Conflicted Omnivores: Meat, Morals, and Money

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Abstract
Conflicted omnivores are people who eat meat but feel bad about it. This study addresses the spending habits of omnivores in the context of their food decisions. There are three measures which each test specific hypotheses relating to these habits. Measure one demonstrated that greater salience of animal origins of meat led to lower sales of meat in shopping settings, particularly in conflicted omnivores. Measure two found that the expected cost of reducing meat consumption is not a significant predictor of the likelihood of doing so. Measure three found that, while participants enjoyed beef more and attributed more mental status to beef/cows, they strongly felt that chicken is the more responsible food choice.

Keywords
conflicted omnivore, animal salience, food shopping

Disciplines
Business
Conflicted Omnivores: Meat, Morals, and Money

By

Benjamin Gendelman

An Undergraduate Thesis submitted in partial fulfillment of the requirements for the

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ABSTRACT

Conflicted omnivores are people who eat meat but feel bad about it. This study addresses the spending habits of omnivores in the context of their food decisions. There are three measures which each test specific hypotheses relating to these habits. Measure one demonstrated that greater salience of animal origins of meat led to lower sales of meat in shopping settings, particularly in conflicted omnivores. Measure two found that the expected cost of reducing meat consumption is not a significant predictor of the likelihood of doing so. Measure three found that, while participants enjoyed beef more and attributed more mental status to beef/cows, they strongly felt that chicken is the more responsible food choice.

Keywords: conflicted omnivore, animal salience, food shopping
INTRODUCTION

Literature Review

While diets and cuisines have varied greatly amongst different groups of people, an interesting phenomenon that has persisted across both time and culture is the conflicted response to meat. Meat has historically been amongst the most treasured and, ironically, most tabooed food items (Rozin, 2004; Fessler & Navarrete, 2003). The controversy over eating meat has manifested itself in a variety of domains, including religious dietary laws (Grandin & Regenstein, 1994), moral qualms over aspects of meat eating and production (Ruby & Rozin, manuscript in preparation; Grandin & Regenstein, 1994), cultural outlawing or restriction of certain meats (Fessler & Navarrete, 2003; Fessler, 2002), and health-based debates regarding different meats’ dietary values (Fessler, 2002). Recent research has explored cognitive dissonance (Festinger, 1957), resulting from inconsistency of beliefs and attitudes, that may arise from eating meat (Loughnan, Haslam, & Bastian, 2010; Ruby & Rozin, manuscript in preparation). Some meat eaters are faced with what is called the “meat paradox”; this paradox occurs when people like and/or respect animals, but also enjoying eating them (Loughnan et al., 2010). “Conflicted omnivores”, (Ruby & Rozin, manuscript in preparation) therefore, are people who eat meat but feel bad about it.

On a spectrum of the moralization of dietary habits (Figure 1.), most people appear to fall into the category of contented omnivores: people who have no problem with eating meat. Following contented omnivores is the relatively smaller portion of omnivores who are conflicted. While a variety of reasons for conflict exist, amongst the most common reasons are concerns over animal welfare, followed by environmental and health concerns (Ruby & Rozin, manuscript in preparation). After conflicted omnivores are partial vegetarians, whose diets include plant-
based foods and animal products but who limit their meat consumption generally first cutting off mammal meat and then moving to white meat (Beardsworth & Keil, 1992). Situated adjacent to partial vegetarians are reducetarians, who practice eating less meat. This reduction can be expressed to mammal meat alone, or to a wider range of animal foods (Reducetarian Foundation, 2016). Finally, at the opposite side of the spectrum from omnivores are vegetarians, who consume no meat, followed by vegans, who consume no animal products.

Figure 1. Spectrum of the Moralization of Dietary Habits

Conflicted omnivores’ presence in the world is significant: previous studies estimate that, of adult populations, they comprise approximately 32% of the U.S., 39% of Germany, and 59% of France (Ruby, Rozin, Gendelman, Li, Arbit, & Pelish, manuscript in preparation). Given their sheer numbers, conflicted omnivores represent an interesting and potentially influential group of people “on-the-margin” regarding their food decisions. Despite this, relatively little has been known about them. In previous studies, predictors of conflict around eating meat include being a woman and holding liberal political views (Ruby et al., manuscript in preparation). Conflict has been positively associated with concern for animals and the environment, and intention to reduce/eliminate meat consumption (Ruby et al., manuscript in preparation). It has been negatively associated with meat consumption, endorsement of the 4Ns of Carnism (the idea that eating meat is Normal, Natural, Nice, and Necessary; Piazza et al., 2015), social dominance orientation (a personality trait encompassing a preference for social hierarchies and anti-egalitarianism; Pratto, Sidanius, Stallworth, & Malle, 1994; see Graça, Calheiros, & Oliveira,
2016 for a discussion of meat-eating in the context of moral disengagement theory), the endorsement of violence (Anderson, Benjamin, Wood, & Bonacci, 2006), and the enjoyment of violent media. Understanding the attitudes of conflicted omnivores towards the aforementioned topics offers a more holistic picture of the values of the group, and provides a scope with which to observe the moral and psychological aspects of eating meat.

In the developed world today, many people have the luxury of being able to consciously choose the food that ends up on their plates. With this extended freedom, food choice possesses not only a dimension of health and liking, but also of morality (Ruby & Heine, 2011). Research has shown that conflicted omnivores deal with moral conflict over eating meat using a variety of different mechanisms. Rothgerber (2014) identifies eight mechanisms used by omnivores to reduce the dissonance that arises from eating meat: avoidance of situations that give rise to the cognitive dissonance (based on Festinger, 1957), dissociation of the animal from the food product, perceived behavioral change (convincing oneself that they are not engaging in meat eating), denial of animal pain, denial of animal mind, pro-meat justifications, reduction of perceived choice (reducing one’s responsibility through claiming that there was no other choice), and actual behavioral change.

A particularly common strategy is perceiving animals as “unworthy and unfeeling”, thereby denying the minds of animals used for human consumption (Bastian, Loughnan, Haslam, & Radke, 2012; Loughnan et al., 2010; Ruby & Rozin, manuscript in preparation). An important conflict-evoking factor is the salience of the animal origin of meat (Ruby & Heine, 2012; Loughnan et al., 2010). People have a tendency to mentally separate the meat that they eat from its animal origins (Hoogland, de Boer, & Boersma, 2005). Tian, Hilston, and Becker (2016) offer additional cross cultural evidence of the dissuasive aspect of the animal-origin of meat in
people’s willingness to eat it, showing that cognitive dissonance from the meat paradox arises in both French and Chinese samples.

The salience of animal origin may have important implications in the realm of consumers’ food choices, particularly in market contexts where the marketer has the ability to make the animal origin of the meat more or less salient. Strategies to separate the animal and food product are already employed by people through euphemistically labeling food products with animal origins (Adams, 1990; Bandura, 1999; Kunst & Hohle, 2016; Plous, 1993); for example, hamburger and bacon, or even beef and pork, do not explicitly share any association with the animal from which they are created. Further along this line, certain topics important to many conflicted omnivores are becoming increasingly important in consumers’ perceptions of meat quality (Grunert, 2006; Ruby & Rozin, manuscript in preparation). These factors, denoted by Grunert (2006) as extrinsic cues (non-sensory cues that signal quality about the food item), include themes such as whether the animal was treated well on the farm it came from and whether the transportation and killing of the animal was done humanely.

The last two studies conducted on conflicted omnivores have primarily sought to identify omnivores’ attitudes toward different types of violent behavior and their attitudes toward animals and other people as a function of social dominance orientation (Pratto et al., 1994). Both studies found that conflicted omnivores are significantly less likely to condone violence and are lower on the SDO scale than are their contented counterparts, suggesting that conflicted omnivores, like vegetarians (Allen, Wilson, Ng, & Dunne, 2000), are less likely to endorse social hierarchies between people and more likely to endorse egalitarian values (Ruby et al., manuscript in preparation). Additionally, the last study on conflicted omnivores used multiple regression to establish which factors played most heavily into people’s decision to take action in regards to
addressing their conflict. For example, the most important factors in predicting the likelihood of reducing meat consumption (with an $R^2$ squared of approximately .5) were found to be the perceived change in self-worth from reducing meat consumption, the perceived impact of reducing meat consumption, the perceived difficulty of reducing meat consumption, and degree of conflict over eating meat (Ruby et al., manuscript in preparation). Loosely based off the Theory of Planned Behavior (Ajzen, 1991), this model focuses specifically on moral situations in which conflict is relevant (for example, taking action to save the environment) in the context of reducing meat consumption. It was also found that perceived change in others’ view of the actor was not a significant explanatory variable. In other words, the results suggest a minimal role for action taken to increase the positive perception of the self by others).

In terms of reducing meat consumption, consistent patterns have emerged in past work. Particularly, in the transition from omnivore to vegetarian, people tend to first cut red meat out of their diets and then proceed to restrict the intake of other meats (Beardsworth & Keil, 1992; Ruby, 2012). It is difficult to say whether this pattern may be applied on a macro-level scale but such an explanation would be consistent with current phenomena in the meat industry.

According to the U.S. Department of Agriculture, in the last 6 years the annual per capita consumption of beef fell by approximately 12%; on the other hand, the consumption of chicken increased in that time frame by approximately 11% (USDA, 2016). As depicted in Figure 2, there appears to be a moderate inverse relationship in percentage change in consumption of beef and chicken during that time frame, with beef consumption generally changing negatively. While the quantity of beef consumed has fallen and the quantity of chicken consumed has increased, the prices do not seem to tell the full story behind this change. As depicted in Figure 3, there is a volatile and seemingly uncertain pattern in the price ratio of chicken to beef that does not suggest
a clear upward or downward trend (IMF, 2016). For example, the upward trend in Figure 3 from 2012 to 2013 would suggest a cheapening of beef relative to chicken, but the pattern in Figure 2 was not reversed to show an increase in beef consumption or a decrease in chicken consumption. If the changes in consumption are not totally attributable to price changes, then attitudinal changes amongst consumers may be playing a role.

Figure 2. Yearly Percent Change in Per Capita Consumption of Beef and Chicken

Figure 3. Monthly Price Ratio of Chicken:Beef
The meat industry as a whole is undergoing considerable changes that may be a result of shifting consumer dietary demographics. While the percentage of self-described vegetarians in the U.S. has increased from approximately one percent in 1971 to four percent in the present day (Jensen, 2013; Stahler, 2011), Tyson Foods Inc., the world’s second largest marketer and processor of meat (chicken, beef, and pork), continues to grow, taking in $41 billion in revenue in 2015 (an approximate 20% increase from revenue in 2013) and has had considerable growth in market capitalization over the last 10 years (Tyson Foods, 2015). At the same time, according to the Nutrition Business Journal, “25% of consumers decreased their meat intake from 2014-2015 and meat alternative sales grew from $69 million in 2011 to $109 million in 2015” (FAIRR, 2016). According to Donnie Smith, current CEO of Tyson Foods, “The consumer demand for [non-meat protein] continues to grow, and we are keeping an eye on that because we want to stay relevant with consumers” (FAIRR, 2016). Smith’s actions have been consistent with his words; in October 2016, Tyson Foods purchased a 5% stake in Beyond Meat, a company focused on creating protein-rich plant-based meat alternatives (McGroarty & Bunge, 2016). This occurrence and statement offers interesting insight into phenomena that may predict the future course of the market for meat. Importantly, for food businesses like Tyson, understanding and predicting the actions of people on the margin regarding meat consumption (such as conflicted omnivores) may present a unique competitive advantage for the firm.

Explanation of Hypotheses

The over-arching question of this study is “What is the effect of what may be a growing population of U.S. consumers who are conflicted omnivores on the future of the meat industry?” Under that over-arching question, this study tests 3 hypotheses:
Hypothesis 1: Greater salience of the animal origins of meat leads to lower sales of meat in grocery store settings, particularly in conflicted omnivores.

This hypothesis builds off the theoretical framework of Bastian et al. (2012) and partially branches off the methodological approach of Grunert (2006) by creating a shopping simulation in order to gauge consumer attitudes. While Grunert (2006) approaches the model from a marketing conjoint analysis standpoint and differentiates between extrinsic and intrinsic cues related to meat quality, my approach will be geared toward testing the effect of animal-origins salience in the overall decision to spend money on meat relative to other non-meat goods. Understanding the effects of greater salience of meat’s animal-origins is relevant in the business world. For example, contextual factors that lead to changes in spending patterns in a real-life and/or online setting may be of crucial importance for meat vendors and marketers. With the advent of online grocery shopping, the increased psychological distance of purchasing meat via a click on the internet (versus buying meat in person) may make it easier for conflicted omnivores to purchase meat and subsequently may increase their meat consumption. On the other hand, a context in which the meat consumer’s purchase situation depicts salient animal origins (such as a pig carcass hanging in a butcher shop) may serve to evoke conflict and decrease sales from conflicted omnivores. In line with the previous work on the effects of the salience of animal-origins of meat (Bastian et al., 2012; Rothgerber, 2014; Tian, Hilston, & Becker, 2016), omnivores confronted with the animal origins of meat in a purchasing situation should feel more cognitive dissonance than they would in the same purchasing situation where the animal origins of meat are not made salient. Additionally, in line with Graça, Calheiros, and Oliveira (2016), it is expected that conflicted
omnivores will face more cognitive dissonance in their purchase decision than will contented omnivores (who are more able to reconcile this conflict through moral disengagement (Bandura, 1999), or other mechanisms. That said, in a shopping simulation where actors choose the amount of money to allocate to the meat section of the store between two randomly assigned conditions (animal origins salient vs. non-salient) and two other sections of the store (bakery and produce), there are two expected effects: 1) In the animal-origins salient condition, all omnivores will allocate less money to the meat section than in the non-salient condition. 2. In the animal-origins salient condition, conflicted omnivores will allocate less money to the meat section than contented omnivores.

**Hypothesis 2:** Low socioeconomic status individuals will expect a reduced meat diet to be more expensive than their current diet, whereas high socioeconomic status individuals will expect a reduced meat diet as less expensive than their current diet. For all participants, the cost of reducing meat consumption will be negatively associated with the likelihood of doing so.

This hypothesis continues the discussion of modeling the factors that predict the likelihood of taking action in regard to a moral cause. While a previous model from conflicted omnivore studies observed different attitudinal factors such as the perceived difficulty, perceived impact, and perceived change in self-worth from taking action (Ruby et al., manuscript in progress); it did not take into account dispositional factors integral to any market situation, namely cost. The cost of reducing meat consumption may mean different things to different people depending on socioeconomic status (SES). Food deserts are defined as areas in the country in which people lack access to fresh fruits, vegetables, and other healthy food; they are generally in impoverished areas and
leave residents to have diets high in meat and cheap, processed, “energy dense” foods (Freudenberg, Galea, & Vlahov, 2006; Gallagher, 2011). In food deserts, individuals try to maximize the calories per dollar benefit that they receive from food and therefore would have to spend significantly more in order to obtain low-calorie nutritious foods such as fresh vegetables which are “more expensive on a per calorie basis than are fats and sugars” (Story, Kaphingst, Robinson-O’Brien, & Glanz, 2008). High-SES individuals who live in areas with ample access to fruits and vegetables, however, may expect a reduced-meat diet as less expensive since they can more readily consume fruits and vegetables and may recognize that animal products are, on average, the most expensive components of total grocery costs (Flynn & Schiff, 2012). Given that low-SES individuals are more likely to live in food desert conditions, they will expect a reduced-meat diet to be more expensive than their current diet, whereas high-SES individuals will expect a reduced meat diet to be less expensive than their current diet. Across all participants, this hypothesis predicts that expected cost of reducing meat consumption will be negatively associated with the likelihood of reducing meat consumption.

**Hypothesis 3:** Attitude changes amongst consumers are leading to a major substitution from beef to chicken.

According to the U.S. Department of Agriculture, in the last 6 years the annual per capita consumption of beef fell by approximately 12%, whereas the consumption of chicken increased in that time frame by 11% (USDA, 2016). This study hypothesizes that there is a fundamental attitudinal difference by consumers towards beef and chicken and these attitudinal differences, rather than the prices of the foods, are causing a significant shift away from beef and towards chicken. Past research does not provide clear predictions for
what the attitudinal changes, if any, would specifically be. That said, this will largely be
treated as an exploratory analysis to attempt to uncover potential attitudinal shifts that
may be at play.

**STUDY**

**Methodology**

This study was conducted as an online survey on Qualtrics Survey software with adult
participants living in the USA recruited from Amazon’s Mechanical Turk. All statistical analyses
were done in SPSS software. The original sample size was $N = 286$ and after filtering for people
who missed the “catch” question (those who do not disagree with the statement “The Earth is a
cube”), the final sample size was $N = 277$. In terms of demographics, this sample had $N = 277$,
48.6% Women, $M_{age} = 36.2$, $SD_{age} = 11.5$. Social political leanings were measured on a scale of 1
(Very Conservative) to 7 (Very Liberal). In terms of social political orientation, the sample was
mostly liberal (approximately 63.5%). This estimate is on par with previous MTurk samples that
have been used for studies on this subject. Approximately 50% of the sample identified as
conflicted; this is substantially higher than the approximate 30% estimate from previous studies
on conflicted omnivores (Ruby et al., Manuscript in preparation). The average level of conflict
did not vary between the salient and non-salient conditions (denoted by subscripts “$ConflictS$”
and “$ConflictNS$” respectively; $M_{ConflictS-ConflictNS} = -.00079$; $p = .996$).

Before proceeding to the study-specific measures, it is important to note the operational
definition this study used to identify conflicted omnivores:
Conflict Around Eating Meat: This measures participants’ attitudes toward various issues related to meat as a composite measure of 6 other variables each measured on a standard 7-point agree-disagree scale (from Ruby et al., manuscript in preparation). (R) means reverse-scored.

1. “I feel bad about eating meat”
2. “I think that eating meat is ethically acceptable” (R)
3. “I am okay with how animals raised for food are killed” (R)
4. “I am okay with how animals raised for food are treated” (R)
5. “I am concerned about the effects of meat production on the environment”
6. “I am concerned about the effects of meat consumption on my health”

These six measures were averaged together and participants with Conflict > 0 were considered conflicted whereas participants with Conflict < 0 were considered contented or non-conflicted.

Measure One

The goal of this measure was to test the first hypothesis that greater salience of the animal origins of meat leads to lower sales of meat in grocery store settings. It consists of three separate test variables. Participants were randomly assigned one of two groups at the beginning of the study: “Salient” or “Non-Salient”. In general, both conditions present some meat-related stimuli to the participants, but the salient condition also includes a prime of the animal origins of the meat. Each of the tests therefore is a between-subject comparison, looking at differences in the two groups’ spending behaviors as a function of the presence of animal origins salience.

Additionally, a new variable was created to observe interactions between salience and conflict (Table 1.). A binary variable was added which coded 1 for people who were conflicted (scored Conflict > 0) and -1 for people who were not conflicted (scored Conflict < 0). This
variable was multiplied by the salience condition plus two (since it is originally coded as 0 or 1, this was done to create 4 differently numbered groups: -3,-2,2,3). Each group is then represented as a combination of two conditions; for example: The Non-Conflicted, Non-Salient Condition group is expressed as \(-1*2 = -2\) or \(NCNS\). Thus, there were four groups as illustrated below:

<table>
<thead>
<tr>
<th></th>
<th>Non-Salient (2)</th>
<th>Salient (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Not Conflicted (-1)</strong></td>
<td>(NCNS (-2))</td>
<td>(NCS (-3))</td>
</tr>
<tr>
<td><strong>Conflicted (1)</strong></td>
<td>(CNS (2))</td>
<td>(CS (3))</td>
</tr>
</tbody>
</table>

Figure 4. Interactions Between Conflict Y/N Variable and Salience vs. Non-Salient Condition

For the purposes of this study, measures referring to the salient condition will have an “S” in the subscript, those referring to the non-salient condition will have “NS”, and those that refer to the interaction variables above will have the phrasing in the table above; for example: \(M_{NCNS-CS}\) would represent the mean of the difference between the contented (non-conflicted)/non-salient condition group minus the conflicted/salient condition group.

**Test One: Grocery Buying Simulation**

All participants were given the following instructions “Imagine you are shopping in a grocery store with $100 total to spend among three sections of the store: Fruits, Vegetables, and Meat. You will next be shown pictures of each of these sections for 10 seconds. Please take a look at each section and think about what you might buy. (Note: you cannot move forward until the 10 seconds have passed.)”

Participants in each condition (salient and non-salient) saw the same photos for the fruits and the vegetables sections, but different photos for the meat section.
Figure 5. Fruits Section

Figure 6. Vegetables Section
After the participants were shown each picture for ten seconds, they were shown each picture side-by-side (meat picture varied based on condition) and asked to denote how much money (in USD) they would spend in each section of the store such that the total amount added up to $100.
To test for significant differences in the spending amounts between the groups, an independent sample t-test was used with condition (“Salient” or “Non-Salient”) as the grouping variable. Another important test that was used was an independent sample t-test which compares the amount of money spent by conflicted vs. contented omnivores when they’re both in either the salient condition or the non-salient condition. This measure is important because it can demonstrate any potential increased sensitivity to the animal origins salience condition by conflicted omnivores as opposed to contented ones. This test used the newly created variable (see general methodology for measure one) as the grouping variable for the independent sample t-tests.

**Test Two: Food Dish Valuation**

Participants were shown a picture of a food item and asked to indicate on a slider scale the maximum amount they were willing to pay, from 0-$20, for it. Each participant was shown six food items in total - lamb chops, steak, chicken wings, fish, salad, and garlic bread. The order of pictures was randomized for each participant. The salient condition participants were shown a picture of the food item and its source (i.e., the animal or plant used to make it), whereas the non-salient condition participants were shown solely the food item.
Independent sample t-tests for each food item were used to measure differences in willingness to pay between the salient and non-salient conditions. Any particular participant saw only one type of item (origin salient or not salient).

Test Three: Catering Menu Selection

Participants were given the following instructions “Imagine that you are planning a catering menu for a meal for 20 people this weekend. All the food items are the same price and you must purchase 20 servings of both the main courses and desserts (40 in total). As you look at the
menus think about how many servings of the food items you would purchase.” Following the same theme as the prior two tests, the non-salient condition group would see only pictures of the food on the menu, whereas the salient group would see pictures of the food and its animal or plant origin. The manipulation was done only in the Main Course menu, therefore each participant saw the same menu for the desserts. In contrast to the prior two tests, this test focuses on the quantity of each food purchased given salience or non-salience; potential spurious effects of price were controlled for by setting each food’s price at $5.

Once again, independent sample t-tests were used to measure differences in the number of servings of each food purchased between the salient and non-salient conditions. Since the dependent variable (here servings) was forced to add up to a certain number, any substitution effects between two foods could be readily observed.

Figure 13. Catering Menu (Salient)  Figure 14. Catering Menu (Non-Salient)
**Measure Two**

The goal of measure two was to test the second hypothesis that “low socioeconomic status individuals will expect a reduced-meat diet to be more expensive than their current diet, whereas high socioeconomic status individuals will expect a reduced meat diet as less expensive than their current diet. Further, for all participants, the cost of reducing meat consumption is negatively associated with the likelihood of doing so.” Participants were asked to indicate the expected cost of reducing meat consumption and their likelihood of doing so on standard -3 to 3 “Much Less to Much More” matrices:

![Figure 15. “Cost” Variable Survey Screenshot](image)

![Figure 16. “Likelihood” Variable Survey Screenshot](image)
The above two matrices would ask participants their likelihood and expected cost of cutting their meat consumption in half, stopping to eat meat, and stopping to eat animal products. Another new variable that was used was the “Enjoyment of food” variable which asked: “On a scale of -3 to 3 how much would your enjoyment of eating change if, over the next year you (cut meat consumption in half; stop eating meat; stop eating animal products).” This measure was included as a potential alternative predictor of the difficulty of cutting one’s meat consumption.

A multiple regression was used to identify the factors that best predicted one’s likelihood of reducing meat consumption. Previous studies on this subject used variables including expected change in self-worth and expected difficulty of reducing meat consumption to predict the likelihood of reducing meat consumption.

Subjective socioeconomic status and income were both used as measures of SES. The former asked participants where they would put themselves on a ladder where people who are best off are at the top and people who are worst off are at the bottom (adapted from Cantril, 1965); the latter simply asked participants to indicate their previous year’s household pre-tax income.

To test for the expected negative relationship between income and expected cost of reducing meat consumption, the second measure included a correlation matrix between SES, Income, and Expected Cost for each of the three reductions in meat consumption.

**Measure Three**

**Chicken vs. Beef Questionnaire**

The first part of measure three was the chicken vs. beef questionnaire, which first asked participants about their own chicken and beef consumption along with their thoughts on the
population averages. This measure was largely exploratory and the questions were more general than the prior two measures. Specifically, participants were asked to indicate their answer to each of the following questions on a sliding scale:

- “As a percentage (%) of your total chicken and beef consumption, what % is chicken?”
- “What do you think that % ought to be?”
- “What % chicken do you think the average American would say?” (Participants answered for both actual % chicken and ideal % chicken.

![Figure 17. “Actual % Chicken” Variable Survey Screenshot](image)

Participants were then asked two multiple choice questions regarding their consumption preferences: “Compared to a few years ago, do you now eat more, less, or the same amount of servings of chicken per week?” “Which do you prefer to eat? (Chicken or Beef)”

On the next part of the chicken vs. beef questionnaire, the participants were given a list of characteristics and told to indicate to what extent they believe chicken or beef is greater on each characteristic. The characteristics of comparison included “Healthy to eat”, “Taste”, “Availability for purchase”, “Quality of the meat”, “Animal’s richness of emotional experience”, “Animal’s capacity for pain and suffering”, “Worthy of moral concern”, “Environmentally
friendly food choice”, “Intelligence of the animal”, “Texture of the meat”, and “Higher price”. For each trait, participants responded on a scale of -3 to 3 which -3 being “Chicken much more X” and +3 being “Beef much more X” and 0 indicating that they are equal for that trait. Following the traits, the participants were asked via an open-ended response to list any other characteristics for which they believe chicken or beef is greater. To test for traits for which chicken or beef was significantly greater, a one-sample t-test was used comparing the mean response to zero; therefore, a negative mean would indicate that chicken is greater on a particular characteristic.

**Trolley Problem**

This second test in the third measure uses a modified three-outcome trolley problem (Foot, 1967) which involved choosing between sending a trolley to kill a cow, child, or chicken. The participants were shown the following:

![Trolley Problem](image)
The trolley problem measure was created to assess people’s relative valuations of the lives of chickens in terms of cows. Following the initial question, the participant would see two questions conditionally based on the choice they first picked. For example, if the participant elected to hit the chicken, then the follow up questions would be in the following format:

**Figure 19. First Conditional Question if Participant Selected “Hit Chicken” Survey Screenshot**

**Figure 20. Second Conditional Question if Participant Selected “Hit Chicken” Survey Screenshot**

Thus, for whatever choice the participant selected, the two follow-up questions would ask how many of that choice would need to be on the track for the participant to elect to hit one of the other two options. There was an option on each of the follow-up questions to not hit the other option regardless of the number of the chosen option.
Results

Measure One

Test One: Grocery Buying Simulation

An independent sample t-test showed no significant difference for money spent in the meat section of the grocery store (Cohen’s $d = .06; p = .615$) between participants in the salient condition and those in the non-salient condition. As a group, conflicted omnivores spent, on average, $9.66 less in the meat section than did contented omnivores ($p < .001; Cohen’s $d = .54$).

When both in the salient condition, conflicted omnivores spent significantly less in the meat section than contented omnivores ($M_{NCS-CS} = 12.455; p < .001; Cohen’s d = .67$). Conflicted omnivores also spent significantly less than contented omnivores in the non-salient condition ($M_{NCNS-CNS} = 7.46; p = .018; Cohen’s d = .43$). Note: NCNS stands for Not Conflicted, Non-Salient; NCS stands for Not Conflicted, Salient; CNS standards for Conflicted, Non-Salient; and CS standards for Conflicted, Salient.

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<th>CNS - CS</th>
<th>NCNS-CNS</th>
<th>NCS-CS</th>
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<td>$0.34$</td>
<td>$7.46$</td>
<td>$12.46$</td>
</tr>
</tbody>
</table>

![Graph showing differences between groups in money ($) spent on meat in grocery buying simulation](image)
Figure 21. Differences Between Groups in Money ($) Spent on Meat in Grocery Buying Simulation

There was no significant difference in meat section spending between conflicted omnivores across salience vs. non-salience conditions ($M_{CNS-CS} = .337; p = .915; Cohen’s d = .019$). Additionally, there was no significant difference in meat section spending between contented omnivores across salience vs. non-salience conditions ($M_{NCNS-NCS} = -4.655; p = .178; Cohen’s d = .252$).

Test Two: Food Dish Valuation

Independent sample t-tests were performed for the amount spent on each of the six food items between salient and non-salient conditions. Participants in the salient condition (denoted in this example by the subscript LambNS) were willing to pay significantly less ($M_{LambNS-LambS} = 2.21; p = .003; Cohen’s d = .37$) for lamb chops than participants in the salience condition. This difference was also significant in the same direction for Steak ($M_{SteakNS-SteakS} = 1.38; p = .039; Cohen’s d = .25$). The differences in dollar valuation went in the hypothesized direction for all the other meat dishes, but were only marginally significant, with between-condition (non-salient minus salient) mean differences of $M_{ChickenNS-ChickenS} = 0.88; p = .056$ for Chicken Wings and $M_{FishNS-FishS} = 1.20; p = .052$ for fish.

Conflicted omnivores in the salient condition were willing to spend significantly less on steak than were contented omnivores in the salient condition ($M_{SteakNCS-SteakCS} = 1.855; p = .048; Cohen’s d = .38$). When comparing mean spending of conflicted vs. contented omnivores in the non-salient condition, there was no significant difference ($M_{SteakNCNS-SteakCNS} = .344; p = .704; Cohen’s d = .068$). While spending on the other meats all followed the same pattern, steak was
the only meat for which there was a significant difference between contented and conflicted omnivores, controlling for salience condition.

<table>
<thead>
<tr>
<th></th>
<th>Non-Salient</th>
<th>Salient</th>
<th>Difference</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamb Chops</td>
<td>$8.39</td>
<td>$6.19</td>
<td>$2.20</td>
<td>3.048</td>
<td>.003**</td>
</tr>
<tr>
<td>Steak</td>
<td>$11.03</td>
<td>$9.65</td>
<td>$1.38</td>
<td>2.070</td>
<td>.039*</td>
</tr>
<tr>
<td>Chicken</td>
<td>$6.68</td>
<td>$5.80</td>
<td>$.88</td>
<td>1.915</td>
<td>.056</td>
</tr>
<tr>
<td>Fish</td>
<td>$8.72</td>
<td>$7.52</td>
<td>$1.20</td>
<td>1.952</td>
<td>.052</td>
</tr>
</tbody>
</table>

**Test Three: Catering Menu Selection**

An independent sample t-test comparing the number of servings of each food item purchased by participants between the salient and non-salient conditions showed that significantly less smoked salmon was purchased by participants in the salient condition than in the non-salient condition \((M_{CaterSalmonNS-CaterSalmonS} = 1.53 \text{ servings}; \ p = .002; \text{ Cohen's } d = .39)\).

Why the shift away from meat in the salience condition was manifested through the smoked salmon is an interesting question and one that warrants discussion. Given that people initially cut off red meat first when reducing meat consumption (Beardsworth & Keil, 1992), it is interesting that the substitution did not happen from pork chops to pasta. When observing the differences in servings purchased between contented omnivores and conflicted omnivores in the same salience condition, the results continued a pattern found in test two; namely, conflicted omnivores purchased significantly less pork chops than contented omnivores in the salient condition \((M_{CaterPorkNCS-CaterPorkCS} = 1.784 \text{ servings}; \ p < .001; \text{ Cohen’s } d = .68)\) and there was no
significant difference in pork chop purchases between these two groups in the non-salient condition ($M_{\text{CaterPorkNCNS-CaterPorkCNS}} = -0.0337$ servings; $p = .959$; Cohen’s $d = .009$).

<table>
<thead>
<tr>
<th>Measure 2</th>
</tr>
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</table>

The correlation matrix for this measure showed that, while indeed there was a negative relationship between household income and participants’ expected cost of decreasing meat consumption, it was not significant ($r = .077$, $p = .219$). In a stepwise multiple regression of factors predicting the likelihood of reducing meat consumption, the cost of cutting meat consumption by half did not predict a statistically significant amount of variation in the dependent variable; therefore, it was excluded from the regression. Evidently, cost is not amongst the most important factors in Americans’ consideration of reducing their meat consumption. The stepwise regression showed that the most important factors in predicting the likelihood of reducing meat consumption were Enjoyment of eating meat ($\beta = .407$; $p < .001$), Impact of reducing meat consumption ($\beta = .413$; $p < .001$), and Difficulty of reducing meat consumption ($\beta = -.165$; $p = .005$); the overall model has Adjusted $R^2 = .299$. By itself,
Enjoyment of eating predicts approximately 20.4% of the variation in likelihood of reducing meat consumption by half. The strong predictive power of the enjoyment of eating variable in predicting a participant’s likelihood of reducing meat consumption suggests that the pleasure people derive from eating food may be the primary determinant of their food-based decisions (in contrast to moral factors or health-based factors). Enjoyment as a factor was previously assumed to be part of the difficulty of reducing meat consumption, but a univariate regression shows that enjoyment only explains approximately 15.4% ($p < .001$) of the variation in difficulty. Impact expectedly had a strong effect which was in line with previous studies.

![Diagram](image)

Figure 24. Multiple Regression of Factors Predicting Likelihood of Reducing Meat Consumption

**Measure 3**

**Chicken vs. Beef Questionnaire**

As a percentage of their total chicken and beef consumption, participants on average consumed 57% (Median = 60%) chicken, and felt that the average American would say that they consumed 49% (Median = 50%) chicken. In terms of chicken vs. beef trends in the country, 26.6% of participants indicated that they eat more servings of chicken per week now compared to a few
years ago, 59.5% indicated that they eat the same amount, and 13.9% say they eat less now. 54.7% of participants indicated that they prefer beef over chicken.

In regards to the trait-based comparisons of chicken and beef, a factor analysis was done to separate the characteristics into 3 separate groups: Meat Enjoyment, Animal Mind, and Meat Responsible. Meat Enjoyment consisted of Taste, Texture of the meat, and Quality of the Meat. Animal Mind consisted of Animal’s capacity for pain and suffering, Worthy of moral concern, Animal’s richness of emotional experience, and Intelligence of the animal. Finally, Meat Responsible consists of Environmentally friendly food choice and Healthy to eat.

![Pattern Matrix]

Figure 25. Chicken vs. Beef Characteristics Factor Analysis

In the chicken vs. beef traits portion, each of the traits had a strong leaning toward either beef or chicken with the exceptions of “Quality of the Meat” and “Worthy of Moral Concern”. Positive means indicated that participants believe that beef is superior on that particular characteristic,
whereas negative means indicate that chicken is superior. Using the three composite measures “Animal Mind”, “Meat Responsible”, and “Meat Enjoyment”, a stepwise multiple regression showed Meat Enjoyment ($\beta = -.254; p < .001$) and Meat Responsible ($\beta = -.178; p = .004$) were weak but significant predictors of amount of chicken consumed (as a percent of total chicken and beef consumption) $R^2 = .117$. Note that the negative beta coefficients such suggest that the more that participants felt chicken was greater than beef on the characteristics of the composite measures (as chicken was coded on the negative part of the scale), the more chicken participants consumed as a percent of their total chicken and beef intake. It is worthwhile to note that, although the predictive value was not strong, that enjoyment was once again a predominant factor in the food-based decisions.

<table>
<thead>
<tr>
<th></th>
<th>Mean Score</th>
<th>t-score</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy to Eat</td>
<td>-1.59</td>
<td>-21.672</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Taste</td>
<td>.38</td>
<td>3.348</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Availability for purchase</td>
<td>-.84</td>
<td>-9.747</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Quality of the Meat</td>
<td>.10</td>
<td>1.189</td>
<td>.236</td>
</tr>
<tr>
<td>Animal’s Richness of Emotional Experience</td>
<td>.47</td>
<td>6.921</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Animal’s Capacity for Pain &amp; Suffering</td>
<td>.34</td>
<td>5.613</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Environmentally Friendly Food Choice</td>
<td>-.63</td>
<td>-8.986</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Worthy of Moral Concern</td>
<td>.08</td>
<td>1.50</td>
<td>.135</td>
</tr>
<tr>
<td>Intelligence of the Animal</td>
<td>.78</td>
<td>9.761</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Texture of the Meat</td>
<td>.47</td>
<td>5.066</td>
<td>&lt; .001***</td>
</tr>
</tbody>
</table>
Higher Price | 1.64 | 19.472 | < .001***

A one-sample t-test of the mean values for the three composite variables showed a preference toward beef on two out of the three variables:

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>t-score</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat Enjoyment</td>
<td>.3172</td>
<td>4.115</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Animal Mind</td>
<td>.4189</td>
<td>7.988</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Meat Responsible</td>
<td>-1.11</td>
<td>-18.9957</td>
<td>&lt; .001***</td>
</tr>
</tbody>
</table>

**Figure 27. One-Sample T-Test of Chicken vs. Beef Composite Variables**

**Trolley Problem**

In the trolley problem, 248 (89.5%) of the participants selected that they would make the trolley hit the chicken instead of not taking any action. 15 (5.4%) participants said that they would switch it to hit the cow instead and 14 (5.1%) of participants said that they would do nothing and therefore hit the child. For all analysis purposes, the numbers of the latter two were considered negligible and not included. Of the people who responded that they would hit the chicken (N=248), 132 wrote that they would never send the trolley down the track with the cow (i.e., would never kill a cow in place of a chicken). For participants who opted to hit the chicken, when asked how many chickens there would have to be on the track for the participant to hit the cow instead, the median response was 17.5 chickens. This can be interpreted as a ratio of the value of a cow’s life to a chicken’s life as 17.5:1. This analysis was largely exploratory and the goal was to understand what factors are driving people’s decisions to consume chicken or beef.
DISCUSSION

This study sought to test three separate hypotheses. The first measure used three tests to observe participants’ purchasing behaviors as a function of the salience of the animal origins of the meat. While the first test did not produce significant differences between spending in the salient and non-salient conditions, it did confirm other important information about conflicted omnivores. Specifically, test one illustrated two things: 1. Conflicted omnivores spent significantly less in the meat section than did contented omnivores; 2. This effect was amplified in the salience condition where the difference in amount spent was almost twice as large as in the non-salient condition. This is in accordance with hypothesis one which says that the effects of salience on reduced meat sales will be particularly strong for conflicted omnivores. Tests two and three supported the first hypothesis with participants in the salient condition spending significantly less on meat than participants in the non-salient condition for both lamb and steak in test two, and for smoked salmon in test three. Test two also showed that conflicted omnivores spent significantly less than did contented omnivores when in the salience condition, and there was no significant difference in the non-salient condition. Test three continued this same pattern with pork chops as the meat item. These results support the first hypothesis and suggest that 1. Increased salience of the animal origins of meat does lead to reduced sales of meat in grocery settings on average, 2. The salience of animal origins of meat matters more for conflicted omnivores in their decisions of how much to spend/purchase in a food shopping situation.

This finding has important implications in many different fields. For example, advertisers may find it useful to refrain from inserting cues of the animal origin of meat on the packaging of the meat product itself. Similarly, a vegetarian advocacy group may find it particularly beneficial to include cues of the animal origin of meat to dissuade people from purchasing meat products.
A potential issue in test two of measure one is that the salience manipulations may not be homogeneously salient. One reason for the particularly strong effect in the lamb chops may be that the manipulation was more salient than for the other meat dishes. This may call for future manipulations to be stronger and or more homogenous in nature of presentation. A potential issue is that the lamb may have appeared cuter or more baby-like than did the other animals; this could have evoked more empathy in participants and led them to spend less on the lamb chops. In follow-up studies, it will be important to control for these factors and to ensure that the manipulations are adequately salient (a potential issue in test one).

The original intent of measure two was to test the hypothesis that there would be a negative relationship between socioeconomic status (SES) and the expected cost of reducing meat consumption. Further, the hypothesis stated that this negative relationship would lead low SES people to report a lower likelihood of reducing meat consumption than high SES participants. While the first relationship was indeed negative, it was not significant. Further, it came as a surprise that the cost of reducing meat consumption was not an important predictive factor in participants’ likelihood of reducing meat consumption. Rather, enjoyment of meat served as the most predictive factor; this factor was previously assumed to be part of the difficulty of reducing meat consumption. The fact that enjoyment only explains 15.4% of the variation in difficulty suggests that the perceived change in enjoyment of eating upon cutting meat consumption by half may serve as a stand-alone predictive factor of likelihood of doing so. There are many important implications of this: any sort of effort to increase or reduce meat consumption (for example, marketing agencies for meat and meat-alternative companies) may achieve better results by focusing on the enjoyment of meat alternatives rather than solely moral or health-based implications of doing so. Still, the impact variable (which was a composite of the
impact of reducing meat consumption on one’s health, on the environment, and on animal welfare) proved to be a very significant predictor of likelihood of reducing meat consumption as well. While the stepwise regression showed that enjoyment was the more important factor (more predictive power in a simple regression), the betas of the two were approximately equal in the multiple regression.

Measure three served as the broadest measure and was largely focused on identifying the reasoning behind a potential trend in chicken consumption increasing relative to beef consumption. Participants indicated that they, on average, consume the same amount of chicken (as a percentage of their total chicken and beef consumption), with approximately 25% of participants eating a higher percentage of chicken now (than in the last few years). There could be a variety of reasons for this potential shift, however the composite measures do not adequately display a preference for chicken.

The t-test of the composite trait variables introduces a potentially important point: while participants enjoy beef more and attribute more mental status to beef/cows, people strongly feel that chicken is the more responsible food choice (more environmentally friendly and better for one’s health). This leads to results that warrant further discussion in a future study. Particularly, the previous multiple regressions of factors predicting the likelihood of reducing meat consumption suggest that the impact of reducing meat consumption on animal welfare, the environment, and one’s health is highly predictive. These same factors may be at play in reducing people’s beef consumption and causing a shift towards the more “responsible” food choice of chicken. In a future study, it would be worthwhile to delve deeper into this issue by asking reducetarians an open-ended question where they discuss the most important factors in their decision to reduce meat consumption.
CONCLUSION

Conflicted omnivores represent an interesting and substantial portion of the United States population. This study focuses on the food-spending preferences of this group and provides evidence for the ways in which both conflicted omnivores and the larger population may be influenced to change their food buying/consuming habits. Further, this study added greater information into the current understanding of the factors predicting the likelihood of reducing meat consumption. By analyzing the characteristics in which chicken and beef are perceived to differ by the participants, this study offers room for future investigation as to the effectiveness of using moral or “socially responsible” cues to influence people’s beef vs. chicken consumption and their overall meat eating habits. In conclusion, this study adds to the current understanding of conflicted omnivores by observing the economic facets of their behavior which, to the authors’ knowledge, has not been done in reference to this group of people before. As more research is done on conflicted omnivores, this creates opportunities for psychology and food researchers to better understand an infrequently studied group of people, for public policy experts to more effectively communicate food-based initiatives, for businesses to better market their products and predict future consumption patterns, and for consumers to have a greater say in the foods that they want to purchase and eat.
REFERENCES


http://americannutritionassociation.org/newsletter/usda-defines-food-deserts


