertising depictions of fast food consumption (Grier, Mensinger, Huang, Kumanyika, & Stettler, 2007). This increase was not a result of the advertisements changing parents’ attitudes toward fast food. Rather, consistent with the mechanism of social proof, it was because parents perceived fast food consumption as more normal in their communities.

Impression management. Norms against eating excessively are prevalent in the US. These norms take the form of well-substantiated, negative stereotypes that apply to individuals who eat in excess (Vartanian, Herman, & Polivy, 2007). These stereotypes motivate compliance by threatening to withhold social acceptance, which is a potent spur for behavior (Williams, 2007). Therefore people tend to avoid being seen—by self and by others—as excessive eaters. This is the impression management aspect of eating regulation. Taking into account all three social influences on eating, it is reasonable to conclude that the presence of others can either facilitate eating or suppress it, depending on the circumstances.
Overweight: Causes and Consequences

According to the World Health Organization (WHO; 2006) and the Center for Disease Control and Prevention (CDC; 2010), more than one in three adults in the US is overweight and nearly one in ten is obese. The prevalence of overweight in the US rose sharply from the 1980’s through 2003, and though it has since leveled off, it remains high (Flegal, Carroll, Kit, & Ogden, 2012; Ogden, Carroll, Kit, & Flegal, 2014). Overweight and obesity can have grave health consequences such as cardiovascular disease (most commonly heart disease and stroke), type II diabetes, even some cancers such as endometrial, breast, and colon have been tied to overweight. These conditions can cause considerable disability or premature death. The rising obesity rates suggest that today’s youth may be the first generation to have a shorter life expectancy than their parents (Olshansky et al., 2005). In addition to lower quality of life, obese persons require more costly medical care than do their normal-weight counterparts, which places a considerable financial burden on the medical care system (Finkelstein, Trogdon, Cohen, & Dietz, 2009). Specifically, obesity is predicted to add nearly $344 billion to the nation’s annual health care costs by 2018 and will account for more than 21% of health care spending (Thorpe, 2009). This means that more than one in every five dollars spent on health care will be associated with a condition that is both preventable and reversible.

Genetic factors play a role in susceptibility to obesity (Bouchard, 2010; Rankinen et al., 2006). However, changes in the genetic makeup of populations occur too slowly to be responsible for its rapid rise, so this alone cannot explain the obesity epidemic. Body
weight is determined by interactions between the environment and genetics (Maes, Neale, & Eaves, 1997). This means that just because an individual is genetically susceptible to overweight, he or she is not destined to become so. By consuming less energy through reasonable portion size practices, one can prevent or even reverse overweight (Hill, Wyatt, Reed, Peters, 2003). Unfortunately, an environment rife with opportunities to consume large amounts of highly palatable, inexpensive, and energy-dense food has promoted a culture in which overeating is the norm.
Normative Influence on Behavior

Social normative information is the communication of norms. Norms can be descriptive or injunctive in nature. In the following review I elaborate on each kind of norm and give examples of studies that use them to shape behavior. Finally, I address the necessary conditions for norms to effectively shape behavior and common mistakes made by communicators.

Descriptive Norms

Descriptive norms inform a person of what most others do in a given situation (Cialdini Reno, & Kallgren, 1990). In so doing, these norms offer insight into what has been adaptive behavior for others in the same setting. For instance, in an unfamiliar situation, a person is inclined to look around to see what other people are doing and follow suit. This tendency can be explained in the context of social learning (Bandura, 1986), wherein the observation of others’ behavior enables a person to rapidly identify (and thus learn) the apparently wisest thing to do in a given situation.

The descriptive norm serves as a “magnetic middle” that draws people toward it, irrespective of whether they are above or below the norm (Goldstein & Mortensen, 2012). People tend to measure the appropriateness of their behavior by how far they deviate from the norm. For example, if an employer aiming to decrease the frequency with which his employees arrived late sent out a memo communicating that the average employee comes in late three days per month, then the employees with the highest late
rate would likely decrease the frequency with which they arrived late. Unfortunately, the very same memo may cause those employees with better than average late-rates to come in late more often. This has been termed the backfire effect, and it is an undesirable consequence of communicating just the descriptive norm when aiming to change behavior. Fortunately, including the injunctive norm in the persuasive appeal can prevent the backfire effect.

**Injunctive Norms**

Injunctive norms indicate what is commonly approved or disapproved within a relevant group; in other words, it is the group’s moral rules. Whereas descriptive norms refer to what people actually do, injunctive norms refer to what people ought to do. The motivation to comply comes from informal social rewards or punishments associated with the respective compliance or noncompliance with those norms. Descriptive and injunctive norms are sometimes confused as a single construct because in many cases they are in agreement. That is, what is commonly approved in a particular context is also what is commonly done, but this is not always the case (Cialdini et al., 1990; Cialdini, Kallgren, & Reno, 1991). For example, although most people probably believe that a driver should come to a complete stop at a stop sign (injunctive norm), most drivers come close to stopping without actually doing so (descriptive norm).

The efficacy of injunctive norms in reducing the backfire effect was demonstrated in a study of household energy use (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Households received normative information in the form of hand-written feedback
about their energy consumption. Half of the participating households were randomly assigned to receive only the descriptive norm (average household energy use) as feedback, and the other half received both the descriptive norm and an injunctive norm message. The injunctive norm was communicated with a hand-drawn smiley- or frown-face included with the messages left for the residents, that indicated the respective approval or disapproval of the amount of energy used by the household. As predicted, the descriptive normative information brought about energy savings among those who were above the norm and a backfire among those who used less than average energy—those households actually increased their energy use to be more like the norm. The incorporation of the injunctive norm in the message served to eliminate the backfire effect while still decreasing energy use among those above the mean.

Another study designed to demonstrate the combined effects of descriptive and injunctive norms found that hotel guests were most likely to reuse their towels when a sign in the bathroom indicated that other guests had requested such conservation measures (injunctive norm) while also mentioning the large number of guests who had participated in the conservation program by reusing their towels (descriptive norm; Schultz, Khazian, & Zaleski, 2008).

Injunctive and descriptive norms have considerably different effects on behavior. In a study of petrified wood theft, researchers created two different signs instructing visitors not to take home a souvenir of petrified wood from the Petrified Forest National Park in Arizona (Cialdini, 2003; Cialdini et al., 2006). One message was descriptive in nature and the other was just injunctive. The injunctive norm sign communicated
disapproval of the theft. It stated, “Please don’t remove the petrified wood from the park, in order to preserve the natural state of the Petrified Forest” and had a picture of a visitor stealing, with a red circle-and-bar (the universal “banned” symbol) over his hand. The descriptive normative sign emphasized the prevalence of theft by informing visitors that, “Many past visitors have removed the petrified wood from the park, changing the natural state of the Petrified Forest,” and was accompanied by an image of park visitors taking pieces of wood. This descriptive sign was similar to the actual sign that the Petrified Forest was using as a theft deterrent. The researchers placed marked pieces of petrified wood along walkways and alternated which of the two signs was displayed at the entrance to each pathway. Compared to the no-sign control condition in which 2.9% of the pieces were stolen, the descriptive norm message resulted in significantly more theft (7.9%). However, the injunctive norm message resulted in slightly less theft (1.7%) than the control condition. This study demonstrated two points about norms: portraying a high rate of undesirable behavior actually serves to normalize it, leading to an increase in the behavior, and that the communication of descriptive and injunctive norms can have markedly different effects on behavior.

Alignment of Norms

Social normative information is an effective means of shaping behavior. Public service communicators encouraging healthy or environmentally friendly behavior often make use of that appeal (Cialdini, 2005). However, they commonly make the mistake of drawing attention to the large number of people acting in an undesirable way and then
contrast it with an injunctive plea to behave otherwise. This misalignment of norms pulls the target’s behavior in two opposing directions. One prominent example of these conflicting norms can be found in a 1970’s anti-littering public service announcement (PSA) created by the Keep America Beautiful Organization (Cialdini et al., 1991). It features a traditionally dressed Native American canoeing down a river that is littered with garbage, and industrial plants are blowing out black smoke in the distance. As a teardrop rolls down his face, a narrator says, “People start pollution. People can stop it.” The teardrop conveys the injunctive norm against littering, but the accompanying descriptive norm message is that people do litter and pollute. That descriptive norm may undermine the intended message disapproving of those behaviors. A communicator can do unintentional damage when depicting an undesirable behavior to be unfortunately prevalent. Therefore, when discouraging a behavior that is commonplace, communicators would be better served to focus the audience on what kind of behavior is approved or disapproved in that setting.

Focus Theory of Normative Conduct

Social norms serve to both stimulate and direct people’s behavior. The focus theory of normative conduct (Cialdini et al., 1990, 1991) aims to explain the specific role of social norms and the conditions required for norms to influence behavior. This theory has two central components. The first is that descriptive and injunctive norms are distinct from one another, and they have noticeably different effects on behavior. The second is
that any given norm is likely to shape behavior only to the extent that it is prominent in one’s mind. The two features will be explained in turn.

Descriptive and injunctive norms shape behavior through different routes (Cialdini, 2003; Jacobson, Mortensen, & Cialdini, 2011). Individuals focusing on the descriptive norm are applying the heuristic of performing what proved to be adaptive behavior for most others in the same situation. By contrast, complying with injunctive norms is more cognitively demanding, as it requires a person to have an understanding of what others are likely to approve. Compliance with an injunctive norm may involve setting aside what is easiest in the short term in order to gain social approval; this may require effortful self-regulation. To test the differences between the two norms as they relate to intention to perform the portrayed behavior, researchers created PSAs that featured either descriptive or injunctive norms in favor of recycling (Cialdini, 2003). Descriptive norms had a direct relationship to the intention to perform the behavior, but when participants were exposed to the injunctive message, intention to recycle was mediated by the persuasiveness of the message. Because the intention to comply was mediated by another variable, it required mental regulation and did not happen automatically; whereas following descriptive norms happened directly and automatically.

The second component of the focus theory is that a person’s likelihood to comply with a norm is dependent upon whether or not the norm is prominent in the person’s awareness—otherwise known as the norm’s salience. Therefore, even under the conditions outlined above (descriptive and injunctive norms working as a team), if the norm is not relevant in the target’s mind during the opportunity to comply, it will not
elicit the desired behavior. A study of littering behavior among library patrons returning to their cars in a parking garage demonstrated the value of norm salience (Reno, Cialdini & Kallgren, 1993). Researchers manipulated the descriptive norm for littering by making the parking garage either litter-free or heavily littered. To draw attention to the descriptive norm, confederates did one of three things: picked up a piece of trash, littered a piece of trash, or just walked by (control condition). The littering measure addressed whether the participant threw a handbill left on their windshield onto the ground. As predicted, patrons whose attention had been drawn to the descriptive norm littered less, but only when the environment was already litter-free. When patrons’ attention was drawn to the injunctive norm that littering is bad, they littered less, regardless of the descriptive litter norm. So, when descriptive and injunctive norms are misaligned or conflicting, behavior change is likely to be consistent with whichever type of norm is more salient.

Social normative influence is as a powerful tool in shaping behaviors from water conservation (Goldstein, Cialdini, & Griskevicius, 2008; Schultz et al., 2007) to littering reduction (Reno et al., 1993). However, nearly all applications of normative influence in the public health domain focus on college drinking behaviors (e.g., Perkins & Berkowitz, 1986; Perkins, 2012; Chauvin, 2012; Hummer, LaBrie, Lac, Sessoms, & Cail, 2012). Few studies address the use of norms to influence eating behavior. This study aims to reduce portion sizes people choose by exposing them to social normative information.
**Hypothesis**

Individuals exposed to an aligned-norms message that conveys the descriptive norm of small portion sizes and the injunctive norm approving of those smaller portion sizes will consume less food than participants exposed to a misaligned norms message that portrays the conflicting norms that overeating is bad (injunctive) but widespread (descriptive).
Rationale

Communication of descriptive norms can change an individual’s behavior to match the norm (Cialdini et al., 1991; Cialdini, 2009). Furthermore, when coupled with a message about others’ approval or disapproval of that particular behavior, the persuasive power of a normative message is significantly increased, as long as the respective approval or disapproval is in agreement with the descriptive norm (Schultz et al., 2007, 2008; Goldstein et al., 2008; Cialdini et al., 2006). In their efforts to raise awareness and combat harmful behavior, communicators often make the mistake of characterizing the bad behavior as regrettably prevalent. Portraying a high rate of undesirable behavior serves to normalize it, often leading to increases in the behavior in question (Schultz et al., 2007). Additionally it focuses the audience on the unfavorable descriptive norm, and that decreases the persuasiveness of the injunctive message that the behavior is bad.

One benefit to using normative information is that people underestimate the extent to which their actions are determined by similar actions of others in a given situation (Cialdini, 2007; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008), so they are not likely to feel manipulated. In this “introspection illusion,” people devalue the behavioral evidence of their conformity in favor of introspective thoughts and beliefs related to their decision to conform (Pronin, Berger, & Molouki, 2007). That is, when people are asked why they behaved the way they did, the answer is rarely, “because other people did it that way.” Additionally, the perceived norms of one’s peer group significantly predict intentions to engage in healthy behavior (Terry & Hogg, 1996).
Therefore focusing the audience on the ways in which people are opting for reasonable portion sizes should lead to greater compliance with the message.

This study is a novel application of the combination of descriptive and injunctive norms in effecting behavior change. The efficacy of alignment versus misalignment of communicated norms has been tested with pro-environmental behaviors such as water and energy conservation, but it has not yet been published in the context of health habits involving portion size reduction.
Method

Participants

A power analysis was performed in G*power 3 (independent means t-test; Faul, Erdfelder, Lang, & Buchner, 2007) to determine the sample size necessary to detect a meaningful difference between groups. As to the referent effect size for the purposes of the power analysis, no parallel study has been published. The most similar studies range from a small effect, $d = 0.12$ (towel reuse in hotel rooms; Schultz et al., 2008) to a medium effect, $d = 0.63$ (household energy conservation; Schultz et al., 2007).

The following examples were used as an estimate of expected effect size because they are similar in context to the current study. In their study of towel reuse and norms communication, Schultz et al. (2008) had a small effect size of $d = 0.12$ when comparing the combined norms to all other conditions. When comparing the combined norms to the control (information-only appeal) they also had a small effect, $d = 0.33$. Cialdini and colleagues’ study of petrified wood theft compared percentage of wood pieces stolen in each condition, so I calculated an $h$ statistic as a representation of effect size. This is interpreted the same way as Cohen’s $d$. The comparison of both the injunctive message (with strong focus) to all other conditions combined and the descriptive message (strong focus) to all other conditions combined yielded a small effect size ($h = 0.23$ and $h = 0.17$, respectively). The comparison most relevant to the current study was between descriptive norms only and injunctive norms only. The size of that effect was small to
moderate, at $h = 0.31$. Schultz and colleagues (2007) found a medium effect size when using injunctive normative information to correct the backfire caused by descriptive normative information alone, $d = 0.63$.

In spite of the small effect found in some similar studies, I expected a larger effect for three reasons. First, the current study is a true experiment, with random assignment to groups, as opposed to the self-selecting groups common in field studies. Second, the short span of time between manipulation and the measurement of the dependent variable lead me to expect a larger effect from the manipulation. Third, most studies on normative influence relied on a sign to serve as the independent variable, which people may or may not have read. The current study encouraged participants to pay attention to the manipulation by administering a quiz on its contents immediately after exposure. In addition to motivating participants to pay attention, the quiz allowed me to assess whether they did so. Due to the greater amount of control in the current study as compared with a field study, I expected a medium to large effect size. With an expected effect of $d = 0.6$ and $\alpha = .05$, two-tailed, the power analysis revealed that 90 participants would be necessary to yield a power of .80. That sample consists of 45 participants in each condition.

Due to time constraints, the study sample consisted of 77 participants (19 males, 57 females, one unidentified). I recruited them from the psychology undergraduate subject pool at Humboldt State University with IRB approval number 12-158, and they received class credit for their participation. The YouTube playlist failed to load twice, resulting in the loss of two participants. Of the 77 participants, 41 were Caucasian, 16
were Hispanic/Latino, eight were multiracial, six were Asian/Asian American, three were African-American, and three unknown.

**Procedure**

Participants reported to BSS 404, where the researcher introduced them to the purported purpose of the study (Appendix A). This served mainly as a distractor and stated that we were interested in the way different environments affect recall of videos that participants were to view. The introduction included instructions to watch the provided videos and to let the researcher know when those videos were over.

Researchers assigned each participant to a condition by flipping a coin. The videos were contained in a YouTube playlist, so the researcher only needed to press play once for each participant. The manipulation video that participants viewed belonged to one of two conditions: Either the conflicting norms condition or the agreeing norms condition.

Taking into consideration the possibility of short attention spans, the manipulation video was preceded by only one short distractor clip and followed by several more distractor clips. This way it was not so conspicuous as to be the first clip viewed, but it appeared near the beginning.

When the videos finished playing, the researcher brought in the quiz, along with a bowl containing a premeasured amount of M&Ms. The M&M bowl was not made available at the beginning of the study because the manipulation had not yet taken place. For realistic effect, the researcher claimed to have forgotten to make the bowl available sooner and ad-libbed an explanation that the M&Ms are a token of appreciation for
participation, inviting the participant to eat as much as he cares to. Then the researcher again left the participant alone with the quiz and bowl. The quiz was designed to be long enough to give the participant ample time to consume some of the M&Ms. After the participant completed the quiz, the researcher debriefed and dismissed the participant. Then the remaining M&Ms were weighed.

**Instrumentation and Materials**

**Independent variable.** Manipulation videos in both conditions were preceded and followed by unrelated distractor clips taken from YouTube (Appendix H). Each condition contained an injunctive norm and a descriptive norm about overeating. The injunctive norm was identical in both conditions, and the descriptive norm was altered to create the respective misalignment or alignment of norms communications.

**Misaligned norms.** This video communicated conflicting norms (Appendix B). It conveyed that overeating is unfortunately common (injunctive norm: “overeating is bad,” descriptive norm: “but many people do it”). This is a popular appeal used by anti-obesity campaigns.

**Aligned norms.** The agreeing norms condition video communicated both injunctive and descriptive norms in favor of reasonable portion sizes (injunctive norm: “overeating is bad,” descriptive norm: “[look how many] people are eating reasonably”; Appendix B).

**Dependent variable.** All participants received 300 grams (10.58 ounces) of M&Ms in a bowl with a serving spoon, and after each participant, the amount that
remained was weighed using a scale that provided a digital readout in one-gram increments. The portion size was measured as the difference in weight before and after food was eaten.

**Quiz and debriefing.** Participants filled out a “video quiz” (Appendix C), which included distractor questions about the clips viewed. It was made up of items such as, “Do you believe that the presence of a window in the room helped or hindered your ability to recall details from the videos?” The recall assessment was followed by the Meaning in Life Questionnaire (MLQ; Steger, Frazier, Oishi, & Kaler, 2006; Appendix D) and the COPE questionnaire (Carver, Scheier, & Weintraub, 1989; Appendix E). These two scales are included for the purpose of making the quiz longer, and they are not incorporated into the hypothesis.

The debriefing was delivered verbally (Appendix G). It explained the purpose of the study and allowed the participant the opportunity to withdraw. At that point researchers also assessed whether the participant had suspicions about the role of the M&Ms. Lastly researchers provided my contact information, should the participant feel the need to add anything at a later time.

**Experimenters**

I recruited five research assistants (RAs) who performed the data collection. The RAs were trained to run participants in accordance with the approved protocol.
**Data Analyses**

I performed an independent samples t-test to determine whether there was a meaningful difference in amount consumed between participants in the two conditions. The dependent variable was measured as the difference between the amount of M&Ms in the bowl before and after consumption.

**Benefits and Potential Risks**

This research may provide an example of descriptive and injunctive norms shaping portion size practices, which public health policy makers could utilize in framing their messages to the public about reasonable portion sizes. Risks to the participants included possible annoyance or anger about being deceived for the purpose of the study. This was addressed in the debriefing with an explanation and an apology (Appendix G).
Results

Assumptions

Normal distribution of variables. The dependent variable was positively skewed and leptokurtic, and a square root transformation brought the data closest to normality. It brought the skewness (0.525) to standard error (0.274) ratio down to 1.9 and the kurtosis (-0.302) to standard error (0.541) ratio down to -0.6, which is within the desired 3:1 ratio.

Homegeneity of variance. In order to reduce the likelihood of Type I error, the ratio of largest to smallest variance should be less than 10:1 and the ratio of largest to smallest sample size should be less than 4:1 (Tabachnick and Fidell, 2007). With variances of 5.9 and 4.1 and sample sizes of 41 and 36, respectively, the data meet both of these criteria.

Research Hypothesis

An independent samples t-test compared the amount eaten by participants who were exposed to aligned norms and those exposed to misaligned norms about portion size. Contrary to my prediction, those exposed to the aligned norms about portion sizes ate nearly twice as much ($M = 20.2$, $SD = 24.0$) as those exposed to the misaligned norms ($M = 10.9$, $SD = 15.6$), $t(75) = 2.22$, $p = .03$, $d = 0.46$. The means and standard deviations reported are from the untransformed dependent variable. Misaligned norms
viewers ate less than those who viewed the aligned norms, and the size of the effect was medium.

Supplementary Analyses

**Analysis excluding non-eaters.** To examine whether the unequal representation of non-eaters (14 in the misaligned norms condition and 8 in the aligned norms condition) affected the outcome, I repeated the comparison from the primary research question, excluding participants who ate nothing. There was not a significant difference in grams eaten between the aligned norms group ($M = 25.2$, $SD = 24.4$) and the misaligned norms group ($M = 17.9$, $SD = 16.6$), $t(53) = 1.19$, $p = .24$, $d = 0.35$.

**Analysis excluding those who did not pay attention to the manipulation.** Items 14 and 15 on the video quiz (Appendix C) addressed whether the participant could recall the PSA that contained the norms messages. This t-test included only those who answered both questions correctly, indicating that they had paid attention to the video clip. Those who paid attention to the aligned norms PSA ($M = 20.6$, $SD = 24.2$, $n = 38$) still ate more than those who paid attention to the misaligned norms PSA ($M = 10.5$, $SD = 15.6$, $n = 35$), $t(71) = 2.47$, $p = .02$, $d = 0.50$. The size of the effect was medium, and removing those who did not pay attention only decreased the sample size by four participants.

**Difference between sexes.** There was no significant difference in grams eaten between males ($M = 17.7$, $SD = 19.7$) and females ($M = 14.8$, $SD = 21.2$), $t(74) = -0.57$, $p$
The variance was similar between males and females (ratio within 10:1), and though the size of the groups differed, the ratio was within the desired 4:1 criterion.

**Regression with hunger as moderator.** This analysis addressed whether participants’ hunger level moderated eating behavior. I screened the hunger variable for normality both numerically and graphically. Numerically, I divided the skew and kurtosis by their respective standard errors and each was within 3:1. Graphically, I used both a histogram and a P-P plot to examine normality of distribution. Then I examined a box plot for the absence of outliers. To test regression assumptions, I began with multicollinearity. All values in the condition index were less than the maximum 30, and no two variance proportions in a row were greater than .50, thus meeting the collinearity diagnostic criteria (Belsley, Kuh, & Welsch, 1980). I examined residuals by creating a scatter plot with a Loess line to evaluate homoscedasticity and linearity, a P-P plot and a histogram with the normal curve displayed for reference to assess the normality of residuals. Lastly, I centered both hunger level and condition to further reduce multicollinearity, and then I multiplied the two centered variables to create the interaction.

A hierarchical multiple regression predicted the amount eaten from condition and hunger level and then from their interaction in its own block. Altogether, experimental condition, hunger level, and their interaction explain 6% of the variance in grams eaten, \( R^2 = .061, F(3,72) = 1.57, p = .20 \). Exposure to the misaligned norms was negatively related to grams eaten (\( b^* = -.23, p = .04, sr^2 = -.23 \)), and hunger level was unrelated to grams eaten (\( b^* = .05, p = .68, sr^2 = .05 \)). The interaction was not significant (\( b^* = .06, p \))
= .58, \( sr^2 = .06 \). That is to say, the participants’ hunger level and the interaction of condition and hunger level did not contribute meaningfully to the variance in grams eaten, and there was no interaction to probe.

**ANCOVA with hunger as covariate.** Because there was no interaction between hunger and condition, I can perform an ANCOVA to control for participants’ hunger at the time of the study. The assumption for ANCOVA is homogeneity of regression or homogeneity of covariance. That is, the regression coefficient needs to be similar across both levels of the independent variable. So, hunger has to have a similar correlation with grams eaten across both the aligned and misaligned conditions. There was no interaction between condition and hunger in the previous analysis, so these data pass the assumption test. When controlling for the effect of hunger, the difference in grams eaten between norms conditions is no longer significant, \( F(1,73) = 3.40, p = .07, \eta^2 = .04 \).

**Regression with persuasiveness as moderator.** During the debriefing, participants were asked to rate the persuasiveness of the PSA on a ten-point scale. The persuasiveness variable was normally distributed, and examination of residuals revealed no problems with homoscedasticity, linearity, or normality. I used Mahalanobis scores to determine the absence of outliers, and collinearity diagnostics to rule out troublesome overlap of predictors. Additionally, I centered the persuasiveness variable before creating the interaction with centered condition. Altogether, experimental condition, participants’ subjective rating of message persuasiveness, and their interaction predicted 7% of the variance in grams eaten, \( R^2 = .07, F(3,72) = 1.82, p = .15 \). As in the previous moderator analysis, misaligned norms were negatively related to grams eaten (\( b* = -.25 \),
$p = .03, sr^2 = -.25)$. Rating of message persuasiveness was unrelated to grams eaten ($b^* = .11, p = .36, sr^2 = .11$), and the interaction was not significant ($b^* = -.06, p = .63, sr^2 = - .06$).
Discussion

Students who viewed the aligned norms message about portion size consumed nearly twice as much as those who viewed the misaligned norms message. That is the opposite of what I predicted. I explore potential limitations to the study including instrumentation issues, sample size, and the feasibility of using norms to change eating behavior, as well as possible directions for future study.

One question is whether the manipulation of the independent variable was effective. Was a YouTube playlist the best medium to communicate the norms? I chose a video playlist because it allowed me to control the time that elapsed between the IV manipulation and DV measure, and it afforded me the ability to both encourage attention paid to the manipulation and to verify whether participants paid attention via quiz. A shortcoming of this method, however, was my inability to verify that the norm was prominent in the participants’ awareness at the time of the DV measure. Even though participants could recall the video when prompted, that does not indicate that they were thinking of it while consuming the M&Ms. According to the focus theory of normative conduct (Cialdini et al, 1991), the norm had to be salient in the participants’ minds while the M&Ms were available in order to elicit the desired behavior.

In aiming to change behavior the source of the information must appear consistent with the message. In the current study the person in the PSA was overweight, and that may have interfered with the alignment of the descriptive norms being portrayed. The overweight appearance of the narrator was in conflict with the message that most people
eat reasonable portion sizes and avoid overeating. This poses a threat to the validity of the aligned norms condition.

Each manipulation script contained a fabricated descriptive norm statistic (Appendix B). One depicted high rates of overeating, and the other depicted high rates of reasonable portion size practices. Although the statistics were made to seem ostensibly true, it is possible that participants in either condition knew they were made up. That may have affected participants’ eating behavior, especially if one statistic was more obviously incorrect than the other.

Additional limitations involve sample size and generalizability. For adequate power I needed a sample size of 90 and a large effect. Although the present study came close to a sample of 90, the observed effect sizes were medium. With a larger sample I would be able to detect the presence of more subtle effects. For instance, maybe hunger does moderate amount eaten. In my supplementary analyses, both controlling for hunger level and leaving out the non-eaters each made the relationship between condition and DV non-significant. With a small sample, a small relationship is undetectable. From a public health perspective small relationships are worth identifying. On a scale as large as the US population, where the annual medical cost of obesity is $147 billion (Finkelstein et al., 2009), even a small effect in reduction of obesity and the associated health costs would be beneficial. Furthermore, a larger sample would not be as statistically sensitive to outliers and unequal distribution non-eaters.

The limitation of generalizability refers to how long the behavior change lasts. In order to improve public health, the message must produce a change in portion size
behavior beyond the immediate time following exposure to the norms messages. This study examined only the behavior immediately following the manipulation.

Most behavior-change studies that use descriptive and injunctive norms focus on pro-environmental behaviors such as recycling (Cialdini, 2003), littering (Reno et al., 1993), petrified wood theft (Cialdini et al., 2003, 2006), and energy conservation (Schultz et al., 2007, 2008; Goldstein, 2008). There is less literature in support of descriptive and injunctive norms shaping eating behavior. This may be a case of publication bias, where it has been studied and not published due to undesirable study outcomes. Future studies might isolate the contribution of the injunctive norm by comparing agreeing descriptive and injunctive norms with the descriptive norm alone. That would use a study structure already shown to be effective with energy use (e.g., Schultz et al. 2007, 2008) and apply it to portion size reduction. Such a study may provide insight into what kinds of behaviors we can and cannot reasonably change with norms.

The norms messages in the current study focused on the number of people adhering to the norm. That might explain why it didn’t elicit the desired behavior change. According to deviance regulation theory (DRT; Blanton & Christie, 2003) a message to change behavior should focus on deviators from the norm, painted in a positive or negative light depending on whether that deviance is good or bad. This is because behaviors that are rare are considered to be more central to one’s identity than behaviors that are common. A message consistent with this theory would emphasize the positive attributes of people who do not overeat, if overeating is the norm, or portray overeaters unfavorably if most people do not overeat. One caveat to the application of
DRT to eating behavior is the negative portrayal of overeaters, like fat shaming, leads to lower intention to comply with the appeal to be healthier (Puhl et al., 2012). This indicates a potential limit to the applicability of DRT to eating behavior.

One final question is whether it is necessary to decrease everyone’s portion size, as the current study aimed. If the average portion size is reasonable, then those eating less do not need to further decrease their own portions. Efforts to eliminate the backfire effect may be unnecessary, because those who eat less than average can eat slightly more (being pulled in the direction of the magnetic center that is the descriptive norm) without doing themselves harm. A future study may aim to decrease portion size by portraying only a desirable descriptive norm.

Although the results of this study were the opposite of what I expected based on extant literature, it holds several clues to the reasons for the failure to support my predictions. Research is a continuous process, and a thorough understanding of eating behavior and the influence of norms will continue to improve approaches to decrease portion sizes.
References


Appendix A

Researcher Protocol

Participants will arrive up to three at a time to BSS 409. If more than one participant is scheduled, stagger participants long enough to get each person started individually. Other participants are told to wait in their respective assigned lab until the researcher arrives.

RA: “Thank you for participating the Aligned Recollection Study. There are two things we are going to ask you to do today. First, we will ask you to view a short series of video clips taken from YouTube. To open the videos, simply click on the link, beginning from the first one. When the videos are over, we ask that you fill out a brief recall assessment pertaining to those videos. I will bring you the recall assessment after you view the videos.

When you are ready to view the videos click the first link. When they finish playing, please crack you door like this (demonstrate) to let me know you are done. Are you ready to begin?”

When participant opens the door back up, bring in the post-video recall assessment. Instruct participant to answer the questions to the best of his/her knowledge. Immediately after participant begins quiz, bring in bowl of M&Ms.

RA ad lib: “Sorry, I forgot to bring you these sooner. Another researcher brought them in today as a ‘thank you’ for participating, so help yourself.” Instruct participant to crack the door after completing the quiz, as before with the videos.
When participant is finished, collect the quiz and the bowl. Return and read the debriefing script.
Appendix B

Manipulation script

**Condition 1 (misaligned norms message):**

Injunctive norm (IN): “We have all been taught that overweight and obesity have grave health consequences such as high blood pressure and diabetes. In many cases, it’s caused by big portion sizes. The American Medical Association and most health professionals recommend that people reduce their portion sizes in order to reach or maintain a healthy weight.”

Descriptive norm (DN): “Unfortunately, overweight and overeating are rampant among young adults in California. Eight out of 10 students polled say they have gone back for seconds even when they were already satisfied by what they ate. Some examples of this would be going back for a third helping at your favorite all you can eat Chinese Buffet, or by opting for this [size shown] three-serving-size sweet tea over a more reasonable single-serving size of tea like this one [other size shown]. Most people who buy this [show larger size] consume it in one sitting, even though it is meant to serve as three whole servings.”

**Condition 2 (aligned norms message):**

IN: “We have all been taught that overweight and obesity have grave health consequences such as high blood pressure and diabetes. In many cases, it’s caused by big portion sizes. The American Medical Association and most health professionals
recommend that people reduce their portion sizes in order to reach or maintain a healthy weight.”

DN: “Two out of three adults in the US are not overweight. This can be attributed to the trend that young adults are making strides toward healthier lifestyles by spending more time being active and taking advantage of farmer’s markets for fresh, local food. But most importantly, they are eating reasonable portion sizes and drinking fewer sugared beverages. Eight out of ten college students polled say they serve themselves reasonable portion sizes to avoid overeating. For example, a single serving of meat takes up no more space than the palm of your hand [demonstrate]. And there are more ways we can remember how big a portion is—like with more dense foods such as cheese and sweets, a serving is the same size as your thumb [demonstrate] from the last joint to the tip. These are just a couple examples of the visual cues we have at our disposal when judging how much is appropriate to eat.”
Appendix C

Video Quiz

ID # ___________________ (leave blank)

Please answer the following questions about the videos you viewed. Some questions are very detailed. If you do not know the answer, it is okay—just do your best. There are some questions about you at the end—please keep in mind that all of your responses are confidential. If you feel uncomfortable for any reason, you may withdraw from the study without penalty. Note that this form is double sided—please fill out the front and back of all pages.

1. How many videos did you view?
   1  2  3  4  5  6  7  8  9

2. Was there a unifying theme?    YES    NO
   
   If yes, what was it?

3. Did the presence of a window in the room help or hinder your ability to recall details about the videos?
   1. Helped
   2. Hindered
   3. N/A (no window in room)

4. Did the color of the lighting help your ability to recall details from the videos?
   YES    NO

5. If the desk had been uncomfortably high, would you have had trouble paying attention to the videos?    YES    NO
6. Please take a few moments to describe your impression of the HSU student

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

7. Where was the female HSU student from?
   a. Wichita
   b. Sacramento
   c. Los Angeles
   d. San Francisco

8. What difference was noted by the female student comparing Humboldt to her previous home?
   a. More uptight
   b. Smaller community
   c. More relaxed
   d. Wetter

9. What was the event for which she came to Humboldt for the first time?
   a. Freshman orientation
   b. Graduation
   c. Job interview
   d. First day of classes

10. What was the pattern on her shirt?
    a. Polka dots
    b. Stripes
    c. Flowers
    d. Plaid

11. What was her hairstyle?
a. Curly
b. Pulled back
c. Straight
d. Side-swept

12. In the obesity clip, what color shirt was the lady wearing?
   a. White
   b. Blue
   c. Purple
   d. Yellow

13. Was there anything in the background of that clip?
   a. Candles
   b. Photo frames
   c. Futon
   d. Nothing/blank wall

14. How does the narrator suggest we avoid becoming overweight?
   1. Being more active
   2. Eating smaller portions
   3. Getting a gym membership
   4. Start practicing yoga

15. If she used props, what were they?
   a. A microphone
   b. Her hand
   c. A baseball
   d. Iced tea cans

16. In the following video, how many myths were dispelled?
    1. 10
    2. 20
    3. 30
    4. 50

17. What day in 1776 was the Declaration of Independence signed?
   1. July 4
2. August 2
3. December 10
4. June 6

18. Did Einstein fail math? YES NO

19. What does the word “sushi” mean?
   1. Raw fish
   2. Fresh fish
   3. White rice
   4. Sour rice

20. In addition to communication, what is another reason that chameleons change color?
   1. Camouflage
   2. Temperature regulation
   3. It facilitates predation
   4. They do not actually change color

21. Does eating rice make pigeons explode? YES NO

22. Where are Danishes from?
   1. Denmark
   2. Great Danes
   3. Berlin
   4. Austria

23. Would you explode in the vacuum of space? YES NO

24. Was Fidel Castro given a trial by US Congress? YES NO

25. Is the Great Wall of China visible with the naked eye from outer space? YES NO

26. Can sharks get cancer? YES NO

27. If you split an earthworm in half, will it become two worms? YES NO

28. What is the terminal velocity of a penny?
1. 30-50 MPH
2. 80-100 MPH
3. 300-500 MPH
4. 800-1000 MPH

29. Where was the Caesar salad invented?
   1. Rome, Italy
   2. Tijuana, Mexico
   3. Acapulco, Mexico
   4. Vatican City

30. What color was the myth-dispeller’s hair?
   1. Red
   2. Black
   3. Blonde
   4. Brown

31. Please take a moment to imagine that someone put you in charge of creating a video about correcting common misconceptions. In the space below, list 3-5 facts that you would talk about. These can be facts you believe to be misunderstood by most people, or just things you find interesting and would like to share.
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

32. In the social policy clip, was the speaker wearing eyeglasses? YES NO

33. According to the social welfare clip, who contributes to the welfare of citizens?
   1. The government
   2. Private corporations
   3. Informal interpersonal relationships
4. All of the above

34. What is social policy all about? Promoting people’s welfare and ________________
   1. Dependence
   2. Independence
   3. Well-being
   4. Justice

35. Where do children become educated?
   1. At school
   2. At home
   3. Everywhere

36. Does family play a part in social welfare?       YES       NO

37. According to the clip about personal information online, what is one way to assess how much of your information is available online?
   1. Search yourself
   2. Contact the personal information database
   3. Ask a genie in a bottle
   4. Wait until someone brings it up in conversation

38. What can you do if your information online is incorrect or if you did not agree to make it public?
   1. Pout
   2. Contact the content owner and ask that it be corrected/removed

39. Why should you periodically go back and check what information of yours is online?
   1. Websites may change their privacy settings without notice
   2. To see how successful you look
   3. Because other people are doing it

40. Which of the following appeared in the background during the internet privacy clip?
   1. Skyscraper
   2. Ocean
   3. Fireplace
   4. Playground
41. How many people were featured in the social networking clip?
   1. 1
   2. 2
   3. 3
   4. 4

42. What did the people in the clip have in common?
   1. Striped shirt
   2. Glasses
   3. Brown hair
   4. Facial hair

43. Would you recommend that a friend participate in this study?  YES  NO
# Appendix D

## Meaning in Life Questionnaire

**Instructions:** Take a moment to think about what makes your life feel important to you. Respond to each statement as truthfully and accurately as you can, and remember that there are no right or wrong answers.

<table>
<thead>
<tr>
<th></th>
<th>Absolutely Untrue</th>
<th>Mostly Untrue</th>
<th>Somewhat Untrue</th>
<th>Neither True or False</th>
<th>Somewhat True</th>
<th>Mostly True</th>
<th>Absolutely True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I understand my life’s meaning …</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>I am looking for something that makes my life feel meaningful…..</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>I am always looking to find my life’s purpose…………</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>My life has a clear sense of purpose…</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>I have a good sense of what makes my life meaningful...</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>I have discovered a satisfying life purpose…………</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>I am always searching for something that makes my life feel significant………</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>I am seeking a purpose or mission</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
for my life………

9. My life has no clear purpose………

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

10. I am searching for meaning in my life………………

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>
Appendix E

The COPE Questionnaire

**Instructions:** Please indicate what you generally do and feel when you experience stressful events. Read each statement then indicate what you usually do rather than what you think most people do.

<table>
<thead>
<tr>
<th></th>
<th>I usually don’t do this at all</th>
<th>I usually do this a little bit</th>
<th>I usually do this a medium amount</th>
<th>I usually do this a lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I take additional action to try to get rid of the problem………</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>I concentrate my efforts on doing something about it. ………</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>I do what has to be done, one step at a time…</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>I take direct action to get around the problem……………….</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>I try to come up with a strategy about what to do………………………….</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>I make a plan of action……………………</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>I think hard about what steps to take…………….</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>I think about how I might best handle a problem…………….</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td>I put aside other activities in order to concentrate on this…..</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>I focus on dealing with this problem, and if necessary let other things slide a little……</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>I keep myself from getting distracted……….</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12.</td>
<td>I try hard to prevent other things from interfering with my efforts at dealing with this.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13.</td>
<td>I force myself to wait for the right time to do something…..</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14.</td>
<td>I hold off doing anything about it until the situation permits.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
15. I make sure not to make matters worse by action too soon…
   1 2 3 4
16. I restrain myself from doing anything too quickly……………………………………
   1 2 3 4
17. I ask people who have had similar experience what they did.
   1 2 3 4
18. I try to get advice from someone about what to do…………
   1 2 3 4
19. I talk to someone to find out more about the situation………
   1 2 3 4
20. I talk to someone who could do something concrete about the problem…………
   1 2 3 4
21. I talk to someone about how I feel…………
   1 2 3 4
22. I try to get emotional support from friends or relatives……
   1 2 3 4
23. I discuss my feelings with someone……
   1 2 3 4

<table>
<thead>
<tr>
<th></th>
<th>I usually don’t do this at all</th>
<th>I usually do this a little bit</th>
<th>I usually do this a medium amount</th>
<th>I usually do this a lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>24. I get sympathy and understanding from someone…………</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. I look for something good in what is happening…………</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. I try to see it in a different light, to make it seem more positive……………………………</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. I learn something from the experiences………</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. I try to grow as a person as a result of the experience……………………………………</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. I learn to live with it……………………</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. I accept that this has happened and that it can’t be changed. …………………………………</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. I get used to the idea that it happened………</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. I accept the reality of the fact that it happened</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
33. I seek God’s help……………………………. 1 2 3 4
34. I put my trust in God………………………. 1 2 3 4
35. I try to find comfort in my religion……….. 1 2 3 4
36. I pray more than usual……………………. 1 2 3 4
37. I get upset and let my emotions out……….. 1 2 3 4
38. I let my feelings out……………………… 1 2 3 4
39. I feel a lot of emotional distress and I find
    myself expressing those feelings a lot………. 1 2 3 4
40. I get upset, and am really aware of it……….. 1 2 3 4
41. I refuse to believe that it has happened………. 1 2 3 4
42. I pretend that it hasn’t really happened………. 1 2 3 4
43. I act as though it hasn’t even
    happened………… 1 2 3 4
44. I say to myself “this isn’t
    real.”…………………… 1 2 3 4
45. I give up the attempt to get what I
    want………. 1 2 3 4
46. I just give up trying to reach my
    goal………… 1 2 3 4
47. I admit to myself that I can’t deal with it, and
    quit trying……………………………… 1 2 3 4
48. I reduce the amount of effort I’m putting into
    solving the problem…………………….. 1 2 3 4
49. I turn to work or other substitute activities to
    take my mind off
    things…………………… 1 2 3 4
50. I go to the movies or watch TV, to think
    about it less……. 1 2 3 4
51. I daydream about things other than
    this………… 1 2 3 4
52. I sleep more than usual……………………… 1 2 3 4
Appendix F

Demographic Information

What is your sex?

1. Male  2. Female

What is your ethnicity?

1. White
2. African-American
3. Hispanic/Latino
4. Asian/Asian-American
5. Multiracial
6. Other (please specify) ____________________

What is your college year?

Freshman    Sophomore    Junior    Senior    Graduate

What is your major?

1. Psychology
2. Other (please specify) ____________________

Do you consider yourself normal weight?

0 1 2 3 4 5 6 7 8 9
Very under-weight     Slightly under-weight     Slightly over-weight     Very over-weight

In the three hours leading up to your participation today, did you eat a meal?

Meal    Snack    Nothing
Appendix G

Debriefing Script

“Thank you for your participation today. We just have a few more questions for you. Can you tell me what the study was about?” (write down the response)

“Did you make any connection between the videos and the M&Ms?” (record response)

“Now that you have completed the study, I would like to give you a bit more information about the purpose of the study. We want to know how various social norms, when communicated in different ways, have different effects on how much people eat. One of the videos you viewed had a message about overeating. It was a Public Service Announcement that we made up, and we are interested in whether it affected your portion size of M&Ms. We apologize for misleading you, but please understand that this was necessary in order to get your most natural response. At this point you have the opportunity to withdraw from the study if you so choose, and your data will be discarded. Also, please know that any and all data collected here today will remain entirely confidential, and results of the study will only be presented in aggregate. That is, only mean values will be presented. Do you have any questions or concerns right now?” Let participant respond and record feedback/comment if relevant.

“If you have any concerns regarding this project, or any dissatisfaction with any part of this study, you may contact the IRB Chair, Dr. Ethan Gahtan, at eg51@humboldt.edu or (707) 826-4545. If you have questions regarding your rights as a participant, you may report them to the IRB Institutional Office at Humboldt State University, Dr. Rhea
Williamson, at Rhea.Williamson@humboldt.edu or (707) 826-5169. Additionally, you may direct any other questions or concerns to graduate researcher, Svandis Giolitto at suk6@humboldt.edu or (602) 405-4432 or her faculty supervisor Dr. Chris Aberson at cla18@humbold.edu or (707) 826-3670.”

“Now think about the video with the lady in the purple shirt who talked about overeating. Can you remember it?” Give participant time to recall it. “On a scale of one to ten, with ten being the highest, how persuasive did you find that message about overeating?”

1  2  3  4  5  6  7  8  9  10

“Lastly, I am going ask that you promise not to divulge any details about this study. This includes talking about it to classmates, roommates, or anyone who might possibly participate. Can you agree to keep this confidential?” [get verbal confirmation] “Thanks for your participation.”
Appendix H

Videos

1. HSU first impression: [http://www.youtube.com/watch?v=Qfcscsd6tuY](http://www.youtube.com/watch?v=Qfcscsd6tuY)

2. Manipulation Video (one of the following):
   - Condition 1 (Misaligned): [https://www.youtube.com/watch?v=hw2oV1Vgcyk](https://www.youtube.com/watch?v=hw2oV1Vgcyk)
   - Condition 2 (Aligned): [https://www.youtube.com/watch?v=c30AL0HSZVs](https://www.youtube.com/watch?v=c30AL0HSZVs)

3. Fifty common myths dispelled: [http://www.youtube.com/watch?v=kxIglMrrhQM](http://www.youtube.com/watch?v=kxIglMrrhQM)

4. What is social policy?: [http://www.youtube.com/watch?v=Ccfr_50dFP4](http://www.youtube.com/watch?v=Ccfr_50dFP4)

5. How to manage your information online:
   [http://www.youtube.com/watch?v=vUw407RnZpA](http://www.youtube.com/watch?v=vUw407RnZpA)