

The Association between the Moral  
Foundations Theory, Ethical Concern and Fast Food  
Consumption.

by

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## ABSTRACT

Health knowledge alone does not appear to lead to sustained healthy behavior, suggesting the need for alternative methods for improving diet. Recent research shows a possible role of moral contexts of food production on diet related behaviors; however no studies have been conducted to specifically explore the relationship between moral constructs and food consumption. This study examined the relationship between fast food consumption and two measures of morality, Moral Foundations Questionnaire (MFQ), specifically harm/care and purity/sanctity foundations, and the Ethical Concern in food choice (EC) questionnaire, which includes animal welfare, environment protection, political values, and religion subscales. The study also examined the association between the measures of morality. 739 participants, primarily female (71.4%) and non-Hispanic Whites (76.5%), completed an online survey that included the MFQ, the EC questionnaire, and a brief fast food screener. Participant's morality scores in relation to their fast food consumption were examined first using bivariate ANOVA analysis and then using logistic regression to control for covariates. The MFQ foundations were compared with the EC subscales using Pearson correlation coefficient. Significant bivariate relationships were seen between fast food consumption and the MFQ's purity/sanctity foundation and EC's religion subscales ( $p < 0.05$ ). However these significant bivariate relationships did not hold after controlling for gender, race, university education, and religion in the logistic regression analysis. The foundations of the MFQ were positively correlated with the subscales for the EC questionnaire ( $r$  values ranging from .233-.613 ( $p < 0.01$ )).

MFQ's purity/sanctity foundation and EC's religion subscale were the two most highly correlated ( $r=.613$ ,  $p<0.01$ ) showing that moral intuitions may be associated with eating decision making. The study did not find significant associations between MFQ or EC scores and fast food consumption.

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## GLOSSARY

Term	Definition
Animal welfare subscale of EC	Is a subscale of the EC in food choice questionnaire. This subscale measures the important respondents place the treatment of animals in their food choices.
Authority/respect foundation of MFQ	One of 5 moral foundations from the MFT measured by the MFQ. This foundation developed out of traditionally hierarchical societies where certain people act as leader and leaders are revered.
BMI	Body Mass Index. Is a measure of body fatness used to screen for weight categories that may lead to health problems. It is calculated by dividing weight in kilograms by height in centimeters squared. A person is considered overweight with a BMI between 25 and 29.9. A BMI over 30 is considered obese.
Environmental protection subscale of EC	Is a subscale of the EC in food choice questionnaire. This subscale measures the important respondents place on the environmental impact of the food they eat.
EC	Ethical Concern in food choice subscale of the Food Choice Questionnaire. EC measures the role that concern about animal welfare, environmental protection, political values, and religion plays in food decision making.
Fairness/reciprocity foundation of MFQ	One of 5 moral foundations from the MFT measured by the MFQ. This foundation is related to the idea of equal and mutually beneficial interactions and the idea of individual rights.
Harm/care foundation of MFQ	One of 5 moral foundations from the MFT measured by the MFQ. This foundation encompasses the belief that humans are naturally averse to seeing the suffering of humans or animals.
Ingroup/Loyalty foundation of MFQ	One of 5 moral foundations from the MFT measured by the MFQ. This foundation is related to our natural tendency to operate in family based groups and incorporates feelings of patriotism and heroism.
MFQ	Moral Foundations Questionnaire. The questionnaire used to quantify the 5 moral foundations described in the Moral Foundations Theory.

MFT	Moral Foundations Theory. A theory that attempts to expand previous views of morality with 5 moral foundations, harm/care, fairness/reciprocity, ingroup/loyalty, authority/respect, and purity/sanctity.
Political values subscale of EC	Is a subscale of the EC in food choice questionnaire. This subscale measures how important politics is in food decision making.
Purity/sanctity foundation of MFQ	One of the 5 moral foundations from the MFT measured by the MFQ. This foundation is related to feelings of disgust for things believed to be dirty or asocial. It is also associated with spirituality.
Religion subscale of EC	Is a subscale of the EC in food choice questionnaire. This subscale measures the importance respondents place on remaining within their religious values when making food choices.

## Chapter 1

### INTRODUCTION

Simply providing people with information about what is healthy and what is not does not always translate into healthy eating behavior, especially in the long term (Nayga, 2000; Stadler, Oettingen, & Gollwitzer, 2010). This concept is highlighted by a study where improvements in fruit and vegetable consumption seen in the short term disappeared in a group provided only information about the benefits of fruit and vegetable consumption. On the other hand, those participants who were provided with a combination of information and behavior change strategies maintained a higher fruit and vegetable intake two years later (Stadler et al., 2010). At the same time, people are often aware of what foods are recommended for consumption but their dietary choices do not reflect that knowledge (Brown, McIlveen, & Strugnell, 2000; Dunn, Mohr, Wilson, & Wittert, 2008). For example, even as Americans' knowledge of fruit and vegetable consumption recommendations has increased from 8% in 1991 (Stables et al., 2002) to 40% in 2004 (Centers for Disease Control and Prevention [CDC], 2011) their consumption of fruit and vegetables has remained virtually unchanged during a similar time period (1994-2005) (Blanck, Gillespie, Kimmons, Seymour, & Serdula, 2008). Results from a number of studies have also shown that while most people are aware that fast food in particular is not good for them, they still choose to eat it anyway for various other reasons (such as convenience, enjoyment of taste, and feelings of immediate satisfaction) (Brown et al., 2000; Dunn et al., 2008; Rydell et al., 2008).

Information only campaigns on their own may not be sufficient to change consumer behavior; therefore, alternative strategies are needed. Some strategies that have been explored include providing social support, teaching self-regulation strategies, using religious interventions, and ideological movements with behavior goals that overlap with health promotion (Bowen et al., 2009; Devine, Farrell, & Hartman, 2005; Hekler, Gardner, & Robinson, 2010; Stadler et al., 2010). One study looked at small groups of low-income women and saw a significant increase in fruit and vegetable consumption in the group that participated in an active learning class that included social support compared to the control group that only received a pamphlet encouraging fruit and vegetable consumption (Devine et al., 2005). Additionally, a recent study using a stealth intervention (i.e. an intervention that did not focus directly on health outcomes) examined the impact a class about environmental, ethical, social justice and political contexts of food production had on the eating behavior of college students (Hekler et al., 2010). Food frequency questionnaires were collected before and after the class and were compared to food intake data of students who attended traditional health psychology classes during the same semester. The results showed significant improvements in overall diet quality in the food and society class versus that of the traditional health behavior classes. These results may suggest that alternative interventions that do not necessarily appeal directly to eating behavior but rather to ethical or moral connections may have a greater impact on eliciting dietary change compared to more traditional fact based education strategies.

In addition to this stealth intervention recent literature in the field of nutrition and psychology have started to study moralization (Arvola et al., 2008; Crossley, 2003; McPhail, Chapman, & Beagan, 2011; Mooney & Walbourn, 2001; Olsen, Sijtsema, & Hall, 2010; Rozin, Markwith, & Stoess, 1997) showing the importance moral applications may have on improving eating behavior either in addition to, or instead of, traditional methods. In fact, when Canadian teens were interviewed about their general eating habits, without prompts or specific questions about fast food consumption, the teens associated high fast food consumption as a characteristic of “bad” people and poor eating practice (McPhail et al., 2011) a similar pattern was also seen in a group of Norwegian teens (Bugge, 2011). In further studies, positive emotions were connected with the purchase of organic fruits (Arvola et al., 2008) while negative emotions were connected to ready to eat meals (Olsen et al., 2010). The organic fruit was generally classified as morally good while the ready to eat meals were classified as morally bad. These studies all hint at the impact that moral feelings and intuitions may have on food choices.

Interventions targeting food consumption behavior may be most impactful during the transition from adolescences into young adulthood than during other periods of life. Consumption patterns and adult weight status are often established during this transitional period (Gordon-Larsen, Adair, Nelson, & Popkin, 2004; Larson et al., 2008; Videon & Manning, 2003). Poor food choices in adolescence can lead to higher incidence of overweight and obesity related health problems that last into later adulthood (Duffey, Gordon-Larsen, Jacobs,

Williams, & Popkin, 2007; Larson et al., 2008; Pereira et al., 2005). In addition, this is also a time when young adults are defining themselves and exerting a greater sense of autonomy over their decision making (Bassett, Chapman, & Beagan, 2008; M. Lindeman & Stark, 1999; Stok, De Ridder, Adriaanse, & De Wit, 2010). Often food choice is one way people chose to show this independence and use eating as an expression of their developing autonomy and individuality (Brown et al., 2000; M. Lindeman & Stark, 1999; Stok et al., 2010). For these reasons adolescence and young adulthood may be a prime time to intervene.

In particular, dietary intervention aimed at reducing fast food consumption is important due to the impact fast food can have on diet quality and health parameters. Using the USDA's Continuing Survey of Food Intakes data from 1994-1996, fast food consumption in adults was associated with a higher dietary intake of energy, fats, and sodium and a lower intake of important micronutrients (Bowman & Vinyard, 2004; Paeratakul, Ferdinand, Champagne, Ryan, & Bray, 2003). This same trend was seen in adolescent boys and girls (between 12 and 19 years old), where greater fast food consumption was associated with lower vegetable consumption and higher consumption of discretionary energy (Sebastian, Wilkinson Enns, & Goldman, 2009). Similarly, adults that were followed over a total of 15 years as part of the Coronary Artery Risk Development in Young Adults study showed that fast food consumption was also associated with negative health parameters such as higher body weight, waist circumference, insulin resistance, and elevated blood triglyceride concentrations

(Duffey et al., 2007; Duffey, Gordon-Larsen, Steffen, Jacobs, & Popkin, 2009; Pereira et al., 2005). Diets high in energy, fat, and salt together with negative health parameter are known risk factors for diabetes and metabolic syndrome and may contribute to the high prevalence of obesity and its health related consequences (American Diabetes Association, 2010; Duffey et al., 2009; Grundy, Brewer Jr, Cleeman, Smith Jr, & Lenfant, 2004; Neeland IJ, Turer AT, Ayers CR, et al, 2012).

### **Theoretical Framework**

This investigation is relying on the Moral Foundations Theory (MFT) developed from the Social Intuition Model by Jesse Graham, Brian Nosek, and Jonathan Haidt (Graham et al., 2011). MFT expands on previous morality measures that focused primarily on fixed ideas of harm and fairness which are thought to be an incomplete description of moral thinking across cultures (Graham et al., 2011). To provide a more complete picture of the moral domain a review of evolutionary practices and similarities in moral rules across cultures was used to develop the five foundations of morality at the heart of this theory (Haidt & Graham, 2007). These foundations include harm/care, fairness/reciprocity, ingroup/loyalty, authority/respect, and purity/sanctity, and are measured using the Moral Foundation Questionnaire (MFQ). MFT relies on the idea that morality is a system that develops from cultural and social constructs but that also relies on emotion, intuition, and reasoning of individuals within the culture (Graham et al., 2011). MFT recognizes that people differ in the

significance they place on any given foundations and uses this fact to explain and define a broad moral spectrum (Graham et al., 2011).

This study focused on two of the five moral foundations, harm/care and purity/sanctity, the two foundations that may be related to fast food eating behaviors. Harm/care is tied to the belief that humans are naturally averse to seeing the suffering of people or animals and will therefore value actions that lead to reduced suffering (Haidt & Graham, 2007). In this sense the desire to reduce harm to ourselves or to reduce harm to animals may then be associated with decisions surrounding food choice. The purity/sanctity foundation is related to the strong human emotion of disgust often associated with disease and filth (vomiting, dead bodies) or socially unacceptable constructs (obesity, deformity, or disease) (Haidt & Graham, 2007). The purity/sanctity foundation may impact food choice as people seek to maintain the purity of their body by choosing items they deem to be more beneficial for the body. The recruitment of disgust has also been explored within the MFT in relation to vegetarianism (Rozin et al., 1997) highlighting the recruitment of this foundation in food choice.

In addition to the Moral Foundations Theory, this study also aims to review the Ethical Concern (EC) subscale of the Food Choice Questionnaire (FCQ) originally created by Steptoe, Pollard, and Wardle in 1995 (Steptoe, Pollard, & Wardle, 1995). The EC measure was developed in 1999 by Lindeman and Väänänen to capture ethics in relation to food choice and will provide a value for comparison with the MFQ (M. Lindeman & Vaananen, 2000). The EC subscale includes 7 new questions and 3 questions that were already part of the



FCQ. The 7 new questions expand the original version of the FCQ in order to examine the influence of ethics on food choice in more detail and includes questions that address environmental concern, animal concern, and religion in food choice (M. Lindeman & Vaananen, 2000).

The purpose of this pilot study was to determine if there is a correlation between the recruitment of the foundations of harm/care and purity/sanctity as measured by the MFQ and the consumption of fast food. The aim was to investigate if moral development, as defined by the MFT, was related to fast food consumption behavior. The next step would then be to explore options for an effective intervention that can call on the identified foundations with the goal of improving food decision-making patterns.

The primary hypothesis was that eating behavior, measured by frequency of eating fast-food, was associated with high moral foundations scores, specifically with harm/care and purity/sanctity. Our secondary hypothesis was that the measure of ethical concern in food choice, a slightly different measure of moralization that has been specifically created to measure food values, was also correlated with fast food intake. Finally, the tertiary hypothesis was scores on the MFQ were associated with EC scores.

## Chapter 2

### REVIEW OF LITERATURE

#### **Nutrition Knowledge**

Informational campaigns are used as a common strategy to influence eating behavior; however information alone does not appear to be enough to elicit significant or long term changes (Brown et al., 2000; Crossley, 2003; Nayga, 2000; Stadler et al., 2010). Fruit and vegetable consumption provides a good example to illustrate this point where an increasing awareness about the need to consume more fruits and vegetables is not accompanied by an increase in consumption. Using 24-hour recall data from the National Health and Nutrition Examination survey in 1999-2000, only 40% of Americans ate at least 5 servings of fruit and vegetables each day (Guenther, Dodd, Reedy, & Krebs-Smith, 2006). Similarly, data from the Behavioral Risk Factor Surveillance System from 1994-2005 showed a slight decrease in the frequency of fruit and vegetable consumption and relatively no change in the proportion of the population eating 5 or more servings per day (Blanck et al., 2008). During the same time, there was a rapid increase in awareness about the need to increase fruit and vegetable consumption from 8% of the population being aware of the recommendations in 1991 (Stables et al., 2002) to 40% in 2004 (CDC, 2011). Consumption levels remain low despite several national education and informational campaigns and an increase in the awareness of fruits and vegetables recommendations (Stables et al., 2002).

Several studies have shown the disconnection between information and measurable dietary changes. In one randomized control study women between the ages of 30 and 50 were exposed to an informational intervention aimed at increasing fruits and vegetable consumption (Stadler et al., 2010). One group, in addition to the informational intervention, was also provided with techniques to improve self-regulation. Both groups were asked to write down their fruit and vegetable consumption in journals. After 4 months both groups showed an increase in fruit and vegetable consumption (from an average of .47 servings to 1.0 servings per day), however after two years the information only intervention had dropped back down to baseline consumption levels compared to the self-regulation group whose consumption level remained higher than baseline (Stadler et al., 2010). The information only campaign resulted in only a temporary and modest change in fruit and vegetable consumption.

Similarly, a mix of 900 students from both urban and rural areas in Northern Ireland were shown to be aware of what is required to eat healthfully (through questionnaires and focus groups) but this awareness did not translate into healthy eating behaviors (Brown et al., 2000). Instead a majority of students (66% of males and 58% of females) showed a preference for fast food options (Brown et al., 2000). A telephone study conducted in Southern Australia also revealed parallel results. All 66 of the randomly selected participants who completed the telephone survey indicated that they were aware that fast food was not a healthy choice (Dunn et al., 2008). Despite this knowledge more than half

the respondents ate fast food at least once a week and a quarter of the respondents ate fast food between 2 and 6 times per week (Dunn et al., 2008).

Beyond consumption behavior, Nayga (2000) examined the impact nutrition knowledge has on food purchasing behavior and specifically the use of food labels. Nutrition knowledge and label use were both measured via surveys taken outside of grocery stores in New Jersey. Eight questions related to nutritional qualities of specific foods (for example, does fried chicken have more fat than roasted) and knowledge of recommended calorie requirements were asked to determine participants nutritional knowledge followed by questions about shoppers use of food labels in their purchasing decisions. The study found a weak link between nutrition knowledge and the use of food labels indicating that nutritional knowledge may not change shopping behavior (Nayga, 2000).

These studies show that having nutrition information may not be enough on its own to impact consumer behavior (consumption/purchasing) or to maintain behavior change long term.

## **Food and Morality**

### **Social Intuition Model**

Through a complex evolution of moral psychology came the development of the Social Intuitionist Model (SIM) of moral judgment (Greene & Haidt, 2002; Haidt, 2008). SIM incorporates anthropological study of primate evolution together with the moral and cognitive development process in humans. Social intuitionist model states that moral judgments are made quickly and intuitively, essentially an automatic process. Since moral judgments based on the SIM theory

happen so quickly and habitually there is little time for conscious thought to perceive a situation in an unbiased way (Greene & Haidt, 2002; Haidt, 2008). SIM also emphasizes the social nature of moral decision making by highlighting that our moral intuitions about right and wrong are developed through sociocultural norms. The idea that moral reasoning is innate or automatic does not mean that people do not think consciously about morals however conscious thoughts about morality are most common after an initial intuition, when people are seeking to confirm their initial immediate thought process, are looking to influences others in a social situation, or are trying to reconcile two opposing intuitions (Greene & Haidt, 2002; Haidt, 2008).

Out of the SIM comes the Moral Foundations Theory (MFT) which defines 5 moral foundations used to describe the moral intuitions that define our decision making process. Essentially, all moral decisions can call on one or more of these 5 categories: harm/care, fairness/reciprocity, ingroup/loyalty, authority/respect, and purity/sanctity (Haidt & Graham, 2007). Harm/care describes the tendency to dislike the suffering of others and is correlated with feelings of compassion for those that are in need. This foundation also elicits feelings of approval for people or actions that reduce the harm of others (Haidt & Graham, 2007). The fairness/reciprocity foundation is tied to motivations of equal and mutually beneficial interactions, a feeling often referred to as justice. This foundation is frequently associated with the idea of individual rights. However, not all cultures value individual rights and in those cases people are thought to work to oppress this foundation (Haidt & Graham, 2007). Next,

ingroup/loyalty is connected to our natural tendency to operate in family based groups. As members of familial groups we develop emotions related to trust and cooperation among the group while at the same time developing a certain level of distrust of those not in our group. The ingroup/loyalty foundation also incorporates feelings of patriotism and heroism (Haidt & Graham, 2007). The foundation of authority/respect developed out of traditionally hierarchical societies where certain people act as leaders and leaders thought to be good are revered. Good leaders tend to be altruistic, father like, and judicious. Characteristics of compliance and obligation are valued amongst the general population, maintaining the hierarchal balance (Haidt & Graham, 2007). Finally, purity/sanctity is related the uniquely human feeling of disgust. Disgust has several different levels associated with the transmission of disease (disgust for feces, vomit, and animals associated with disease transmission), social appearance norms (obesity or deformity), occupation/caste (those with jobs where they come in contact with things thought to transmit disease) and spirituality (people who have self-control and are not run solely by emotions are thought to be more pure) (Haidt & Graham, 2007).

Haidt and Graham (2007) provide an example of the MFT at work by comparing the decision making process of political liberals versus political conservatives. According to their theory, liberal's moral view of the world is based primarily on two of the five foundations, harm/care and fairness/reciprocity. While conservatives, on the other hand, base their world perspective on all 5 moral foundations (Graham et al., 2011). Therefore an issue that relates to

harm/care, for example, would make up half of the moral intuition of a liberal's thinking while it would only make up one fifth of the moral intuition of a conservative. With a varying moral basis we can see why liberals may find it challenging to understand the point of view of conservatives and vice versa.

In the current study we focused on two foundations, harm/care and purity/sanctity. These foundations, based on their descriptions in the MFT, are hypothesized to be tied more directly to eating behavior than the other foundations. During the development of the MFQ, the measure used to quantify the MFT, social groups were categorized based on how they conceptually related to either the virtue or vice of each foundation (Graham et al., 2011). Vegetarians were indicated as representing the virtue of harm/care while hunters were identified to represent its vice. With this classification harm/care could be tied to eating behavior as the desire to protect animals leads to a reduction in meat consumption. The connection between harm/care, animal welfare, and eating has been made in studies that show that when animals are intended to be consumed as food meat eaters tend to deny that those animals suffer (Bratanova, Loughnan, & Bastian, 2011) or deny that they have minds (Bastian, Loughnan, Haslam, & Radke, 2012) or both (Loughnan, Haslam, & Bastian, 2010). For example, when presented with information about an animal in a distant nation, the animal's perceived capacity to suffer was reduced when it was characterized as food (Bratanova et al., 2011). Similarly, respondents ascribed reduced mental states and disregarded the need to show moral concern to cows after just eating beef as compared to eating nuts (Loughnan et al., 2010). These examples show that there

is at least a connection between harm/care and meat consumption. Finally, it is also possible that individuals may relate their desire to reduce harm to themselves by maintaining healthier eating patterns; however this concept has not yet been studied.

The purity/sanctity foundation, particularly its relations to feelings of disgust, has been linked to eating behavior through avoidance of certain food items that are believed to be disgusting (Houben & Havermans, 2012; Olatunji, Haidt, McKay, & David, 2008; Rozin et al., 1997). First, Paul Rozin (Rozin et al., 1997) focused on the conversion of meat avoidance into a moral value based on feelings of disgust towards animal treatment and slaughter. Rozin's study consisted of a group of vegetarians (104 primarily white, male and female subjects with an average age of 26.6 years) who were classified into two groups based on their reasons for becoming a vegetarian (health reasons versus moral reasons generally related to animal treatment). The group that cited moral reasons for initially becoming vegetarian showed more current reasons for maintaining their vegetarian practices when compared to the group who made the decision based on health (Rozin et al., 1997). Current reasons included healthfulness of a non-meat diet, ecological concerns about meat consumption, as well as the treatment of animals intended for consumption. The moral group also showed higher scores of disgust in relation to meat production and consumption (Rozin et al., 1997). This study provides an example of how the development of the purity/sanctity foundation can be tied meat avoidance and the tendency to continue to avoid meat over a longer period of time.



More recently, Olatunji, Haidt, McKay, and David (2008) correlated disgust scores with the behavioral trait of avoidance (Olatunji et al., 2008). A group of primarily white students from an introductory psychology class completed a survey that measured disgust (using the disgust scale created by Haidt and his colleagues (Haidt, McCauley, & Rozin, 1994), the most commonly used measure of disgust) and personality factors through a personality inventory. The results showed that disgust was correlated with the personality factor of behavior inhibition ( $r=.50$ ,  $p\leq 0.05$ ) (Olatunji et al., 2008). Later, these same students were shown videos of things that are generally considered disgusting (eating animal blood, toilets, trash, and waste, and a live video of open heart surgery) and asked to write down if they watched the videos or turned away. Again the avoidance behavior of students (turning away from videos) was correlated with the disgusting images portrayed in those videos (Olatunji et al., 2008). Relating feelings of disgust to avoidance could be carried into eating behavior as the motivation to avoid something disgusting keeps someone from eating a particular food.

In a second study, Haidt's disgust scale was again used to investigate the relationship between weight status and disgust score (Houben & Havermans, 2012). A group of 135 females recruited from online forums and websites completed an online study where they were asked to rate their desire to consume high calorie foods after being shown a picture of those foods (Houben & Havermans, 2012). In addition, they also completed a 10-item scale designed to capture restraint and Haidt's disgust scale. The study showed that overweight

participants (as defined by BMI calculated from self-report data) had a higher threshold for disgust (scored lower on the disgust scale) compared to those with lower BMI (Houben & Havermans, 2012). The study also showed that lower disgust scores were associated with a greater desire to consume the high calorie foods presented in the study (Houben & Havermans, 2012).

These studies show how intuitive emotions included in the harm/care and purity/sanctity foundations of the MFT can be tied to food based decision making and provide examples of how focusing on these intuitive emotions may be useful in eliciting dietary behavior change.

### **Other views of moralization and eating**

Although Haidt's social intuition model is the basis of the current study, there are other studies that relate idea of morality to eating and food purchasing behavior. Two studies in particular examine consumers' intentions to purchase foods believed to be either morally good or morally bad (Arvola et al., 2008; Olsen et al., 2010). Data from a survey completed by 270 participants in 3 different countries (UK, Italy, and Finland) in March of 2004 was used to explore the impact that moral attitude had on predicting the intention to purchase organic foods (Arvola et al., 2008). The survey's questions focused on intentions to purchase organic apples or organic ready-to-cook pizza rather than their traditional non-organic counter parts. The study revealed that moral attitudes (defined as positive feelings of doing the right thing) played a significant role in predicting consumer's intention to purchase organic apples and to a lesser extent organic ready-to-cook pizza (Arvola et al., 2008). The author's suspect that

relative unfamiliarity with ready-to-cook pizza as well as the perception that its processing does not fit with the idea of organic, may explain why moral attitudes played a smaller role in consumers intentions to purchase organic ready-to-eat pizzas (Arvola et al., 2008). A similar study was conducted in 2009 with respondents from Norway, The Netherlands, and Finland (Olsen et al., 2010). The study used a similar questionnaire as Arvola et.al. (2008) except non-organic ready-to-eat meals replaced the specific food items of organic apples or organic ready-to-cook pizzas. This study examined feelings of moral obligation, defined as negative feelings of guilt, rather than the positive moral attitude described in the previous study. Olsen et al. (2009) showed that feelings of moral obligation were negatively associated with consumer's intentions to buy ready-to-eat meals. These two studies show that moralization of food products may change depending on the characteristics of the product itself where some stimulate positive emotions (organic apples) and others negative emotions (ready-to-eat meals) but that both positive and negative emotions may impact food purchasing behavior.

If fast food was categorized like the food items in the previous studies, either as eliciting positive feelings of doing the right thing or negative feelings of guilt, it would tend to be categorized by feelings of guilt (Bugge, 2011; McPhail et al., 2011). Fast food was directly singled out as morally bad food in a study that examined food consumption patterns among teens in Canada (McPhail et al., 2011). Semi-structured interviews were completed with 132 Canadian teens between (13-19 years old) in 2007 and 2009. In these interviews teens often brought up fast food on their own without prompting from the interviewer and

tended to classify fast food consumption as bad and those who eat fast food as being unknowledgeable, out of control or even disgusting (McPhail et al., 2011). The same teens cited feelings of guilt when they consumed fast food and would often attempt to qualify their fast food consumption, and therefore attempt to maintain their positive moral standing, by choosing to eat at only “healthy” fast-food outlets or by choosing only “healthy” menu items (McPhail et al., 2011). Interestingly this study also noted no class or fast food access patterns related to fast food consumption level, highlighting the prominent influence that teen’s moral view of fast food consumption plays in their decision making (McPhail et al., 2011).

Similar attitudes to fast food were found in Norwegian teens (Bugge, 2011). In this study researchers used several methods to explore teen eating habits and their perceptions about fast food (such as interviews, non-participant observations, written texts from teens, and picture documentation from teens taken with disposable cameras). The Norwegian teens had similar views of fast food to those in Canada and often associated feelings of disgust towards fast food, and in McDonald’s in particular (Bugge, 2011). When asked for examples of “bad foods” teens most often replied with “fast food,” “junk food,” and “hamburgers” (Bugge, 2011). In addition, fast food was associated with weight gain and weight gain was then associated with negative social implications (Bugge, 2011).

These studies begin to explore the moral aspects involved in the decision making frame work of food choice. In particular, the notion that non-organic,

processed, and fast foods are typically ascribed negative moral connotations implies that those who have particularly strong moral views may tend to avoid these “amoral” items more often.

## **Fast food: Health Impact and Perceptions**

### **Health impact of fast food**

The amount of fast food consumed by adults in the US has increased over the last two decades (Bowman & Vinyard, 2004; U.S. Department of Labor, Bureau of Labor Statistics, 2006) and fast food consumption has been associated with poor diet quality, higher weight status, and increased insulin resistance (Duffey et al., 2007; Duffey et al., 2009; Paeratakul et al., 2003; Pereira et al., 2005; Sebastian et al., 2009).

The USDA’s Continuing Survey of Food Intakes II, a nationally representative study completed by more than 9,000 adults and children, showed that those who reported eating fast food during the testing period also consumed higher overall calories, fat, saturated fat, carbohydrates, and added sugar than those who did not eat fast food (Bowman & Vinyard, 2004; Paeratakul et al., 2003). This same group of fast-food consumers also reported eating less fresh fruit, vegetables, and milk than non-fast-food eaters resulting in diets lower in vitamin A, vitamin C, and magnesium (Bowman & Vinyard, 2004; Paeratakul et al., 2003). Negative association between fast food intake and milk, fruit, and vegetable consumption as well as a positive association between fast food consumption and discretionary calorie and solid fat intake were also seen in twenty-four hour recall data from adolescent boy and non-pregnant girls between

12 and 19 years old as part of the What We Eat in America, National Health and Nutrition Examination Survey 2003-2004 (Sebastian et al., 2009).

Considering the impact fast food consumption can have on diet quality, it is not surprising that higher consumption has also been related to weight gain, higher BMI, insulin resistance, and higher triglyceride concentrations (Duffey et al., 2007; Duffey et al., 2009; Pereira et al., 2005). Each of these studies used data from the Coronary Artery Risk Development in Young Adults (CARDIA) study to examine fast food consumption (as reported in interviews and food frequency questionnaires) and physical health parameters including height, weight, triglyceride concentration and insulin sensitivity. Duffey et al. (2007) specifically examined how increasing fast food consumption over a three year study period impacted BMI. For those whose fast food consumption increased over the study period there was an increase of 0.16 BMI units (Duffey et al., 2007).

Using the same population but extended over the full 15-year span of the CARDIA study, Duffy et al. (2009) examined fast food consumption and its specific impact on metabolic outcomes. Increased fast food consumption in participants 18-30 years of age was associated with greater weight gain compared to those subjects who reduced or maintained their fast food intake over the same period (Duffey et al., 2009). Increased fast food consumption was also positively associated with larger waist circumference, higher triglyceride concentration, and insulin resistance (Duffey et al., 2009) all of which are known risk factors for diabetes and metabolic syndrome (American Diabetes Association, 2010; Grundy

et al., 2004; Neeland IJ, Turer AT, Ayers CR, et al, 2012). In addition to metabolic outcomes, Duffey et al. (2009) also analyzed away from home food consumption in two groups (sit down restaurants versus fast food) and were able to link fast food consumption specifically to a higher BMI compared to other away from home options (Duffey et al., 2009). This relationship indicates that fast food in particular may play a larger role in weight status and negative health parameters than other away from home restaurant options (Duffey et al., 2009).

The connection between fast food consumption, poor diet quality, weight gain, and increased insulin resistance makes finding successful interventions to lower fast food consumption important.

### **Awareness of the health implications of fast food and its continued consumption**

Most consumers are aware of the negative weight and health outcomes associated with fast food consumption, however understanding these implications does not necessarily result lower fast food consumption (Brown et al., 2000; Dave, An, Jeffery, & Ahluwalia, 2009; Dunn et al., 2008). Using questionnaires and focus groups Brown et al. (2000) examined young consumers (defined as ages 11-16) nutritional knowledge and food preferences. The study found that almost all study participants were aware of healthy eating requirements (100% of females n=450 and 99% of males n=445) and yet participants still indicated a significant preference for fast food lunches (Brown et al., 2000). Preference for fast food was stronger in social and schools settings compared to at home, indicating that nutrition knowledge in and of itself did not dictate food choice and

that, depending on the situation, this knowledge was selectively applied (Brown et al., 2000).

Perceived convenience of fast food, dislike of cooking, family member's influence, and the expected enjoyment from fast food all play a role in determining fast food consumption (Dave et al., 2009; Dunn et al., 2008). A random digit-dial survey was completed in Minnesota to identify attitudes towards eating meals away from home and the how frequently these meals were consumed (Dave et al., 2009). A total of 530 participants who indicated that they consumed fast food the week prior to the interview were included in the data analysis (Dave et al., 2009). The study showed that frequency of fast food consumption was not associated with its perceived healthfulness but instead was associated with perceived convenience of fast food and dislike towards cooking (Dave et al., 2009). In this case, consumers were aware of the unhealthfulness of fast food but looked past this information and focused on their desire to avoid cooking and eat quickly.

In another study, a random sample of participants was drawn from the West Adelaide Health Study in Australia to complete phone interviews about their beliefs and perceptions of fast food consumption (Dunn et al., 2008). All participants in this study stated that they were aware that fast food is not a healthy choice but at the same time half reported eating fast food at least one time per week and a quarter reported eating fast food anywhere from 2 to 6 times per week (Dunn et al., 2008). This group cited familial influence, cost, and feelings of



immediate satisfaction as reasons to choose fast food despite knowledge of its unhealthfulness (Dunn et al., 2008).

Knowing that fast food is not the most nutritious choice does not often outweigh other factors impacting consumer's fast food consumption (social pressure, convenience, dislike of cooking, cost, etc), highlighting that a singular focus on consumer educating may not be the most effective way to reduce consumption.

### **Focus on the Young Adult Population**

#### **Importance of intervention in young adult population**

During the transition into adulthood adolescents and young adults seek out ways to define themselves through the development of greater autonomy, making this an influential period and a prime target for interventions. Autonomy can be broadly defined as either the desire to improve one's image or as a desire for self-regulation and self-control (Stok et al., 2010). It is the second definition that is most often cited in the literature in reference to eating behaviors (Bassett et al., 2008; Hill, 2002; M. Lindeman & Stark, 1999; Stevenson, Doherty, Barnett, Muldoon, & Trew, 2007). Eating behaviors in particular can be a vehicle for self-definition and expression of greater control over decisions (Bugge, 2011; M. Lindeman & Stark, 1999). In some cases a desire for greater control over food choices is seen as leading to more unhealthy choices as young adults rebel against often healthy parental food suggestions (Hill, 2002), however this is not always the case as young adults also exercise their autonomy to make healthy food choices (Bassett et al., 2008; Stevenson et al., 2007). This period of transition and

self-development provides an opportunity to influence adolescent food consumption patterns that may be more impactful than during adulthood when dietary patterns have already been established.

### **Habits formed as young adults carry into adulthood**

The transition from adolescences into young adulthood is a prime time to implement interventions targeting food consumption. During this time food consumption patterns are established along with weight status that is likely carried into adulthood (Gordon-Larsen et al., 2004; Larson et al., 2008). The heights and weights of students aged 13-19 were recorded as part of the National Longitudinal Study of Adolescents Health. These students were tracked and heights and weights measured again 5 years later. Obesity prevalence at the two time points was compared and revealed an increase from 10.9% at the first measurement point to 22.1% at the second measurement point (Gordon-Larsen et al., 2004). The increase in body mass was compared to age-matched age-standardized data from NHANES to understand if the increase in weight was greater than what would be expected during normal growth over this transition period. These data revealed that the increase in weight was in fact greater than what would be expected, indicating an increase in excessive body mass rather than an expected growth from adolescents into adulthood (Gordon-Larsen et al., 2004). During the 5 year test period 11.7% of participants became obese, 10.4% remained obese, and only 2.1% of those who started out overweight moved into a non-overweight category (Gordon-Larsen et al., 2004). The number of adolescents becoming or staying obese as they transition into adulthood highlights the need for

interventions during this period to potentially thwart the development of negative weight gain patterns.

Like weight status, fast food consumption patterns have also been shown to develop in adolescence and be carried over into adulthood (Larson et al., 2008). As part of project EAT (Eating Among Teens) a study conducted to examine the determinants of dietary intake and weight status of teens and young adults, 1686 young adults completed a survey and food frequency questionnaire in the classroom (Larson et al., 2008). The surveys were repeated 5 years later through the mail. One question was used to capture fast food intake at both measurement points. These data showed that 24% of males and 21% of females were high fast-food consumers (reporting consumption of 3 or more servings per week) at the first test point (Larson et al., 2008). At the 5 year follow up, the percent of males who were high consumers increased to 33% and remained the same in females (23%) (Larson et al., 2008). Adolescents not only tend to be high consumers of fast food (Larson et al., 2008; Paeratakul et al., 2003) but that the pattern of high consumption is carried forward into adulthood (Larson et al., 2008). Given the association of fast food intake with increased weight status and negative metabolic outcomes addressed above it is clear that interventions during adolescents that focus on reducing fast food consumption would be beneficial.

The use of food as part of adolescents developing sense of self, their tendency to consume fast food and the creation of life long habits this life stage is a time of great influence and could be the prime time to implement nutrition and health interventions.

## Chapter 3

### METHODS

#### **Study Design**

This two part study was conducted as part of formative research with the final goal of designing an intervention study aimed at impacting consumption behavior. Step one of the study was formative and was used to shape the design of step two as well as to develop research hypotheses and data measures used in step two. Step two of the study consisted of an online survey.

#### **Step one**

The first step used qualitative interviews to elicit college student's views and perceptions regarding the concept of moralization, if they tied moralization to eating behaviors or weight status, opinions of veganism and vegetarianism, government control over the food system, and knowledge about green principals (a full list of questions is provided in appendix C). Participants for this segment of the study were recruited during the fall semester 2011 at ASU's main and downtown campuses (see appendix A for the advertisement and consent forms). Signs were placed in the dining area of Taylor Hall, an on campus cafeteria associated with the dormitories, at the ASU downtown campus. In addition to posted signs researchers also approached students to solicit interviews. The interviews lasted from 5 to 15 minutes depending on subjects responses. All participants were given a 5 dollar gift card as an incentive for completing the interview. The subjects in the qualitative study were over the age of 18 and were students at ASU. The study consisted of 15 total students, 9 male and 6 female.

Qualitative interview responses were categorized into general themes including morality, morality and eating, peer influence, thoughts towards over and underweight individuals, and vegan/vegetarianism. Morality was frequently described as something innate and generally associated with knowing the difference between right and wrong. Morality and eating however was often related to cleanliness (not making a mess while eating as well as eating clean/healthy foods), politeness, or following religion based food guidelines. Participants discussed peer influence in both positive and negative terms indicating that at time peers helped them to eat more healthfully and at other times encouraged poor eating habits. However peer influence was most often associated with poor eating habits, especially in the dorm setting. Weight status (either over or underweight) was described by participants as destructive and unhealthy. Obesity in particular elicited comments about lack of control, laziness, and food as a vice. None of the participants interviewed in this step were vegan or vegetarian. Almost all of the participants mentioned that they respected vegans/vegetarians eating habits but felt that they were unable to follow the same dietary pattern. These themes allowed the research team to identify constructs to include in step two of the research process.

### **Step two**

Based on these themes and the theoretical framework of the SIM and MFT a self-administered online survey was created (See Appendix C for survey questions and Appendix A for the recruitment letter). The survey included

several measurements however only those relevant to the MFT, EC, fast food, and demographics were used in this study.

Data were collected in the spring of 2012 from a convenience sample of students at Arizona State University and Brigham Young University. The sample was drawn from email messages sent to students who belong to nutrition, exercise science, sustainability, and/or honors college university list serves. In an attempt to broaden the spectrum of study participants, recruitment also took place via Facebook. In order to take part in the study participants had to be over the age of 18. No personally identifiable information was collected and all survey participants were entered into a drawing for a one hundred dollar gift certificate as an incentive for completing the survey. The qualitative interview and survey procedures were both approved by the Institutional Review Board of Arizona State University.

### **Sample**

The minimum sample size for the survey was determined by using Statistical Considerations for Clinical Trials and Scientific Experiments web site (Schoenfeld, n.d.). Calculating the minimum sample size requires the user to set the study type (in this case, study to find an association), significance (.05), and the power (.80) of the study. In addition, a 2007 study that measured fast food consumption among a similar age group (18-30 years old) (Duffey et al., 2007) provided probable and reasonable values for measurement of the depended variable of fast food consumption. Based on this study's findings an expected standard deviation for the dependent variable of fast food consumption was 2.41,

indicating that the deviation from the mean fast food consumption level is plus or minus 2.41 servings per week. Finally, the minimal detectable difference in this study was 1.2, indicating that fast food consumption per week would have to change by at least 1.2 servings per week for a treatment effect to be seen in the study. These values (significance, power, standard deviation, and minimum detectable difference) were all imputed into the web site to calculate the minimum number of participants needed for the study to see meaningful results. The result was 34 participants were needed to meet these criteria for statistical significance. The final participant count for the online survey was 739 participants, well above the minimum needed to power the study.

## **Measures**

The survey included general demographic questions such as years of education, university major, ethnicity, weight, and height. The survey also included questions measuring moral foundations (Graham et al., 2011), ethical concern in food choice (M. Lindeman & Vaananen, 2000) and fast food consumption (Nelson & Lytle, 2009). (The full survey can be viewed in Appendix C).

Moral foundations were measured using The Moral Foundations Questionnaire (MFQ) developed by Graham, Nosek, and Haidt (Graham et al., 2011). This questionnaire was developed based on the MFT model of moral foundations that states that all 5 moral foundations (harm/care, fairness/reciprocity, ingroup/loyalty, authority/respect, and purity/sanctity) are universal but that people do not place the same value on each foundation

universally. In other words, moral intuitions may be based on one of these foundations more than another. The questionnaire is designed to highlight which foundations influence a person's moral intuition and provide a numerical score for each foundation. The score is determined by averaging the score for each response that relates to the given foundation (scores can range from 1-6 based on the participants selection of level of influence a given statement has on their view of right and wrong, with 1 representing "not very relevant" and 6 representing "extremely relevant"). There are 6 total questions that address each of the 5 foundations. The reliability and validity of these questions have been discussed elsewhere (Graham et al., 2011).

In addition to the MFQ the Ethical Concern in food choice (EC) subscale was also used. This measure was created as an extension of the Food Choice Questionnaire with the intention of capturing how the ethical domains of animal protection, environmental protection, political values, and religion play a role in the decision making process surrounding food choice (M. Lindeman & Vaananen, 2000). Scores for this questionnaire are calculated in a similar way to the MFQ except that response on each subscale ranges from 1-4 depending on the level of importance a given statement has on eating behavior. Response options range from "not at all important" (score of 1) to "very important" (score of 4). The reliability and validity of this scale has also been discussed elsewhere (M. Lindeman & Vaananen, 2000).

Fast food intake was measured using a quick screener developed by Nelson and Lytle (2009). The screener measures the number of times food is



bought per month “at a restaurant where food is ordered at a counter or at a drive-through window”. The response options were: never or rarely, 1 time per month, 2-3 times per month, 1-2 times per week, 3-4 times per week, 5-6 times per week, 1 time per day, 2 times per day, or 3 or more times per day. Fast food intake was converted to servings per week for evaluation.

### **Statistical Analysis**

All data were processed in 2012 using SPSS version 20. Based on the distribution of the data fast food consumption was broken down into two consumption levels, less than 2 servings per week and 2 or more servings per week. Using 2 or more servings as a cut off to differentiate between low and high consumers is supported in by previous research in the area that typically shows a cutoff for high and low fast food consumption between 2 and 3 servings per week (Bowman & Vinyard, 2004; Dave et al., 2009; Duffey et al., 2007; Duffey et al., 2009; Larson et al., 2008; Paeratakul et al., 2003; Pereira et al., 2005). One-way ANOVA and t-tests (where appropriate) were run to examine the relationship between demographic variables, MFQ, EC and fast food consumption. To compare the proportion of the sample from each demographic category consuming fast food the Chi-square test was used. The Pearson bivariate correlation test was used to examine the relationship between the two measures of morality. Finally, controlling for demographic characteristics of the sample, multivariate regression analysis was used to examine the independent association between moral foundations and ethical concern subscales and fast food.

## Chapter 4

### RESULTS

Table 1 summarizes the demographic characteristics of the study sample. Of the 739 respondent who completed the survey, a majority (68.2%) were 18-24 years old, 16.9% were 25-30 years old, and the remaining 14.9% were 31 years and older. Seventy-one percent of respondents were female and 76.5% were non-Hispanic Whites. The “other” race category made up 23.5% of the sample and included all others who identified as any race other than non-Hispanic White. Roughly 30% of the population classified themselves as being in a health or health related major, 15.2% as STEM (science, technology, engineering, and math) majors, and 5.8% as arts or social science majors. Thirty percent of respondents were classified as having “other” as a major. More than half of the respondents attended college but had not yet earned a degree (56.3%). Of those who did earn a degree 4.8% had earned at least an Associate’s degree, 18.7% had earned a Bachelor’s degree, and 7.7% had earned a Masters or professional degree. Twenty four percent of the respondents selected Christian as their religion (including Catholic, Lutheran, Protestant, and non-denominational Christians) while 21.2% selected Mormon. The remainder of the respondents either did not disclose their religious preference (26.9%), indicated that they did not have a religious preference (7.4%), or fell into the “other” category (13.0%). The majority of the respondents (64.6%) were in in the normal weight BMI category while about 22% were in the overweight category. A small percentage

of the study sample were underweight (4.3%) and approximately 10% were obese.

Table 1

*Demographic Characteristics of Study Sample (N=739)*

	n	%
<b>Age(yrs)</b>		
18-24	420	68.2
25-30	104	16.9
31+	92	14.9
<b>Gender</b>		
Male	208	28.6
Female	520	71.4
<b>Race/Ethnicity</b>		
Non-Hispanic White	509	76.5
Other	156	23.5
<b>University Major</b>		
Health/Medical <sup>a</sup>	203	27.8
STEM	111	15.2
Arts/Social Sciences	42	5.8
Other/Non-specified <sup>b</sup>	221	30.3
Not Current Student	153	21.0
<b>Education Level</b>		
HS Diploma or equivalent	88	12.1
Some college no degree	409	56.3
Associates Degree	35	4.8
Bachelors	138	18.7
Graduate/Professional	56	7.7
<b>Religion</b>		
Christian <sup>c</sup>	180	24.4
Mormon	157	21.2
Did not disclose	199	26.9
Other <sup>d</sup>	96	13.0
No particular belief	55	7.4
Multiple religions selected	52	7.0
<b>BMI</b>		
Underweight	21	4.3
Normal weight	316	64.4
Over weight	106	21.6
Obese	48	9.8
<sup>a</sup> Includes nutrition, exercise and wellness, nursing, medical degree, and other health sciences		
<sup>b</sup> Includes sustainability, earth sciences, other, and those who did not specify		
<sup>c</sup> Includes Catholic, Lutheran, Protestant, non-denominational Christian		
<sup>d</sup> Includes Agnostic, Atheist, Buddhist, Muslim, Hindu, Humanist, Jehovah's Witness, Orthodox, Russian Orthodox, Unitarian Universalist		

## Moral Foundation Scores

Table 2 shows the mean scores of the two moral foundations of interest (harm/care and purity/sanctity) by the demographic characteristics of the study sample. The possible range for harm/care scores was 1.0- 6.0. Male respondents scored significantly lower on harm/care with an average score of 4.25 compared to the average score of 4.76 among females ( $p < 0.001$ ). Significant associations were also observed in the average harm/care scores among respondents with different university major. Respondents in both the health/medical category and “other” category had significantly higher scores (4.70 and 4.74 respectively) compared to respondents in the STEM category (4.41,  $p < 0.05$ ). Respondents in the “other” major category also scored significantly higher ( $p < 0.05$ ) than those respondents who are not currently students (4.47). In the religion category respondents who identified themselves as Christian had a higher mean harm/care score (4.74) compared to 4.47 among those who identified themselves as Mormon ( $p < 0.05$ ). None of the remaining demographic variables showed significant relationships with harm/care moral foundation scores.

The possible range for purity/sanctity scores was also 1.0-6.0. Significant differences were observed between purity/sanctity scores in the university major and religion categories. Respondents in the STEM major had significantly lower average scores on purity/sanctity (3.23) compared to all other university major categories ( $p < 0.001$ ) with the exception of arts and social science majors (3.63). In the religion category Mormons had significantly higher mean purity/sanctity score (4.73) than all other religion categories ( $p < 0.001$ ). Respondents in the

Christian and the “did not disclose” categories also scored significantly higher (4.08 and 4.00 respectively) compared to those who were in the “other” category (2.84), those who listed that they had no particular religious belief (3.23), and those who selected multiple religions (3.03).

Table 2

*Mean Moral Foundation Scores by Demographic Characteristics of the Sample (N=630)*

	Moral Foundation Scores	
	Harm Care Mean (SD) [SEM]	Purity Sanctity Mean (SD) [SEM]
<b>Age(yrs)</b>		
18-24	4.63 (.74) [.04]	3.84 (1.18) [.06]
25-30	4.51 (.86) [.09]	4.03 (1.07) [.11]
31+	4.71 (.87) [.10]	3.83 (1.11) [.12]
<b>Gender</b>		
Male	4.25 (.97) <sup>a</sup> [.07]	3.77 (1.16) [.09]
Female	4.76 (.66) <sup>a</sup> [.03]	3.94 (1.13) [.05]
<b>Race/Ethnicity</b>		
Non-Hispanic White	4.62 (.77) [.04]	3.90 (1.16) [.06]
Other	4.61 (.82) [.07]	3.78 (1.15) [.10]
<b>University Major</b>		
Health/Medical	4.70 (.81) [.06]	3.89 (1.04) <sup>a</sup> [.08]
STEM	4.41 (.80) <sup>a</sup> [.08]	3.23 (1.25) <sup>abc</sup> [.13]
Arts/Social Sciences	4.72 (.71) [.12]	3.63 (1.18) [.19]
Other/Non-Specified	4.74 (.68) <sup>ab</sup> [.05]	4.09 (1.08) <sup>d</sup> [.08]
Not Current Student	4.47 (.85) <sup>o</sup> [.07]	4.11 (1.11) <sup>c</sup> [.09]
<b>Education Level</b>		
HS Diploma or equal	4.70 (.62) [.07]	4.03 (1.05) [.12]
Some college no degree	4.63 (.80) [.04]	3.85 (1.18) [.06]
Associates Degree	4.74 (.72) [.13]	4.34 (.79) [.14]
Bachelors	4.51 (.85) [.08]	3.82 (1.10) [.10]
Graduate/Professional	4.59 (.81) [.11]	3.85 (1.26) [.18]
<b>Religion</b>		
Christian	4.74 (.76) <sup>a</sup> [.06]	4.08 (.87) <sup>abcd</sup> [.06]
Mormon	4.47 (.85) <sup>a</sup> [.07]	4.73 (.80) <sup>aeign</sup> [.06]
Did not disclose	4.54 (.82) [.08]	4.00 (1.03) <sup>ejk</sup> [.11]
Other	4.70 (.75) [.08]	2.84 (1.03) <sup>dn</sup> [.10]
No particular belief	4.60 (.74) [.10]	3.23 (1.05) <sup>cgj</sup> [.14]
Multiple selected	4.68 (.68) [.09]	3.03 (.99) <sup>dnk</sup> [.14]
<b>BMI</b>		
Underweight	4.89 (.58) [.13]	4.09 (1.14) [.26]
Normal weight	4.64 (.76) [.04]	3.81 (1.18) [.07]
Over weight	4.65 (.80) [.08]	3.88 (1.11) [.11]
Obese	4.34 (1.08) [.16]	3.74 (1.25) [.18]

a,b,c,d,e,f,g,h,i,j,k same superscript denotes significant difference between demographic categories for each Moral Foundation Scale (Bonferroni's test, p <0.05)

## **Ethical Concern Scores**

Table 3 highlights the mean scores of the Ethical Concern in food choice (EC) questionnaire and demographic characteristics of the sample population. Animal welfare subscale scores showed significant differences with gender, university major, religion, and BMI demographic categories. The possible range of animal welfare subscale was 1.0-4.0. The mean animal welfare score for females (2.48) was significantly higher than males (2.17,  $p < 0.05$ ). The mean animal welfare score for health/medical majors, 2.60, was significantly higher ( $p < 0.05$ ) than that for respondents who were not current students (2.24) or were STEM majors (2.08). Animal welfare scores were also significantly higher for respondents in the “other” major category (2.46) compared to STEM majors ( $p < 0.05$ ). In the religion category Mormon’s scored significantly ( $p < 0.05$ ) lower on the animal welfare subscale (2.07) compared to all other religion categories with the exception of those respondents who did not disclose their religion (2.30). Respondents in the obese BMI category scored significantly lower ( $p < 0.05$ ) on the animal welfare subscale with the mean score of 1.99, compared to respondents who are normal weight (2.43).

The environment protection subscale showed significant differences in the age and religion demographic categories. The possible range of environment protection scores was 1.0-4.0. Respondents in the 31 and over age category scored significantly higher ( $p < 0.05$ ) on the environment protection subscale (2.90) of the EC than those in the 18 to 24 age category (2.57). In the religion category, Mormons scored significantly lower (2.34) than all other religion

categories except those who did not disclose their religion (2.64) and those who selected multiple religions (2.72,  $p < 0.05$ ).

The political values subscale had a possible range of 1.0-4.0. Significant differences were only seen in the age category of the political values subscale with respondents in the 31 and over age category scoring 2.34, which was significantly higher ( $p < 0.001$ ) than those in the 18 to 24 age category who scored 1.94.

In the religion subscale of the EC significant differences were seen in the university major and religion demographic categories. The possible range for religion scores was also 1.0-4.0. The mean religion score for those in the “other” major category (2.55) was significantly higher than health/medical majors (2.13) and STEM majors (1.76,  $p < 0.05$ ). Those who were not current students also had significantly higher mean scores (2.52) than STEM majors ( $p < 0.001$ ). In the religion demographic category Mormons scored significantly higher (3.72) in the EC religion subscale than all other religion categories. Christians and those who did not disclose their religious affiliations had significantly higher scores (2.09 and 2.27 respectively) compared to respondents in “other” category (1.41), than those who have no particular belief (1.34), and those who selected multiple religions (1.52).



Table 3

*Mean Ethical Concern Scores by Demographic Characteristic of the Sample (N=630)*

	Ethical Concern Scores			
	Animal Welfare Mean (SD) [SEM]	Environment Protection Mean (SD) [SEM]	Political Values Mean (SD) [SEM]	Religion Mean (SD) [SEM]
<b>Age(yrs)</b>				
18-24	2.34 (.97) [.05]	2.57 (.90) <sup>a</sup> [.05]	1.94 (.80) <sup>a</sup> [.04]	2.33 (1.30) [.07]
25-30	2.42 (1.04) [.11]	2.69 (.93) [.10]	2.08 (.76) [.08]	2.47 (1.26) [.13]
31+	2.62 (1.04) [.12]	2.90 (.96) <sup>a</sup> [.11]	2.34 (.91) <sup>a</sup> [.10]	2.00 (1.29) [.15]
<b>Gender</b>				
Male	2.17 (.95) <sup>a</sup> [.07]	2.58 (.91) [.07]	2.07 (.85) [.07]	2.28 (1.27) [.10]
Female	2.48 (1.00) <sup>a</sup> [.05]	2.66 (.93) [.04]	2.00 (.81) [.04]	2.33 (1.31) [.06]
<b>Race/Ethnicity</b>				
Non-Hispanic White	2.37 (.98) [.05]	2.58 (.92) [.04]	2.00 (.81) [.04]	2.32 (1.31) [.06]
Other	2.40 (1.03) [.09]	2.73 (.91) [.08]	2.04 (.85) [.08]	2.28 (1.25) [.11]
<b>University Major</b>				
Health/Medical	2.60 (1.08) <sup>ab</sup> [.09]	2.77 (.93) [.07]	2.11 (.87) [.07]	2.13 (1.22) <sup>a</sup> [.10]
STEM	2.08 (.78) <sup>ac</sup> [.08]	2.45 (.81) [.09]	1.81 (.71) [.08]	1.76 (1.08) <sup>bc</sup> [.11]
Arts/Social Sciences	2.58 (1.01) [.17]	2.67 (.87) [.14]	1.92 (.91) [.15]	2.46 (1.37) [.23]
Other/Non-Specified	2.46 (.97) <sup>c</sup> [.07]	2.73 (.94) [.07]	2.05 (.78) [.06]	2.55 (1.32) <sup>ab</sup> [.10]
Not Current Student	2.24 (.97) <sup>b</sup> [.08]	2.48 (.95) [.08]	2.07 (.85) [.07]	2.52 (1.33) <sup>c</sup> [.11]
<b>Education Level</b>				
HS Diploma or equal	2.47 (.96) [.11]	2.67 (.86) [.10]	1.91 (.75) [.09]	2.37 (1.29) [.15]
Some college no degree	2.35 (1.00) [.06]	2.60 (.92) [.05]	1.99 (.83) [.05]	2.28 (1.29) [.07]
Associates Degree	2.58 (.98) [.18]	2.81 (.87) [.16]	2.16 (.81) [.15]	2.60 (1.23) [.22]
Bachelors	2.32 (.97) [.09]	2.54 (.95) [.09]	2.06 (.83) [.08]	2.32 (1.33) [.12]
Graduate/Professional	2.51 (.98) [.14]	2.82 (.93) [.13]	2.18 (.84) [.12]	2.26 (1.38) [.19]
<b>Religion</b>				
Christian	2.46 (.99) <sup>a</sup> [.07]	2.74 (.90) <sup>a</sup> [.07]	2.08 (.84) [.06]	2.09 (1.09) <sup>abcd</sup> [.08]
Mormon	2.07 (.86) <sup>abcd</sup> [.07]	2.34 (.85) <sup>abc</sup> [.07]	1.85 (.77) [.06]	3.72 (.67) <sup>aeigh</sup> [.05]
Did not disclose	2.30 (1.12) [.13]	2.64 (1.08) [.13]	2.10 (.97) [.12]	2.27 (1.22) <sup>eijk</sup> [.15]
Other	2.62 (1.00) <sup>b</sup> [.10]	2.81 (.91) <sup>b</sup> [.09]	2.10 (.80) [.08]	1.41 (.86) <sup>bhi</sup> [.09]
No particular belief	2.65 (1.03) <sup>c</sup> [.14]	2.76 (.92) <sup>c</sup> [.12]	2.12 (.78) [.10]	1.34 (.85) <sup>cgl</sup> [.12]
Multiple selected	2.59 (.90) <sup>d</sup> [.12]	2.72 (.81) [.11]	2.03 (.75) [.10]	1.52 (.94) <sup>dhk</sup> [.13]
<b>BMI</b>				
Underweight	2.64 (1.01) [.22]	2.75 (.91) [.20]	2.11 (.74) [.16]	2.67 (1.39) [.30]
Normal weight	2.43 (1.01) <sup>a</sup> [.06]	2.59 (.92) [.05]	1.98 (.78) [.04]	2.30 (1.29) [.07]
Over weight	2.43 (.97) [.09]	2.79 (.85) [.08]	2.16 (.83) [.08]	2.30 (1.32) [.13]
Obese	1.99 (.92) <sup>a</sup> [.13]	2.40 (.93) [.13]	1.90 (.91) [.13]	1.97 (1.21) [.17]

a,b,c,d,e,f,g,h,i,j,k same superscript denotes significant difference between demographic categories for each Ethical Eating Scale (Bonferroni's test, p <.05)

## Relationship between Moral Foundation and Ethical Concern Scales

Correlation between participant's mean moral foundation and EC scores are reported in Table 4. The Pearson correlation test revealed several positive correlations between moral foundations and the EC subscales. Harm/care and fairness/reciprocity showed the greatest positive correlations (r values ranging from .233-.374) with animal welfare, environmental protection, and political values of the EC measure. Ingroup/loyalty and authority/respect showed similar levels of correlation with the religion EC subscale (r=.267 and .359 respectively). The strongest positive correlation was found between purity/sanctity and the religion subscale of the EC (r=.613, p<0.01).

Table 4

### *Correlation between Moral Foundations Scale and Ethical Concern Scale*

Moral Foundation Scale	Ethical Concern Scale			
	Animal Welfare	Environment Protection	Political Values	Religion
Harm Care	.374 **	.282 **	.233 **	.048
Fairness Reciprocity	.361 **	.359 **	.294 **	-.010
Ingroup Loyalty	.089 *	.112 **	.151 **	.267 **
Authority Respect	.064	.080 *	.155 **	.359 **
Purity Sanctity	.040	.058	.117 **	.613 **
** . Correlation is significant at the 0.01 level (2-tailed).				
* . Correlation is significant at the 0.05 level (2-tailed).				

## **Fast food Consumption**

Fast food consumption among respondents was dichotomized into low consumers (<2 servings/week) and high consumers ( $\geq 2$  servings /week). Overall, 84.3% and 15.7% of the sample was classified into the low and high consumer groups respectively. Table 5 shows the association between fast food consumption (high vs. low) and demographic characteristic of the sample based on chi square analysis. Female respondents were significantly less likely ( $p < 0.001$ ) to be high consumers compared to male respondents (11.7% vs. 26.1%). Significant race/ethnicity differences were observed with 13.8% of non-Hispanic Whites being classified as high fast-food consumers compared to 21.9% of all other respondents ( $p < .05$ ). Fast food consumption level was also significantly associated with religious affiliation with 25% of those classified as belonging to the other religion category being high consumers, followed by 23.1% of those who selected multiple religions, 14.3% of those who did not disclose a religion, 13.9% of Christians, and 11.5% of Mormons ( $p < .05$ ).

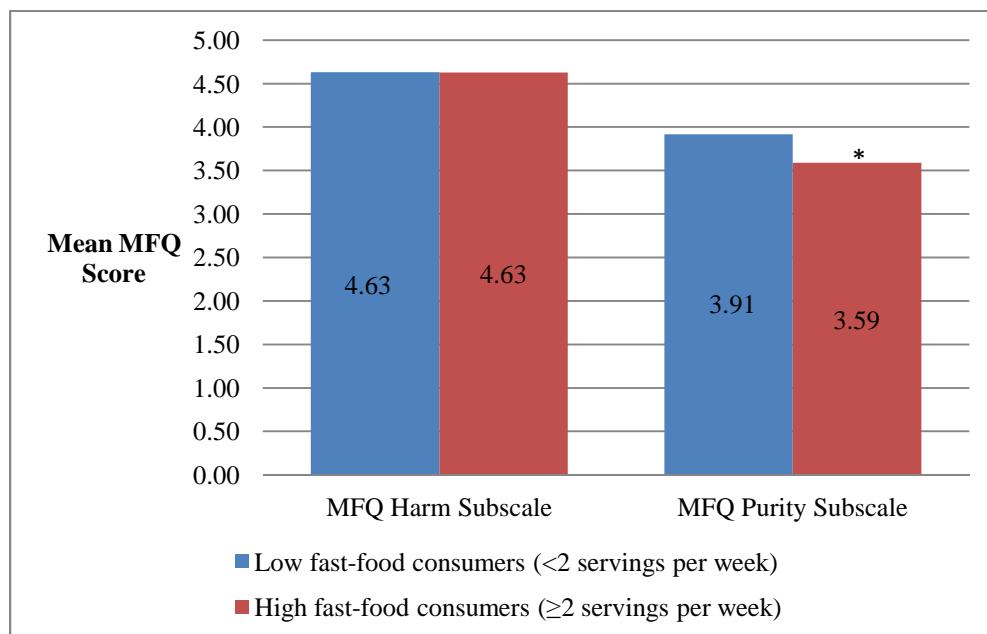
Table 5

*Proportion of Sample Consuming Fast food by Demographic Characteristic (N=560)*

	Fast-food Consumption		p value
	< 2 servings/week (Low)	≥ 2 servings/week (High)	
	n (%)	n (%)	
<b>Total</b>	472 (84.3)	88 (15.7)	
<b>Age(yrs)</b>			
18-24	273 (85.8)	45 (14.2)	0.25
25-30	63 (78.8)	17 (21.2)	
31+	65 (86.7)	10 (13.3)	
<b>Gender</b>			
Male	113 (73.9)	40 (26.1)	0.00
Female	356 (88.3)	47 (11.7)	
<b>Race/Ethnicity</b>			
Non-Hispanic White	349 (86.2)	56 (13.8)	0.04
Other	82 (78.1)	23 (21.9)	
<b>University Major</b>			
Health/Medical	111 (81.0)	26 (19.0)	0.11
STEM	66 (77.6)	19 (22.4)	
Arts/Social Sciences	28 (82.4)	6 (17.6)	
Other/Non-Specified	151 (89.3)	18 (10.7)	
Not Current Student	114 (85.7)	19 (14.3)	
<b>Education Level</b>			
HS Diploma or equal	55 (82.1)	12 (17.9)	0.24
Some college no degree	248 (81.6)	56 (18.4)	
Associates Degree	26 (92.9)	2 (7.1)	
Bachelors	93 (88.6)	12 (11.4)	
Graduate/Professional	45 (88.2)	6 (11.8)	
<b>Religion</b>			
Christian	155 (86.1)	25 (13.9)	0.03
Mormon	139 (88.5)	18 (11.5)	
Did not disclose	18 (85.7)	3 (14.3)	
Other	71 (74.7)	24 (25.3)	
No particular belief	49 (89.1)	6 (10.9)	
Multiple selected	40 (76.9)	12 (23.1)	
<b>BMI</b>			
Underweight	18 (85.7)	3 (14.3)	0.00
Normal weight	279 (88.6)	36 (11.4)	
Over weight	85 (80.2)	21 (19.8)	
Obese	32 (66.7)	16 (33.3)	

p values based on chi square test

Figure 1 shows the bivariate relationship between mean moral foundation scores (harm/care and purity/sanctity) and fast food consumption level. The mean score on the purity/sanctity scale was significantly lower among high fast-food consumers (3.59;  $p < 0.05$ ) than in low fast-food consumers (3.91). Harm/care scores, on the other hand, were not significantly different ( $p > 0.05$ ) between high and low fast-food consumers. Figure 2 shows the relationship between mean Ethical Concern scores and fast food consumption level. A significant difference was found between mean scores of high and low fast-food consumers (2.04 and 2.34) in the religion EC subscale ( $p < 0.05$ ). The significant associations between MFQ purity/sanctity and fast food consumption and between EC religion subscales and fast food consumption were further investigated using multivariate analysis.



*Figure 1.* Mean Moral Foundation Score by Fast food Consumption Level (\* $p < 0.05$ )

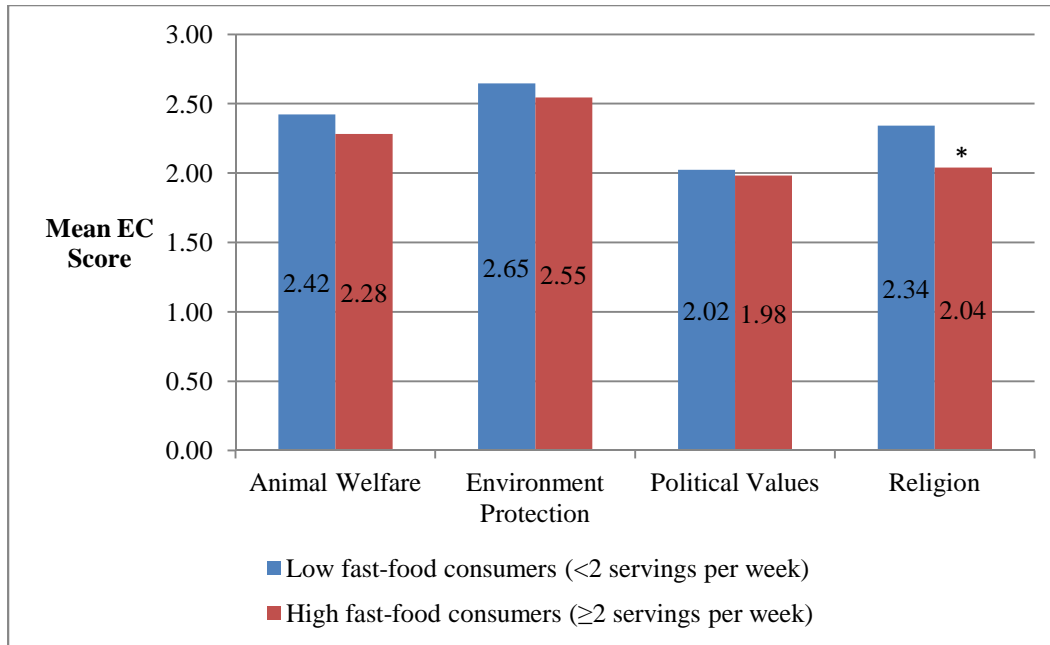


Figure 2. Mean Ethical Concern Score by Fast food Consumption Level (\*p<0.05)

Tables 6 and 7 show the results from multivariate logistic regression analysis. Multivariate analysis was used to investigate the association between the purity/sanctity foundation of the MFQ and the religion subscale of EC with the dependent dichotomous variable, fast food consumption (low vs. high) after controlling for the gender, race, university major, and religion of the respondents. After controlling for the covariates purity/sanctity scores were no longer significantly associated with fast food consumption (OR= .85, 95% CI: 0.64-1.13). In this model, female respondents were about half as likely to be high fast food consumers compared to males (OR=0.45, 95% CI: .26-.77). Respondents in the “other” religion category were 2 times more likely to be high fast-food consumers than Christians (OR=2.04, 95% CI: .99-4.20), however this relationship only approaches significance (p=0.052).

Table 6

*Results from multivariate logistic regression analysis of the association between Moral Foundation Purity/Sanctity Scores and Fast food Consumption*

	OR	95% C.I.	
		Lower	Upper
<b>Purity Sanctity</b>	0.87	0.67	1.13
<b>Gender</b>			
Male (Reference)			
Female	0.44*	0.25	0.76
<b>Race/Ethnicity</b>			
Non-Hispanic White (Reference)			
Other	1.35	0.75	2.44
<b>University Major</b>			
Health/Medical (Reference)			
STEM	0.76	0.35	1.64
Arts/Social Sciences	1.26	0.43	3.71
Other/Non-Specified	0.62	0.29	1.30
Not Current Student	0.75	0.35	1.58
<b>Religion</b>			
Christian (Reference)			
Mormon	0.92	0.42	2.02
Did not disclose	1.20	0.34	4.95
Other	2.03	0.96	4.31
No particular belief	0.53	0.16	1.71
Multiple selected	1.50	0.61	3.66

\* p<.05

Table 7 shows the multivariate logistic analysis between the religion subscale of the EC and the covariates of gender, race, university major, and religion of the respondents. After controlling for these covariates religion was not associated with fast food consumption (OR= 0.87, 95% CI: 0.67-1.13). Again, in this model females are less than half as likely to be high fast-food consumers compared to males (OR=0.44, 95% CI: 0.25-0.76).

Table 7

*Results from multivariate logistic regression analysis of the association between Ethical Concern Religion Subscale Scores and Fast food Consumption*

	OR	95% C.I.	
		Lower	Upper
<b>Religion</b>	0.85	0.64	1.13
<b>Gender</b>			
Male (Reference)			
Female	0.45*	0.26	0.77
<b>Race/Ethnicity</b>			
Non-Hispanic White (Reference)			
Other	1.46	0.80	2.66
<b>University Major</b>			
Health/Medical (Reference)			
STEM	0.80	0.37	1.72
Arts/Social Sciences	1.16	0.37	3.60
Other/Non-Specified	0.63	0.30	1.33
Not Current Student	0.76	0.36	1.61
<b>Religion</b>			
Christian (Reference)			
Mormon	1.10	0.45	2.72
Did not disclose	1.23	0.32	4.73
Other	2.04^	0.99	4.20
No particular belief	0.50	0.16	1.61
Multiple selected	1.60	0.67	3.82

\* p<.05, ^approaches significance (p=.052)



## Chapter 5

### DISCUSSION

The purpose of this study was to investigate the relationship between morality and fast food consumption using Moral Foundation Questionnaire (MFQ) and Ethical Concern in food choice (EC) questionnaire two measures of morality. Further, the study investigated the relationship between the two morality measures to determine if they are related to one another. The goal of the study was to provide data for designing an intervention to test alternative strategies for reducing fast food consumption by appealing to consumer's morality.

#### **Sample Characteristics Compared to Larger Samples**

The participants in the current study tend to eat less fast food than what would be expected in a nationally representative sample. Eighty-four percent of participants in the current study were low fast-food consumers (eating less than 2 servings of fast food per week) compared to a more representative sample (the CARDIA study) where 61.7% of the sample were low fast-food consumers (Duffey, 2007). The sample discussed in this study had a large proportion of students in health related majors (27.8%), (particularly nutrition and exercise and wellness). This population may be less likely to consume fast food (80% of health majors fell into the low fast food consumption category). In addition, 76.5% of the sample was non-Hispanic-White and 71.4% were females. These two demographic groups are known for lower fast food consumption levels compared to their counterparts (Dave et al., 2009; Driskell, Meckna, & Scales,

2006; Larson et al., 2008; Paeratakul et al., 2003; Pereira et al., 2005) which may explain why lower consumers of fast food made up a large proportion of the study sample.

While the study population ate less fast food than the average American, they also scored higher on all 5 moral foundations compared to a larger sample (Koleva, Graham, Iyer, Ditto, & Haidt, 2012). More than 10,000 participants, primarily male (62%) with a mean age of 38 years, completed the MFQ online at [www.yourmorals.org](http://www.yourmorals.org) (Koleva et al, 2012). The mean scores of this larger sample were 3.53 for the harm/care subscale and 1.61 for the purity/sanctity subscale (Koleva, et al., 2012) compared to 4.62 and 3.88 in the current sample. This difference may be a reflection of the sample selection in our study where the vast majority of the sample were younger, White females in health related majors.

### **Fast food Consumption and Moral Foundations Theory**

The first hypothesis in this study was that moral foundation scores, specifically on the harm/care and purity/sanctity foundations, would be associated with fast food consumption. Bivariate analysis showed purity/sanctity scores to be significantly different between high and low fast-food consumers. This result is consistent with previous research that has connected purity/sanctity to eating and avoidance behavior through feelings of disgust (Olatunji et al., 2008; Rozin et al., 1997). The frequent association of feelings of disgust with fast food (Bugge, 2011; McPhail et al., 2011) may explain why low fast-food consumers had higher purity/sanctity scores.

When the relationship between purity/sanctity and fast food consumption was explored with multivariate analysis (controlling for gender, race, university major, and religion) the association was no longer significant. The makeup of our study population was largely non-Hispanic Whites and females; two groups who we would expect to be low fast-food consumers (Dave et al., 2009; Driskell et al., 2006; Larson et al., 2008; Paeratakul et al., 2003; Pereira et al., 2005). In addition, in the multivariate analysis gender was a significant predictor of fast food consumption with females significantly less likely to be high consumers. These data suggest that the bivariate relationship between purity/sanctity and consumption levels may be driven by an individual's gender rather than their moral intuition.

Bivariate analysis of harm/care and fast food consumption showed that the two were not related. In fact, scores on this foundation were identical for both high and low fast-food consumers (both had a score of 4.63). The lack of a relationship between harm/care and fast food consumption suggests that the desire to reduce harm to one's self or to animals may not be sufficiently strong to impact the fast food consumption of the study participants.

### **Fast food Consumption and Ethical Concern Scale**

The study's second hypothesis was that the Ethical Concern in food choice questionnaire would be associated with fast food consumption. This scale was created to expand on the Food Choice Questionnaire to specifically identify ethical motivations in food choice (M. Lindeman & Vaananen, 2000). Given the negative ethical feelings often associated with fast food consumption (Bugge,

2011; McPhail et al., 2011) it was believed that higher scores on the EC would be associated with lower fast food consumption.

The study results revealed that while the scores for each subscale of the EC were in fact higher for low fast-food consumers, the only significant difference in scores was seen on the religion subscale (low fast-food consumers scored 2.34 compared to 2.04 for high consumers). This tells us that those participants who consider religious factors to be an important part of their eating decision making also tend to consume less fast food. Other research has shown a connection between religious affiliation and sanctification of the body with high levels of health protective behavior (Holt & McClure, 2006; King, Burgess, Akinyela, Counts-Spriggs, & Parker, 2005; Mahoney et al., 2005) including avoidance of illicit drugs and premarital sex. These studies however did not show any association between religious beliefs and diet specifically (Holt & McClure, 2006; King et al., 2005; Mahoney et al., 2005).

As we saw in table 4 there was a strong positive association between purity/sanctity and the religion subscale of the EC ( $r=0.613$ ,  $p < 0.01$ ). It is not surprising then to see a similar bivariate relationship between low fast food consumption and higher religion scores as we saw with purity/sanctity. Again however, the bivariate relationship between the religion subscale and fast food consumption disappeared when controlling for relevant demographic characteristics (gender, race, major, and religion) suggesting the difference in religion scores and fast food consumption can be explained by the largely female and non-Hispanic White sample. These two groups are typically low fast-food

consumers (Dave et al., 2009; Driskell et al., 2006; Larson et al., 2008; Paeratakul et al., 2003; Pereira et al., 2005).

### **Relationship between Moral Foundations and Ethical Concern Scales**

The two morality measures in this study, MFQ and EC, were moderately correlated with each other. Harm/care and fairness/reciprocity from the MFQ showed moderate positive associations with animal welfare, environmental protection, and political values subscales from the EC with  $r$  values ranging from .233 to .374 (Table 4). The strongest correlation in this group was between harm/care and animal welfare ( $r=.374$ ,  $p<0.01$ ). The basis of the harm/care foundation is that actions that limit harm to oneself, others, or animals is valued (Graham et al., 2011), this falls in line with the animal welfare subscale of the EC which specifically addresses the desire to eat food that respects the rights of animals and does not cause them pain (M. Lindeman & Vaananen, 2000). The positive correlation between the two constructs may provide a link between moral intuition (specifically harm/care) and food choice, although more research is warranted to further explore this relationship.

The purity/sanctity foundation from MFQ and religion subscale of EC had a strong positive correlation ( $r=.613$ ,  $p<0.01$ ). Therefore those who scored high on the purity/sanctity foundation also considered religion to be important in their food decision making process (by scoring high on the religion subscale of the EC), again suggesting that moral intuitions may play a role in food decision making. This relationship makes sense given the fact that purity/sanctity incorporates the idea of living a higher life that is not dictated by wants and

desires (Graham et al., 2011), a concept that is common in religious thought. The EC asks participants “if it is important that food I eat on a typical day is not forbidden by my religion or is in harmony with my religion” (M. Lindeman & Vaananen, 2000). So if a person has a highly attune purity/sanctity intuition it is likely that they will also consider religion to be important in their food decision making.

### **Limitations**

There are a number of limitations to this study. First, the study is cross-sectional which does not allow us to make any inference of a cause and effect relationship between morality and fast food consumption. However, based on the goal of the study to explore associations between morals and fast food consumption in an effort to direct future research, a cross-sectional study was the best study option.

Second, our sample was a convenience sample taken from the university population to which we had access. The sample was made up of participants who were self-selected into the study. As a result our sample consisted of a large proportion of students in health related majors (27.8%), (particularly nutrition and exercise and wellness), non-Hispanic Whites (76.5%) and females (71.4%). The characteristics of our sample do not allow us to generalize the results to the broad college population.

Finally, the nature of survey research lends itself to potential biases. The fast food screener used to capture fast food consumption, while a validated

instrument, asks respondents to report fast food consumption retrospectively for the past month. It is possible that poor respondent memory or social desirability biases influenced how the fast food question was answered (Hebert et al., 2008). Social desirability may also play a role in how respondents answer moral and ethical questions as well (Randall & Fernandes, 1991).

## **Conclusion**

This study investigated the association between two measures of the morality, the MFQ and EC, in a sample of 739 primarily white female college students. The study found an association between MFQ and EC suggesting that moral intuitions play a role eating decision making. The association between moral foundations and eating decision making should be further researched as a potential alternative model to impacting food decision making beyond traditional knowledge based approaches.

In addition, the study also investigated the association between fast food consumption and the MFQ and EC. The study results showed that, after controlling for relevant covariates, there was no relationship between moral foundations or ethical eating and fast food consumption. It is important to note that the fast food consumption level in this self-selected sample was lower than what would be expected nationally. The characteristics of the participants who enrolled in created a sample of lower than average fast-food consumers. Future studies should explore if these associations exist in groups that consume fast food at rates similar to those observed in the US population.

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APPENDIX A

ADVERTISEMENT, CONSENT AND IRB

## Advertisement: Qualitative Interviews



**Want a \$5** ARIZONA STATE UNIVERSITY **gift card to Starbucks?**

Researchers at ASU are exploring new ways to eat better and more sustainably.

To receive your \$5 gift card, you can help us by answering questions about your eating.

**We are looking for healthy college students who are 18 or older.**

## Consent Form: Qualitative Interviews

### INFORMATION LETTER-INTERVIEWS, GROUP INTERVIEWS, or FOCUS GROUPS

Food and morality study – development

10/31/11

Dear Participant:

I am a professor in the School of Nutrition and Health Promotion at Arizona State University. I am conducting a research study to explore how morality and food are related.

I am inviting your participation, which will involve any one of the following options (a) semi-structured interviews; (b) focus groups; (c) participant observation in an eating; and/or d) user testing/feedback on preliminary prototypes of interventions focused on morality and food. You will have the option to participate in as many or as few options as you so choose. Each task listed above will take between 20 minutes to 1 hour each. For your involvement you will be offered a small \$5 gift card. You have the right not to answer any question, and to stop participation at any time.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty, for example, it will not affect your grade. You must be 18 or older to participate in the study.

Although there is no benefit to you possible benefits of your participation are the identification of new insights on ways to promote healthful eating among college students. There are no foreseeable risks or discomforts to your participation.

Your responses will be confidential. The results of this study may be used in reports, presentations, or publications but your name will not be used.

I would like to audio/videotape this interview. The interview will not be recorded without your permission. Please let me know if you do not want the interview to be taped; you also can change your mind after the interview starts, just let me know. These audio/video tapes will be stored on a password-protected computer in my locked lab space in a locked room within a locked and guard protected building (ABC1) on the ASU campus.

If you have any questions concerning the research study, please contact the research team at: Eric Hekler, [ehekler@asu.edu](mailto:ehekler@asu.edu), or 6028272271. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788. Please let me know if you wish to be part of the study.

By signing below you are agreeing to participate in the study.

_____	_____
Signature	Date

By signing below, you are agreeing to be taped.

_____	_____
Signature	Date

---



**Advertisement: Survey**



**Help out a fellow student!**

Students at ASU want to explore your views and thoughts related to food and food production. You must be 18 or older to participate.

Please help us out by filling out this BRIEF survey: [PUT LINK HERE](#).

For more information contact:

Eric Hekler: [ehekler@asu.edu](mailto:ehekler@asu.edu) or (602) 827-2771

**Consent Form: Survey**

Food and Morality Study - Development

Date 10/24/2011

Dear Participant:

I am a Professor in the Department of Nutrition in the School of Nutrition and Health Promotion at Arizona State University.

I am conducting a research study to explore how morality and food are related. I am inviting your participation, which will involve completing an online survey. The following survey you are about to complete contains several questionnaires. Each questionnaire has its own set of instructions. Please read the instructions completely before filling out each questionnaire. These questionnaires should take you no more than 20 minutes to complete. Your participation in this study is voluntary. You can skip questions if you wish. If you choose not to participate or to withdraw from the study at any time, there will be no penalty, (for example, it will not affect your grade). You must be 18 or older to participate in the study.

Although there is no benefit to you, results from this study will aid us in the development of new strategies to promote healthful eating. There are no foreseeable risks or discomforts to your participation.

Your responses will be anonymous. The results of this study may be used in reports, presentations, or publications but your name will not be known. At the end of the survey, you will have the option of electing to include your name and contact information

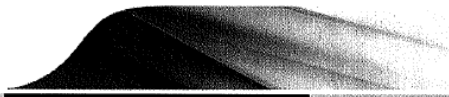
If you have any questions concerning the research study, please contact the research team at: Dr. Eric Hekler, School of Nutrition and Health Promotion, ABC1 room 121, mailing address, 500 N 3<sup>rd</sup> st Phoenix, AZ 85004, 602-827-2271, [ehekler@asu.edu](mailto:ehekler@asu.edu). If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Return of the questionnaire will be considered your consent to participate.

Sincerely,

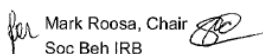
Dr. Eric Hekler

### IRB Approval



Office of Research Integrity and Assurance

**To:** Eric Hekler

**From:**  Mark Roosa, Chair  
Soc Beh IRB

**Date:** 10/31/2011

**Committee Action:** Exemption Granted

**IRB Action Date:** 10/31/2011

**IRB Protocol #:** 1110007008

**Study Title:** Food and morality study

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2).

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.

APPENDIX B  
QUALITATIVE AND SURVEY QUESTIONS

## **Qualitative Interview Questions**

1. What is your major?
2. Do you have any religious affiliation, if any?
3. Are you, or have you ever been, any type of vegetarian?
4. If you were to participate in a study that required you to provide your opinion about a topic, how would you prefer to provide your response? Written, spoken, survey or interview?
5. As part of a study, would you be willing to write a one to two paragraph essay?
6. How comfortable do you feel with public speaking on a scale of one to five, one being very comfortable and five being very uncomfortable?
7. How comfortable do you feel with debate on a scale of one to five, one being very comfortable and five being very uncomfortable?
8. What does morality mean to you?
9. What comes to mind when I say “moral eating”?
10. How do you feel about people who are extremely obese?
11. What about individuals who are extremely thin?
12. How do you feel about people who are vegan?
13. What do you think about junk food taxes, requirements to post calorie information, or the government putting restrictions on food consumption or purchasing?
14. If all vending machines were removed in an effort to discourage unhealthy eating, what would be your opinion/feelings about that?
15. Do you think it is the government’s responsibility to control food in the market?
16. Do you think we should all pay the same for health care regardless of lifestyle choices? Why or why not?
17. When you are eating, how much do you think about where your food comes from or what it is made of?
18. How many times per day or week do you eat meat?
19. What does sustainable eating mean to you?
20. Do you find sustainability important in your food choices?
21. How influential do you think your food choices are on your friends’ choices and vice versa?
22. How important is it to you to support your community by buying local?

## **Survey Questions**

### Demographics 1

1. Please indicate your gender. Male or Female
2. How old are you?
3. Are you of Spanish, Hispanic, or Latino origin or descent? Yes, No, Don’t Know

4. Please indicate your ethnicity (mark all that apply): African-American/Black, White, American Indian/Native American/Aleutian or Eskimo, Asian/Pacific Islander, or Don't Know
  5. What is your employment status? Full time (i.e., average 40 hours per week or more), High hours Part time (i.e., 9-39 hours per week), Low hours Part time (i.e., 8 or fewer hours per week), or Not currently employed
  6. Are you affiliated with Arizona State University? Yes or No
  7. Are you currently enrolled as a student (at ASU or any other school)? Yes or No
  8. What year of college are you currently enrolled in? Freshman, Sophomore, Junior, Senior, Graduate Student, Postdoc, or other
  9. What is your major?
  10. What is the highest grade or level of school that you have completed? Less than 12th grade, 12th grade or GED or High School Diploma, Less than 4 years of college, Bachelor's degree, or Graduate or professional degree
- Moral foundations Questionnaire
11. When choosing between right or wrong, how much does each of the following influence your thinking? Answer options: not at all relevant, not very relevant, slightly relevant, somewhat relevant, very relevant, or extremely relevant.
    - a. Whether or not someone suffered emotionally
    - b. Whether or not some people were treated differently than others
    - c. Whether or not someone's action showed love for his or her country
    - d. Whether or not someone showed a lack of respect for authority
    - e. Whether or not someone violated standards of purity and decency
    - f. Whether or not someone was good at math\*
    - g. Whether or not someone cared for someone weak or vulnerable
    - h. Whether or not someone acted unfairly
    - i. Whether or not someone did something to betray his or her group
    - j. Whether or not someone conformed to the traditions of society
    - k. Whether or not someone did something disgusting
    - l. Whether or not someone was cruel
    - m. Whether or not someone was denied his or her rights
    - n. Whether or not someone showed a lack of loyalty
    - o. Whether or not an action caused chaos or disorder
    - p. Whether or not someone acted in a way that God would approve of

12. Please read the following sentences and indicate your agreement or disagreement Answer options: Strongly Disagree, Moderately Disagree, Slightly Disagree, Slightly Agree, Moderately Agree, or Strongly Agree.
- a. Compassion for those who are suffering is the most crucial virtue.
  - b. When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
  - c. I am proud of my country's history.
  - d. Respect for authority is something all children need to learn.
  - e. People should not do things that are disgusting, even if no one is harmed.
  - f. It is better to do good than to do bad.\*
  - g. One of the worst things a person could do is hurt a defenseless animal.
  - h. Justice is the most important requirement for a society.
  - i. People should be loyal to their family members, even when they have done something wrong.
  - j. Men and women each have different roles to play in society.
  - k. I would call some acts wrong on the grounds that they are unnatural.
  - l. It can never be right to kill a human being.
  - m. I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.
  - n. It is more important to be a team player than to express oneself.
  - o. If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.
  - p. Chastity is an important and valuable virtue.

\*These questions are not used in the final calculation of the MFQ score. They are intended to be "catch" questions.

#### Ethical Concern Scale

13. Please rate the following statements related to your eating practices and habits. It is important that the food I eat on a typical day... Answer options: Not at all Important, A little Important, Moderately Important, or Very Important.
- a. Has been produced in a way that animals have not experienced pain.
  - b. Has been produced in a way that animals' rights have been respected.
  - c. Has been prepared in an environmentally friendly way.

- d. Has been produced in a way which has not shaken the balance of nature.
- e. Is packaged in an environmentally friendly way.
- f. Comes from a country I approve of politically.
- g. Comes from a country in which human rights are not violated.
- h. Has the country of origin clearly marked.
- i. Has been prepared in a way that does not conflict with my political values
- j. Is not forbidden in my religion.
- k. Is in harmony with my religious views.

#### Fast Food Screener

14. In the past month, how many times did you buy food at a restaurant where food is ordered at a counter or at a drive-through window (there is no waiter/waitress)? Answer options: Never or rarely, 1 time per month, 2-3 times per month, 1-2 times per week, 3-4 times per week, 5-6 times per week, 1 time per day, 2 times per day, or 3 or more times per day

#### Dietary Screener

All answer options for numbers 15-18 are: Never, One time last month, 2-3 times per month, 1 time per week, 2 times per week, 3-4 times per week, 5-6 times per week, 1 per day, 2 or more times per day

15. During the past month, how often did you eat any of the following foods?
- a. Green leafy or lettuce salad, with or without other vegetables
  - b. Fruit (fresh, frozen, or canned but not juice)
  - c. Fried potatoes (french fries, home fries, or hash brown)
  - d. Any other kind of potatoes (baked, boiled, mashed, sweet potatoes, or potato salad)
  - e. Refried beans, baked beans, beans in soup, pork and beans or any other type of cooked dried beans
  - f. Not including lettuce, potatoes, or cooked dried beans how often did you eat other vegetables
  - g. Mexican-type salsa made with tomatoes
16. During the past month, how often did you eat any of the following foods?
- a. Red meat, such as beef, pork, ham, or sausage (Do not include chicken, turkey or seafood)
  - b. Processed meat, such as bacon, lunch meats, or hot dogs
  - c. Poultry, such as chicken, turkey (Do not include beef, pork, ham, seafood or sausage)

- d. Seafood, including all kinds of fish (e.g., tuna, salmon) or shellfish (e.g., lobster, shrimp)
  - e. Eggs
17. During the past month, how often did you eat any of the following foods?
- a. Regular soda or pop that contains sugar (Do not include diet soda)
  - b. 100% pure fruit juice (Do not include any juice and drinks with added sugar)
  - c. Coffee or tea that had sugar or honey added to it (Include coffee and tea you sweetened yourself and presweetened items. Do not include diet, artificially sweetened, or sugar free options)
  - d. Sweetened fruit drinks, sports or energy drinks, such as Kool-aid, lemonade, Hi-C, Gatorade, Red Bull or Vitamin Water (Include all drinks with added sugar. Do not include diet or artificially sweetened drinks)
  - e. Chocolate or any other types of candy (Do not include sugar-free candy)
  - f. Doughnuts, sweet rolls, Danish, muffins, pan dulce or pop-tarts (Do not include sugar-free items)
  - g. Cookies, cake, pie or brownies (Do not include sugar-free kinds)
  - h. ice cream or other frozen desserts (Do not include sugar-free kinds)
18. During the past month, how often did you eat any of the following foods?
- a. Any kind of cheese (Include cheese as a snack, on burgers, sandwiches, and in foods such as casseroles. Do not count cheese on pizza.)
  - b. Pizza (Include frozen pizza, fast food pizza, and homemade pizza)
  - c. Butter added to food or bread (don't include use in cooking)
  - d. Margarine and other plant-based spreads
  - e. Milk (Include skim, low-fat, or whole milk)
  - f. Yogurt

#### Demographics 2

19. Please indicate your height in feet and inches. For example, if you are 5'10", you would choose '5' from the feet dropdown menu, and '10' from the inches dropdown menu.
20. Please indicate your weight in pounds.
21. What is your religious preference/affiliation? Please choose from the following list, and choose all that may apply. Agnostic, Atheist, Buddhist, Catholic, Christian – Nondenominational, Greek Orthodox, Hindu, Humanist, Jehovah's Witness, Jewish, Mormon, Muslim, Orthodox –



Other, Protestant, Russian Orthodox, Unitarian Universalist, No particular beliefs, or I do not wish to disclose this information

22. How religious would you say you are? Not all religious, only slightly religious, fairly religious, deeply religious, or I don't know
23. How often do you usually attend religious services? Never, One or twice per year, Three to ten times per year, Once per week, More than once per week, I do not wish to disclose this information, or Not applicable
24. When it comes to politics, do you usually think of yourself as liberal, moderate, conservative, or something else? 1 - very liberal, 2 – liberal, 3 - slightly liberal, 4 – moderate, 5 - slightly conservative, 6 – conservative, 7- very conservative, Libertarian, or Don't know/not political

