GENETICALLY MODIFIED FOODS, PERSONAL VALUES, PERCEPTIONS OF MORALITY, AND THE EFFECTS OF SELF-CONFRONTATION ON THE STABILITY OF PERSONAL VALUES

By

CRAIG DUBLIN MACMILLAN

A dissertation submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

WASHINGTON STATE UNIVERSITY

Department of Sociology

MAY 2012

© Copyright by CRAIG DUBLIN MACMILLAN, 2012

All Rights Reserved
To the Faculty of Washington State University:

The members of the Committee appointed to examine the dissertation of CRAIG DUBLIN MACMILLAN find it satisfactory and recommend that it be accepted.

__________________________________________
Thomas Rotolo, Ph.D., Chair

__________________________________________
Raymond A. Jussaume, Ph.D

__________________________________________
Julie A. Kmec, Ph.D.

__________________________________________
Craig D. Parks, Ph.D.
ACKNOWLEDGEMENT

The list of people who made this dissertation possible is long and I will undoubtedly forget some who lent a hand in a time of need. The very notion I should pursue a Ph.D. was born during my graduate studies at California Polytechnic State University San Luis Obispo where I earned my Master’s degree. I am thankful for the ongoing inspiration, support, and encouragement of Dr. Michael Costello (my M.S. thesis advisor) who believes I can do anything I set my mind to.

My doctoral studies were funded in part by the California State University Chancellor’s Doctoral Incentive Program. I would like to thank Dr. Joe Grimes who helped me enroll in the program and Dr. W. Keith Patterson who was my CSU faculty mentor. This dissertation also honors the memory of Dr. Thomas Ruehr who was my first CSU CDIP faculty mentor. There are many other faculty at Cal Poly who encouraged me including the associate dean of the College of Agriculture at Cal Poly, Dr. Mark Shelton, and Dr. Jennifer Rider-Fox who was the head of the Horticulture and Crop Science Department when I was at Cal Poly. Deserving of special mention are Dr. Scott Steinmaus and Dr. Jeff Wong who got me started down this particular road in the summer of 2004. They may remember my question, “Gentlemen, have we learned nothing?” I can now say with confidence, “Yes, gentlemen, we have!”

I want to thank Dr. Ulrich Lund who served on my thesis committee at Cal Poly and helped me overcome my fear of statistics by telling me: “you understand the concepts, you just need to learn the symbols”. And of course, I must thank Paul DeCarli for his support and encouragement.

Moving forward in time, my fellow doctoral students at Washington State University
were a constant source of support, especially my cohort which included William Nevue, Megan Whalen, Dr. Morgan Millar, Dr. Lindsey Trimble, Sarah Cook, and Mick Wilkes. My office mate, Sean Genter, was a constant source of encouragement. There were also people who transitioned from student to colleague such as Ian Stewart, those ahead of me who helped show me the way such as Dr. Bryan Rookie and Dr. Taj Mahon-Haft, and like-minded colleagues in other departments such as Frank King, Sky Wilson, Dr. Shane McFarlane, and Steve Barella. Thank you all for believing in me. I also wish to thank Laura Whitaker-Wilson for believing in all of us. Dr. Robert MacAuslan deserves special mention for his friendship and guidance through this process.

There were many faculty members at Washington State University outside of the sociology department who contributed to my intellectual development during my doctoral studies and I wish to thank them all including Dr. Jeff Joireman, Dr. Blythe Duell, Dr. Linda Arthur Bradley, Dr. Thabiti Lewis, and Dr. Melynda Huskey. I also want to thank Dr. Laurie Drapela, Dr. Taj Mahon-Haft, Dr. Regina McMenomy, Erika Abad, Dr. Pavithra Narayanan, Leola Dublin Macmillan, Dr. J.P. Garofalo, and Dr. Dana Baker for allowing me to recruit subjects for my experiment from their classes at WSU Vancouver.

Obviously, I also owe a debt of gratitude to all the students at WSU Vancouver who agreed to participate as subjects in the experiment. Thank you all.

It is with great respect and gratitude that I would like to recognize all of the faculty in the Department of Sociology at WSU who gave me guidance and support along the way including Dr. Lisa J. McIntyre, Dr. Scott Frickel, Dr. Gregory Hooks, Dr. Daniel Jaffee, Dr. Amy Wharton, and Dr. Clayton Mosher. I also could not have gotten through the technical and administrative maze of doctoral studies without the help of Sheri Clevenger, Ginny Taylor, Cecil Williams,
Laurie Byers-Brown, Megan Comstock, and Lana Woods, plus Andrea Bucherite and Mary Ohnemus at the Graduate School.

Many hands guided this dissertation over the years and I am grateful to them all. Dr. Daniel Holbrook reawakened the philosopher in me and brought out a new dimension in my thinking about values. Dr. Eugene A. Rosa was the first chair of my dissertation committee and his influence can be seen throughout this dissertation. The same is true for Dr. Christine Horne who was an original member of the committee. Dr. Rosa and Dr. Horne held me to a standard of intellectual skepticism and honesty which I have benefited from beyond measure. This dissertation would not have been possible without their many years of supervision. Dr. Louis N. Gray deserves special mention and thanks for his years of service as well. He was unable to remain on my committee as I approached completion, but his comments on the early drafts of this work were vital to making the final product possible.

I give my deepest appreciate, thanks, gratitude, and respect to the members of my committee. Dr. Julie A. Kmec agreed to join my committee late in the process, but she was invaluable in helping me finish. Dr. Craig D. Parks was a member of my committee from the beginning and an inspiration throughout the process. Dr. Raymond A. Jussaume was the original chair of my committee, a role he had to relinquish when he left WSU to take the helm of the sociology department at Michigan State University. I cannot overstate how important Dr. Jussaume has been to my development as a sociologist, writer, scholar, and person. Thank you, Ray.

And finally, my heartfelt thanks to Dr. Thomas Rotolo who was willing to step into the role of chair after Dr. Jussaume’s departure from WSU. Dr. Rotolo is the person who recruited me to WSU and never stopped believing in me right up until the very end. Thank you, Tom. I
never would have finished without you.

In the arena of sanity maintenance I must recognize the entire gang at Swilly’s, my favorite restaurant of all time, including Joan Swenson, Liza Swenson, Rosie and Devon Simons, Craig, and Dennis.

The same is true for the staff of the Heathman Lodge in Vancouver, Washington where the bulk of this dissertation was actually written including Julie, Burt, Saxon, Lowell, Breck, Tim, and Ron. This group of people offered a welcome change of pace after a full day of writing.

Similarly, the staff of the Courtyard Marriott in San Luis Obispo welcomed us repeatedly during our travels back and forth between San Luis Obispo and Pullman.

And to my friends Matt Burrier and Dr. Scott J. Zimmer, thank you for believing in me and not letting me quit.

A special thanks goes out to Mark Welch, M.S. You are a friend, confidant, co-conspirator, roommate, business partner, and inspiration. Thanks for helping me get through the last ten years and making this dissertation possible.

Obviously, I am grateful for the support of my family. My sister, Dr. Heather MacGibbon finished her Ph.D. while I was studying for mine and she showed me dreams really do come true. My mother, Carol Macmillan, always thought I should be a Ph.D. and she was very patient while I took almost two decades after finishing my Bachelor’s to figure this out. Thanks, Mom. And of course, my father, Dr. James G. Macmillan, deserves special recognition as the first person in our family lineage to receive a Ph.D. The paths to the Ph.D. for both my sister and I were very different than his, but he was a constant source of encouragement and guidance. Dad, I never could have done it without you. Thank you.

And finally, anyone who knows me knows how important my wife, Leola Dublin
Macmillan, was to the completion of this dissertation. I can never express how absolutely crucial she is to my existence. Leola, thank you.
GENETICALLY MODIFIED FOODS, PERSONAL VALUES, PERCEPTIONS OF MORALITY, AND THE EFFECTS OF SELF-CONFRONTATION ON THE STABILITY OF PERSONAL VALUES

Abstract

By Craig Dublin Macmillan, Ph.D.
Washington State University
May 2012

Chair: Thomas Rotolo

The purpose of this study was to investigate the role of moral perceptions in activating personal values. This study attempted to address three questions: (a) Does perceiving a moral component to biotechnology activate values? (b) Does a person’s value orientation strengthen when their attitudes toward biotechnology are in alignment with their existing values orientation? and (c) Does a person’s value orientation weaken when their attitudes toward biotechnology are in conflict with their existing values orientation?

To answer these questions, an experiment was conducted where 77 undergraduate students completed a survey instrument. All subjects responded to the ten items of the Short Schwartz Value Survey (SSVS), items measuring basic science knowledge, and items about demographic variables. The treatment group responded to an additional set of items about biotechnology. Subjects in the treatment group were classified according to whether they believe decisions about biotechnology should be made primarily based on risks and benefits (Utility
group) or based primarily on ethical or moral considerations (Morality group) for analysis. All subjects returned two weeks later and responded to only the ten items of the SSVS.

The results of the experiment showed that subjects in the Morality group gave more importance to the value of “Power” and grew stronger on the value dimension of Self-Transcendence when retested. These subjects were more religious than subjects in either the Utility group or the control group. Subjects in the Utility and Control groups did not show statistically significant changes in their values or values orientations. Although there was a statistically significant change in the value of “Power” and on the value dimension of Self-Transcendence for the Morality group, this change was not reflected in changes in other values or the subject’s values orientation overall.

The findings in this study did not show the patterns of change predicted by Schwartz’s Value Theory. Additionally, no associations were found between values and of the independent variables.

The usefulness of values as a predictive or explanatory concept in sociological research is challenged by the results of this experiment, at least as conceptualized in Schwartz’s Value Theory.
# TABLE OF CONTENTS

ACKNOWLEDGEMENT ........................................................................................................ iii

Abstract ................................................................................................................................. viii

TABLE OF CONTENTS ........................................................................................................... x

LIST OF TABLES ................................................................................................................... xv

LIST OF FIGURES ................................................................................................................ xvi

Dedication ............................................................................................................................. xvii

PROLOGUE ............................................................................................................................ 1

   Making Sense of Experience ............................................................................................ 1

   HOW THIS RESEARCH CAME ABOUT ........................................................................... 2

CHAPTER ONE: INTRODUCTION ............................................................................................ 9

   Why values and morality? ............................................................................................... 9

   How are values and morality connected? ...................................................................... 10

   Introduction of this Research ....................................................................................... 12

   Problem Statement ....................................................................................................... 13

   Values ............................................................................................................................... 15

   Biotechnology ................................................................................................................ 17

   Overview of Theoretical Arguments .............................................................................. 18

   Previous Work On Short-Term Changes In Value Orientation .................................... 18

   Self-Confrontation Theory ............................................................................................. 19

   Hypotheses ..................................................................................................................... 20

   Research Design and Analysis ....................................................................................... 21

   Implications and Sociological Importance ...................................................................... 21
Organization of the Dissertation ........................................................................................................... 22

CHAPTER TWO: REVIEW OF THE LITERATURE ....................................................................................... 23

Introduction to Values as a Concept in Sociological Theory and an Illustrative Example of
Values in Action ........................................................................................................................................ 23

The Role of Values in Social Theory Building ......................................................................................... 24

What are values? ....................................................................................................................................... 25

Milton Rokeach: Value Priorities and the Self-Confrontation Effect ..................................................... 33

Shalom Schwartz: The Universal Structure and Content of Values ......................................................... 37

Theories of Morality .................................................................................................................................. 52

CHAPTER THREE: THEORETICAL ARGUMENTS AND HYPOTHESES

REHABILITATING HUMAN VALUES AS A SOCIOLOGICAL CONCEPT ............................................. 56

Chapter Overview ..................................................................................................................................... 56

Establishing the Phenomenon .................................................................................................................... 56

Specified Ignorance ................................................................................................................................. 57

Strategic Research Materials .................................................................................................................... 58

Why do people need values and how do people use them? ..................................................................... 59

Why does sociology need a conception of values? ................................................................................... 61

What is the difference between values and norms and why do values matter? ..................................... 64

Values may explain the emergence and content of norms .................................................................... 66

Norms may provide data about values and demonstrate how values are translated into actions ............ 69

Values Encompass Both Utility and Morality as Motivations for Behavior ........................................... 70

"Values are relatively..." ....................................................................................................................... 78
How does context affect the values people draw upon in decision-making and attitude formation?

Object of consideration provides context

Context on a personal level

Contexts determined by the "realm" of the object of consideration

Others affected by decision as context

Conflicting and cohering values as context

Place as context

Time as context

Some general thoughts about values and contexts

Why do the contexts that affect value decisions tend to travel together?

Social location, status, and values

Race, class, gender tied to education

Race, class, gender tied to occupations

Race and gender are tied to "class" in a more subtle sense meaningful to values decisions

Age tied to historical events and "eras" of history

Hypothesis 1: Values and values orientations will be strengthened when a values decision is in alignment with the dominant values orientation of the subject.
Hypothesis 2: Values and values orientations will be changed when a values decision is in conflict with the dominant values orientation of the subject. ................................................................. 97

Hypothesis 3: Only for decisions where the subject perceives a moral component to be present will the decision-making process affect the values orientation of the subject. ....................... 98

CHAPTER FOUR: RESEARCH DESIGN AND METHODS ................................................................. 99

Chapter Overview .......................................................................................................................... 99
Research Setting............................................................................................................................ 99
Research Design.......................................................................................................................... 100
Questionnaire Development ........................................................................................................ 101
Independent Variables ............................................................................................................... 102
Dependent Variables .................................................................................................................. 103
Control Variables ....................................................................................................................... 106

CHAPTER FIVE: ANALYSIS ......................................................................................................... 109

Chapter Overview ........................................................................................................................ 109
Issues with Interpreting Instructions of the Short Schwartz’s Value Survey ....................... 109
Assignment to Groups for Analysis ............................................................................................ 111
Descriptive Statistics ................................................................................................................ 111
Differences and Changes in Values ............................................................................................ 118

    Value dimensions .................................................................................................................. 118

    Motivational types ............................................................................................................... 119

    Value Orientation Types .................................................................................................... 120

Categorical Data Analysis ......................................................................................................... 122
LIST OF TABLES

Table 1. Definition of Concepts, Operationalization of Variables, and Source of Survey Items. ................................................................................................................................................................................................. 108

Table 2. Descriptive Statistics by Group- Categorical Variables ........................................... 112
Table 3. Descriptive Statistics by Group- Categorical Variables, continued. ......................... 112
Table 4. Descriptive Statistics by Group- Categorical Variables, continued. ......................... 113
Table 5. Descriptive Statistics by Group- Continuous Variables. ........................................... 114
Table 6. Ipsatized Value Ratings and Dimension Scores, Time 1 ...................................... 115
Table 7. Ipsatised Value Ratings and Dimension Scores, Time 2 ...................................... 116
Table 8. Changes in Ipsatized Value Ratings and Dimension Scores. ................................. 117
Table 9. Value Orientation Types by Group-Counts ............................................................... 122
Table 10. Value Orientation Types by Group- Percentages ................................................. 123
Table 11. “How would you describe your religious beliefs?” .............................................. 125
Table 12. “Which of these statements comes closest to your beliefs?” ................................. 126
Table 13. “How often, if at all, do you think about the meaning and purpose of life?” ........ 126
Table 14. “How would you describe your religious practices?” .......................................... 127
Table 15. “How would you describe your political orientation?” ...................................... 131
Table 16. Decisions about Technology.................................................................................. 132
Table 17. Attitudes toward Biotechnology. .......................................................................... 133
Table 18. Familiarity with Biotechnology............................................................................. 134
Table 20. Value Ratings of Paul and Eunice. ...................................................................... 144
LIST OF FIGURES

Figure 1. Values, Utility, and Morality. ................................................................. 29

Figure 3. The Schwartz Model the Relationships between Motivational Types. ................. 40

Figure 4. Value Orientation Types and Value Dimensions ............................................. 121

Figure 5. Paul’s Values .................................................................................................. 145

Figure 6. Eunice’s Values ............................................................................................ 145
Dedication

This dissertation is dedicated to my wife, Leola Dublin Macmillan, who believes in me in a way that is beyond description and helped me to never lose sight of the goal.
PROLOGUE

Throughout this dissertation I will tell the story of a very influential experience in my life. This experience led me to the field of sociology and the study of values. Because these events occurred prior to my training in qualitative social data collection, my telling of them cannot be considered evidence supporting or even explaining the claims and ideas of this dissertation. My retelling of this story is intended as a way of illustrating those claims and ideas. The experiment I conducted was designed to provide support for either accepting or rejecting the hypotheses of this dissertation which were suggested to me by the experiences I will relate.

Making Sense of Experience

As time passes we remember the past not as a recording played back from permanent storage, but we create a narrative to communicate what happened to our listener (or reader) in a way that makes sense. In this respect all retellings of the past are a type of fiction as the actual events themselves cannot be recreated and certain details cannot be verified independently.

I ask the reader to consider my anecdote as an allegory, a fiction, but a meaningful fiction. Whether the events described actually happened or happened as I have described them is not important. My thoughts about what is described are what is important.

Despite the title, this dissertation is not about biotechnology. It is about values. Biotechnology was chosen as the prime for this experiment because there is a lot of information already in the
literature about attitudes toward biotechnology and I have experience and knowledge of this
topic. The series of events which brought about this project originally had to do with agricultural
biotechnology exclusively, but became about values and moral perception at the end.

The following is the story of how a simple study of consumer acceptance of a specific product
became part of much larger public debate about biotechnology. At the time of the study there was
a measure on the local ballot to ban the production of genetically modified organisms in the
county of San Luis Obispo, California. During that campaign season it seemed to me that a
“moral sense” was activated in some people when confronted face-to-face with agricultural
biotechnology. Without the training needed to investigate this question, I decided to pursue a
Ph.D. in sociology. This dissertation is the direct result of my experiences during the summer and
fall of 2004.

HOW THIS RESEARCH CAME ABOUT

In the summer of 2004 two friends of mine wanted to conduct a field experiment to assess the
pest management advantages of Bt sweet corn at Cal Poly. One of my friends oversees a student
project growing sweet corn on campus every summer. The students take the harvest and sell it at
the local farmers' markets. He had a friend back in Illinois (also a corn grower) who simply
gushed about how great the Bt varieties of sweet corn were. There was very little damage from
corn ear worm and no need to apply insecticides. The limitation for my friend was that since the
corn was only sold at farmers' markets and the other stands that sold sweet corn were usually
selling organic products, would that group of customers be interested in buying a GMO product? No matter how great the pest management advantages or how great the saving on the production side of the equation, if the change in product resulted in no sales, then the cost/benefit analysis solves in favor of not making the change. Knowing that I had an interest in "social things" (their description of me), my friends asked if I could design and conduct the data collection for determining whether the particular market this product was destined for would buy it or not. I did some research, found some experiments which had asked the same question and used methodologies which could be easily adapted for our purposes.

The corn grown in the experiment fell into four categories:

1. Not sprayed with insecticide during growing and not a "biotech" variety
2. Not sprayed with insecticide during growing and a "biotech" variety
3. Sprayed with insecticide during growing and not a "biotech" variety, and,
4. Sprayed with insecticide and a biotech "variety."

The only categories of real interest were what we called "conventional," a non-biotech variety sprayed with insecticide, and what we called "biotech," a genetically-modified variety which was never sprayed. Why would anyone plant a non-biotech variety and not protect it from the certain devastation corn ear worm would bring? Similarly, why would anyone plant a biotech variety and then spray it? That would defeat the purpose of using a biotech variety.

When harvest came and we brought our corn to market we were very surprised by the reaction
we got from the public. And, yes, I mean "public" as in "the people of the community," not the customers at our farmers' markets. During the growing period of the crop a group of activists gathered enough signatures to put a measure on the ballot of the election that November. This measure would ban the growing of genetically-modified organisms in the county of San Luis Obispo. Obviously, this was news. We first learned of the ballot initiative when one of my friends was contacted by the local paper and asked to comment. The reporter has done some research and discovered that our quarter-acre plot of sweet corn was the only GMO crop currently being grown in the county. And so began a saga which continues to this day.

During the month prior to the harvest of our crop media attention to the issue increased. A political action committee was formed to fight the measure. The activists who proposed the measure began an aggressive campaign for passage of the measure. By the time we brought our crop to the markets, people knew who we were.

We presented our corn with simple placards. They read "Biotech, sprayed," "Conventional, not sprayed," etc. Our customers now had all the information they needed to make an informed choice. You don't want a GMO? No problem- I have two other types to choose from. You don't want icky pesticides sprayed on your food? Of course not- try one of these two products.

We had no plans to interact with the customers aside from the usual pleasantries of commerce. We would count the ears of corn left at the end of the night and we would have our answer. To our surprise, we had not anticipated the question we were really posing (apparently) with our display. One of the first questions we were asked was "Which one is organic?" Totally
unprepared for this question, one of my friends answered "none of these are organic," because, well, none of the corn was grown in compliance with the standards or under certification of the National Organic Program. "But this one is not genetically modified and it was not sprayed with insecticide, so that makes it organic, doesn't it?" All three of us became involved in this conversation now about what the term "organic" really means in relation to food. Our customer would not take us at our word that this product was NOT organic.

After this exchange more people asked us which one of the four choices was organic. Hoping to avoid another protracted investigation of the concept (which presumably would muddy the waters of our otherwise pristine data collection) we would answer "this one (conventional, not sprayed) is the closest to being organic of the four." Not surprisingly, almost every consumer would go to that box and start picking out ears of corn. But then something unexpected happened. Most customers would peel back the husk of the ear, see damage on the ends of the ear from corn ear worm, and put the ear back in the box. After being unable to find an ear without damage they would move on to the next box and begin inspecting ears. This behavior was especially puzzling to us because the damage done by corn ear worm is easily remedied by breaking off the damaged part as most of the damage is at the tip. At the end of the project after our data collection was complete we even showed people that they could break off the ends of the ears and have a perfectly pretty and edible ear of corn. But that was not what most people seemed to want. They wanted a pristine ear of corn, not a "manually modified" one.

In fact, we sold quite a bit of corn which was both sprayed and genetically modified. These ears were almost all "perfect." And despite the labeling, which to my mind was a warning of potential
doom, people wanted the best looking corn.

There were many other conversations had that first night with all kinds of people. One person stopped in front our stand, pointed at us, and shouted "the Devil!" Although this kind of behavior is not completely unheard of at the SLO farmers' market, it was the first time I had ever seen someone condemn a farm stand at the market.

Another person accused us of trying to deceive the public. He insisted our secret agenda was to promote organic produce and we were using the biotech and sprayed corn as a way of influencing people to buy organic. He insisted this was a shameless and irresponsible thing to do.

One of the activists leading the campaign for the measure and a local reporter spent almost two hours at our booth engaged in arguments with various customers and continually trying to engage us in arguments as well. We refused to argue. We talked with them, but that didn't seem to be what they wanted. One of the caveats I have about the sales data we collected that night was that these two camped out on the side of the table where the "close to organic" corn was. I suspect we sold more of the other varieties because people wanted to avoid getting too close to them and risk being accosted or dragged into a conversation or argument they didn't want to have.

The final and most surprising thing that happened that first night was the insistence by many people to "choose for me." This type of customer would approach the stand and say "I would like four ears of sweet corn, please." We would then say, "I have four types of corn tonight. Some is
biotech and some was sprayed with pesticides while it was growing. What kind would you like?"
The customer would then say "I don't care what type. I just want four ears of corn." This kind of
ambivalence was completely unexpected. When we insisted that the customer make a choice we
were surprised how many said "I don't know; you choose for me." Not wanting to alienate our
customers we would take one ear from each box, put it in a bag, and take their money. This type
of consumer seemed to be perfectly happy with that outcome.

We had designed our data collection method naively. All of us thought that the sales data would
tell the whole story of whether these particular consumers (shoppers at the San Luis Obispo
Farmers' Market) would accept this particular product (Bt sweet corn). During the market time
described above I noticed something unexpected. Many people were engaging in vocal behaviors
as they engaged the product. They reasoned out loud, ask questions, and generally talked to each
other about biotechnology. I noticed two distinct camps or philosophies among the vocalizers.

Some customers were primarily interested in matters of cost and preference. They preferred
sweet corn which had not been sprayed with pesticides, had no visible insect damage, and was
not genetically-modified. Essentially, no ears of corn met all of these parameters. Customers then
began a process of satisficing. They asked for more information, but the information we could
provide was limited and we didn't want to lead the buyer to a specific product. They prioritized
the costs and their preferences. Eventually, the customer had to make a choice. Some people
decided they did not want our corn and walked away. Others struggled through the process and
did make a purchase. Regardless of the final outcome, the process appeared to be the same for
this type of customer.
As I listened to the shoppers that night I also noticed that some customers seemed much less concerned about costs, benefits, and preferences, but were more concerned with the moral implications of the products. Again, regardless of the product finally purchased (or rejected) the outward evidence of this process was the use of words like “right,” “wrong,” “must,” “can't,” and “moral.” I was surprised to hear moral arguments both in favor of and against agricultural biotechnology. As a powerful, technologically advanced society we either have the responsibility to feed the world using whatever technology we have available or we have a responsibility to protect the environment and human health from the unknown consequences of transgenic biotechnology.

To me, it seemed that a “moral sense” was activated in some people when confronted face-to-face with agricultural biotechnology. Without the training needed to investigate this question, I decided to pursue a Ph.D. in sociology. This dissertation is the direct result of my experiences on that night at the farm stand in 2004.
CHAPTER ONE: INTRODUCTION

Why values and morality?

In chapter two I will argue that there has been little agreement among social theorists about the nature of values. I believe one of the reasons for this lack of agreement is that values are activated by the social environment. If they are not activated, they do not play a role in behavior. This is why values appear to be very important at certain times and not at others. Behaviors driven by aggression, compassion, or a sense of responsibility are more likely when a person receives cues from the social environment. Values operate in a similar way. Perceiving a moral component to a situation makes a person's values salient to that situation, thereby activating values which can then have an influence on the decisions or actions of that person.

I believe this partially because of the language people use when making an argument about moral things and the language people use when talking about their values. Values are abstract criteria for what is “best” or “most desirable.” Morality is a system for determining what is “best” or “most desirable” in the realm of the social. Although it can be argued that one has a moral responsibility to the self, I consider this a special case. Morality is primarily concerned with the welfare of others.

Using the sweet corn example again, I could base my choice on how the promotion of biotechnology in the production of sweet corn will impact others. Maybe the reduction in pesticides will protect the environment for future generations or prevent the poisoning of a child alive now. Maybe this technology can feed more people with fewer inputs. These reasons are
other-focused. They are focused on the well-being of others who I presumably have some responsibility to, and that is a moral implication. Additionally I think arguments against these reasons would be viewed as immoral. That is, of course, an empirical question which deserves greater study and will be discussed in the chapter on future work.

If, on the other hand, I base my choice on how biotechnology will benefit me, then I am not making my choice based on morality. I do not want to eat pesticides. I want ears of corn which are perfectly free from insect damage. I want the cheapest product possible. The only way I could argue these reasons are moral is if someone else wanted to prevent me from having my damage-free, pesticide-free, inexpensive sweet corn. In this case, the moral implications would be of the other person's actions, not my own.

**How are values and morality connected?**

There are justificatory theories of morality. The language of morality and the reasoning behind it may have the sole purpose of justifying or condemning what has already been done. And, indeed, self-justification (or group justification) may be why humans recognize the idea of morality. It is not unreasonable to think that individuals (and groups) want (or need) something to which to attribute their actions which is beyond reproach or otherwise unassailable. If I know that other people will recognize certain reasons for action or certain outcomes of action as being higher or more important than others, then it makes sense I would cite these reasons when I want to bring an argument to a swift and complete end. If I am challenged I will say that the challenger is challenging a moral principle which is the realm of philosophy. If we debate the philosophical foundations of that moral principle, then I have succeeded at shifting the focus of discussion
from my action to some other topic. Similarly, individuals and groups may need a way of
drawing clear lines around what types of behavior are completely unacceptable and use these
distinctions for both internal policing and distancing from outgroups.

A good example of justificatory moral language and reasoning is something a friend of mine and
I call the “What about the children?” argument. If you are having trouble convincing someone
what you are doing or want to do is acceptable, you can immediately appeal to the welfare of
children and quickly bring the discussion to a close and go about your business. Similarly, if
someone is doing something that you would prefer they didn't, you will often stop them by
asking “what about the children?” By doing this the other person has to explain how what they
are doing does not harm children at the very least. A skilled rhetorician will take such a challenge
and grab victory by showing how what they are doing benefits children. The true gold standard is
to go further and show a pattern of how all of the decisions and actions that led to the current
situation were prompted by a deep-seated and sincere desire to promote the welfare of children.
By making the welfare of children the reference point for evaluating an action a clear line is
drawn. You are either promoting and protecting the welfare of children or you are not. If you are,
you are a “good person.” The alternative is clearly undesirable.

This argument is one of the reasons I decided on this topic for my dissertation. A topic without
an obvious moral component is suddenly cast in a moral light when the “what about the
children?” argument is brought into play. In response, language about values begins to be used.
My hypotheses are based on the assumption that the values which inspire that language are
already in place in the individual and have now been activated. Therefore, if one knew the values
orientation of the challenged person ahead of time, one could predict the reasons they would give for their action. Where I differ from theories that reasons are “mere” justifications, is that I believe the values which the challenged person draws on for their justifications are also part of their motivations. Words and actions are not always in alignment, but there are patterns of actions and patterns of words. These patterns come from motivations. Values are trans-situational motivations and, therefore, may help explain these patterns.

For instance, if I have just purchased four ears of biotech sweet corn and someone asks me about my purchase I can say “it looked the best,” “it was the cheapest,” or “I just wanted some corn.” No one would suggest based on these answers that my purchase is a moral act. If I responded that “biotechnology reduces pesticide use,” “biotechnology feeds more people,” or “because of the children,” then my choice will probably be viewed in the realm of morality. In either case my words are not necessarily empty rhetoric. I probably do want ears of corn without insect damage. I may very well make purchasing decisions based on my understanding of the pesticide use required to bring agricultural products to market. In the first instance my values are not at play in my decision-making. In the second instance they are.

**Introduction of this Research**

This research examines the relationship between morality and values. It is hypothesized that perceiving a moral component to a previously unexamined attitudinal object causes a person to turn to their values for guidance in evaluating that object. Previous research suggests that when a person is made aware of their values, their value orientation will shift as a result of this self-awareness. The goal of this study is to determine if there is a change in the values orientation of
an individual when two conditions are met: 1) when the individual is asked to evaluate a previously unexamined attitudinal object, and 2) when the individual perceives there to be a moral component or dimension to the evaluation. This dissertation also argues that values could be a useful concept for sociological theory building, particularly in light of recent advances in defining, operationalizing, and understanding the values construct in the fields of personality and social psychology.

**Problem Statement**

Biotechnology is an example of a technology with obvious moral implications and dimensions. As new technologies enter our society, our current societal system of debate and evaluation of the benefits and costs of these technologies often ignore, avoid, or elide the ethical and moral components of these technologies. This is because moral considerations cannot be quantified in a way that allows for easy analysis. In California there is an “impartial analysis” of any proposed ballot measure included in the Voters’ Pamphlet. This analysis is written by an official financial or legal expert employed by the government such as a comptroller, auditor, attorney general, or chief counsel. These authorities describe the fiscal and legal impacts of the ballot measure if passed. Whether the impacts of the measure are “right” or “wrong” is for others to debate. Morality and utility are treated as separate spheres requiring separate processes of evaluation.

Understanding how values and perceptions of moral implications interact has practical applications for predicting and explaining social behavior. Personally, I am driven by a desire to know why people do what they do and what they will likely do next. From a governance standpoint, it would be useful to have some idea how people perceive their world and how they
might act based on that perception. This approach is already evident in laws governing dangerous behaviors like drunk driving. Driving in an impaired state is considered immoral as it endangers the lives of others. The moral transgression is greater because the victims of drunk driving accidents are considered “innocents” – they did not make a decision or take an action which is blame worthy. The fault lies with the intoxicated driver who knowingly put others at risk. While anti-drunk driving campaigns reinforce the moral component of driving while intoxicated, the laws which define and punish the action are based on simple, quantifiable variables. Operating a motor vehicle while exceeding a specific blood alcohol concentration as measured by specific scientific tests is a violation of the law. Additional proven violations of this law after the first offense result in increasing levels of punishment including the loss of driving privileges and incarceration. In especially egregious cases the prosecutor may press charges of vehicular manslaughter. This is an important distinction from a societal perspective. If a person violates drunk driving laws, but no one is injured, then the violation is handled as a citation and does not require a jury trial. If the offender has harmed others, then a moral violation has occurred in addition to a legal violation. By placing the decision as to guilt and punishment into the hands of a jury as well as a judge, our society is recognizing that a judgment must be made on non-quantifiable moral factors.

This example exists on the continuum of utility and morality. Drunk driving should be discouraged from a utility point of view because accidents caused by intoxicated drivers cost society as a whole in terms of medical expenses and property damage. Infractions are punished by taking away the violator’s money (fines), property (impounded vehicles), and time (incarceration). Violations with an indisputable moral component such as causing death or injury
to others are established and punished using a different system- a system which draws upon the moral sense of the populace and carries the additional stigma of having been found guilty of acting in “a negligent” or “malicious” way. These are descriptions of how someone views another person- ways of viewing them as an immoral person.

But why is a negligent or malicious action immoral? I believe it is partly due to whether that action promotes or distracts from the ultimate goals and motivations of both the individual and the group. These ultimate goals and motivations are values. Therefore, to understand when morality is considered salient to a question, one must understand how values influence attitude formation, decision-making, and behavior.

**Values**

When confronted with a novel situation requiring a response, people draw upon their previous experiences. If a situation is truly novel, the person will not have experiences which are applicable to the new situation. When this is the case, a person has to evaluate the situation in terms of some abstract set of criteria. These criteria are “values.”

Values are not simply a set of criteria, but a system for comparison in order to make decisions about what is “best,” “good,” “moral,” “least bad,” etc. Regardless of the content of such a value system or how it might work, such a system would be the result of a combination of biological, psychological, and social factors. Presumably, people are similar in the biological and psychological aspects of the system. Although there is genetic variation in humanity, these variations do not make genetic subpopulations of people stand apart from each other from a
sociological perspective. Groups of people are all faced with the same types of problems. They must make decisions and coordinate action. Resources need to be collected and distributed. What varies between peoples is how these problems are solved.

Differences in how people solve fundamental problems can be described in differences in values. Within societies there is also variation in how groups and individuals solve problems. These differences are inherently social because the difference is important in comparison to other people. Therefore, both the content and operations of any individual’s value system would be dependent on their social location as defined by the intersection of the individual’s sex, age, socio-economic status, education, occupation, marital status, parental status, religious affiliation, religiosity, and race or ethnicity. Social location may influence value systems on two levels. First, the social location of the individual during childhood is based on ascribed statuses. These statuses determine what kinds of values are internalized during childhood. Second, once a person becomes an adult some of their statuses may have changed due to achievement. People who share similar social locations would therefore share similar value systems both in terms of internalization during childhood and actions, decisions, or experiences as an adult.

The people I saw at the Farmers' Market in San Luis Obispo appeared quite similar to each other in terms of their social location. Obviously, social location is not something which can be accurately determined from visual information alone, but the population of people who attend this particular Farmer's Market has been studied and found to be surprisingly homogenous (Wolf & Berrensen 2003). Despite this homogeneity, the reactions to the sale of GMO sweet corn at the Market were diverse. I argue that this diversity is in response to a novel situation and this
response is mediated by some factor or factors in addition to social location.

**Biotechnology**

Biotechnology in the form of genetic engineering presents a novel situation for humanity. Although humans have manipulated the genetic material of microorganisms, plants, and animals for millennia through the selective breeding of plants, animals, and microorganisms, the ability to manipulate the genetic code of an organism in such a direct way is without precedent. If value systems are the mechanism people use to evaluate novel situations and if value systems are dependent on social location, then perceptions of genetic engineering will vary by social locations on a macro-level. As a result, public perceptions of genetic engineering will vary depending on social location at the individual-level. There may also be similar patterns and tendencies for people who share social locations.

Food is both a very promising and threatening area for the application of genetic engineering. Food has a special place in human life beyond mere sustenance. People use food to celebrate and communicate who they are, form or strengthen ties with others, and celebrate spirituality. Foods are key present symbol elements for all cultures. Some foods are delicacies, others are taboo. Some foods are staples, some are only prepared and eaten on certain dates or for certain purposes. Foods can be medicine. If foods are part of the symbol system of a culture and can have a variety of meanings, then there should be a wide variety of attitudes, beliefs, and behaviors toward the same food- both within and between societies.
Overview of Theoretical Arguments

The reasoning which leads to the hypotheses tested in this dissertation is as follows:

If a person perceives an attitudinal object as having moral implications, then it is more likely that person will be motivated to take some form of action regarding that attitudinal object.

If there are shared values orientations amongst subgroups within a nation and those value orientations are known, then it might be possible to predict how those subgroups would react to new technologies.

Although the study of human values has seen a resurgence of interest in the field of sociology recently, there are methodological and theoretical issues which have kept the construct of values from contributing to the advance of sociological theory (Gecas 2008, Hitlin and Piliavin 2004, Wuthnow 2008). Research on human values and value orientations in personality and social psychology has improved our understanding of the structure of values, their role in motivation, and the correlation of social and individual characteristics with values (Bardi et al. 2009, Bernard et al. 2003, Glover et al. 1997, Maio et al. 2009, Schwartz 1992, Schwartz et al. 1997, Torelli & Kaitati 2009). Despite these advances, there are still major conceptual and methodological barriers to understanding the cognitive foundations of values (Wuthnow 2008). In addition, there is the problem that by definition values are both stable and malleable.

Previous Work On Short-Term Changes In Value Orientation

Milton Rokeach and others (Ball-Rokeach et al. 1984, Rokeach 1973) explored what they called
the effect of "self-confrontation" on changing a person's value orientation over short time periods. They found that when a subject is given feedback about their value orientation and then presented with a prime that suggests there is a conflict or contradiction in the overall patterns of value priorities of Americans as a group, the subject will show a shift in value priorities in a prosocial direction.

In this study, subjects were asked if they believe there to be moral implications to biotechnology in general and agricultural biotechnology in particular. This should activate the subject's value orientation in the attitude formation process creating the possibility that their value orientation will shift as a result of the self-confrontation effect. This study differs from the work of Rokeach and his colleagues on self-confrontation in that instead of leading the subject to compare their value priorities to what is presented as the national norm, the subjects in this study were asked if they believe there to be moral implications to biotechnology in general and agricultural biotechnology in particular. As demonstrated by Ball-Rokeach, Rokeach, and Grube (1984), simply making people aware of the role that values play in everyday life can produce changes in behavior which reflect a change in value priorities.

**Self-Confrontation Theory**

This dissertation proposes that the sociological study and application of human values has been limited, overlooking the need for values to be activated before they will have an observable effect on behavior. This dissertation proposes that the key element that affects the activation of values and therefore leads to values affecting behaviors, is the activation of moral reasoning. This experiment did not test the connection between values activation and behavior. It will
determine if the activation of moral reasoning also activates the "self-confrontation" effect described by Rokeach. If a self-confrontation effect is observed, this is evidence that values have been activated.

If the self-confrontation effect were better understood, it could be possible to predict how much influence activists will have on public opinion. If there is a connection between the perception of moral implications and actions, predictions could be made as to who can be expected to take action and who can be expected to not take action at a variety of sociological levels of analysis including the group, subgroup, subculture, counterculture, or subpopulations grouped by orientations on the Schwartz Values Survey. Additionally, if there is a demonstrated mechanism connecting value orientations as motivations and attitude formation, then better simulations of social phenomena can be designed.

**Hypotheses**

The hypotheses to be tested are:

1. Values and value orientations will be strengthened when a values decision is in alignment with the dominant value orientation of the subject.

2. Values and value orientations will be weakened or changed when a values decision is in conflict with the dominant value orientation of the subject.

3. Only decisions where the subject perceives a moral component to be present will affect the value orientation of the subject.
Research Design and Analysis

Hypotheses were tested using an experiment designed to isolate the role of perceptions of moral implications on values change. For this dissertation, data were collected from an experiment and analyzed using a series of Chi-squared comparisons, Analysis of Variance (ANOVA), and means comparisons.

Implications and Sociological Importance

This study will provide sociological insight into the effects of perceptions of moral implications on the activation of values based upon whether there are significant mean differences in the ratings of values between experimental groups or not. If there are no differences between any of the groups, this means that values are completely stable over short time periods. This finding would be a contribution to the values literatures in both sociology and social psychology because it would demonstrate that value orientation is a stable construct for comparing groups in terms of motivations. In this case a "non-finding" is an important finding. Values are more stable than malleable under these experimental conditions and, therefore, are a useful construct in social theory building. If there are no differences observed, then value orientation is a valuable construct to use as an independent variable in social research. The average ratings of Schwartz's ten values by a group would provide a picture of the shared motivations of the members of the group. Groups could also be compared not only in terms of their value orientations, but also in terms of their internal variability in value orientations.
Organization of the Dissertation

This dissertation is composed of the following chapters: 1) Introduction, 2) Review of the Literature, 3) Theoretical Arguments and Hypotheses, 4) Materials, Methods, and Procedures, 5) Analyses and Results, and 6) Discussion and Implications. Chapter One gives a brief overview of the theoretical arguments made in Chapter Three and the methodology of this study. Chapter Two describes the concept of values as it has been researched and discussed in the academic literatures of sociology, psychology, and philosophy. Chapter Three argues that values can and should be an important part of sociological and social psychological theory building, and describes the theoretical arguments supporting the choice of instruments and questionnaire items used in this study. Chapter Four describes the methods, materials, and procedures used during data collection. Chapter Five presents the results of analyses and hypothesis testing. Finally, Chapter Six discusses the results and their implications for sociological theory building and future research.
CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction to Values as a Concept in Sociological Theory and an Illustrative Example of Values in Action

I will discuss the definition of values at length later in this chapter, but for now I will offer the following description of values by Shalom H. Schwartz as a starting place:

"Values (1) are concepts or beliefs, (2) pertain to desirable end states or behaviors, (3) transcend specific situations, (4) guide selection or evaluation of behavior and events, and (5) are ordered by relative importance....In addition to the formal feature of values,...the primary content aspect of a value is the type of goal or motivational concern that it expresses" (Schwartz 1992, 4).

To illustrate why values are motivations as well as criteria and to make this description easier to grasp, let's consider the case of San Luis Obispo sweet corn described previously. There are four types representing combinations of two factors. First, let's suppose I really want some sweet corn. Any motivations, tendencies, or preferences that came into play during the decision-making process which resulted in my desire for sweet corn specifically and Cal Poly sweet corn in particular are in the past. I thought my work was done, but now I am faced with another set of choices. Do I want a genetically-modified variety or its cousin which only contains genes from the Zea mays genome? Do I want ears of corn which have never come in contact with pesticides or do I want ears which have been sprayed with pesticides?

As I observed at the Farmers' Market, the obvious choice is ears which are a non-GMO variety and have not been sprayed. Why? If the price of the different types of ears is the same, then what else contributes to my preference? In the case of pesticides, there may be a range of reasons, but
I believe the concept of “pesticides” generally has a “bad” connotation for people. “Chemicals” or “sprays” are something which should be avoided if possible. As to genetic modification, the same principle applies. I believe the concept of “genetically-modified” has a negative connotation for most people.

So, I want good old-fashioned pesticide-free, traditional sweet corn. I go to the box labeled as such and what do I find? Ears of corn with corn ear worm damage at the tips. The kernels are shriveled or missing entirely and there is black, white, and gray mold under the husk. New criteria enter my awareness: appearance and purity. These ears are unappetizing to look at and are tainted with mold. Should I try to overcome my aversion to the corn ear worm damage? Examining the ear more closely and knowing that I have other choices, I decide this is not an option. Perhaps there are ears of the other types of corn that are not damaged. I desire to avoid both pesticides and GMOs. I now have to examine these desires and put them into a context for comparison. And here, I turn to my values.

The Role of Values in Social Theory Building

"The value concept, more than any other, should occupy a central position...able to unify the apparently diverse interests of all the sciences concerned with human behavior."- Milton Rokeach from The Nature of Human Values, 1973, p.3.

In the rest of this chapter I will describe the history of the concept of values as it has been applied by different scholars. Values as a concept has been included in sociological theory because 1) people use “values language” when talking about sociological phenomena in everyday life, 2) identifying motivations for actions has proven to be useful in psychology, 3) as
motivations for social actions, values bridge the gap between the micro (individual) and meso (group) levels of analysis, and 4) motivations shared by a group could bridge the gap between meso and macro (societal) levels of analysis. Values appear to be a link in a mechanism that connects levels of analysis and that can be operationalized and observed.

Values have been a part of the theories of many important sociologists. Every era of sociological thought had a sociologist who attempted to include values in their theories. The difficulties of understanding and describing values led some of these theorists to bring other ideas to the forefront of their work as their careers progressed (Durkheim, Weber). In other cases, work built on values by theorists was left behind by the scholars that followed (Parsons, Wrightsman, Rokeach). With a new appreciation of values and their role in social organization we open doors left shut by previous theorists, possibly leading to new ways of understanding the social world based on their work.

I will make the case that sociological work with values has been hampered by a conceptual confusion about what values are. Psychology has made major strides in clarifying what values are. Because of the conceptual confusion surrounding values, sociologists prior to the 1970s had difficulty operationalizing values in a way that allowed for observation, measurement, or comparison in a meaningful way. Again, tremendous advances have been made in this area beginning with the foundational work of Milton Rokeach (1972, 1973).

**What are values?**

"Values are relatively general and durable internal criteria for evaluation." (Hechter 1992, 215).
Currently, one of the most widely accepted definition of "values" in the sociological literature is the one offered by Michael Hechter in his 1992 article from *Sociological Theory* entitled "Should Values be Written out of the Social Scientist's Lexicon?" Many other definitions have been offered over the years (see Kluckhohn 1951, Spates 1983, Hitlin and Piliavin 2004), but these definitions have tended to be too vague and amorphous to allow for successful operationalization of values as a useful sociological concept. Hechter addresses this issue in his article and makes several very useful suggestions for how to define and investigate values in a way that is productive for sociological theory-building.

Values as a construct for sociological theory-building has been underutilized, however (see Spates 1983, Hitlin & Piliavin 2004, Gecas 2008, and Wuthnow 2008 for discussions of why this has been the case as well as arguments for why and how values merit a more prominent place in social theory). I believe the confusion and lack of specificity in definitions of values come from two sources. On the one hand, the idea of "values" can be linked to the concept of "value" in an economic or rational sense. I will call these "utility definitions." On the other hand, when people use the word "values" in everyday parlance they often use the word in relation to ethical or moral concerns. I will call these "morality definitions." These two conceptual areas are linked, but the nature and usefulness of the two concepts are different.

Utility definitions focus on phenomena internal to actors that yield evaluative judgments of what is "better" or "worse" in terms of a simple cost/benefit accounting for qualities that are easily identifiable or quantifiable. The internal process of evaluating alternatives is a process of valuation, and hence, is a process of assessing the "value" of a thing. These definitions are
grounded in the economic and rational choice conceptions of personal preferences and desired goods and outcomes. "Better" or "worse" label what is more or less desirable for either the individual or a group to which the individual belongs.

Utility definitions employ the concept of values as a way of explaining the unobserved processes that yield preferences. Preferences are observable, but the process or processes that produce them are not. Values are, therefore, a "black box" which the social scientist can avoid opening by focusing on the stimulus-response patterns of actors or experimental subjects. This approach to values is very much in keeping with a behaviorist perspective on human behavior. We do not need to understand what is in the box or how it works to include variation in preferences between individuals in social theory-building. If we can find patterns to preferences at the individual level we can make predictions about how that actor will behave in the future given the same set of choices in the same context. We also can make predictions about the choices groups or types of people will make based on the patterns of group level preferences. I would place Weber's theory of values as originating from a utility definition perspective (see discussion of Weber below). Proponents of utility definitions make the connection to ethical or moral questions by adopting a utilitarian view of morality and ethics that, again, is in keeping with the assumptions and beliefs of behaviorism.

When I designed the data collection methods for the San Luis Obispo sweet corn study I took a behaviorist perspective and I had a utility definition of values in my mind. I did not particularly care how people came to a decision about what type of corn to buy. I only wanted to know if they would buy less sweet corn if they knew it was a biotech variety. As far as their motivations
were concerned, I assumed that shoppers had different kinds of motivations for their purchases, but the overriding pattern of those motivations was satisfaction. The consumer has a need that can only be met with farm-fresh sweet corn. They will seek out sweet corn to satisfy that need. When presented with multiple types of sweet corn they will assess how well each type meets their needs and will make a purchase accordingly. As I have described, the situation in the field was not so clear-cut. I began to think there was more going on here.

In contrast to utility definitions, morality definitions of values focus on phenomena internal to actors that yield evaluative judgments of what is "right" or "wrong." In these cases values are the interpretation and relationship of outcomes or objects to what is "best" or "most desirable" in terms that transcend a simple cost/benefit analysis. Unlike utility definitions, morality definitions of values often turn to sources outside of the individual for their origins, usually conceived in a transcendental or spiritual way. Obviously, the foundations of morality are an ongoing area of philosophical debate and I concede that the distinction I am making between utility and morality may seem artificial. I think it is meaningful and useful, however. Values are motivations and motivations can have a variety of sources. If I have a choice between eating a hot dog and eating a carrot I can make my decision based on what will give me the greatest benefit in terms of satisfaction, health, or price. I can also decide based on more abstract criteria such as the injustice and cruelty of raising animals for slaughter. It is also possible that I may have mixed motives or that I may decide based on different motives at different times as shown in Figure 1.
From a morality perspective one can understand how patterns emerge at the group level due to the shared nature of moral conceptions that result from shared processes and contexts of socialization. Variations in behavior between individuals of the same group or type are harder to explain. Even if all members of a particular social group experience a common socialization experience as part of becoming group members, there is still variation in socialization experiences due to things like sex, age, or simply individual differences in perceptions, preferences, interpretations, and experiences. If this type of within-group variation is great
enough, then the explanatory power of values as a concept diminishes. I would place Durkheim's theory of values as originating from a morality definition perspective (see discussion of Durkheim below). From there he then worked to explain the variation between individuals in the same society and identified the division of labor as the source of this variation.

In terms of operationalizing the concept of values, utility definitions will look to quantitative descriptions of human choice behavior; morality definitions will look to qualitative analyses of the reports actors give explaining the reasons for their choices. Both of these operationalizations are lacking for purposes of building social theory. Although empirical quantitative data collection and statistical analysis are the foundation of scientific inquiry, without a grounded understanding of the processes which produce those data one is left without a description of the mechanisms which link the stimulus and the response. Parsons' and Shils' 1951 volume *Toward a General Theory of Action* is an attempt to describe the mechanisms that are in the black box of values. Although this work was an important step, I do not believe Parsons succeeded in resolving the conflict between utility and morality perspectives. Parsons and his collaborators desired to "have it both ways," but didn't succeed because these two perspectives are too different in their underlying assumptions and require very different methodologies of investigation to be joined into a unified theoretical conception.

The source of this problem is the tendency of theorists to redefine the concepts they need to talk about in ways that remove the power or original meaning of the concept. For example, utility definitions have difficulty explaining why people act altruistically. This problem is "solved" by defining acts that appear to be altruistic as motivated by self-interest. Although on its face an act
may appear to be altruistic because it prioritizes the needs of others over the needs or desires of the self, this is explained away by supposing that the altruistic actor is receiving an internal reward in the form of increased self-esteem and external reward in the form of increased social standing or status, or the actor is avoiding a punishment in the form of internal self-criticism or external social approbation.

The maintenance of identities, self-concepts, or self-schemas are also possible selfish motivations for acting in a way that does not appear to be "rational" in a utility sense. But defining altruistic acts in this fashion robs the definition of altruism of its meaning. Altruism is by definition acting to promote the welfare and well-being of others over the self. To redefine altruism in strictly rational terms reduces altruism to an empty descriptor for a class of actions and avoids or denies the core of the concept. This redefinition only works if actors are realizing these rewards and avoiding these punishments. What if an actor behaves altruistically, but they really don't want to? It is hard to imagine, especially from a behaviorist perspective, that people who go to the extreme of endangering or losing their lives receive an internal reward for doing so. If the motivation is due to external rewards and punishments, then the redefinition fails because the actor may not be around to enjoy these outcomes. Surely, the preservation of one's own life is the highest utility imaginable, unless the actor expects their rewards in Heaven, in which case we are traveling into the arena of morality (i.e. transcendental) definitions.

Morality definitions of values, on the other hand, struggle with explaining why people act selfishly. If people are socialized to have the same values and those values are in relation to an external shared conception of what is best or most desirable then one would expect people to act
altruistically, or at least prosocially most of the time. When people act selfishly they are either ignoring or acting against their moral education in a Durkheimian sense. This issue can be avoided by including a responsibility to oneself as a moral duty, but I find this approach lacking as I explained earlier.

Under this definition actors are faced with conflicting moral injunctions related to the enhancement of other versus the enhancement of self. If this trade-off is resolved in favor of the self, it is hard to see how this is not a utility/rationality decision on the part of the actor. This robs "morality" of the heart of its meaning, because morality is about what an individual's responsibilities are to others. This also leaves unexplained how people who were socialized in the same way would vary in their values and values-based decision-making. One solution is to recognize that people do not always do the "moral" thing when faced with conflicts between the needs of the self and the needs of others.

Again, because these processes are internal to the actor we can only rely upon qualitative reports from subjects about how and why they make the decisions they do. This methodological approach is fraught with problems. People may not be fully conscious of the processes which produced their decision or people may choose to report what they perceive to be the most socially appropriate reasons, not the actual reasons for their choices.

There are areas of overlap and areas of exclusion in the Venn diagram of utility and morality definitions of values (Figure 1). Making these areas explicit is part of what Hechter calls for in his 1992 article, although he doesn't recognize the same typology I have just proposed. I propose
that the definition of values offered by Hechter needs further elaboration. Unfortunately, I think this elaboration would require a two-pronged research agenda, neither prong of which I have come across in the sociological literature on values. One area of research which I believe needs to be explored is how people use the word "values" when justifying their decision-making, especially when people recognize a choice as having a values dimension as opposed to a strictly rational dimension. Similarly, do people recognize certain decisions as being in a realm of morality or ethics (more on the distinction between the two later) and NOT containing a values dimension? How do modern, everyday people, and not social theorists, define values? This is a qualitative research program requiring interviews with people from across the entire spectrum of social locations and would also need to be conducted cross-nationally.

For values to be a useful concept for sociological theory it has to be defined in a way that is universal across social groups. The content, prioritization, and outcomes of values and value processes may vary, but the fundamental nature of values and value processes must be universal to be theoretically useful. I liken this to the idea that everyone is a naïve sociologist, psychologist, and physicist whether they recognize it or not. People need some naïve theory of how the world works in a social, psychological, and physical way to survive and operate in their daily lives. Without having information about the basic universal aspects of what I call "naïve sociology" our formulations of sociological processes is not grounded in the social reality of everyday life.

**Milton Rokeach: Value Priorities and the Self-Confrontation Effect**

Milton Rokeach first published his research and theory of the connections between values,
beliefs, attitudes, and behaviors in 1968 (Rokeach 1968). He then pursued a comprehensive research program to validate those ideas and test hypotheses derived from them (Rokeach et al. 1970; Rokeach 1971; Rokeach & Cochkan 1972; Rokeach 1973, 1975, 1979; Ball-Rokeach et al. 1984). This work included the development of an instrument for describing value orientations—the Rokeach Value Survey (RVS) (Rokeach 1973). This instrument was validated and used by other psychologists and sociologists (Greenstein 1976; Grube, et al. 1977; Paris 1980; Braithwaite 1982; Braithwaite & Law 1985; Greenstein 1989; Grube et al. 1994; Johnston 1995; Kennedy 1995; Braithwaite 1998; Kasser et al. 2002; Firestone 2003). Using this instrument Rokeach and his colleagues measured the effects of social comparison, reflection, and media influence on values and values change (Rokeach 1971; Rokeach & Cochkan 1972; Rokeach 1973, 1975, 1979; Ball-Rokeach et al. 1984).

In addition to the development of an instrument for describing value priorities (and, hence, value orientations), two of Rokeach's early contributions to the social psychology of human values were his definition of human values and his distinction between values and norms. Rokeach developed these conceptions from the work of Robin Williams (Williams 1968). Rokeach defined a value as “...an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence” (Rokeach 1973, 5). Rokeach describes a value orientation as a “value system” which is “...an enduring organization of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance” (Rokeach 1973, 5). Although Rokeach did not make an explicit connection between his conception of value systems and morality, there is an overlap between his definition of value systems and the definition of morality used in many
psychological theories of moral reasoning and judgment.

In addition to providing conceptual clarity and methodological consistency for the study of values, Rokeach and colleagues also studied changes in values, especially due to what Rokeach called the self-confrontation effect (Rokeach & Cochkan 1972; Rokeach 1973, 1975, 1979). Rokeach found that when subjects are confronted with contradictions between their own value priorities and those of an important reference group (“other Americans” in this case), the value priorities of the subject shift in a direction to resolve this conflict. Those changes are stable for many weeks or months after the stimulus is experienced. This effect is produced when the subject is confronted with the contradiction face-to-face by an experimenter in a non-anonymous condition as well as when the subject is presented with the contradiction alone in an anonymous condition. This effect is also produced when the source of the feedback about the subject's values and those of a reference group are delivered by a computer (Rokeach 1975). Rokeach believed this effect has potential for applications in psychotherapy and other fields where producing a change in a target individual is desirable (Rokeach 1971, 1973, 1975, 1979; Rokeach & Cochkan 1972). Rokeach also established a connection between the degree of dissatisfaction resulting from self-confrontation and behaviors such as joining an organization that promotes social justice and equality (the NAACP) or enrolling in an ethnic studies course (Rokeach 1971). Rokeach and colleagues also studied changes in values over time using national representative polling data (Rokeach & Ball-Rokeach 1989).

The work of Rokeach and his colleagues established the connection between values and behavior- especially value-congruent behavior. If a person's values are activated, then they are
more likely to engage in behaviors which reflect or promote values which are important to them. This would explain how it is possible for there to be variation in behavior relate to values. Two people may have the same values orientation, but if values are activated for one person and not the other, then you will see a difference in behavior related to values. Or two people may find themselves in a situation which activates their values. If they differ in their values orientations, then one would expect a difference in behavior.

Subsequent research by social scientists who based their work on Rokeach's theory and methodology has further illuminated the interrelationship of values, self-concept, self-dissatisfaction, and behavior (Grube at al. 1977), demonstrated the influence of the self-confrontation effect on teaching ability (Greenstein 1976), shown that self-confrontation can change attitudes toward lesbians and gay men (Kennedy 1995), and established the influence of childhood environment on the values held by adults (Kasser et al. 2002). The shortcomings of Rokeach's theory and methodology discovered by other researchers include a lack of reproducibility (Paris 1980, Kennedy 1995, Firestone 2003, ), the ordinal data generated by the RVS violate some of the basic premises of scale construction preventing exploration using factor analysis (Johnston 1995), and the fact that attitudes and behaviors can change as the result of self-confrontation without a corresponding change in value priorities (Grube et al. 1977, Kennedy 1995).

Although Rokeach made a tremendous contribution to the study of values, the limitations and shortcomings of his theory and the RVS instrument itself required new conceptualizations, operationalizations, and methodologies be developed to continue progress in this field of study.
Researchers such as Valerie Braithwaite (1982, 1998; Braithwaite et al. 1985, Braithwaite et al. 1991) and Norman Feather (1982, 1992, 1995) (both in Australia, working separately) continued to use the RVS and Rokeach's value theory in spite of the acknowledged problems which they tried to overcome or repair. Eventually a new theory of values supplanted the Rokeach model.

Shalom Schwartz: The Universal Structure and Content of Values

Shalom Schwartz began his career studying the interrelationship of morality, awareness of consequences, norms, and behavior (1967, 1968a, 1968b). Schwartz also studied the influence of personality and internal moral conflict in mediating the relationship between norms and action (Schwartz et al. 1969), awareness of consequences and volunteering (Schwartz 1974), the activation of personal norms by the perception of the “justice of need” (Schwartz 1975), and perceived moral imperative as motivations for behavior (Schwartz 1975).

After Rokeach began publishing his work (1968, 1973, 1979), Schwartz's research turned to values including the use of Rokeach's self-confrontation method to increase the weight loss of dieters (Schwartz & Inbar-Saban 1988) and the use of the RVS to study personality (Bilsky & Schwartz 1994). Using Rokeach's theory of values, Schwartz and Bilsky organized the 36 values identified in the RVS into a two-dimensional arrangement around axes of individualist-versus-collectivist and instrumental-versus-terminal values (1987). This organization was based on a definition of values as “cognitive representations” of three (presumably universal) requirements for human life—“biological needs,” “interactional requirements for interpersonal coordination”, and “societal demands for group welfare and survival” (Schwartz & Bilsky 1987, 551). Values were further defined as “concepts or beliefs,” which “pertain to desirable end states or
behaviors,” “transcend specific situations,” “guide selection or evaluation of behavior and events,” and “are ordered by relative importance” (Schwartz & Bilsky 1987, 551). From their analysis Schwartz and Bilsky formulated definitions for eight “motivational domains of values” (Schwartz & Bilsky 1987, 551-553). These eight domains were “enjoyment,” “security,” “social power,” “achievement,” “self-direction,” “prosocial,” “restrictive conformity,” and “maturity” (Schwartz & Bilsky 1987, 551-553). They also demonstrated that multiple values can be motivations for action without contradiction and that the relationship between values is dynamic, reflecting the cognitive and motivational complexity of value systems in a way Rokeach and his colleagues were not able to capture (Schwartz & Bilsky 1987).

In 1992 Shalom Schwartz published the landmark paper “Universals in the Content and Structure Of Values: Theoretical Advances and Empirical Tests in 20 Countries.” The influence of this article cannot be overstated. A search of the ISI Web of Science citation database (accessed 2/28/11) identified 1196 articles citing the 1992 article presenting Schwartz Values Theory (SVT) and the Schwartz Values Survey (SVS). The theory and the instrument were validated with data collected from 9140 subjects in 20 nations representing 13 languages and including samples from “every inhabited continent” (Schwartz 1992, 18). This new theory and these data demonstrated predictive power for changes and differences of value orientations in terms of age and/or country of origin, suggesting that there is value change over the life course and variation in value priorities between cultures.

The organization of motivation types first proposed by Schwartz and Bilsky in 1987 was further refined based on the new theory and data collected using the Schwartz Values Survey (SVS).
Schwartz reformulated the eight value domains previous identified into a new two-dimensional model of 10 “motivational types” of values arranged in a circle, namely: “Self-Direction,” “Stimulation,” “Hedonism,” Achievement,” “Power,” “Security,” “Conformity,” “Tradition,” “Benevolence,” and “Universalism” (Schwartz 1992, 5-13). Schwartz also postulated “Spirituality” as an eleventh motivational type, but this value was not found as a single type across all countries studied suggesting that spirituality is not a single value, but is expressed through combinations of the other ten values. Therefore, “Spirituality” was dropped from the model (Schwartz 1992; 23, 26-27).

Theoretically, universal motivational types will display similarities and conflicts based on the content of the types. Subjects who give a high priority to Self-direction should also give a relatively high priority to Stimulation and Hedonism. Similarly, subjects who place a high priority on Self-direction should assign lower priority to the values of Tradition and Conformity (Schwartz 1992, 14-15). Based on the compatibilities and conflicts between values Schwartz proposed an arrangement of the ten value types reflecting their similarities, oppositions, and relationships. Using Smallest Space Analysis (a type of non-metric multidimensional scaling) Schwartz found support for this arrangement of values with the exceptions of “Tradition” and “Conformity” which share the same sector of the circular arrangement (Schwartz 1992, 23-27).
Another advance in the study of values from this paper was the introduction of the Schwartz Values Survey (SVS) (Schwartz 1992, 16-17). Although based on the Rokeach Values Survey, the SVS introduced several new features to address the shortcoming of the RVS previously discussed. First, instead of forcing the respondent to rank values in terms of their importance, the respondent assigns ratings of importance as “A GUIDING PRINCIPLE IN MY LIFE” using a nine-point Likert scale anchored at the top with “7- Of supreme importance.” Second, the scale includes the numbers -1 and 0 to represent “opposed to my values” and “not important,” respectively. This allows for the rejection of some values— a phenomenon which should be observed between cultures. Third, Schwartz included 21 of the 36 values in the RVS, but also
incorporated values identified by other researchers such as Hofstede (1980), Braithwaite and Law (1985), Levy and Guttman (1974), Chinese Culture Connection (1987), and Munro (1985). Fifty-six items were selected as examples of values which represent the ten motivational types. Respondents who responded to less than 41 items, used the same number more than 21 times, or used the number 7 more than 35 times were dropped from the data set prior to analysis because those respondents were "...assumed to have failed to make a serious effort to differentiate among their values" (Schwartz 1992, 20).

A fourth advance stemming from this research was the identification of two orthogonal dimensions for organizing the ten motivational types. One dimension is conservation versus openness to change. The other dimension is self-enhancement versus self-transcendence (Schwartz 1992, 43). These two axes allow for the testing of hypotheses generated by other theories of value and motivation using the SVS and allow data collected using different methods to be compared. These axes overlap conceptually with other polar distinctions such as individualism-collectivism, prosocial-proself, and xenophobic-xenophilic.

With a solid theoretical and methodological foundation established, Schwartz and his colleagues began a coordinated research program. They tested hypotheses developed from the new theory, studied previously unanswered questions regarding values, and addressed critiques and shortcoming of the theory. These studies included improvements to the general theory of the universal structure of values (Schwartz 1990, 1994; Schwartz & Boehnke 2004), progress toward a general theory of motivation (Schwartz et al. 1990, Schwartz 2005, Bilsky & Schwartz 2008), and improvements to the methodology (Schwartz et al. 2001, Davidov et al. 2008).
Values and culture were a major area of interest for Schwartz and his colleagues. Studies related to culture and values included establishing the consistency in meaning of values and existence of value dimensions both within and between cultures (Schwartz & Sagiv 1995, Schwartz 1999), describing the influence of democratization and development on value consensus (Schwartz & Sagie 2000), identifying a pan-cultural hierarchy of values (Schwartz & Bardi 2001), exploring value transmission processes (Knafo & Schwartz 2001), describing perceptions of parental values by adolescents (Knafo & Schwartz 2003), identifying cultural orientations expressed through values between cultures (Schwartz 2006), describing the influence of national culture on organizational values (Sagiv & Schwartz 2007), distinguishing sample variation from cultural variation (Fontaine et al. 2008), and confirming the universal structure of values across levels of analysis (individual/country) (Fischer et al. 2010). Addressing specific variables and causal relationships, Schwartz and his colleagues studied the relationship of values to gender (Prince-Gibson & Schwartz 1998, Struch et al. 2002, Schwartz & Rubel 2005), personality (Schwartz et al. 1997, Sagiv & Schwartz 2000, Roccas et al. 2002), religiosity (Schwartz & Huismans 1995), and the dynamics of worry (Boehnke et al. 1998, Schwartz et al. 2000). More applied research by these scholars focused on behaviors (Ros et al. 1999, Smith et al. 2002, Bardi & Schwartz 2003, Schwartz 2007b), and politics (Sagiv & Schwartz 1995, Schwartz & Bardi 1997, Barnea & Schwartz 1998, Devos et al. 2002, Caprara et al. 2006).

Other researchers built upon the same foundations. Some confirmed the structure theorized by Schwartz (Kopelman et al. 2004, Pakizeh et al. 2007). Others further validated or improved the SVS instrument (Maio et al. 1996, McCarty & Shrum 2000, Caprara et al. 2005, Lindeman &

Some of Schwartz's colleagues pursued parallel research projects to Schwartz's own. These included comparing the SVS with other instruments (Bilsky & Koch 2000) and using SVT for archival research (Bardi et al. 2008). Others studied the influence of values and identification on individual behavior in organizations (Lipponen et al. 2008) or the connection between values and other personality constructs (Calogero et al. 2009), and moral inclusiveness (Schwartz 2007c).

Most importantly for this dissertation is the work of Anat Bardi, Norman Feather, and Gregory Maio (separately) on values change. Bardi (et al. 2009) demonstrated that intra-individual value change “...mirrors the circumplex-like structure of values so that conflicting values change in opposite directions and compatible values change in the same direction” (913). The structure of the Schwartz circular model of values is maintained even when value priorities change. Another important finding by Bardi is that “...the greater the extent of life-changing events, the greater the value change found, whereas age was only a marginal negative predictor of value change when life events were taken into account” (913).

Norman Feather began using SVT and the SVS shortly after Schwartz's 1992 article presenting the theory and instrument. Feather used the SVS to confirm the circular relationship of values as described by Schwartz (Feather 1995). He expanded on SVT by studying the relationship between values and actions using expectancy-value theory (Feather 1992). Feather found that
“values induce valences on events and potential outcomes, and that these valences in association
with expectations are important determinants of the final action that is taken” (Feather 1992, 109). Feather defined values much as both Rokeach and Schwartz did, but he also focused on the
moral and affective aspects of values (Feather 1995, 1135). Values have a normative quality, a
sense of “oughtness,” and an affective quality. This separates values from needs in that “… values
are tied to a normative base involving a dimension of goodness and badness, whereas no
necessary connection exists between needs and evaluations of goodness and badness” (Feather
1995, 1135-1136). People have an emotional reaction when their values are either supported or
challenged (Feather 1995, 1135). Whereas values are general and relatively durable over time,
valences “… refer to the subjective attractiveness or aversiveness of specific objects and events
within the immediate situation” (Feather 1995, 1135). Feather synthesized these different ideas
into a coherent theoretical perspective:

Thus, values affect the way a person construes or defines a situation so that some
objects, activities, and potential outcomes are seen as attractive, or positively
valent, whereas others are seen as aversive, or negatively valent..... They
influence a person's cognitive-affective appraisal of a situation in relation to both
means and ends. Just as a hungry person sees food as attractive or an anxious
person sees an unfamiliar situation as threatening, so a person who values honesty
sees an honest course of action as attractive and a person who values equality sees
forms of discrimination that restrict equal opportunity as aversive. Thus, actions
and their possible outcomes become linked to the cognitive-affective system via a
person's dominant needs and values. The immediate situation thereby takes on
affective meaning, with some potential actions and outcomes having positively
valent characteristics, and other potential actions and outcomes having negatively
valent characteristics... (Feather 1995, 1136).

Based on this framework Feather hypothesized that when presented with alternative courses of
action 1) “the perceived attractiveness of each alternative would be related to the values that
alternative was designed to arouse or elicit,” and 2) “… that for each scenario, relations among
the higher order dimensions, the perceived attractiveness of an alternative, and the choice of that alternative would be opposite in sign for value types at the opposite ends of each dimension (Self-Transcendence versus Self-Enhancement, Conservation versus Openness-to-change)...” (Feather 1995, 1138-1139).

To test these hypotheses Feather surveyed college students who completed a questionnaire composed of the SVS, 10 scenarios for evaluation, and “standard demographic items” (Feather 1995, 1139). The 10 scenarios describe situations where different value types are relevant. The respondent was asked to put themselves in the place of the stimulus person described in the scenario and choose between two alternative courses of action. Feather analyzed the relationship between individual values and choice. He also described individuals in terms of their value orientation along the Self-Enhancement/Self-Transcendence and Conservation/Openness-to-change dimensions (1995, 1141). Feather found support for both hypotheses (1995, 1141). Unfortunately, Feather did not conduct a longitudinal survey, so the possibility that the process of evaluating the scenarios and courses of action produced changes in the value priorities of the respondents was not tested.

Gregory Maio, on the other hand, did study values change. Maio studied values as a doctoral student (Maio et al. 1996, Maio 1997) and found support for what he termed the “values-as-truisms” hypothesis. This hypothesis states that values are like truisms in that they do not have “cognitive support,” are widely shared by people in the same culture, and are rarely questioned or challenged by members of that culture. In support of this hypothesis, Maio found that when experimental subjects are asked to contemplate the reasons behind their value priorities a change
in value priorities results. When subjects were given cognitive support for their values in the form of arguments supporting a value, value change was not produced, suggesting that values are stable when they go unchallenged or when a person has already been provided with rational justifications for the priority of the value (Maio 1997, Maio & Olson 1998). Thinking about reasons for a value increase the expression of that value through behavior indicating that justification modulates the values-behavior relationship (Maio et al. 2001). Similarly, providing cognitive defense for a value under attack increases the defense of the attacked value, increases the importance of the attacked value, and strengthens attitudes and other values congruent with the attacked value (Bernard et al. 2003b). Regarding changes in value priorities, Maio (et al. 2009) found that changes in values follow the pattern predicted by SVT. When the importance of one value increases, the priority of other values that are motivationally compatible also increase while the priority of motivationally incompatible values decrease. The priming of a value also increases value congruent behavior (Maio et al. 2009).

Similarly, when presented with risks and benefits subjects evaluate those risks and benefits in terms of whether the risks and benefits are compatible or incompatible with their value orientation (Godfrey 2008). The outcome of this evaluation also influences how much trust is instilled in the source of the information (Godfrey 2008). Siegrist (et al. 2000) found that trusting a source of information regarding risks and benefits is related to the perceived values similarity between the provider and the receiver and the salience of certain values over others based on the specifics of the situation under consideration.

Lönnqvist (et al. 2006) found that when a person anticipates regret related to performing or
failing to perform an action they are more likely to act in a value-consistent way. Self-transcendence values are especially tied to both altruistic behavior and anticipating regret for actions (or lack of action), although the degree to which the subject conforms to social norms which are salient moderates this relationship (Lönnqvist et al. 2006). This suggests that people who have a more self-transcendent value orientation will perceive situations differently from people with other value orientations and this difference will translate into different attitudes and behaviors. Other researchers have confirmed this tendency under experimental conditions (Norman et al. 2010). The strength of this congruence between self-transcendence values and behavior is partially due to the importance of these values for personal identity and the formation of role identities (Hitlin 2003). The connection between identity and values was demonstrated by Robbins (1998) who found that the college environment encourages the adoption of the dominant value orientation of tenured faculty by entry-level faculty and students over time, presumably due to a greater degree of identification with the dominant group as the result of a process of socialization.

There is a large corpus of work in social psychology research that does not utilize SVT, but does include other measures of value orientation that overlap with the two primary dimensions of Schwartz's model and isolate mechanisms that translate those motivational priorities into behaviors. Much of this work has been done with Prisoner's Dilemma (PD) and Public Goods (PG) games.

Altruistic value orientation (the Self-Transcendence dimension in SVT) and altruistic behavior is one of the areas of research that has received the most attention. This line of research is inspired
by the differences in altruistic behavior observed between humans and chimpanzees. The key
difference that has been demonstrated experimentally is that chimpanzees will not engage in
altruistic behavior unless the beneficiary of that behavior is kin or an active reciprocating partner
(Silk et al. 2005). Humans will engage in altruistic behavior toward strangers and anonymous
others suggesting that chimpanzees do not have the same degree of regard for others as humans.
What is the source of the difference?

Fehr and Gächter (2000) found that subjects who were cooperators in a PG game were very
willing to punish free riders, even when the costs of punishment were great and provided no
material benefit to the punisher. In addition, the severity of punishment increases with the
degree to which the free rider deviates from any norm of cooperation that has emerged in the
game. Fehr and Gächter (2002) also found that negative emotions in response to defection by
free riders or other non-cooperators is a proximate mechanism for encouraging punishment. Not
only do subjects have a strong emotional reaction against non-cooperators, but they also imagine
others would view them negatively and punish them severe for similar violations of a
cooperative norm. Much of the literature on this type of punishing behavior assumes it is
motivated by either a desire for fairness or a desire for revenge (Clavien & Klein 2009). A review
of the research on altruistic, helping, and punishing behavior by Clavien and Klein found that
both interpretations could be supported. Perhaps there are other motivations that can better
explain altruism.

Although altruism is found in cultures around the world, there is substantial variation between
cultures in altruistic behavior in social dilemma games (Henrich et al. 2001, 2005, 2006). These
differences cannot be explained in terms of self-interest, appear to be connected to the social and economic organization of the culture, and have greater explanatory power than individual-level demographic and economic variables. Similarly, Parks and Vu (1994) found lower levels of cooperation by subjects from an individualistic culture (America) and higher levels of cooperation by subjects from a collectivist culture (Vietnam) in social dilemma games. The higher level of cooperation was observed in the subjects from the collectivist culture even when playing against an aggressive non-cooperative strategy ("All defection", i.e. "All D"). To me, this suggests that the values which have the highest shared priority by members of a culture and the need to be a respected member of that culture have motivational primacy over self-interest (see Hechter & Kanazawa 1997 for a competing view).

Even research on choice focused on economic motivations finds that moral considerations play a role in decision-making and evaluation (Kahneman & Knetsch 1992; Kahneman et al. 2000, 167-168). Kahneman and his colleagues found that the willingness-to-accept (WTA) payment for the rights to develop the Grand Canyon into a water park was greater than the willingness-to-pay (WTP) to buy those rights back if the developer already owns them. I would argue this difference is not based simply on how the choice is framed (as argued in Tversky & Kahneman 1981), but on the congruence and conflict with values which share a high priority in American culture and the moral implications of those shared values. Different values are applicable to different situations. Also the moral implications of selling the rights to the Grand Canyon are different from the moral implications of buying those rights back. Economists see this as a problem because the economic or cost-benefit outcome is the same in both cases. A values perspective
resolves that conflict.\footnote{Despite the title of their book, Kahneman, Tversky, and Foundation largely ignore theories of values. In the 860 pages of \textit{Choices, Values, and Frames} there is no mention of Shalom Schwartz, one mention of Milton Rokeach, and one mention of morality.}

This suggests that humans operate in a mental world where imagined future events, the possible motives and characteristics of others, and self-concept are at least as, if not more, important than material gains. This tendency to engage in cooperation and altruism is moderated by situation factors, however. People are more influenced in their behavior by group members who do not cooperate (“bad apples”) than by group members who do cooperate (Kerr et al. 2009). The temptation to follow the example of the “bad apples” is countered by the threat of exclusion from the group. This effect is greater in small groups than in large groups and is lessened when the majority of other group members are not cooperating (Kerr et al. 2009).

The importance of group membership is not simply a question of cooperation producing public goods for the group. Identification with, and comparison to, others also moderates cooperative behavior. Information about “similar others” produces the same kind of behavior (cooperative) in subjects as is reported for the “similar others.” Information about “dissimilar others” does not influence behavior of subjects (Parks et al. 2001). Similarly, an example individual who succeeds is identified with the subject's in-group (Stelzl et al. 2008). An example individual who fails or brings dishonor is distanced from the in-group and recast as belonging to an out-group. This supports the idea that people employ the strategies of “BIRGing” (Basking in Reflected Glory) and “CORFing” (Cutting Off Reflected Failure) to maintain a positive self-concept by including and excluding others based on a variety of social identities (Stelzl et al. 2008). Other studies (Bouas & Komorita 1996) have found that identifying with a group is not enough to produce
cooperative behavior by itself, but a desire for consensus and cooperation must also be present. Another moderating factor is concern with certainty (Sorrentino et al. 2007). When assimilation is viewed as a need, certainty-oriented people view themselves as similar in value orientation to a relevant comparison group and they consider this similarity important. The same is not true when a need for differentiation is aroused suggesting that BIRGing may have primacy over CORFing. These processes are probably even more salient in future considerations given that emotional events are remembered longer and have more influence on judgment when they are congruent with the subject's values (Oishi et al. 2007).

Verplanken and Holland (2002) made the connection between the self-concept, situational factors, and the role of values in judgment and behavior in six related studies of values-centrality and values priming. When primed with values that are consistent with their value priorities, subjects are more likely to engage in value-congruent behaviors. This was not true when the primed values were not central to the subject's self-concept or when task-relevant values that are central to self-concept were not primed. In the words of Verplanken and Holland, this research "...demonstrates the innate nature of how value systems might function, which thus can be considered as a symbolic self-defining property of human beings" (2002, 445).

Others factors have also been found to moderate the relationship between values, emotions, judgment, and behavior. In a study similar to Maio's work with the values-as-truisms hypothesis, Torelli and Kaikati (2009) found that inducing an abstract as opposed to a concrete mindset produces judgments and behaviors consistent with a variety of value types from SVT. The same is true of behavioral intentions for scenarios in the near or distant future with values predicting
intentions for behaviors in the distant future (more abstract), but not in the near future (more concrete) (Eyal et al. 2009). Hunt (et al. 2010) brought several of these ideas together in one study and found that indeed, values predict attitudes toward a proposed tuition increase when the effects of the proposal will only be experienced in the distant future. When short-term financial self-interest is affected, self-interest and not values predicts attitudes. Lending additional support for the differential activation of values depending on a value-specific congruence or conflict with the characteristics of the situation, Hunt found that anti-egalitarian values predicted attitudes toward a tuition increase in the distant future.

Does the central role played by values in identity, evaluations, and group memberships also affect moral reasoning? It would appear so. Lan (et al. 2010) found a positive association between the post-conventional level of moral reasoning and the value Universalism.

**Theories of Morality**

Much research has been conducted on moral reasoning, moral motivations, perceptions of morality, behavior, values, and identity since Kohlberg published his typology of moral development (Blatt & Kohlberg 1975, Kohlberg 1984). Although Gilligan (1982) proposed gender differences in moral reasoning as the result of different motivational priorities, support for this hypothesis has not been strong and the influence of other factors appears to be more important than gender (Carlo et al. 1996, Jaffee & Hyde 2000, Maeda et al. 2009). If differences in moral reasoning are due to motivational differences, then values are a logical place to look for differences that correlate with or predict moral reasoning.
An important step for this theoretical position is the work of James Weber (1993) who synthesized Rokeach's theory and definition of value orientations with Kohlberg's stage theory of moral development. In a related mode of thought, Hotte (1993) studied the relationship of values and attitudes to moral reasoning and found some support for a moderating effect of morality on the relationship between values and attitudes. Others have also found a relationship between values and moral reasoning, specifically, that altruistic values contribute to and self-enhancement values detract from ethical decision-making (Fritzsche & Oz 2007). Studies showing a relationship between worldviews and moral reasoning also suggest that there is a connection between moral reasoning and value orientations (Jensen 1997, Beyerlein & Vaisey 2007).

Morality and values also share the features of differential activation for temporal and social distance (Skitka et al. 2005, Eyal et al. 2008) and the strengthening of self-concept (Hitlin 2007).

Janoff-Bulman (et al. 2008) proposed a model of moral motivations that overlaps with the two primary dimensions of the Schwartz model of values. Janoff-Bulman combined the approach-avoidance distinction for motivation with the cognitive focus on self or other yielding a typology of four moral motives: Self-Restraint (avoidance-self), Social Order (avoidance-other), Self-Reliance (approach-self), and Social Justice (approach-other). These motives would be similar to the SVT dimensions of Conservation, Self-Enhancement, and Self-Transcendence, but not Openness-to-change. In terms of content, Social Order would seem to be the same as Conservation (Tradition, Conformity) and not Openness-to-change (Hedonism, Stimulation) where it would belong if it is oppositional to Social Justice. I suspect this is because the dimensions in the motivation-focus model are not orthogonal. Janoff-Bulman (et al. 2009) also proposed that morality is composed of two different motivational processes based on the
distinction between prescriptive moral and proscriptive moral beliefs. Prescriptive morality encourages actions that produce positive outcomes and is, therefore, activation-based. Proscriptive morality discourages actions that produce negative outcomes and is, therefore, inhibition-based. Understanding moral motivation is additionally complicated by the dual system of automatic and controlled information processing humans have inherited as a result of evolution (Krebs 2008).

Stephen Vaisey (2008, 2009) proposed a sociological model of morality that includes both motivational and justificatory aspects of morality. Vaisey found support for his model in the relationship of moral reasoning by adolescents and changes in their behavior and network composition over time. Vaisey argued that his findings were consistent with unspoken or unexamined cultural beliefs influencing social and personal outcomes. Choices are influenced by moral beliefs, even if those beliefs cannot be articulated in relation to the choice.

Other researchers have also established a connection between perceiving an action as moral or immoral, values, and behavior (Liebrand et al. 1986, Joireman et al. 2003, Lönnqvist et al. 2009). Bauman and Skitka (2009) found that perceiving a situation as moral predicts changes in cognition, affect, and behavior. Indeed, the perception of a moral dimension to things in the world outside the individual extends to the otherwise mundane inanimate objects humans come across in everyday life (Jarudi et al. 2008).

In my opinion the most important continuous research program to synthesize all of the existing data and theory about morality into a coherent whole for the purposes of social theory-building

54
has been done by the social psychologist Jonathan Haidt and his colleagues. Haidt builds his
theory on the foundational role of emotions in morality (Haidt et al. 1993, Rozin et al. 1999,
Haidt & Hersh 2001), especially disgust: an emotion that defines and defends the boundary
has also studied the influence and interaction of social roles and types of actions on moral
judgments (Haidt & Baron 1996) and proposed a social-functional model of emotion (Keltner &
Haidt 1999). This culminated in the formulation of the social intuitionist model of morality
cultural factors in moral judgments over rational deliberation internal to the individual. Recent
findings in psychology and cognitive neuroscience have also been incorporated into the model
(Greene & Haidt 2002). Haidt has applied this model to understanding the existence of some
apparent human universals in the concerns of morality (reciprocity, loyalty, respect for authority,
limits on physical harm, dietary practices and sexuality) across social groups with extremely
CHAPTER THREE: THEORETICAL ARGUMENTS AND HYPOTHESES
REHABILITATING HUMAN VALUES AS A SOCIOLOGICAL CONCEPT

Chapter Overview

The concept of human values has been repeatedly identified as important to understanding, influencing, and predicting human behavior. Most theories of human values are psychological, locating values as internal to the individual. I argue that psychological conceptualizations of human values underemphasize the sociological dimensions of human values. A widely accepted sociological definition of values is revised to improve the operationalization and applicability of the concept of values for social theory building. Several hypotheses generated from this revised definition are developed.

Establishing the Phenomenon

"In the abstract, it need hardly be said that before one proceeds to explain or to interpret a phenomenon, it is advisable to establish that the phenomenon actually exists, that it is enough of a regularity to require and to allow explanation. Yet, sometimes in science as often in everyday life explanations are provided of matters that are not and never were" (Merton 1987).

"Human values" has a long tradition as a concept in philosophy and the social sciences (Joas 2001). The nature of this concept has been hard to define, however. Theorists have offered many definitions for values, but the range of phenomena related to values requires those definitions to be relatively vague. Contributing to difficulties with understanding values is the societal and cultural nature of values. "Society" and "Culture" are ephemeral concepts themselves. If values are connected to societies and cultures in an important way, then conceptualizations of what
values are will suffer from the same vagueness. These difficulties are so great, the respected sociologist Michael Hechter entertained the idea of jettisoning the word from sociology entirely (Hechter 1992). In that article Hechter ultimately concludes that the concept is worthy of retention in the toolbox of sociological theory building, but that it was in need of serious rehabilitation (Hechter 1992, 227). Similarly, Hitlin and Piliavin argued that values could be an important and powerful concept in social theory building, but the concept requires more attention and thoughtfully conceived research programs before it will make major contributions to our understanding of social processes and phenomena (Hitlin & Piliavin 2004, 384).

These issues with the concept of values stem from the human tendency to assume the existence of something we can imagine without ever having observed the thing itself. Robert K. Merton brings the reader's attention to this error in the passage cited above. In that article Merton suggests sociologists need to remember to stop and simply observe from time to time (1987, 2) because "...it is advisable to establish that the phenomenon actually exists, that it is enough of a regularity to require and to allow explanation." In the case of human values this is sage advice. Values may be a "social ether"- obvious, necessary, and ubiquitous- until they are investigated with empirical instruments and scientific methodology.

**Specified Ignorance**

The usefulness of values as a social theoretical concept has also suffered from the fact that people seem to just "know" what values are, what they do, and how they work. The sociological study of values would benefit from a more agnostic awareness of the limits of what values are and how they work. Merton defines "specified ignorance" as:"...the express recognition of what
is not yet known but needs to be known in order to lay the foundation for still more knowledge" (Merton 1971, 191). In the previous chapter, areas where something appears to have been learned about values were interrogated to develop the type of specified ignorance Merton describes. This awareness of what is not known about values will lead to the hypotheses generated in this chapter.

**Strategic Research Materials**

As discussed in the previous chapter, the study of values has utilized historical events, cultural artifacts, and experimental data. The first two categories of information are examples of what Merton calls "Strategic Research Material" or SRM. Merton defines SRM as "...the empirical material that exhibits the phenomena to be explained or interpreted to such advantage and in such accessible form that it enables the fruitful investigation of previously stubborn problems and the discovery of new problems for further inquiry..." (Merton 1987, 10-11). SRM can be temporal (Strategic Research Events) or physical (Strategic Research Sites) (Merton 1987, 11).

And indeed, if one is looking for material for the study of values, SRM abounds. Every political election is SRM for the study of the values of a society. One of the beneficial qualities of SRM is that the material itself may not seem to be of much consequence, but what can be learned from it, particularly when connected to other materials and ideas, is important. Merton extols the virtues of SRM by stating, "...it has long been recognized in a variety of disciplines that there is no necessary relation between the socially ascribed importance of the empirical materials under study and their importance for the better understanding of how nature or society works" (Merton 1987, 18).
In this passage Merton is discussing how the seemingly trivial can, in fact, be important. The converse is also true, however. In the case of values, something which seems important because people attach great social significance to it, may not, in fact, contribute anything to our understanding of how society works. If values are as fundamental, ever-present, and influential as they appear, then we should be aware that historical events and cultural shifts are likely to be both a cause and an effect of the changing values of the people possessing them. The election of Ronald Reagan in 1980 introduced a reappearance of conservative thoughts and actions by Americans which had been in decline during the preceding 30 years. This historical event might be an important indicator of how values in the United States were changing, but without a measurement of the values orientations of Americans before and after that event, drawing conclusions about values from an event that "appears" to be about values is dangerous. Just because Reagan called for a return to "family values" does not mean that his election was primarily an endorsement of this sentiment by Americans. With energy costs sky-rocketing, the economy lagging, and 53 Americans still held hostage in Iran more than a year after their capture, there were many motives a voter might have had for rejecting the re-election of Carter other than sharing a values orientation with Reagan.

Why do people need values and how do people use them?

"Values" exist in the human lexicons of both language and behavior because they "do something" for people. Values serve a function. This statement could lead down the path to an empty functionalism, but this trap can be avoided.
We believe that values exist, not simply because they have an explanatory role in social scientific theories, but because people talk about values. Although it would be unusual to hear words like "anomie" or "status hierarchy" in a political debate, it is not unusual to hear the word "values" in such a context. The ways people talk about values suggest that values are deeply-held, durable, and important. One could explore values employing a research program which focuses exclusively on the analysis of language about values. An example of this type of methodology was employed by James Spates in his content analysis of alternative and popular press periodicals to assess the acceptance of counterculture values into the American mainstream culture during the 1960s and 1970s (Spates 1971, 1976).

The connection between values and language is two-fold. We use language about values to justify our actions, attitudes, beliefs, and decisions to others and we use language about values to influence the actions, attitudes, beliefs, and decisions of others. These justifications can invoke ideas of utility, morality, or both. The utility aspect of values comes from our need to produce some desired result. Publicly and internally consistent presentation and conception of self is motivation for providing justifications for actions. Also, to produce desirable results in the actions of others produces utility for the individual. The morality aspect of values comes from the implications of those actions and presentations. Ultimately, values language is a collection of words representing concepts that are responses to the question "why?" If the answer to that question is "Because it is the right thing to do" or "To act otherwise would be wrong," then we need reasons why this is so. Psychological research on values has focused on what internal mental constructs the subject turns to when pressed further about why something is right or wrong or most preferable. The psychological assumption is that values exist as internal referents.
As neurology, biology, and evolutionary psychology have gained greater influence in psychology, there is a growing body of literature that considers values language as an expression of internal processes. Both of these conceptions of values and their functions are concerned with what values "do" for the individual.

**Why does sociology need a conception of values?**

From a sociological perspective, although values may "do" something for the individual, they also do something for groups of people, ranging from small groups of intimates to societies. My need to justify myself may reduce my cognitive dissonance or fulfill my psychological need for a consistent self-concept. In addition, by justifying my decisions and actions I also defend my membership and status in my social groups. I could fulfill this need simply by claiming my membership and status due to birth, prior achievement, or just because I am already a member with a relatively high status in the group. Human groups display a substantial amount of flexibility when it comes to these things, however. The renegotiation of membership and status requires a set of criteria for evaluation that are more than classificatory. We need reasons for why memberships and statuses should be reconsidered, reconceived, and reorganized. Language about values is how we communicate these reasons. A utilitarian would suggest that in these communications the goal is to find the greatest utility for the group. But assumptions of utility cannot be made given how people use values language. Sometimes the "right" thing to do is not expressed as being "the most utility producing" thing to do. An action or decision is "right" because it is in alignment with a more abstract concept such as "freedom" or "tradition" or "the Sacred." That alignment might indeed produce utility for the group and/or the individual, but this is not the reason or justification a person would give in response to the question "why?" By
expressing our reasons in support of or explaining actions, attitudes, beliefs, and decisions we are fulfilling a social function as well as a psychological one.

Where sociology has not engaged in an extensive analysis of values language, moral philosophy has. Robert Merton famously suggested sociologists look for "strategic research materials" (Merton 1987), collections of information that can produce data for sociological analysis that were not originally considered as being sociological. Having defined values language as being sociological in nature, I will claim the work of moral philosophers as providing us with a starting place, data that has already been analyzed if you will, for investigating values language sociologically.

Moral philosophers fall into two main camps: rationalists and emotivists (Haidt 2001, 815-816). The rationalists view morality as the product of moral reasoning. People think their way to moral conclusions. Immanuel Kant is the best known advocate of this position (Haidt 2001, 816). The emotivists view morality as the product of an intuitive process similar to aesthetics. People have reactions to things. They "feel" or "sense" that something is "right" or "wrong." David Hume is the standard-bearer for this position (Haidt 2001, 816). The debate between the two camps for priority of their view revolves around the ultimate nature of humans and human minds. Rationalists start from the assumption that humans are essentially and primarily "rational animals" and point to reasoning as the thing that separates humans from other animals and employ descriptions of how moral reasoning arrives at moral conclusions. Emotivists explain the descriptions of moral reasoning as post hoc justifications of moral emotional reactions.
A relatively new approach to this quandary is the social intuitionist model (Haidt 2001). Social intuitionists conceive of morality as the product of a dual process: part active (rational) and part automatic (emotional) (Haidt 2001, 820). They support their position by drawing on the entire corpus of psychological, neurological, biological, philosophical, and primatological research on morality. By doing so, they are able to address the unchallenged assumptions and unsolved problems of both rationalist and emotivist theories of morality with scientifically-defensible data and methods. Sociology should avail itself of the same breadth of data. Whereas the social intuitionists use these data in an attempt to resolve the debate between rationalist and emotivist positions in moral philosophy and competing schools of thought in psychology, I suggest that sociologists use this same data for social theory building.

Evolutionary psychology examines human behavior from the point of view that behaviors have some basis in biology and, therefore, patterns of behavior must be the result of selection pressures (Horne 2004, 478). What has stymied evolutionary explanations of human behavior is the tremendous variation of behavior between individuals given the same stimulus and the effect culture has on those behaviors (Tooby & Cosmides 1992, 112). Natural selection would suggest human behavior should be very consistent between individuals, even between cultures, especially if we consider that humans as a species have less genetic diversity than our nearest primate cousins (Long & Kittles 2003, Deka et al. 1995) who do not display the same range of cultural variation. As different disciplines converge on the same object of study, social intuitionists draw on all of the available information and theory to understand morality. The picture which is emerging suggests that morality is both intrinsic and enculturated. This is the point where sociology stands to make its contribution. Sociology is where the link between the
individual and society is made. We can use the same data and theoretical inclusiveness as social intuitionists to address some of the great unanswered questions and unchallenged assumptions of the sociology of values.

This section began with the assertion that language can provide important information about values. Sociological analytical processes and mechanisms also have a need to focus on behaviors, however, which aggregate or interact to produce societal level macro-phenomena. Social structures may be describable, but where the "conceptual rubber meets the sociological road" is the point at which social structures affect behavior. Values is a concept that bridges this gap. This is possible because values exist at both the individual and societal levels. The dual nature of values as determinants of individual behavior and patterns of cultural and societal organization make the connection between micro and macro possible. The dual routes of active and automatic psychological processing allow for the flexibility societies and individuals need to adapt to changing contexts while providing the stability and consistency societies and individuals need to produce social order and stable expectations about the social world.

What is the difference between values and norms and why do values matter?

After the time of Talcott Parsons, the trend in sociology has been to study norms as opposed to values, and with good reason. If we believe that actions and not thinking about actions is the arena where the mechanisms which produce social structures are to be found, then norm enforcement is where we should turn for data. Norms are distinguished from other types of social concepts because they are by definition enforced through punishments and rewards. Norms are identifiable because there are behaviors associated with them. Values are by definition abstract
and internal, two qualities which make them difficult to study empirically and equally difficult to apply theoretically. So why bother with values? Perhaps the social sciences should simply focus on norms and forget about values altogether. I believe this would be a mistake because, in my opinion, values are a likely source of the content of norms.

The greatest weakness plaguing values from a sociological perspective is a lack of empirical identification. Norms are preferred to values as objects of study because they are observable. The lack of observability of values is due to the internal nature of values at the individual level, the ephemeral quality of values at the societal level, and the shifting nature of values expressed verbally depending on context. The work of Shalom Schwartz (Schwartz & Bilsky 1990, Schwartz 1992, Schwartz 1996) in psychology and Paul Stern (Stern et al. 1995, Stern et al. 1998) in sociology have come a long way toward capturing values at the individual level despite their existence in the private realm of thoughts. We have instruments and methodologies now that did not exist even twenty years ago for making values observable in a meaningful way at the individual level. At the societal level Schwartz (Schwartz & Sagiv 1995), Inglehart (Inglehart et al. 1998), and others have found support for meaningful similarities and differences between societies in terms of values. Grand interpretations of entire cultures and societies are not necessary to talk about values at the macro level, however. Aggregate patterns of individual level attitudes and behaviors can provide for the same level of analysis, but in a more empirical and less idiosyncratic way.

Norms are also preferable to values as objects of study because the normative environment can be manipulated experimentally. This is an especially attractive aspect of norms for sociological
study because one particular norm can be identified and activated while eliminating the influence of spurious variables and lending some certainty to the experimenter that they are examining one thing and not many. Experimental manipulations of the normative environment can also isolate the mechanisms that affect norm enforcement behaviors, exposing the link between micro and macro phenomena. Norm enforcement is also quantifiable, making the data collected available for statistical analysis. These are all good reasons for choosing norms over values as objects of sociological study. Observing norm enforcement under experimental manipulation can tell us about norms as mechanisms, but capturing and explaining the content and emergence of norms is more difficult in the experimental setting. The subject has to know the norm and have a sense of the norm's importance to others to make a decision whether to enforce the norm and how strong the enforcement should be. When a norm is emerging, the subject has to learn what the norm is as it develops. In the experimental setting the time frame available to influence and observe subjects is much shorter than the time it takes for a norm to emerge in a social group.

Values may explain the emergence and content of norms

Research on norms needs to focus on norms and exclude other factors that could produce spurious results. To achieve this, the experimenter must limit the information given to experimental subjects and constrain their responses to this information in ways that are quantifiable. This has yielded progress toward understanding the conditions under which norms are enforced and to what degree (Horne 2001a, 2001b, 2003a, 2003b, 2007; Horne & Cutlip 2002).
These findings lead to new research questions. People will punish a simulated thief in an experimental setting and will increase their punishments when they see others do the same and/or they are rewarded for doing so (Horne & Cutlip 2002). But why does a thief deserve to be punished in the first place? It may be that violating a norm is understood by the subject as part of a punishment/reward schedule. If the subject punishes violators and rewards enforcers for this reason, then the phenomenon can be explained in terms of norms and utility—both individual and group—without recourse to other concepts or explanations. But a person may feel a thief deserves punishment simply because the thief is "bad" or has done something "wrong." If this is so, the norm of punishing a thief is connected to values. The norm enforcement behavior observed is rooted in something more than the rewards and punishments given in the experimental setting. The content of the thief-punishing norm is rooted in the values of "fairness" and "justice." This may not be the case, but it is a reasonable alternate explanation that deserves study.

Supporting both the social intuitionist model and the assertion that norms have a basis in values are the results of experiments and surveys conducted by Ernest Fehr and Simon Gächter regarding the altruistic punishment of defection in public goods games (Fehr & Gächter 2002). To understand why subjects would engage in costly punishment of defectors, even in one-shot interactions with no opportunity for reward from other players for punishing the defector, they conducted a survey asking both the participants in their study and a sample of people who had not been participants how much anger they would feel toward a player who was a free-rider on the costly punishment meted out by others in the public goods game they had just participated in if they met the free-rider and how much anger they would expect others to feel towards them if they had been the free-rider (Fehr & Gächter 2002, 139). They found both participants and non-
participants thought they would feel angry toward a free-rider. This suggests that there are deep, psychological reasons other than utility that motivate people to engage in cooperative behavior.

What Fehr and Gächter did not ask, which would be useful for establishing a link between those negative emotions and values, is "why would you feel angry toward the free-rider?" New norms may emerge when the behavior of others increases or decreases utility for either individuals or groups. Exchange interests can explain the emergence of norms in some contexts (Horne 2003b). There are other situations when utility does not seem to apply. The study of negative or destructive norms engages this problem. Again, in order to learn about norms as a sociological concept, norms must be the focus and other factors must be excluded. Using this methodology it is possible to arrive at explanations of why people will either enforce or conform to norms which appear to violate basic assumptions of individual or group utility. There must be a higher order utility that is being provided. Perhaps the punishment of violating the norm is so great that it is better to bear costs through norm compliant action than to risk higher costs from punishment. Perhaps the utility of increased group cohesion is greater than the sum of individual costs suffered by observing the norm. It is also possible that negative norms are the observable behavior which results from a particular values orientation which prioritizes the group over the self, the self-transcendent over the self-enhancing, or tradition over innovation. Again, this may not be the case, but the connection between values and the foundations of norm emergence and content is worthy of study.
Norms may provide data about values and demonstrate how values are translated into actions

If there is a meaningful connection between values and norms and they are separate, distinct constructs, then norms could be a strategic research material for the study of values. This assumes that values are not subsumed by norms, which is possible. As Merton warned us earlier, when we talk about values we may be talking about something that does not exist in a meaningful way.

If values do exist in a way that their analysis can contribute to social theory building, then norms may provide data about them. In the case of sanctioning costs, it has been demonstrated that both the likelihood of punishing norm violators and the degree of the sanction vary with the cost of sanctioning to the punisher. By excluding spurious variables and limiting the information and behaviors available to subjects, experimental studies of sanctioning cost on norms enforcement may be focusing the subjects so intently on the normative aspect of the situation that other factors, such as values, which would come into play in everyday interactions, are silenced. This is a necessary part of studying norms experimentally and contributes to social theory building, but this does not in and of itself exclude the existence or influence of values on human behavior.

The number and types of norms people must take into account in their everyday interactions would suggest that there would be another construct or mechanism which prioritizes which norms to conform to, which to violate, when to conform, when to violate, and when to enforce norms in others. Values would be such a set of criteria. Because the enforcement of norms is observable, an analysis of the types of norms an individual will enforce and under what
conditions would tell us something about the underlying construct which prioritizes norms when they are faced with many norms and have a freer range of possible actions than in a controlled experimental setting.

**Values Encompass Both Utility and Morality as Motivations for Behavior**

At this point in time, one of the most widely accepted definition of "values" in the sociological literature is the one offered by Michael Hechter in his 1992 article from *Sociological Theory* entitled "Should Values be Written out of the Social Scientist's Lexicon?" Many other definitions have been offered over the years (see Kluckhohn 1951, Spates 1983, Hitlin & Piliavin 2004 for discussions of the different definitions of values offered in sociology and anthropology), but these definitions have tended to be too "fuzzy" to allow for successful operationalization of values as a useful sociological concept. Hechter addresses this issue in his article and makes several very useful suggestions for how to define and study values in a way that will be productive for sociological theory building [I will discuss this article in detail in the Literature Review]. Hechter defines values as "...relatively general and durable internal criteria for evaluation." (Hechter 1992, 215).

In my examination of the literature on values, the confusion and lack of specificity in definitions of values come from two sources. First, the idea of values is linked to the concept of "value" in an economic or rational sense. Values are defined in relation to the concept of utility. Second, when people use the word "values" in everyday parlance they often use the word in relation to ethical or moral concerns. Values can be defined in terms of the concept of morality. These two conceptual areas are linked, but the nature and usefulness of the two concepts are different. Both
approaches to defining and understanding values recognize values as a source of motivation. The two approaches diverge in their assumptions about the source and nature of that motivation.

The conflict between these two views of values can be reconciled to a degree by modifying Hechter's definition of values as follows:

"Values are general and durable internal criteria for evaluation which are affected by context, where the object of consideration suggests that ethics or morality apply to the process of evaluation."

The collection of beliefs that are commonly recognized as "values" encompasses both utility and morality as sources of motivation. In the history of sociological theory, theorists have tended to focus on either utility or morality as the primary motivation for decisions, attitudes, and actions which have a values component.

Definitions of values based on utility focus on phenomena internal to actors which yield evaluative judgments of what is "better" or "worse." The internal process of evaluating alternatives is a process of valuation, and hence, is a process of assessing the "value" of a thing. These definitions are grounded in the economic and rational choice conceptions of personal preferences and desired goods and outcomes. "Better" or "worse" label what is more or less desirable for either the individual or a group to which the individual belongs.

Definitions of values based on utility employ the concept of values as a way of explaining the unobserved processes that yield preferences. Preferences are observable, but the process or processes that produce them are not. Values are, therefore, a "black box" which the social scientist can avoid opening by focusing on the stimulus-response patterns of actors or
experimental subjects. This approach to values is very much in keeping with a behaviorist perspective on human behavior. We do not need to understand what is in the box or how it works to include variation in preferences between individuals in social theory building. If we can find patterns to preferences at the individual level we can make predictions about how that actor will behave in the future given the same set of choices in the same context. We also can make predictions about the choices groups or types of people will make based on the patterns of group level preferences. Proponents of utility as the primary motivation behind values make the connection to ethical or moral questions by adopting a utilitarian view of morality and ethics that, again, is in keeping with the assumptions and beliefs of behaviorism.

Definitions of values based on morality or ethics focus on phenomena internal to actors that yield evaluative judgments of what is "right" or "wrong." These definitions depend on a conception of "the Good," usually in an Aristotelean sense rather than in a Platonic sense. Values are the interpretation and relationship of outcomes or objects to what is "best" or "most desirable." Unlike conceptualizations of values as an expression of utility, conceptualizations of values based on morality place values outside of the individual, usually conceived in a transcendental or spiritual way. From this perspective one can understand how patterns emerge at the group level due to the shared nature of moral conceptions that result from shared processes and contexts of socialization. Variations in behavior between individuals of the same group or type are harder to explain. Even if all members of a particular social group experience a common socialization experience as part of becoming group members, there is still variation in socialization

---

2By this I mean that Aristotelean understandings of "the Good" look to what can be observed in the world of the senses and what is good is found in the attitudes and behaviors of people (which are observable), whereas Platonic conceptions of "the Good" place the ultimate nature of what is good in a transcendental realm beyond direct human experience.
experiences due to things like sex, age, or individual differences in perceptions, interpretations, and experiences due to other factors. If the variation within groups is great enough, then the explanatory power of values as a sociological concept diminishes.

To operationalize the concept of values, theorists who prioritize the concept of utility over morality depend on quantitative descriptions of human choice behavior; theorists who prioritize morality over utility depend on qualitative analyses of the reports actors give explaining the reasons for their choices. Both of these operationalizations are lacking for purposes of social theory building. Although empirical quantitative data collection and statistical analysis are the foundation of scientific inquiry, without understanding the processes which produce those data one is left without a description of the mechanisms which link the stimulus and the response. Parsons' and Shils' 1951 volume *Toward a General Theory of Action* is an attempt to describe the mechanisms that are in the black box of values. Although this is an important and influential work, there is not a clear distinction made between utility and morality in relation to values.

These two perspectives have different underlying assumptions and require very different methodologies of investigation to be integrated into a unified theoretical conception. This lack of conceptual clarity stems from the tendency of theorists to redefine the concepts they need to discuss values in ways that remove the power or original meaning of the concept. This is problematic because values are collected and prioritized as values orientations. There is no single dimension to values. Behaviors motivated by values are various. Conceptualizations of values that prioritize either utility or morality over the other concept can only address behaviors from a single type of motivation. To explain behaviors that are described in terms of the other concept,
the descriptor needs to be redefined in terms of the preferred concept. For example, theories that prioritize utility as a source of motivation have difficulty explaining why people act altruistically.

This problem is "solved" by defining acts that appear to be altruistic as motivated by self-interest. An act may appear to be altruistic because it prioritizes the needs of others over the needs or desires of the self. Theorists relying on utility as the foundation of values believe that the altruistic actor is receiving an internal reward in the form of increased self-esteem, an external reward in the form of increased social standing or status, or the actor is avoiding a punishment in the form of internal self-criticism or external social approbation. The maintenance of an identity, a self-concept, or a self-schema is also a possible selfish motivation for acting in a way that does not appear to be "rational" in a utility sense. But defining altruistic acts in this fashion robs altruism of its meaning. Altruism is by definition acting to promote the welfare and well-being of others over the self. To redefine altruism in strictly rational terms reduces altruism to an empty descriptor for a class of actions and essentially denies the existence of altruism. This redefinition only works if actors are realizing these rewards and avoiding these punishments. But what if an actor behaves altruistically when they really don't want to? It is hard to imagine, especially from a behaviorist perspective, that people who go to the extreme of endangering or losing their lives receive an internal reward for doing so. If the motivation is due to external rewards and punishments, then utility conceptualizations of values fail because the actor may not live to enjoy these outcomes. Surely, the preservation of one's own life is the highest utility imaginable, unless the actor expects their rewards in Heaven, in which case we are entering the arena of morality.
Conceptualizations of values based on morality struggle with explaining why people act selfishly. If people are socialized to have the same values and those values are in relation to an external shared conception of "the Good," then one would expect people to act altruistically or at least in a pro-social way. When people act selfishly they are either ignoring or acting against their moral education. This issue can be avoided by including a responsibility to oneself as a moral duty. With this conceptualization of values actors are faced with conflicting moral injunctions related to the enhancement of others versus the enhancement of self. If this trade-off is resolved in favor of the self, it is hard to see how this is not a decision based on utility or rationality. This robs "morality" of its meaning when an individual chooses self-enhancement over their responsibilities to others. This also leaves unexplained how people who were socialized in the same way would vary in their values and values-based decision-making. While one solution is to recognize that people do not always do the "moral" thing when faced with conflicts between the needs of the self and the needs of others, it is still incumbent upon the theory to describe the mechanisms that lead to those variations. Context, mood, and degree of moral development following either Kohlberg (1984) or Piaget (1965) are all possible mechanisms. Again, because these processes are internal to the actor we can only rely upon qualitative reports from subjects about how and why they make the decisions they do. This methodological approach is fraught with problems. People may not be conscious of the processes that went into their decision. Or people may choose to report what they perceive to be the most socially appropriate reasons (social desirability). Reports of internal states are unreliable and because internal states cannot be observed by the researcher, research about values based on morality as the primary motivation for behaviors explained in terms of values are ontologically weak.
The Venn diagram presented earlier provides a visual representation of the problem. There are areas of overlap and areas of exclusion in the Venn diagram of utility and morality as motivations for behaviors or decisions with a values component. To understand what values are and what role they play in human social behavior a comprehensive program of research is required. To be completely successful this research program requires an agenda with two parallel sub-programs, neither of which I have come across in the sociological literature on values. One area of research that needs to be explored is how people use the word "values" when justifying their decision-making. The primary question for this research would be: "How do modern, everyday people, and not social theorists, define values?" This is a qualitative research program requiring interviews with people from across the spectrum of social categories that would also need to be conducted cross-nationally. For values to be a useful concept in sociological theory it has to be defined in a way that is universal across social groups. The content, prioritization, and outcomes of values and value processes may vary, but the fundamental nature of values and value processes must be universal to be theoretically useful.

Everyone is a naive sociologist, psychologist, and physicist, whether they recognize it or not. People need some naive theory of how the world works in a social, psychological, and physical way to survive and operate in their daily lives. Without having information about the basic universal aspects of what I call "naive sociology" our formulations of sociological processes is not grounded in the social reality of everyday life. This is especially important for the study of values if values are motivations for social behaviors.
The second area of research to ground the concept of values in a theoretically useful way is quantitative. This program would study speech acts that are either meant to justify decisions or are meant to influence others in their decision-making and behaviors or decisions in response to such speech acts. The data for this research would come from the analysis of public speech acts, especially speech acts made by people who occupy key roles in society—roles of leadership and expertise which people look to for guidance when faced with choices which include a values dimension. The "culture wars" we have observed in the United States and other liberal democracies since the 1980s have been fought on a battleground defined by values and value priorities. Camps attract adherents and motivate them to collective action by employing language meant to persuade people they must join one camp and reject another because of perceived conflicts in values, value orientations, or value processes. Although I suggest focusing on speech acts as primary data, non-speech acts would also be important data for this project. These data could be analyzed for how often and to what degree do people's speech acts and actions correlate, if there are identifiable patterns for when they do and do not match, and if these patterns suggest what other mechanisms might connect thought, emotion, language, and action.

Obviously, such a research program is ambitious. The hypotheses tested in this dissertation are derived from the elaboration of Hechter's 1992 definition of values presented previously. The hypotheses are developed from each of the important components of the elaborated definition. The support or rejection of these hypotheses will provide the groundwork for the research programs described above.
"Values are relatively..."

Values are not specific or stable. While this variation presents a problem for positivistic social theory, this variability may also suggest that all of the forces and factors influencing choices and actions that contain a values dimension have not been adequately considered. Those factors and forces can be grouped under the concept of "context." The Oxford English Dictionary defines "context" as:

"• noun 1 the circumstances that form the setting for an event, statement, or idea. 2 the parts that immediately precede and follow a word or passage and clarify its meaning." (Oxford English Dictionary online. "Context." 2009).

The OED gives the origin of the word as "...originally denoting the construction of a text: from Latin contextus, from texere ‘to weave’." (Oxford English Dictionary online. "Context." 2009).

Behaviors, choices, and speech acts would all be affected by "context" by this definition and, indeed, all of these are affected by "circumstances." Essentially, the control and modification of variables in social psychological experiments is to see how behaviors will vary between contexts. The etymology of the word is also important. From a phenomenological perspective, consciousness weaves all the threads of sense-data and mental activity into a coherent cloth of experience. Hechter acknowledges the variation observed in values over time both at the micro and macro levels with the word "relatively" in his definition. To say that values are "contextual" captures the variability of values over time, but proposes a mechanism that explains this variation.

"...general and durable..."

Values differ from attitudes in that attitudes are directed toward some specific object, whereas values tend to more general and therefore applicable to a wider range of situations. There is
empirical evidence to support this as shown in the work of researchers following both Rokeach and Schwartz. Attitudes are very predictive of behavior when the attitudinal object is proximate to the behavior as in church attendance or likelihood to recycle. Value measures have never been very good at predicting whether someone will go to church this week or that they will throw this particular soda can in the recycle bin. Values might be useful, however, for predicting what a person's attitudes and beliefs will be toward the importance of religion or support for recycling programs in the abstract. Values are wider in their scope of consideration than attitudes or norms. Therefore, values are a useful theoretical concept in that they are a referent around which attitudes and norms are activated or organized depending on context. Hechter describes values as "relatively general." This qualification recognizes the multidimensional nature of values. Values are somewhat specific in that "equality" is a value that applies to some situations and not others. "Equality" is general enough, however, to be applied to a wide range of situations- just not every situation.

Similarly, Hechter uses the word "relatively" in his definition to underscore the fact that although values are more durable- i.e. more stable and longer-lasting- than attitudes, they must have the ability to change. There is obviously variation is values between groups, between individuals within groups, and across both groups and individuals over time. The values I have today at age 40 are probably different from the values I held at age eighteen. The change in values between the 18 year-old me and the 40 year-old me was slow, to the point of being imperceptible. Although, people sometimes describe "road to Damascus" conversions from one values orientation to another, this is probably not how changes in values orientations at either an individual or group level usually take place. I again return to the idea of context. My values have
changed as I have aged not only from processes of socialization and experience, but also from my change in social categorization from "adolescent" to "middle-aged." Similarly, one would expect changes in values orientations from changes to the individual's or group's societal context and social categories such as emigrating to a new country, experiencing a devastating war, living through a crushing economic downturn, etc. Becoming a parent is a useful example here. Although many people report dramatic changes to their worldview with the birth or adoption of a child, you will often see new parents attempting to hold onto their previous way of life in spite of the radical changes their new role of "parent" has brought to their life. The role of parenthood brings not only new tasks to a person's life, but also a new perspective. The tasks come immediately; the perspective comes slowly over time as the individual becomes accustomed to the new role.

Therefore, values are general, but applicable to specific objects or situations. Values are also durable, but capable of change over time. The forces and factors which determine the applicability of and changes in values are the contexts of the group or individual.

"...internal..."

"Internal" is an important part of the definition of values because it separates the concept from norms. Norms are external to the individual, but have many of the same properties as values. Although the expression of values and norms is contextual, the internal nature of values has to be retained because of how people talk about values in everyday life. People speak of "my values" (internal to the individual) or "our values" (internal to the group). These claims imply the same kind of ownership and exclusive access one has to one's own mental states, even at the group
level. You and I may be able to share concepts and ideas to the degree that we can communicate our thoughts and experiences, but we cannot have exactly the same thoughts and experiences.

The contents of my mind are mine, and cannot be possessed by another. This is the very core of what makes values such a slippery concept to define. This is also why some conceptualizations of values based on morality fail. Although the source of morality may be "out there" in a transcendent or spiritual sense, decisions about how to act morally are the result of an internal process. The problems of Evil and Free Will revolve around the fact that one may know what God has handed down from on high as "right" and "wrong," but one is free to act either way. Higher powers and spiritual insights might tell us what we "should do," but often times we don't do what we believe to be "right." Why not? Doesn't everyone seek to be a "good person?" Isn't this an essential aspect of constructing a stable and healthy conception of the self? Perhaps.

Although values might come from somewhere outside the individual and become part of the individual's personality through socialization or religious experience, in terms of how values affect behavior, the content and processes by which these values operate are internal to the individual or group. There is also mounting evidence from neurology that suggests the types of situations and decisions we often associate with having a values dimension activate very particular neurological processes and areas of the brain (Moll et al. 2002a,b).

"...criteria for evaluation..."

Values are criteria for evaluation. If I am making a comparison of what is "better" or "worse," "good" or "evil," "more preferable" or "less preferable," etc. then I am evaluating alternatives.
Values allow people to do that. This is also why values are an important concept to incorporate into social theory building. People act based on the evaluations they make of the information they have. Values are applied to the evaluation of objects, actions, and situations which suggest ethics and morality are part of the consideration. The application of ethics and morality to an evaluation separates values from norms, which by definition are known from observable punishments or rewards. Therefore, Hechter's definition of values requires the addition of this moral/ethical dimension.

"... where the object of consideration suggests that ethics or morality apply to the process of evaluation."

The moral/ethical dimension makes values a useful sociological concept and is also in keeping with the way people use the term in everyday life. Specifically, when people consider actions or outcomes which affect both the subject and other people, morality is part of the process of evaluation. Again, the Oxford English Dictionary is a suitable source for a definition of "morality" as it is used in common parlance:

"• noun (pl. moralities) 1 principles concerning the distinction between right and wrong or good and bad behaviour. 2 moral behaviour. 3 the extent to which an action is right or wrong. 4 a system of values and moral principles." (Oxford English Dictionary online. "Morality". 2009)

What makes values a sociologically useful concept is its connection to the continua of “good" or "bad,” and "right" or "wrong." These continua exist beyond simple preferences. I might prefer a raw carrot to a hot dog (at the moment, given the context), but I won't come to express that
preference as the result of a values process unless the choice between the carrot and the hot dog brings to my mind the cruelty of the commercial meat industry and the suffering it inflicts on the hogs which are the raw material for my frankfurter. If my decision between the two objects of consideration is affected by my appetite, cravings, available funds, or availability of the product, then I may not be making a choice with a values dimension in my definition. The process of this decision is interesting and the work of economists, psychologists, and physiologists can inform our theoretical understanding of how this choice was made. But if there is something "wrong" with eating meat, or "right" about eating fresh vegetables, then we need a theory of values and how they work to understand the choice. This distinction is especially important for sociology because, from a sociological perspective, "right" and "wrong" are socially defined qualities.

There is no *mala in se* from the sociological perspective, only *mala prohibita*. Sociology needs a conceptualization of values that favors the morality dimension of internal evaluations to provide us with the tools required to understand some of the most important social phenomena it studies. The subdisciplines of sociology of religion, sociology of the family, sociology of medicine, sociology of science and technology, environmental sociology, and deviance all study social phenomena which have a moral dimension because of the kinds of acts and the justification for those acts given by the actors studied in those specializations.

**How does context affect the values people draw upon in decision-making and attitude formation?**

I have proposed the following definition of values:
"Values are general and durable internal criteria for evaluation which are affected by context, where the object of consideration suggests that ethics or morality apply to the process of evaluation."

This definition differs from previous sociological definitions of values by suggesting that values are dependent on context and that values include a dimension of morality. In this section I will address the contextual aspect of values.

I drew upon the Oxford English Dictionary definition of "context" in my definition which focus on “circumstances." What are "circumstances" in a sociological sense? I propose that the circumstances which affect how people use values in decision-making and attitude formation are object-specific, personal, social, and environmental.

**Object of consideration provides context**

In many cases the object under consideration itself provides the context for evaluation. I gave the example of whether I should eat a raw carrot or a hot dog when I am hungry. If I identify this choice as containing a moral dimension, then values will come into play in my consideration of the alternatives. Neither the carrot nor the hot dog spring fully formed from the thigh of Zeus without antecedent. In the case of the hot dog, I am aware of the commercial meat industry which raises hogs, transports them to a meat-packing plant, and then proceeds to turn live animals into an array of packaged food products, one of which is the hot dog I am considering for consumption. In my case, I believe that the animals in this supply chain suffer at the hands of men at various points between birth and becoming my food. I also believe that the very existence of the commercial meat industry which causes this suffering is the result of the demand for
products like hot dogs. By its very nature, in my case, the object of consideration itself, suggests to me that this decision has a moral component.

**Context on a personal level**

Context takes many sociologically interesting forms at the level of the individual. First and foremost is the idea of social location. People are defined socially by the roles and statuses they have, are assigned, or attain. Some of these roles and statuses are the result of the social descriptions a society recognizes as important or meaningful. The most basic of these categories are race/ethnicity, class, and gender (for now I will use "gender" interchangeably with "sex" although sex and gender are not the same thing). To these we can add age, occupation, education, religious affiliation, sexual orientation, class, and nationality. Simply by being a middle class white male, I am placed in relation to other class positions, other races/ethnicities, and genders. My access to resources and what are generally considered appropriate behaviors for me are determined to an extent purely by my particular accident of birth. My access to resources and what is expected of me is also determined by the occupation I have chosen to pursue, my age, education, etc. Therefore, one can expect I will share some degree of values and values orientation with other people who share my social location because our access to resources and what is expected of us is similar.

There is good reason to believe this. If values are instilled in the individual via processes of socialization and if the content and/or processes of socialization vary by social location, then we would expect variations in values and values orientations between social groups defined by social location variables. For roles and statuses that are achieved such as education or
occupation, there is also a process of socialization surrounding these positions. One would expect that doctors would have some degree of shared values and values orientation due to the process of becoming a doctor and associating with other doctors who face similar challenges, make similar types of decisions, and receive similar access to resources (economic and social).

Obviously, the number and types of descriptors that determine ones relationships to others in a society is extensive and will vary between societies. This means that the context of one's social location is extremely complicated. Although the field of possible contexts may seem impenetrably complex, I believe that people will simplify this field of contexts when making value-based decisions in response to cues they receive from other environmental and communicative contexts. For some objects of consideration, my occupation may not appear to be as salient to the decision process as my race or gender, for instance. In some cases, the opposite will be true. One would expect that gender would be a salient characteristic for most people when considering whether abortion should be legal in the United States, for instance. For a doctor, their occupation may be more salient than their gender in their consideration of the issue. It also may not. That is an empirical question which could be studied. I believe studying the modulating effects of personal contexts on value decisions is extremely important and has been often overlooked by theorists because of the need to reduce the number of variables included in model building. What I am proposing in this dissertation is that personal contexts are simplified by individuals based on the cues they receive from external sources and internal perceptions of which social location variables are salient to any particular values decision.
Contexts determined by the "realm" of the object of consideration

I discussed above how the very object of consideration requiring a decision may suggest a values dimension to the evaluation. There is another context which also stems from the object of consideration itself, but is modulated by the type of effect the decision will have. Value decisions typically affect a particular area of human life. In my carrot versus hot dog example the physical and emotional well-being of the hogs that become 'dogs provided a context for my decision. The economic well-being of hog farmers could also have played a role. In the example of abortion, a person's values-based decision-making regarding legal access to abortion could be in the context of the economic well-being of women who do not have the means to support a child, the economic costs to society of unwanted children, the spiritual well-being of a mother who aborts a fetus, the physical well-being of the unborn child, and the physical well-being of a woman who chooses to have an abortion, but is forced into a dangerous medical situation because abortion is not legal. I call these types of "well-being" the "realms" of the object of consideration. These realms are economic well-being, physical well-being, emotional well-being, and spiritual well-being. All are important. Some decisions will fall into a realm or realms where other decisions do not. Again, this type of context will be modulated by the cues the individual receives from the outside and their internal perception of what is important. These modulations will likely vary between and within groups. This suggests that socialization produces strong similarities in values and value orientations within social groups, but that for many value orientations the prioritization of the spiritual or the physical or the emotional well-being of others may dominate value decisions of the same type of object of consideration. I believe the realms an individual or group sees as salient can be identified from both actions and attitudes. A good example of how we can operationalize this type of context is found in the details of the debate surrounding abortion. One
of the key tests I believe which identifies the realms a person sees as salient to the question of abortion is the life of the mother. There are those who take a position that abortion should not be legal even in cases where the life of the mother may be in jeopardy as a result of the pregnancy.

The same is true for the question of pregnancies resulting from rape or incest. The biblical injunction "Thou shalt not kill" takes precedence over all other aspects of the evaluation suggesting that the spiritual well-being of everyone involved in an abortion (including the society that allows it) is at stake. Those who support abortion as a form of birth control\(^3\) are obviously viewing the value decision primarily in the economic and emotional realms over the physical or spiritual realms (especially when one considers that even in the safest medical conditions there are still risks to the pregnant woman undergoing the procedure).

**Others affected by decision as context**

Another type of context that I assume affects values deliberations are the people who will be affected by the decision other than the individual making the deliberation. Because we know that social location in a broad sense affects not only how individuals see themselves, but also how others see them, one would expect that the social group or groups affected by the values decision will modulate the values employed in a decision with a values dimension. Societies view children differently than adults, women differently than men, and people in high status occupations differently than people in low status occupations, etc. When the people affected by a decision are wealthy, the individual may not see this as a cue which would trigger a values process as part of the decision process because the wealthy are perceived as being able to meet

\(^3\)This is a socially unpopular position, but I have reports from a former abortion clinic counselor that there are people who view abortion as another form of birth control.
their needs with little or no impact from changes in societal conditions. When the people affected by the decision are poor, this may act as a cue that there is a moral dimension to the decision if the individual believes that society as a whole has responsibilities to protect, support, assist, or at least do no harm to its less advantaged members. Children are the most obvious socially defined group that would act as such a cue. Children are a socially defined group because we have codified the ages at which people earn certain rights and responsibilities and lose certain protections. And in fact, a common debating tactic is to invoke what effect a decision will have on children as a way of gaining acceptance for a position.

Conflicting and cohering values as context

A murkier form of context, but one that I assume can be explored is the context of the values and values orientation internal to the individual themselves. This seems a bit circular, using values as a context that modulates the use of values, but this idea deserves consideration. In any values system there will be values which conflict and values that cohere with each other. If external cues modulate whether a decision is seen as a values one and if certain values are prioritized by cues from things like the realm of the object of consideration or the nature of others affected by the decision, then one would expect there to be predictable patterns in values decision in light of cues and triggers for people with similar values orientations. This type of context would explain why there is variation within individuals and within groups in values decisions if values cluster in supporting or conflicting ways and these relationships between values are identified before the question is posed. If we know that an individual values both freedom and responsibility, and the individual is given some cue which would suggest prioritizing responsibility over freedom, then we would expect the individual to weigh responsibility more heavily in their deliberation. Again,
I think children are a good example of such a trigger. Using the same individual who highly values both freedom and responsibility as an example, the cues "same-sex," "marriage," and "taxes" should activate both the value of freedom and responsibility without conflict. The cues "marijuana," "legalization," and "middle school" will likely produce a conflict between freedom and responsibility with responsibility being given priority. On the other hand, the cues "marijuana," "legalization," and "prison" will produce the opposite result with freedom being given priority. I suggest this idea as a way of explaining the apparent weakness of using values as predictive agents. Expecting values alone to predict behavior ignores other important factors influencing the behavior. Values can still be predictive if the internal as well as external contexts in which values are activated and employed are considered.

**Place as context**

A less murky type of context is the physical place where the decision will have an effect. Values decisions about what happens in my town will likely be different from decisions about what happens on a national level and those will likely be different from decision about what happens in other countries. This seems simplistic, and could be viewed as another form of social location identification, but I think place is different in a meaningful way. We may think of people cross-nationally as belonging to different social groups, but as the world becomes increasingly globalized, cultural differences may fade in importance for many decisions if the contextual cues prioritizing things like the nature of the object of consideration or the others affected by the decision become more universal. For instance, although there are important cultural differences between the United States and India, both are capitalist democracies. If the cues given for the values decision do not emphasize cultural variables and do emphasize or activate universal
variables like age, gender, or occupation, then the physical proximity and/or inclusion of others in the relation to the individual doing the considering become important. I may support the idea of nuclear power as a way of generating electricity without increasing carbon emissions, but I may not support having a nuclear power plant constructed in my town or state. Building nuclear power plants on the other side of the globe may be far more acceptable. Similarly, someone may support the legalization of marijuana because their values orientation emphasizes freedom, self-expression, and hedonism, but they may also support criminal penalties for selling marijuana within 1000 feet of a school. Communities have made exactly these types of values trade-off (group level values deliberations) regarding the siting of sex shops and liquor stores.

**Time as context**

Time as a type of context is similar to place as a context. Just as there is distance between people in space there is distance between people in time. The debate around global climate change and pollution provide useful examples. The effects of global climate change or pollution may be relatively minor in the time frame of a single lifetime, but effects may be much greater for future generations. Again, the cues given to an individual regarding the issue should affect their values decision process. One would expect that people who emphasize responsibility over hedonism will tend to take a proactive stance on pollution prevention and carbon emission regulation. If the individual holds both responsibility and hedonism as highly important values, then one would look to other cues to predict the outcome of their values decision process. For instance, if the individual is given cues emphasizing the severity of the long-term effects of global climate change, one would expect they would prioritize responsibility over hedonism. If the individual receives cues emphasizing the immediate economic impacts and restrictions on personal
freedoms from carbon emission regulation, one would expect the individual would prioritize hedonism over responsibility in this case.

Some general thoughts about values and contexts
Because of the general and durable nature of values and the purported importance people place on their values for decision-making, social theorists have tended to treat values in an overly simplistic fashion. And indeed, if values were simple, this would have greatly contributed to their use in social theory building before now. Values and the ways people employ them in decision-making are not in fact as simple as we would like. This does not, however, mean that values need to be jettisoned as a concept that can contribute to social theory. We simply need to be aware of the environments (internal and external) in which values operate. Although my typology of value-modulating context may appear so extensive as to condemn the concept of values to the same issue of vagueness of which I accused other theorists, this field of contexts I have described can be simplified without being over-simplified. This is because many of these context types tend to travel together. I will show this in the next section.

Why do the contexts that affect value decisions tend to travel together?
Perhaps the phrase "travel together" is too strong as it implies that the contexts I have discussed are connected by some ontological or mechanistic similarity that ties them together. What I am going to argue for is that contexts are often "squashed" together along axes of polarity by other contexts that will dominate the others. For values decisions of a "deep," "important," or "extreme" nature, the universal characteristics of human values which seem to have often escaped the observation of social researchers through the fog of social differences begin to take
shape, salvaging the concept of values as a useful theoretical construct. First, however, let me describe why I believe some of the values-affecting contexts will tend to "load on" the same type of values orientation, reducing the complexity of social difference and making values orientations shared within social groups defined in this way.

**Social location, status, and values**

When discussing the concept of social location, one of the key points to remember is that race, class, and gender cannot be teased apart as easily as we would like for social theory building. We would like to be able to separate the effects of race from those of class and gender, and indeed, many statistical models of social phenomena include these classifications as separate variables. Often an interaction term is included in the model to see if the intersections of race and gender, or gender and class, have a more pronounced effect than these variables considered as separate classifications. This approach is moving in the right theoretical direction, but it still cannot capture the radically different lived experiences of people from different social locations taking race, class, and gender together as an interrelated whole. The lived experiences of people who share the same social location and the likelihood that primacy is given to the roles and scripts learned through socialization as being primary for that social location, as well as the primacy that hearing the narratives of the lives of others who share ones social location over the narratives of others, suggest to me that race, class, and gender do interact in a multidimensional way, but produce simple social categories which are ranked in relation to each other in terms of status. If sociologists and others are going to investigate values in a meaningful way, I believe we need to start by exploring the degree of similarity in values and values orientations within specific intersections of race, class, and gender.
I suspect that one of the things we would find in such an investigation is that the higher in the status hierarchy a social location is placed, the greater the variety of values orientations within the group. The more status one has in society, the greater freedom one has to see oneself as an individual and not as defined by ascribed characteristics. This greater freedom changes the relationship of the self to others, thereby changing one of the key fundamental characteristics of what makes a decision a values decision. This is an empirical question worthy of study. A corollary to this assumption is that individuals from groups higher in the status hierarchy of social locations will be more easily affected by cues suggesting the priority of one value over another.

This discussion is leading us into conceptually murky waters, the same area where the conflation of concepts has stymied work on values in the past. Having "freedom" and "status" in a society is not the same as the valuing of "freedom" and "status" by an individual or group. This is one of the reasons I rejected utility as the exclusive source of values. The concept of utility assumes that "the Good" is embodied in the possession of the highly evaluated thing. The having and the valuing need to be kept separate from each other conceptually if values is to be a theoretically useful concept.

I also propose that variation in values orientations within social locations is dependent on the relative status of the social location due to the treatment of members of the location by members of higher status social locations. When a status differential exists between people, the higher status individual will tend to treat the lower status person not as an individual, but as a
representative of their social classification. This is the nature of the "isms." The oppression of racism, classism, and sexism is the result of the aggregate pattern of interactions between people, not the individual acts themselves. These aggregate patterns are the environments of socialization in which people develop their values orientations. Oppression is usually thought of as taking the form of denying access to resources. Oppression can also take the form of driving people into particular values orientations, thereby reducing the variation found in orientations between individuals of the same social location.

**Race, class, gender tied to education**

If different social locations produce status differentials for individuals assigned to different social locations, and status determines access to resources in a society, then a resource such as education should be differentially distributed in a society according to that status hierarchy. Therefore, although education may affect the values a person internalizes or prioritizes either because of the process of education, the content of the education, or the new group memberships achieved as a result of education, those outcomes will be determined by a person's social location. The meaning of educational attainment certainly will be interpreted in terms of one's race, class, and gender.

**Race, class, gender tied to occupations**

The occupations one is most likely to be allowed into and the implications of being a member of a particular occupation are also determined and interpreted in terms of race, class, and gender. Even within occupations, we know that race and gender affect earnings. We have to look very hard to find an occupation that is not gendered if not also raced. The occupation of a person
making a values decision provides a context for that decision, but there will be a pattern of occupations held at a group level for a particular social location.

**Race and gender are tied to "class" in a more subtle sense meaningful to values decisions**  
Most people think of class as synonymous with wealth. For sociologists this is not the case. Class is about life chances and access to resources. Class may also play a role in determining preferences and tastes. If class is about differences in the life chances and likely life outcomes of people, then although we separate class out from race and gender, in a sense, the intersection of race and gender produce a subset of class-classes within classes. And again, because of status differentials and differential treatment, race and gender will have a more salient impact on value decisions for members of marginalized groups.

**Age tied to historical events and "eras" of history**  
Now that I have argued that men and women, Blacks and whites, the elites and the working classes may have nothing in common regarding values orientations I will argue the opposite. All people who live through the same historical events at roughly the same age (cohorts) will be shaped by the historical milieu and if the events that shaped their lives are of a values-valent nature and influence, then they will share value priorities and orientations. Especially when other values-valent contexts are of a scope or realm that de-emphasizes racial, gender, or class differences, then one might reasonably expect other contexts to be "squashed" along the axis of age. Taking a page from the life course literature, many types of life experiences are only available once one has reached a certain age and therefore, the older a cohort gets the larger the
range of experiences they, both individually and as a group, have to draw upon as criteria for evaluation and as motivations for behavior.

One way in which these cohort effects play out in terms of values-valent contexts is if the meanings and relative status differentials around social locations change over time. Whether race, class, or gender are salient to a values decision may decrease for some values decisions for a particular cohort of individuals or during a particular historical era.

Hypothesis 1: Values and values orientations will be strengthened when a values decision is in alignment with the dominant values orientation of the subject.

Both Schwartz and Rokeach claim to have supported this (or a similar) hypothesis using different methodologies. Their studies were conducted using instruments that have demonstrated good validity and reliability, but their studies did not account for the contextual variables I have suggested are important for explaining change or variability in values. If the important contexts identified in this chapter are included as variables to be controlled or manipulated, then the importance of the contextual variables manipulated will be accepted or rejected.

Hypothesis 2: Values and values orientations will be changed when a values decision is in conflict with the dominant values orientation of the subject.

Rokeach and his colleagues found support for a related hypothesis in his studies which he explained as the result of "self-confrontation." Schwartz also has tested a similar hypothesis using cross-national data to judge the effects of the changing status of women on the values
orientations of men and women. Both of these approaches used control groups, but did not consider all of the contexts identified as important in this chapter.

**Hypothesis 3: Only for decisions where the subject perceives a moral component to be present will the decision-making process affect the values orientation of the subject.**

This hypothesis will confirm or deny that the moral component of a decision influences values, following Rokeach's theory of self-confrontation and will also confirm or deny the importance of morality for the concept of values.
CHAPTER FOUR: RESEARCH DESIGN AND METHODS

Chapter Overview

In this chapter the research methods including the design of the experiment, survey instrument, and procedures are discussed. These materials are designed to address the following research questions: 1) is a person's value orientation strengthened when a values decision is in alignment with that person's dominant value orientation? 2) does a person's value orientation change when a values decision is in conflict with that person's dominant value orientation? and 3) does a person's value orientation change when they perceive there to be a moral component to the decision-making process? Topics discussed in this chapter include the setting and design of the research, development of the questionnaire used in the study, the operationalization of key concepts and variables, and the categorization of subjects in terms of value orientations.

Research Setting

This study was conducted on the campus of Washington State University, Vancouver. Undergraduate students were recruited from sociology, political science, psychology, English, and criminal justice courses (N=112). Although young adults tend to be higher on the dimensions of Openness to Change and Self-Transcendence in the Schwartz model of value orientations than older adults, this group is not necessarily homogenous (Schwartz & Bilsky 1987, Schwartz 1992, Schwartz & Sagiv 1995, Schwartz & Bardi 2001, Schwartz et al. 2001). Age, educational attainment, and values have all been shown to be correlated with the acceptance of genetically modified foods within this age cohort (Magnusson & Koivisto Hursti 2002, Honkanen & Verplanken 2004, Dreezens et al. 2005, Saher et al. 2006, Costa-Font et al. 2008). Although the
similarity in age and educational attainment among subjects in this study prevent generalizing beyond this group to the larger population, acceptance of genetically modified food, *per se*, is not the focus of this study. Therefore, this is an appropriate setting for this study.

**Research Design**

The hypotheses of this study were tested using an experiment with a 2 (self-confrontation prime/no prime) X 2 (perception of moral component/no perception of moral component) within-subjects design. Such a design allows for causal relationships to be established and isolates the mechanisms that translate conditions (considering an attitudinal object, perception of a moral component to that object) into outcomes (values change). Information about a range of variables believed to be correlated with the acceptance of genetically modified foods was collected to control for the possible influence of intervening variables.

Subjects were recruited from undergraduate classes in sociology, political science, psychology, English, and criminal justice courses. The incentive for participation was the chance to earn extra credit in those courses. Participants were only eligible for the extra credit if they came to both meetings required for the study. Subjects were randomly assigned to two groups (treatment/control) balanced by gender.

Students interested in participating in this study were told to contact me by email. A first appointment with the subject was scheduled through email. At the end of the first meeting an appointment was made for the student to complete the second survey. Student names and the course for which the student wished to receive credit were recorded in a database along with a
unique subject ID number so that the subjects’ responses could be matched between the two meetings (T1 and T2). This database file was deleted upon completion of data collection. The database compiled for analysis does not contain the students' names, the courses they were enrolled in, their email addresses, or other personally identifiable information with the exception of individual educational attainment, parental educational attainment, age and gender. These personal data were discarded so that strict anonymity could be maintained.

All data were collected using a paper-and-pencil instrument presented as a single packet including a consent form and instructions. The post-test packet also included a debriefing form. All subjects completed the Short Schwartz's Value Survey (SSVS) (Lindeman & Verkasalo 2005) at meetings two weeks apart. In the survey administered at the first meeting all subjects were asked about their knowledge and attitudes about science, their religious or spiritual beliefs, their political orientation, the educational attainment of themselves and their parents, and what types of science courses they have taken in the past. At the first meeting one group was also asked about their attitudes toward genetically modified foods and biotechnology in general (treatment group). These subjects were then asked if they believed there is a moral component to biotechnology in general and food biotechnology in particular. The other group (control group) was not asked about their attitudes toward genetically modified foods or biotechnology in general or whether there is a moral component to biotechnology. At the second meeting all the subjects who returned completed the SSVS and were fully debriefed.

**Questionnaire Development**

Questionnaire items were selected from four well-respected studies. All of the items in the
questionnaire have been used for many years for data collection in the *Eurobarometer* project of the European Commission and the *Surveys of Public Attitudes Toward and Understanding of Science and Technology* by the National Science Foundation (Melich 1996, Melich 1999, Miller & Kimmel 2001, Papacostas 2005). The items measuring value orientation were taken from the Short Schwartz's Value Survey (Lindeman & Verkasalo 2005). A summary of the operationalization of the variables used in this study is presented in Table 1.

**Independent Variables**

*Self-confrontation prime.* All subjects responded to questionnaire items about their values. Subjects assigned to the treatment group responded to questionnaire items about their knowledge of and attitudes toward biotechnology. Subjects in the control group were not exposed to any questionnaire items regarding biotechnology. If thinking about values and then thinking about biotechnology produces a self-confrontation effect, then both subgroups in the treatment group should show significant differences from the control group in value orientations and mean value ratings at T2.

*Perception of a Moral Component to Biotechnology and Food Biotechnology.* The perception of a moral component to biotechnology generally and genetically modified foods specifically was determined using two items I wrote based on similar items in the *Eurobarometer*. The respondent was asked if they agree, disagree, neither agree or disagree, or don't know how they feel about these two statements:

“Regardless of how a person feels about biotechnology, this is a moral question and morality plays a role in deciding what should be done.”
“Specifically concerning food biotechnology, regardless of how a person feels about food biotechnology, this is a moral question and morality plays a role in deciding what should be done.”

**Dependent Variables**

*Value Orientation.* As discussed in Chapter Three, human values can, do, and must change over time. As the work of Rokeach and others has shown (Rokeach et al. 1970; Rokeach 1971; Rokeach & Cochkar 1972; Rokeach 1973, 1975, 1979; Greenstein 1976; Grube, et al. 1977; Paris 1980; Braithwaite 1982; Ball-Rokeach et al. 1984; Braithwaite & Law 1985; Greenstein 1989; Grube et al. 1994; Johnston 1995; Kennedy 1995; Braithwaite 1998; Kasser et al. 2002; Firestone 2003), human value orientations can shift, at least in the short term, in response to both social comparisons and possibly the comparisons a subject makes between an idealized concept of self and their "actual" self after receiving information about their values. Therefore, human value orientation can be either an independent or a dependent variable. In this study value orientation is treated as a dependent variable, although value orientation at T1 is analyzed for its possible influence on attitudes about biotechnology and perceptions of morality.

There are objections to Rokeach's original method of ranking values (Lee & Soutar 2010). One objection is that statistical analysis using ranked data is problematic. There are methods for analyzing rank data, but drawing conclusions from those data can be questionable in terms of generalization. Second, ranking does not allow for respondents to assign ties. Using a multi-point Likert-style scale is preferable from a methodological point of view because people are better able to understand this type of scale (Lee & Soutar 2010). Also, by the time a person is an adult in the United States they have been asked many questions in Likert scale format. In addition,
statistical analysis using Likert scale data is dependable, well-understood, and widely accepted.

There needs to be separation between items for a values measure to be viable. Schwartz's original scale was a nine-point scale. Schwartz also made an advance by using -1 as the low-end anchor for his scale. Many subjects commented on this fact. They seem to be able to use this structure successfully. I used a ten-point scale (-1 to 8) to increase resolution between items.

_Categorization of Subjects._ The original set of respondents who were asked questions about biotechnology were grouped as to whether they perceive a moral component to biotechnology generally and genetically modified foods in particular. The group that was not asked questions about biotechnology is the control against which the other two groups are compared. Subjects were categorized into value orientation type following and expanding on the methods of Norman Feather (1995).

_Value Change._ Changes in values and value orientation were calculated following the methods of Bardi (et al. 2009), Maio et al. (2009), Feather (1995), and Rokeach (1979). The dependent variable of values change was calculated as follows. First, a mean of the responses on the SSVS was calculated. This mean is subtracted from the value ratings given by the respondent. This is a standard practice with the SVS and SSVS to correct for individual differences in use of the scale and interpretation of the instructions and make comparisons between subjects more meaningful. The idea is that a subject may consistently assign either high or low values to all the items. The calculation of this mean also takes into account the range of responses the subject offered. If the subject used all ten numbers in their assignments this produces the greatest degree of resolution
and therefore difference between values. If the subject did not use all ten numbers, it produces a comparable measure of the value items in relation to each other. This ipsatizes the data at the level of the subject. This SSVS mean was subtracted from the actual numbers assigned to the items in the SSVS. This produces positive and negative numbers which reflect the structure of universal values in the Schwartz model. This was done separately for responses at T1 and T1.

Value change was calculated by taking the difference between ipsatized item responses at T1 and T2 (T2 – T1). This produced measurements of the amount of change in each of the ten values for the subject between T1 and T2. This difference between T1 and T2 was averaged across the control group to calculate a reference for the amount of change in values expected from the subjects due to variables other than the treatment stimuli. All subjects in the control group were considered to be "stable" in their values orientation between T1 and T2. This assumption is justified because there was no reference group presented to produce the self-confrontation effect and there was no stimuli to produce value change for any reason.

Subjects were categorized into value orientation types using the following equations suggested by Feather (1995):

**Equation 1**

\[
\text{Conservation} = \frac{\text{Security} + \text{Conformity} + \text{Tradition}}{3} - \frac{\text{Stimulation} + \text{Self Direction}}{2}
\]

**Equation 2**

\[
\text{Self – Transcendence} = \frac{\text{Universalism} + \text{Benevolence}}{2} - \frac{\text{Power} + \text{Achievement} + \text{Hedonism}}{3}
\]

This produced a description of the value orientation of the subject in two-dimensions.
Value orientation was further categorized into types based on these dimension scores. Positive scores were counted as “high” readings; negative scores were counted as “low” readings. This categorization produces four value orientation types: Low Conservation/Low Self-Transcendence, High Conservation/Low Self-Transcendence, Low Conservation/High Self-Transcendence, High Conservation/High Self-Transcendence. Subjects were categorized into these four value orientation types at T1 and T2.

**Control Variables**

Science knowledge and attitudes regarding science were measured using two sets of items from *Eurobarometer* 63.1. Science knowledge was measured using a thirteen-item true-false quiz of basic facts about the natural world established by the physical sciences. Responses on this quiz are scored and the number of correct answers is calculated to produce a scale from 0 to 13 and a “grade” of percent correct answers. A similar quiz of ten items was used to measure knowledge of biotechnology and a similar score and grade was calculated for these items. Attitudes regarding science were measured using a seven-item set of questions from the same survey. Because these items ask about a variety of topics, they are not combined into a scale. They are used in this study for purposes of comparison between experimental groups as a control variable. Knowledge of and attitudes regarding biotechnology in general and genetically modified foods in particular were measured using several sets of items from *Eurobarometer* 63.1.

Religiosity and spirituality were measured using sets of items also from *Eurobarometer* 63.1. Political orientation was determined with a single item from *Surveys of Public Attitudes Toward and Understanding of Science and Technology* (Miller & Kimmel 2001). Educational attainment
was determined using a single item from the same study. Subjects were asked about their own 
educational attainment as well as the educational attainment of both parents.

Subjects were assigned to experimental groups by gender based on my perception of the subject's 
performed gender from their visual presentation of self and from the subject's first name. 
Additionally, subjects were asked to describe their gender as “female,” “male,” or “gender non- 
conforming” in the questionnaire. This provided both a check of my determination of gender as 
well as allowing for gender non-conforming subjects to be represented.

Age was determined by asking the respondent “What year were you born?” This response was 
subtracted from the year 2011 to compute the age of the respondent. Educational exposure to 
science, technology, agriculture, and mathematics was determined using items from 
Eurobarometer 46.1 (Melich 1996). These data were used both for comparison and as controls 
for the intervening variable of exposure to science and technology.
Table 1. Definition of Concepts, Operationalization of Variables, and Source of Survey Items.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Conceptual Definition</th>
<th>Operational Definition</th>
<th>Questionnaire Item(s)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Values</td>
<td>Important motivations</td>
<td>Ratings of value types</td>
<td>SSVS</td>
<td>Lindeman &amp; Verkasalo 2005</td>
</tr>
<tr>
<td>Conservation Dimension</td>
<td>Two quadrants in SVT</td>
<td>Averages of ratings of</td>
<td>SSVS</td>
<td>Feather 1995</td>
</tr>
<tr>
<td>Self-Transcendence Dimension</td>
<td>Two quadrants in SVT</td>
<td>Averages of ratings of</td>
<td>SSVS</td>
<td>Feather 1995</td>
</tr>
<tr>
<td>Value Orientation</td>
<td>Four quadrants in SVT</td>
<td>Location in 2D space</td>
<td>SSVS</td>
<td>Calculated from Feather 1995</td>
</tr>
<tr>
<td>Value change</td>
<td>Changes in important</td>
<td>Differences in rating of</td>
<td>SSVS</td>
<td>Calculated from Feather 1995</td>
</tr>
<tr>
<td>Science knowledge and education</td>
<td>Knowledge of science facts, education in the sciences</td>
<td>Correct answers on quiz, science courses taken</td>
<td>Eurobarometer</td>
<td>Papacostas 2005</td>
</tr>
<tr>
<td>Science attitudes</td>
<td>Beliefs about science</td>
<td>Risks and benefits of science</td>
<td>Eurobarometer</td>
<td>Papacostas 2005</td>
</tr>
<tr>
<td>Biotechnology knowledge and familiarity</td>
<td>Beliefs about biotechnology</td>
<td>Correct answers on quiz</td>
<td>Eurobarometer</td>
<td>Papacostas 2005</td>
</tr>
<tr>
<td>Biotechnology concern</td>
<td>Fears related to biotechnology</td>
<td>Risks and benefits of biotechnology, trust in regulation</td>
<td>Eurobarometer</td>
<td>Papacostas 2005</td>
</tr>
<tr>
<td>Perception of moral component</td>
<td>Values are activated by moral deliberation, reasoning, and emotions</td>
<td>“Regardless of how a person feels...this is a moral question...”</td>
<td>NSFs Surveys</td>
<td>Miller &amp; Kimmel 2001, Papacostas 2005</td>
</tr>
<tr>
<td>Demographics</td>
<td>Possible correlates or determinants of values, attitudes, and beliefs</td>
<td>Gender, Age, educational attainment, religious beliefs, political orientation</td>
<td>NSF Surveys</td>
<td>Miller &amp; Kimmel 2001, Papacostas 2005</td>
</tr>
</tbody>
</table>
CHAPTER FIVE: ANALYSIS

Chapter Overview

This chapter presents the analyses of the experimental data and results of hypothesis testing. Issues created by the lack of variability in responses given to the ten-items on the Short Schwartz's Value Survey by some subjects are discussed. The relationships between the ten motivational types are examined for support of the structure of value relationships described by Schwartz and for evidence supporting hypotheses. Next, the effect of control and intervening variables on the dependent variables is discussed. Finally, hypotheses are tested using a number of chi-squared analyses, analysis of variance, and mean comparisons. These findings are confirmed using Monte Carlo simulation and an examination of the data using ranks instead of ratings.

Issues with Interpreting Instructions of the Short Schwartz’s Value Survey

The bulk of the literature which uses any of the versions of the Schwartz value measures demand that the subject use no number more than twice. Standard procedure is to throw out any subject who uses any number more than twice. This does not appear to be how the subjects in this study used the scale. During the first round of data collection 20 respondents only used the five numbers listed in the instructions in their responses to the items on the Short Schwartz's Value Survey. This left 41 subjects from the first round of data collection that produced useable data. Because of this issue, the instructions for the SSVS were modified to make explicit the possibility of using all the numbers available. During the second round of data collection in addition to the written instructions subjects were given verbal instruction as follows:
“For the first set of items you are asked to assign numbers between negative one and eight to the ten items. If you can use all the numbers between negative one and eight, please do so. If you truly cannot distinguish between two of the items you may assign the same number more than once.”

These instructions 1) make the possible responses more obvious and 2) still give the subject the flexibility to allow for ties in the ranking of values. This second consideration is important because it is not unheard of that a subject would truly prioritize two values similarly, especially if the two values are contiguous in the circular model of value relationships described by SVT. If the subject assigns the same number to two values which are opposed to each other in the Schwartz model, this would suggest that the subject is not following instructions or did not take the survey seriously. During the second round of data collection two subjects used only the numbers listed in the instructions in their responses to the items on the Short Schwartz's Value Survey. This left 44 subjects from the second round of data collection that produced useable data.

The problematic cases from both rounds of data collection were dropped using the following procedures. A total of 112 students volunteered for the study. Of these, five did not return for retesting and are not included in the analyses. Subjects were dropped from the data set if they used fewer than six different numbers for their responses on the SSVS which means they had to have used at least one of the numbers not listed on the instructions for the SSVS. This method dropped an additional 30 cases from the set of 107 yielding 77 useable cases.

There were very few cases for analyzing the effects of perceiving a moral component to biotechnology (11) and food biotechnology (9). Perceiving a moral component to biotechnology
in general and food biotechnology in particular is strongly positively correlated \((r = 0.78, p < 0.01)\). Because of this strong correlation and the smaller number of cases for perceiving a moral component to food biotechnology, the analyses in this chapter focus on biotechnology in general and not food biotechnology.

**Assignment to Groups for Analysis**

The subjects in this study were randomly assigned to either the treatment or the control at the first meeting (“Treatment” or “Control”). Subjects assigned to the treatment were further grouped based on whether they perceived there to be a moral implication to biotechnology or if they answered that decisions about biotechnology should be based on risks and benefits. This yielded three groups for analysis: “Control,” “Morality,” and “Utility.”

**Descriptive Statistics**

Frequencies and descriptive statistics for the cases in this study are shown in Tables 2-5. The distribution of subjects between the three groups by gender and semester of data collection are not significantly different. The groups did not display any significant differences in categories for ordinal and nominal variables or means for interval variables. There were no significant effects from gender or semester of data collection on the dependent variables in this experiment. There is no evidence that the descriptive and control variables in this dataset influence the analyses that follow.
Table 2. Descriptive Statistics by Group- Categorical Variables

<table>
<thead>
<tr>
<th></th>
<th>All Subject, N = 77</th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>31</td>
<td>17</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Female</td>
<td>45</td>
<td>24</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Gender non-conforming</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Semester</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td>35</td>
<td>21</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Spring</td>
<td>42</td>
<td>20</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td><strong>Have taken a course in:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algebra</td>
<td>77</td>
<td>41</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>Geometry</td>
<td>68</td>
<td>37</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Statistics</td>
<td>38</td>
<td>19</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>Biology</td>
<td>71</td>
<td>38</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>Chemistry</td>
<td>56</td>
<td>31</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>Physics</td>
<td>35</td>
<td>19</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Genetics</td>
<td>16</td>
<td>10</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Physiology</td>
<td>28</td>
<td>14</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Ecology</td>
<td>29</td>
<td>15</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Agriculture</td>
<td>14</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 3. Descriptive Statistics by Group- Categorical Variables, continued.

<table>
<thead>
<tr>
<th></th>
<th>All Subject, N = 77</th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Educational Attainment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma or GED</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Some college</td>
<td>21</td>
<td>12</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Associate's degree</td>
<td>41</td>
<td>22</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>8</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Some graduate education</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 4. Descriptive Statistics by Group- Categorical Variables, continued.

<table>
<thead>
<tr>
<th></th>
<th>All Subject, N = 77</th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother's Educational Attainment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't know/Declined</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>No formal schooling</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Some formal schooling</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>High school diploma or GED</td>
<td>20</td>
<td>11</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Some college</td>
<td>12</td>
<td>7</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Associate's degree</td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>13</td>
<td>7</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Some graduate education</td>
<td>7</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Grad. or prof. degree</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Father's Educational Attainment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't know/Declined</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>No formal schooling</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Some formal schooling</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>High school diploma or GED</td>
<td>15</td>
<td>10</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Some college</td>
<td>17</td>
<td>8</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Associate's degree</td>
<td>6</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>17</td>
<td>8</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Some graduate education</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Grad. or prof. degree</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 5. Descriptive Statistics by Group - Continuous Variables.

<table>
<thead>
<tr>
<th></th>
<th>All Subject, N = 77</th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M (SD)</strong></td>
<td><strong>M (SD)</strong></td>
<td><strong>M (SD)</strong></td>
<td><strong>M (SD)</strong></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>27.57 (8.80)</td>
<td>27.68 (10.02)</td>
<td>28.0 (7.5)</td>
<td>26.1 (6.67)</td>
</tr>
<tr>
<td>Science knowledge grade</td>
<td>0.73 (0.20)</td>
<td>0.71 (0.19)</td>
<td>0.75 (0.20)</td>
<td>0.72 (0.21)</td>
</tr>
<tr>
<td>Science optimism index</td>
<td>0.61 (0.11)</td>
<td>0.61 (0.10)</td>
<td>0.61 (0.14)</td>
<td>0.58 (0.09)</td>
</tr>
<tr>
<td>Science/math education index</td>
<td>0.56 (0.13)</td>
<td>0.56 (0.16)</td>
<td>0.57 (0.14)</td>
<td>0.56 (0.20)</td>
</tr>
<tr>
<td>Biotechnology knowledge grade</td>
<td>N/A</td>
<td>N/A</td>
<td>0.51 (0.19)</td>
<td>0.51 (0.16)</td>
</tr>
</tbody>
</table>

Chi-squared analyses find no statistically significant differences in the distribution of subjects between groups by gender ($\chi^2 = 2.32, df = 4, p = 0.68$), semester of data collection ($\chi^2 = 1.45, df = 2, p = 0.48$), science and math courses taken ($0.14 < \chi^2 < 3.38, df = 2, 0.93 < p < 0.68$), educational attainment ($\chi^2 = 9.38, df = 8, p = 0.31$), educational attainment of the subject's mother ($\chi^2 = 9.54, df = 16, p = 0.89$), or the educational attainment of the subject's father ($\chi^2 = 17.36, df = 14, p = 0.24$). This means the three groups compared in the analyses which follow are balanced in terms of all control variables after data cleaning. In addition, the number and types of science and math courses taken is not associated with the perception of a moral component to biotechnology. The three groups were compared for differences in the continuous variables shown in Table 5 using One-way Analysis of Variance (ANOVA). There is not a statistically significant difference between groups in terms of age ($F = 0.17, df = 2, p = 0.85$) or science knowledge as measured by the science knowledge quiz ($F = 0.28, df = 2, p = 0.76$). Age and science knowledge are not predictors of perceiving a moral component to biotechnology and the three groups are balanced in terms of these variables. One-way ANOVA found no statistically significant differences in mean ipsatized value ratings at Time 1 (Table 6) ($0.01 < F < 1.27, df =$
Value ratings at Time 1 were not predictors of perceiving a moral component to biotechnology.

Table 6. Ipsatized Value Ratings and Dimension Scores, Time 1

<table>
<thead>
<tr>
<th></th>
<th>All Subject, N = 77</th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ipsatized value ratings- Time 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>-1.95 (2.41)</td>
<td>-2.00 (2.41)</td>
<td>-2.14 (2.18)</td>
<td>-1.34 (3.02)</td>
</tr>
<tr>
<td>Achievement</td>
<td>0.98 (2.40)</td>
<td>0.88 (2.39)</td>
<td>0.70 (2.59)</td>
<td>2.03 (1.86)</td>
</tr>
<tr>
<td>Hedonism</td>
<td>-0.89 (2.39)</td>
<td>-0.73 (2.39)</td>
<td>-1.22 (2.18)</td>
<td>-0.70 (2.93)</td>
</tr>
<tr>
<td>Stimulation</td>
<td>-0.04 (2.41)</td>
<td>-0.05 (2.24)</td>
<td>0.26 (2.59)</td>
<td>-0.70 (2.69)</td>
</tr>
<tr>
<td>Self-direction</td>
<td>1.71 (2.29)</td>
<td>1.68 (2.40)</td>
<td>1.86 (2.24)</td>
<td>1.48 (2.16)</td>
</tr>
<tr>
<td>Universalism</td>
<td>0.11 (2.81)</td>
<td>-0.02 (2.82)</td>
<td>0.62 (2.68)</td>
<td>-0.52 (3.12)</td>
</tr>
<tr>
<td>Benevolence</td>
<td>2.02 (2.11)</td>
<td>2.27 (1.75)</td>
<td>1.98 (2.27)</td>
<td>1.21 (2.85)</td>
</tr>
<tr>
<td>Tradition</td>
<td>-0.84 (2.59)</td>
<td>-1.02 (2.66)*</td>
<td>-0.62 (2.63)*</td>
<td>-0.61 (2.44)</td>
</tr>
<tr>
<td>Conformity</td>
<td>-1.03 (2.46)</td>
<td>-1.07 (2.72)</td>
<td>-0.98 (2.39)</td>
<td>-0.97 (1.60)</td>
</tr>
<tr>
<td>Security</td>
<td>-0.08 (2.37)</td>
<td>0.07 (2.26)*</td>
<td>-0.42 (2.49)</td>
<td>0.12 (2.64)</td>
</tr>
</tbody>
</table>

Value dimensions- Time 1

<table>
<thead>
<tr>
<th></th>
<th>All Subject, N = 77</th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation</td>
<td>-1.48 (3.30)</td>
<td>-1.49 (3.36)</td>
<td>-1.73 (3.41)</td>
<td>-0.88 (3.02)</td>
</tr>
<tr>
<td>Self-transcendence</td>
<td>1.69 (3.15)</td>
<td>1.74 (2.73)</td>
<td>2.19 (3.57)</td>
<td>0.35 (3.54)</td>
</tr>
</tbody>
</table>

*Significant difference within group between T1 & T2, p < 0.05

There are statistically significant differences between value ratings at Time 2 (Table 7) and for changes in values (Table 8). One-way Analysis of Variance (ANOVA) of these data show a statistically significant difference between groups for the values of Power (p = 0.02) and Universalism (p = 0.01), and the Self-Transcendence value dimension (p = 0.04) at Time 2. Changes in the ratings of the values Power (p = 0.04) and Tradition (p = 0.01) are also statistically significant. These findings are discussed in more detail below.
Table 7. Ipsatized Value Ratings and Dimension Scores, Time 2

<table>
<thead>
<tr>
<th></th>
<th>All Subject, N = 77</th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ipsatized value ratings- Time 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power**</td>
<td>-2.00 (2.46)</td>
<td>-2.33 (2.27)</td>
<td>-2.30 (2.17)</td>
<td>-0.09 (3.08)</td>
</tr>
<tr>
<td>Achievement</td>
<td>1.03 (2.41)</td>
<td>1.11 (2.385)</td>
<td>0.62 (2.60)</td>
<td>1.64 (2.15)</td>
</tr>
<tr>
<td>Hedonism</td>
<td>-0.98 (2.57)</td>
<td>-1.06 (2.77)</td>
<td>-0.98 (2.30)</td>
<td>-0.73 (2.55)</td>
</tr>
<tr>
<td>Stimulation</td>
<td>-0.08 (2.33)</td>
<td>-0.38 (2.51)</td>
<td>0.42 (2.10)</td>
<td>-0.09 (2.13)</td>
</tr>
<tr>
<td>Self-direction</td>
<td>1.70 (2.37)</td>
<td>1.65 (2.47)</td>
<td>1.90 (2.28)</td>
<td>1.45 (2.36)</td>
</tr>
<tr>
<td>Universalism**</td>
<td>0.03 (2.76)</td>
<td>-0.03 (2.48)</td>
<td>0.98 (2.75)</td>
<td>-1.91 (2.90)</td>
</tr>
<tr>
<td>Benevolence</td>
<td>2.03 (2.02)</td>
<td>1.94 (1.83)</td>
<td>2.26 (2.09)</td>
<td>1.82 (2.61)</td>
</tr>
<tr>
<td>Tradition</td>
<td>-0.48 (2.50)</td>
<td>0.01 (2.58)*</td>
<td>-1.38 (2.16)*</td>
<td>-0.27 (2.53)</td>
</tr>
<tr>
<td>Conformity</td>
<td>-1.08 (2.46)</td>
<td>-0.94 (2.66)</td>
<td>-1.42 (2.24)</td>
<td>-0.82 (2.30)</td>
</tr>
<tr>
<td>Security</td>
<td>-0.50 (2.19)</td>
<td>-0.72 (2.12)*</td>
<td>-0.34 (2.34)</td>
<td>-0.09 (2.21)</td>
</tr>
<tr>
<td><strong>Value dimensions- Time 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conservation</td>
<td>-1.50 (3.16)</td>
<td>-1.18 (3.28)</td>
<td>-2.21 (2.99)</td>
<td>-1.08 (3.11)</td>
</tr>
<tr>
<td>Self-transcendence**</td>
<td>1.68 (3.05)</td>
<td>1.71 (2.46)</td>
<td>2.51 (3.25)</td>
<td>-0.32 (3.87)</td>
</tr>
</tbody>
</table>

*Significant difference within group between T1 & T2, p < 0.05
**Significant difference between group at T2, p < 0.05
Table 8. Changes in Ipsatized Value Ratings and Dimension Scores.

<table>
<thead>
<tr>
<th></th>
<th>All Subject, N = 77</th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td><strong>Changes in ipsatized value ratings- T2-T1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power*</td>
<td>-0.05 (1.87)</td>
<td>-0.33 (1.88)</td>
<td>-0.15 (1.54)</td>
<td>1.25 (2.13)</td>
</tr>
<tr>
<td>Achievement</td>
<td>0.05 (1.98)</td>
<td>0.23 (1.92)</td>
<td>-0.07 (2.35)</td>
<td>-0.39 (1.21)</td>
</tr>
<tr>
<td>Hedonism</td>
<td>-0.10 (2.67)</td>
<td>-0.33 (2.75)</td>
<td>0.25 (2.21)</td>
<td>-0.03 (3.40)</td>
</tr>
<tr>
<td>Stimulation</td>
<td>-0.03 (2.02)</td>
<td>-0.33 (1.84)</td>
<td>0.17 (1.63)</td>
<td>0.61 (3.19)</td>
</tr>
<tr>
<td>Self-direction</td>
<td>-0.01 (0.54)</td>
<td>-0.03 (0.63)</td>
<td>0.05 (0.26)</td>
<td>-0.03 (0.70)</td>
</tr>
<tr>
<td>Universalism</td>
<td>-0.08 (2.34)</td>
<td>-0.01 (2.09)</td>
<td>0.37 (2.46)</td>
<td>-1.39 (2.69)</td>
</tr>
<tr>
<td>Benevolence</td>
<td>0.01 (1.56)</td>
<td>-0.33 (1.27)</td>
<td>0.29 (1.48)</td>
<td>0.61 (2.42)</td>
</tr>
<tr>
<td>Tradition*</td>
<td>0.36 (2.35)</td>
<td>1.04 (2.34)</td>
<td>-0.75 (1.85)</td>
<td>0.34 (2.60)</td>
</tr>
<tr>
<td>Conformity</td>
<td>-0.05 (1.78)</td>
<td>0.14 (1.64)</td>
<td>-0.43 (1.85)</td>
<td>0.15 (2.16)</td>
</tr>
<tr>
<td>Security</td>
<td>-0.42 (2.16)</td>
<td>-0.79 (1.96)</td>
<td>0.09 (2.43)</td>
<td>-0.21 (2.17)</td>
</tr>
<tr>
<td><strong>Changes in value dimension scores- T2-T1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conservation</td>
<td>-0.2 (1.83)</td>
<td>0.31 (1.52)</td>
<td>-0.47 (1.89)</td>
<td>-0.20 (2.57)</td>
</tr>
<tr>
<td>Self-transcendence</td>
<td>-0.1 (2.25)</td>
<td>-0.03 (2.10)</td>
<td>0.32 (2.22)</td>
<td>-0.67 (2.88)</td>
</tr>
</tbody>
</table>

*Significant difference between groups, p < 0.05

None of the descriptive variables were associated with any of the ten motivational types, value orientation, or views about biotechnology including whether decisions about biotechnology should be based on morality or utility. These findings suggest that the social location of an individual in terms of age, gender, education, and socio-economic background does not predict the value priorities of that person. These findings also suggest that values and values orientation, within a sample of college students at least, do not predict a person’s views about biotechnology.
Differences and Changes in Values

Value dimensions

Ipsatized value ratings were used to calculate scores for the Conservation and Self-transcendence dimensions of Schwartz's model of value relationships. The three groups were compared for differences in these dimensions using One-way ANOVA. There are no statistically significant differences in either dimension at Time 1 (0.25 < F < .32, df = 2, 0.27 < p < 0.78). There is a significant difference between groups on the Self-transcendence dimension at Time 2 (F = 3.51, df = 2, p =0.04).

The differences identified above in ipsatized value ratings and dimension score between groups must be interpreted in relation to the amount of change in these variables between Time 1 and Time 2. Although values and value orientation should be relatively stable in the short-term, it is possible that factors other than the independent variables in this study could produce a statistically significant change in the dependent variables. Therefore, the changes in values and value orientations of the control group are used as the reference against which changes in the other groups are compared. If factors other than the independent variables produced a change in values or value orientations in the control group, then the other two groups should have experienced a similar shift if the connections between contexts and values described in Chapter Three are true.
**Motivational types**

Paired samples $t$-tests were used to compare the mean ipsatized value ratings of each group at Time 1 and Time 2. The control group did show statistically significant differences in the mean ipsatized ratings of Tradition ($t = -2.84, df = 40, p = 0.01$) and Security ($t = 2.58, df = 40, p = 0.01$). The mean difference of ipsatized ratings for Tradition was -1.04 and 0.79 for Security. This means the control group rated Tradition higher at Time 2 than Time 1 and security lower at Time 2 than Time 1.

The two groups exposed to the treatment did not show the same pattern, however. The Utility group rated Tradition lower at Time 2 than Time 1 ($t = 2.04, df = 24, p = 0.05$, mean difference = 0.75). There were no statistically significant changes in ipsatized value ratings for the Morality group.

These findings suggest that there were differences in the pattern of changes in values between the three groups. These findings do not take into consideration the amount of change in values which needs to be included in the assessment of change because of the large dispersion around the means for all ratings. The standard deviation is greater than the mean for all values and value dimensions at both Time 1 and Time 2 for all three groups with the exceptions of Power (Control, T2, mean = -2.33, $SD = 2.27$; Utility group, T2, mean = -2.30, $SD = 2.17$), Achievement (Morality group, T1, mean = 2.03, $SD = 1.86$) and Benevolence (Control, T1, mean = 2.27, $SD = 1.75$; Utility group, T2, mean = 2.26, $SD = 2.09$). Even these exceptions display a large amount of dispersion around the mean. There was a great deal of variation in the ratings assigned to each of the ten values within each group. Therefore, the *amount* of change in value ratings between
Time 1 and Time 2 is a more meaningful comparison and this is why the hypotheses in this
dissertation are formulated in those terms.

The amount of change in ipsatized value ratings and value dimension scores was analyzed by
comparing the three groups using One-way Analysis of Variance. There is a statistically
significant difference in the amount of change between times 1 and 2 for the values Power ($F =
3.32, df = 2, p = 0.04$) and Tradition ($F = 5.01, df = 2, p = 0.01$). The Morality group increased
their ratings of Power and the Control group increased their ratings of Tradition.

Value Orientation Types

Schwartz’s Value Theory identifies the ten motivational types as representing a comprehensive
and complete set of values which are recognized by people around the world. SVT also identifies
the relationships of the ten motivational types as important. These relationships can be
summarized as a values orientation. The values orientation of a person can be described in terms
of the two dimensions which describe the circumplex arrangement of motivational types. A score
which places the subject on a values dimension can be calculated using the equation described in
Chapter Four. The Conservation dimension describes how open to change a person is. A high
score on this dimensions means a person is resistant to change and gives more importance to the
values of Tradition, Conformity, and Security and less importance to the values of Hedonism and
Self-direction. The Self-transcendence dimension describes a person in terms of proself or
prosocial orientations. A high score on this dimension means a person is more prosocial than
proself and gives more importance to the values of Universalism and Benevolence and less
importance to the values of Power, Hedonism, and Achievement.
I use these two dimensions to classify subjects into four value orientation types. Dimension scores greater than 0 are considered “high” and scores of 0 or less are considered high. The four value orientation types are:

A- Low on Conservation, Low on Self-transcendence

B- High on Conservation, Low on Self-transcendence

C- Low on Conservation, High on Self-transcendence

D- High on Conservation, Low on Self-transcendence

Figure 3. Value Orientation Types and Value Dimensions
Categorical Data Analysis

Differences and changes in value orientations were examined using the Fisher-Freeman-Halton Exact Test, and the Cochran-Mantel-Haenszen Test. The contingency tables analyzed are shown in Tables 5.8 and 5.9. These analyses showed no significant differences between groups at Time 1 ($p = 0.3428$) or Time 2 ($p = 0.4011$). There were also no significant differences within groups between Time 1 and Time 2 (Cochran-Mantel-Haenszel $M^2 = 9.2582$, $df = 6$, $p = 0.1596$).

Table 9. Value Orientation Types by Group-Counts

<table>
<thead>
<tr>
<th>VO Type</th>
<th>Time 1</th>
<th>Time 2</th>
<th>VO Type Changed?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control group, N = 41</td>
<td>Utility group, N = 25</td>
<td>Morality group, N = 11</td>
</tr>
<tr>
<td>A</td>
<td>8</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>21</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>9</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Yes</td>
<td>14</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
Table 10. Value Orientation Types by Group- Percentages

<table>
<thead>
<tr>
<th>VO Type</th>
<th>Time 1</th>
<th></th>
<th></th>
<th></th>
<th>Time 2</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control group, N = 41</td>
<td>Utility group, N = 25</td>
<td>Morality group, N = 11</td>
<td>Control group, N = 41</td>
<td>Utility group, N = 25</td>
<td>Morality group, N = 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>20%</td>
<td>20%</td>
<td>27%</td>
<td>A</td>
<td>15%</td>
<td>24%</td>
<td>36%</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>7%</td>
<td>4%</td>
<td>0%</td>
<td>B</td>
<td>10%</td>
<td>0%</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>51%</td>
<td>52%</td>
<td>18%</td>
<td>C</td>
<td>49%</td>
<td>52%</td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>22%</td>
<td>24%</td>
<td>55%</td>
<td>D</td>
<td>27%</td>
<td>24%</td>
<td>27%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VO Type Changed?</th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>66%</td>
<td>80%</td>
<td>45%</td>
</tr>
<tr>
<td>Yes</td>
<td>34%</td>
<td>20%</td>
<td>55%</td>
</tr>
</tbody>
</table>

These findings demonstrate several important relationships (or more accurately lack thereof).

First, none of the three groups can be described as belonging to a particular value orientation type. Not only are individual motivational types not associated with any of the independent variables, but there are no statistically significant differences in the distribution of value orientation types either within or between groups.
Possible Influence of Control and Possible Intervening Variables

*Spirituality and Religiosity*. Because the topic of this dissertation is the perception of a moral component to an object of consideration and values, the possible influence of spirituality and religiosity on said perceptions should be examined. First, it would not be surprising for there to be a connection between spirituality or religiosity and values. Although Schwartz did not find support for “Spirituality” as a value type (Schwartz 1992), the values of Universalism, Benevolence, Tradition, and Conformity have spiritual overtones and probably describe different aspects of the human spiritual or religious experience. Second, a connection between spirituality/religiosity and perceiving a moral component to an object of consideration is possible given that moral reasoning can include spiritual or religious justifications for what is right or wrong.

Spirituality and religiosity were measured using four items. The distribution of responses on these items for the three groups are shown in Tables 5.10, 5.11, 5.12, and 5.13. Fisher-Freeman-Halton Exact Tests did not find significant differences between groups on Table 5.11 and 5.13, and did find significant differences on Table 5.10 ($p < 0.001$) and 5.12 ($p = 0.03113$). Subjects who perceived there to be a moral component to biotechnology (Morality group) described themselves as more religious than other subjects. The only subjects who described themselves as “deeply religious” were in this group. Subjects in the Morality group were also more likely to describe themselves as thinking about the meaning of life “often.” This item came after the biotechnology items including the question of whether biotechnology is a moral issue or not, so it is possible that perceiving a moral component to biotechnology caused an increase in self-reported religiosity.
<table>
<thead>
<tr>
<th>Category</th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Neither spiritual or religious</td>
<td>10</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Atheist</td>
<td>2</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Somewhat spiritual</td>
<td>6</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Very spiritual</td>
<td>9</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Religious</td>
<td>13</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Deeply religious</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know</td>
<td>0%</td>
<td>8%</td>
<td>0%</td>
</tr>
<tr>
<td>Neither spiritual or religious</td>
<td>24%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Atheist</td>
<td>5%</td>
<td>24%</td>
<td>0%</td>
</tr>
<tr>
<td>Somewhat spiritual</td>
<td>15%</td>
<td>16%</td>
<td>0%</td>
</tr>
<tr>
<td>Very spiritual</td>
<td>22%</td>
<td>24%</td>
<td>9%</td>
</tr>
<tr>
<td>Religious</td>
<td>32%</td>
<td>24%</td>
<td>64%</td>
</tr>
<tr>
<td>Deeply religious</td>
<td>0%</td>
<td>0%</td>
<td>27%</td>
</tr>
</tbody>
</table>
Table 12. “Which of these statements comes closest to your beliefs?”

<table>
<thead>
<tr>
<th></th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>No spirit, God, or life force</td>
<td>5</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Some sort of spirit or life force</td>
<td>9</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Believes in God</td>
<td>25</td>
<td>12</td>
<td>11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know</td>
<td>5%</td>
<td>12%</td>
<td>0%</td>
</tr>
<tr>
<td>No spirit, God, or life force</td>
<td>12%</td>
<td>16%</td>
<td>0%</td>
</tr>
<tr>
<td>Some sort of spirit or life force</td>
<td>22%</td>
<td>12%</td>
<td>0%</td>
</tr>
<tr>
<td>Believes in God</td>
<td>61%</td>
<td>48%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 13. “How often, if at all, do you think about the meaning and purpose of life?”

<table>
<thead>
<tr>
<th></th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rarely</td>
<td>2</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Sometimes</td>
<td>16</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Often</td>
<td>23</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>0%</td>
<td>4%</td>
<td>9%</td>
</tr>
<tr>
<td>Rarely</td>
<td>5%</td>
<td>28%</td>
<td>9%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>39%</td>
<td>28%</td>
<td>18%</td>
</tr>
<tr>
<td>Often</td>
<td>56%</td>
<td>36%</td>
<td>64%</td>
</tr>
<tr>
<td>Missing</td>
<td>0%</td>
<td>4%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Table 14. “How would you describe your religious practices?”

<table>
<thead>
<tr>
<th></th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Neither attends nor make time for spiritual experiences</td>
<td>7</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Makes time for spiritual experiences</td>
<td>10</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Rarely if ever attends worship services</td>
<td>6</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Attends worship services, but not regularly</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Regularly attends worship services</td>
<td>12</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know</td>
<td>0%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Neither attends nor make time for spiritual experiences</td>
<td>17%</td>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td>Make time for spiritual experiences</td>
<td>24%</td>
<td>16%</td>
<td>0%</td>
</tr>
<tr>
<td>Rarely if ever</td>
<td>15%</td>
<td>28%</td>
<td>18%</td>
</tr>
<tr>
<td>Not regularly</td>
<td>10%</td>
<td>12%</td>
<td>45%</td>
</tr>
<tr>
<td>Regularly</td>
<td>29%</td>
<td>20%</td>
<td>36%</td>
</tr>
<tr>
<td>Missing</td>
<td>5%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
This possibility is unlikely given the responses on the two items that came before the biotechnology items in the survey and the self-reports of religious service attendance which came after. As shown in Table 5.11, 100% of the subjects in the Morality group believe there is a God. Similarly, Table 5.12 shows that a larger percentage of subjects in the Morality group responded “often” when asked about how often they think about the meaning and purpose of life than the other two groups. The relatively large percentage of subjects in all three groups who responded “sometimes” to this item, the small number of response categories, and the subjective nature of interpreting what “often” and “sometimes” mean in terms of actual frequency, make these data impossible to interpret definitively, but it does suggest subjects in the Morality group are more religious than subjects in the Control and Utility groups.

Table 5.13 shows the reported frequency of attending worship services or for making time for spiritual experiences. Subjects who perceived there to be a moral component to biotechnology reported a higher frequency of attending worship services than the other two groups, but an exact test of this table did not find a significant difference between groups. Although, this item came after the items about biotechnology, this questions asks about the frequency of a specific type of behavior which is both observable to others (as opposed to a belief) and that behavior requires an investment of time and effort (as opposed to simply “thinking” about something). Therefore, responses to this item should be relatively consistent regardless of what items precede them. The data from these four items taken together suggest that there is connection between religiosity and perceiving a moral component to biotechnology, although that evidence is not strong because exact tests did not find significant differences in all four tables.
There is not a relationship between spirituality or religiosity and values, however. The simplest evidence that there is not a relationship between spirituality or religiosity and values is the fact that there were no differences in the ratings of any of the values between groups at Time 1. If the subjects in the Morality group are in fact more religious than the other subjects and if there is a relationship between religiosity and values, then that group of subjects should have rated the ten values differently than the other two groups. They did not.

*Science optimism.* The set of seven items measuring attitudes toward science were taken from a larger set of items used in the *Eurobarometer* to measure overall optimism about science (science optimism) (Pardo & Calvo 2006). These seven items were combined to calculate an index of science optimism between 0 and 1. Science optimism expresses how much a person believes that science can solve problems and improve human life. It would not be surprising to find a relationship between science optimism and values or perceiving a moral component to biotechnology. One-way Analysis of Variance did not find a statistically significant difference in science optimism between the three groups ($F = 0.33$, $df = 2$, $p = 0.72$). Science optimism does not play an intervening role in the relationship between independent and dependent variables in this study.

*Science/math education index.* The number of science and math courses taken by the subjects were combined into an index of science/math education ranging for 0 to 1. One-way Analysis of Variance found no statistically significant differences between the three groups. The number of science and math courses taken does not have a role as an intervening variable in perceiving there to be a moral component to biotechnology.
**Political orientation.** Table 5.14 shows the distribution of responses to the item asking the subject to describe their political orientation. A Fisher-Freeman-Halton Exact Test indicate there is a difference between groups on these categories ($p = 0.01129$). The largest percentage of subjects who described themselves as “extremely conservative” belong to the Morality group. The largest percentage of subjects who described themselves as “somewhat liberal” belonged to the Utility group. The largest percentage of subjects assigned to the Control group described themselves as “neither liberal nor conservative.” No subjects in any of the three groups responded that their political values could not be described in terms of “liberal” or “conservative.” Because this item came after the items about biotechnology and the distribution of responses are relatively polarized between groups, it is possible that thinking about biotechnology affected responses to this item. The distribution of responses for the control group suggest that political orientation was not made salient by the items all subjects responded to, but that the biotechnology items made political orientation salient for the subjects exposed to those items. Political orientation is not a predictor of perceiving a moral component to biotechnology. Political orientation is associated with perceiving a moral component to biotechnology, but only after thinking about the topic. The topic itself could have produced an effect similar to the group polarization effect where subjects express stronger endorsement of an attitude after interacting with others who have similar attitudes. In this case however, the subjects did not interact with each other. This finding is problematic because of the causal order between variables and the lack of interaction between subjects. This issue deserves greater investigation and may require a reexamination of studies which use political orientation as either an independent or control variable.
Table 15. “How would you describe your political orientation?”

<table>
<thead>
<tr>
<th></th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Can't be described in terms of liberal or conservative</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Extremely conservative</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Very conservative</td>
<td>10</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Somewhat conservative</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Neither liberal nor conservative</td>
<td>12</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Somewhat liberal</td>
<td>3</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Very liberal</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Extremely liberal</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Control group, N = 41</th>
<th>Utility group, N = 25</th>
<th>Morality group, N = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know</td>
<td>7%</td>
<td>4%</td>
<td>9%</td>
</tr>
<tr>
<td>Can't be described in terms of liberal or conservative</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Extremely conservative</td>
<td>5%</td>
<td>0%</td>
<td>36%</td>
</tr>
<tr>
<td>Very conservative</td>
<td>24%</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>Somewhat conservative</td>
<td>5%</td>
<td>16%</td>
<td>9%</td>
</tr>
<tr>
<td>Neither liberal nor conservative</td>
<td>29%</td>
<td>24%</td>
<td>18%</td>
</tr>
<tr>
<td>Somewhat liberal</td>
<td>7%</td>
<td>28%</td>
<td>9%</td>
</tr>
<tr>
<td>Very liberal</td>
<td>2%</td>
<td>12%</td>
<td>0%</td>
</tr>
<tr>
<td>Extremely liberal</td>
<td>20%</td>
<td>4%</td>
<td>9%</td>
</tr>
<tr>
<td>Missing</td>
<td>0%</td>
<td>4%</td>
<td>0%</td>
</tr>
</tbody>
</table>
**Table 16. Decisions about Technology.**

<table>
<thead>
<tr>
<th></th>
<th>Utility</th>
<th>Morality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decisions about new technology</td>
<td>21</td>
<td>4</td>
</tr>
<tr>
<td>should be based primarily on</td>
<td></td>
<td></td>
</tr>
<tr>
<td>scientific evidence about the risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and benefits involved.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decisions about new technologies</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>should be based primarily on the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>moral and ethical issues involved.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Decisions about technology.* Subjects assigned to the treatment condition were asked “which of the following views is closest to your own?”:

1. “Decisions about new technology should be based primarily on scientific evidence about the risks and benefits involved.”

2. “Decisions about new technologies should be based primarily on the moral and ethical issues involved.”

Subjects in the Morality group were more likely to support the second statement than subjects in the Utility group as shown in Table 5.15 (Fischer-Freeman-Halton Exact Test, \( p < 0.01 \)).
Table 17. Attitudes toward Biotechnology.

"How confident would you say you are in the safety and regulatory approval system governing genetically modified foods?"

<table>
<thead>
<tr>
<th></th>
<th>Utility</th>
<th>Morality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Not at all confident</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Not very confident</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Fairly confident</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Very confident</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

"Overall, which of the following best describes your views about genetically modified foods?"

<table>
<thead>
<tr>
<th></th>
<th>Utility</th>
<th>Morality</th>
</tr>
</thead>
<tbody>
<tr>
<td>I do not approve of genetically modified foods under any circumstances.</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I do not approve of genetically modified foods except under very special circumstances.</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>I approve of genetically modified foods if they are more tightly regulated.</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>I approve of genetically modified foods, as long as the usual levels of government regulation are in place.</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>

Attitudes about the regulation of food biotechnology and familiarity with food biotechnology are shown in Tables 5.16 and 5.17. Fisher-Freeman-Halton Exact Tests did not find significant differences between the Utility and Morality groups on these items. Subjects in the Utility group were the only subjects who approved of genetically modified foods “as long as the usual levels
of government regulation are in place.” Subjects in the Morality group both approved and disapproved of genetically modified food, but only if they are “more tightly regulated” or “under very special circumstances.” None of the subjects in this group gave either of the two extreme responses demonstrating complete approval or disapproval of genetically modified foods. This suggests that subjects who perceived there to be a moral component to biotechnology were not involved in the deliberative process in a different fashion than subjects who did not perceive there to be a moral component to biotechnology.

**Table 18. Familiarity with Biotechnology.**

<table>
<thead>
<tr>
<th></th>
<th>Utility</th>
<th>Morality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Unfamiliar</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not very familiar</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Somewhat familiar</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Very familiar</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

"How familiar would you say you are with genetically modified foods?"

The findings described above regarding decisions about technology, attitudes toward, feelings about, familiarity with, exposure to information about, and information acquisition regarding biotechnology are counter to expectations. These variables would all appear to be closely related to each other and should also be associated with perceiving a moral component to biotechnology. Not finding associations between these variables suggests that evaluating the moral dimensions of an object of consideration is not connected to feelings, attitudes, and information acquisition.
in the ways one would expect. The mechanisms connecting mental states such as attitudes and emotions to moral reasoning are still unknown.

**Confirming Results Using Ranks**

Because there are ten items and only subjects who used more than five different items were included in the data set, these data can be viewed as ranks with many ties. Responses on the SSVS were analyzed as ranked data using the Mann-Whitney U Test, the Kruskal-Wallis Test, the Related-Samples Wilcoxon Signed Rank Test, and the Independent Samples Median Test. The Mann-Whitney U Test found a significant difference between groups at Time 2 for Tradition ($p = 0.49$) and the Kruskal-Wallis Test found a significant difference between groups at Time 2 for Universalism ($p = 0.23$). The Independent Samples Median Test did not find any significant differences between groups at either Time 1 or Time 2. The Related-Samples Wilcoxon Signed Rank Test found significant differences between Time and Time 2 for the Control group on the motivational types Tradition ($p = 0.012$) and Security ($p = 0.023$).

I do not consider these findings to support any of the hypotheses or to be evidence of differences between groups at either time or within groups between times. For values change to be meaningful it should be reflected in changes in multiple motivational types. Also, the control group is the only group where value changes were found between Time 1 and Time 2 using non-parametric procedures. Given that information is lost when using these procedures I do not feel these findings challenge the findings of the One-way ANOVAs and paired sample $t$-tests.
Confirming Results Using Monte Carlo Simulation

There is no reason to believe that the data in this study were drawn from a truly random sample of subjects and there is also no reason to believe the underlying distribution of responses to items on the SSVS are normally distributed. Additionally, when the three groups (Control, Morality, and Utility) are further grouped into value orientation types, there is a small number of subjects per group. One way to analyze this kind of data is to use Monte Carlo simulation. Results were similar to those produced using $t$-test comparisons. Differences in value dimension scores between Time 1 and Time 2 were not significantly different for any of the four value orientation types.

Support for Hypotheses

The hypotheses tested in this dissertation are:

Hypothesis 1: Values and values orientations will be strengthened when a values decision is in alignment with the dominant values orientation of the subject.

Hypothesis 2: Values and values orientations will be changed when a values decision is in conflict with the dominant values orientation of the subject.

Hypothesis 3: Only for decisions where the subject perceives a moral component to be present will the decision-making process affect the values orientation of the subject.

Hypotheses 1 and 2 state that values and value orientations will change based on the nature of a decision or evaluation and, therefore, will be examined together. One problem with evaluating
these hypotheses is that there is no information on which to base a judgment of which values would be connected with perceptions of biotechnology. This is not a major roadblock to analysis because regardless of which motivational types might be associated with different views of biotechnology, if the hypotheses are true, then shifts in values between Time 1 and Time 2 should be observed. Additionally one or both of the treatment groups should be significantly different from the Control group in terms of values and value orientation types.

These shifts must have a certain pattern to support Hypotheses 1 and 2. Namely, shifts in value ratings, value dimension score, and value type orientations have to display a pattern which reflects the circumplex arrangement of the 10 motivational types in SVT. A shift in the rating of a one motivational type should be accompanied by a mirror shift in the motivational types on the other side of the circumplex. Strong support for Hypotheses 1 and 2 would be shifts observed across a range of values and should be reflect in changes in value orientation types and value dimension scores.

There are significant differences between groups at Time 2. This is evidence in support of Hypotheses 1 and 2, but this evidence is weak. There are differences between groups on the motivational types of Power and Universal and one the Self-transcendence value dimension. Rating of Tradition is different between Time 1 and Time 2 within groups for the Control and Utility groups. Security is also different between Time 1 and Time 2 for the Control group. The amount of change between Time 1 and 2 is more important. The amount of change between Time 1 and Time 2 is significantly different between groups for the motivational types Power and Tradition.
These differences are only meaningful in the context of all the analyses. To support hypotheses these differences and changes should be reflected in other changes to value ratings and the distribution of value orientation types. This is not the case.

The strongest evidence for a meaningful change is the difference between groups on the Self-transcendence dimension at Time 2. The Morality group does shift from a positive to a negative score on the self-transcendence dimension. This shift is not reflected by a significant difference in the distribution of value orientation types for the Morality group. Although the percentage of subjects who changed value orientation types is highest for the Morality group, this difference is not statistically significant. Additionally, the amount of change on the Self-transcendence value dimension is not significantly different between groups.

Hypotheses 1 and 2 would only be supported if the findings described above were accompanied by other changes consistent with SVT. This is not the case. If the shift on the Self-transcendence dimension was meaningful, then there should have been changes in the ratings of the other values associated with that dimension.

The most important information that rejects Hypotheses 1 and 2 are the non-significant findings of the Fisher-Freeman-Halton exact tests. The changes described above were not large enough to produce changes in the overall scheme of values as described by SVT. There is not enough evidence to accept Hypotheses 1 and 2. Based on this experiment, an object of consideration does not strengthen or weaken a person’s value orientation.
There is no evidence to support Hypothesis 3. For Hypothesis 3 to be true the Morality group would have to be significantly different than the other two groups on a variety of measures, especially on the Conservation and Self-transcendence dimensions. Although some differences were found between groups at Time 2, none of the motivational types or value dimension scores were significantly different between Time 1 and Time 2 for the Morality group. Most importantly, the distribution of value orientation types for the Morality group is not significantly different between Time 1 and Time 2.

If Hypothesis 3 were true, there should have been no changes in the Control and Utility groups, but changes in the Morality group. This was not the case and therefore Hypothesis 3 is not supported.
Chapter Overview

This chapter begins with a brief overview of the study followed by a discussion of the major findings from the study. The implications of these findings for the study of biotechnology and the study of values are explored next. The limitations of this study and ways these limitations can be addressed in future research are described. The chapter closes with a discussion of the theoretical contributions of this dissertation.

Overview of this Study

Based on the self-confrontation theory of Rokeach (1973, 1979), the social intuitionist theory of moral reasoning (Haidt 2007), Schwartz's Value Theory (1992), and the work of Bardi (et al. 2009), and Maio (2010) on value priming and value change, this dissertation proposes a previously unidentified role of perceiving a moral component to an object of consideration as activating values in the process of consideration. This relationship would explain why values are associated with decision making at some times for some subjects, but not consistently for all subjects at all times. This dissertation hypothesized that values and values orientations will be strengthened when a values decision is in alignment with the dominant values orientation of the subject (Hypothesis 1), values and values orientations will be changed when a values decision is in conflict with the dominant values orientation of the subject (Hypothesis 2), and only for
decisions where the subject perceives a moral component to be present will the decision making process affect the values orientation of the subject (Hypothesis 3).

Both Schwartz and Rokeach claim to have supported hypotheses similar to Hypothesis 1 using different methodologies (Schwartz 2005b, Rokeach 1973). Their studies were conducted using instruments that have demonstrated good validity and reliability, but their studies did not account for the contextual variables I have suggested are important for explaining change or variability in values. If the important contexts identified in this chapter are included as variables to be controlled or manipulated, then the importance of the contextual variables manipulated will be accepted or rejected. Rokeach and his colleagues (Rokeach & Cochrane 1972, Rokeach 1973, Greenstein 1976, Grube et al. 1977, Greenstein 1989, Grube et al. 1994) found support for a hypothesis related to Hypothesis 2 in his studies that he explained as the result of "self-confrontation." Schwartz also has tested a similar hypothesis using cross-national data to judge the effects of the changing status of women on the values orientations of men and women (Schwartz & Rubel 2005, Schwartz & Rubel-Lifschitz 2009). Both of these approaches used control groups, but did not consider all of the contexts identified as important in this chapter. Hypothesis 3 was not supported which means that the moral component of a decision does not influences values as Rokeach's theory of self-confrontation suggests.
Interpretation of Findings

There was no support for the hypotheses based on the sample of students I used. There were no statistically significant differences between the Control group, the Morality group, and the Utility group at Time 1. This is true for statistical analysis using Chi-squared, Fischer's exact test, ANOVA, Student’s t-tests, and Monte Carlo simulations confirming those tests. Values were not strengthened, weakened, or changed. Additionally, values and value orientation are not predictors of perceptions of a moral component to biotechnology.

Although it is possible the lack of association between values and perceptions of biotechnology are due to some quality specific to biotechnology, this is doubtful and casts doubt on the usefulness of values as an explanatory concept in social theory building. All of the subjects in this experiment had their values made salient by completing the SSVS before being asked any other questions in the questionnaire. If a person’s values do affect their perceptions and judgments, then one would expect there to be some association between values and attitudes. None was found.

The subjects in this study did not display differences in value orientations associated with any of the variables meant to identify the role of context in producing homogeneous value orientations within groups. This group of subjects also did not display strong value orientations in any particular direction. This homogeneity makes supporting or rejecting Hypotheses 2 and 3 difficult. There was much variation, but no clearly defined groups. When grouped using scores
on the Conservation and Self-transcendence dimensions, none of the three groups were statistically different from the others. Additionally, none of the four value orientation types displayed a strong cluster or grouping. Many of the subjects in each value orientation type were close to the border of another value orientation type. These groups did not grow stronger or weaker in their scores in a meaningful way.

*At least for this group of subjects*, values do not appear to be a useful construct for understanding social phenomena. In this study all of the subjects were undergraduate students at a public university and were all recruited from courses in sociology, crime and deviance, psychology, and English. It is possible that this group is relatively homogenous in terms of: 1) factors which affect values orientations, 2) views about biotechnology, and 3) general demographic variables. It is also possible that this group is different from groups of people who are not undergraduate students, attend a different type of institution, or live in another part of the country.

To better understand what these findings mean let’s consider a hypothetical situation that connects these variables. Paul is a 43 year-old father of two. He has a high school education and works as a meter reader for the local power company. His parents both worked at a factory that assembles marine electronics before they retired. He is a devout Christian and attends services regularly. The main goals in Paul’s life are to send his children to college and to enjoy a comfortable retirement. Paul spends most of his free time socializing with members of his bowling league. Paul takes the SSVS and gives ratings to the ten motivational types shown in the table and figures below.
Table 19. Value Ratings of Paul and Eunice.

<table>
<thead>
<tr>
<th></th>
<th>Raw scores</th>
<th>Ipsatized scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paul</td>
<td>Eunice</td>
</tr>
<tr>
<td>Power</td>
<td>6</td>
<td>-1</td>
</tr>
<tr>
<td>Achievement</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Hedonism</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Stimulation</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Self-Direction</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Benevolence</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Universalism</td>
<td>-1</td>
<td>6</td>
</tr>
<tr>
<td>Tradition</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Conformity</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Security</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Personal mean for ipsatization</td>
<td>4.2</td>
<td>3.5</td>
</tr>
<tr>
<td>Conservation Dimension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Transcendence Dimension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value Orientation Type</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Eunice is single, 19 years-old, and attends a public university in the suburbs of a major metropolitan area. Her parents describe themselves as “free spirits.” They are unmarried, but
have been a stable, monogamous couple for 24 years. Eunice intends to join the Peace Corps after graduation. Then she plans to go to medical school. Her ultimate goal is to work as a general practitioner in an underserved community. Religion has never played an important role in Eunice’s life, but she does consider herself a very spiritual person. She does not plan to have children. She spends much of her free time working with the local chapter of Habitat for Humanity. Eunice takes the SSVS and gives the ratings to the ten motivational types as shown in the table above.

Paul and Eunice are about as different as they can be in terms of their values. They are also very different in terms of age, gender, education, religious beliefs, and goals. One could even say their values are opposed to each other. Their values also are consistent with what we know about them as people. The findings in this study tell us that these differences in values tell us nothing about how Eunice and Paul view biotechnology. More importantly, their values do not tell us whether they believe that decisions about biotechnology should be made from a morality or utility perspective. This study also suggests that their value orientations are not the product of their social locations. If we took a sample of Paul’s bowling league and Eunice’s chapter of Habitat for Humanity, administered the SSVS to them and looked at the results, there should not be a statistically significant difference between those two groups. The value orientations of Paul, Eunice, and their social groups tell us nothing useful about them from a sociological perspective.

Furthermore, based on the findings in this dissertation we cannot make any predictions about what Paul, Eunice, or the social groups they belong to might find to be moral or immoral. Their values do not predispose them to see a particular issue as primarily a question of morality or
utility. And if they do perceive there to be moral implications to an issue, their values will not be activated by that perception.

Let’s return to Paul’s bowling league and Eunice’s chapter of Habitat for Humanity to better understand the implications of these findings. Although Paul’s value orientation is strong in the conservation dimension and weighted more in the direction of self-enhancement than self-transcendence, we would probably find that this was not the case for his bowling league as a group. These findings lead us to believe that even if Paul’s bowling league appeared to be very homogeneous (similar backgrounds, religiosity, income, education), the group would not have a shared value orientation. In fact, one would expect a wide range of value priorities and value orientations. The same would be true of Eunice’s friends at Habitat for Humanity.

Additionally, when these two groups are compared one would not expect to see statistically significant differences between the two groups in terms of their values as measured by the SSVS and value orientation types derived from the SSVS.

This is exactly the opposite of what most people would think to be the case and is certainly contrary to what we are led to believe from the personality and social psychology literature on values using SVT. Other studies have found significant differences between different types or groups of people in terms of their values and value orientations. Again, it is possible that different types of groups will show greater or lesser internal consistency in values. The subjects in this study may be special or unusual in this respect. It is also possible that some other variable or set of variables which were not measured are connected to value orientation.
However, if we accept the premise that university students are legitimate test subjects for studying social psychological phenomena which are fundamental or important for explaining and predicting human behavior, then we must accept the conclusion that values do not have enough of an effect in psycho-social processes to be meaningful for sociological theory building.

The finding that the value of Power increased for those subjects who did perceive there to be a moral component to biotechnology is contrary to what is predicted by the theories I used in designing this study. This provides new information about the ways that morality operates. The theories I discussed in Chapter Two suggest that there is a connection between moral reasoning and prosocial orientation. This study suggests that moral reasoning can activate a shift toward a proself orientation. If something like biotechnology is perceived as a greater threat to the individual than to others and this threat is a moral violation, then such a shift would be expected. Other related shifts would be expected as well, however, which was not the case. Taking all the evidence together as a whole, I believe this finding about Power is an example of Type I error and there was not a meaningful shift toward a more proself orientation in the Morality group.

The fact that there was little or no support for the hypotheses of this study may be evidence that values are very stable both within individuals and within groups. Therefore, values might be a useful construct to measure for comparing groups as they will not be affected by simply evaluating an object of consideration.
Limitations of this Study

Possible self-selection effects. The incentive for participation this study was earning extra credit in one or more of the courses the subjects were enrolled in during the fall or spring semester of the 2010-2011 academic year. Because the incentive is especially valuable to students who are not performing well academically, it is possible that there was a self-selection bias in favor of students who do not perform well academically. There is no reason to believe that students who are motivated to seek extra credit opportunities are different from students who don't in any meaningful way with respect to the values and issues in question. The overdispersion observed in many of the variables in this study (standard deviations greater than the means) suggests this is a very diverse and heterogeneous group of people. However, without being able to make a comparison to students who do not seek out extra credit opportunities, it is not possible to draw a conclusion about this matter.

Responding to a values survey as a cognitive task. One of the first subjects in the second wave of data collection was observed as he thought aloud about his assignment of numbers to the ten SSVS items. From what he said, it was evident that he did indeed understand that he could use all ten numbers. He also seemed to be agonizing over his choices. This suggests to me that although there were very probably subjects who only used the five numbers listed in the instructions with descriptions because they misunderstood the instructions, there were other subjects who understood the instructions, but chose to assign less than all ten numbers purposefully.
A number of subjects commented on the difficulty of assigning ratings to the values listed. Although the task of assigning rating to the ten items on the values survey would appear to the professional researcher to be simple and not time consuming, the actual load of the task may be great enough to interfere with later cognitive tasks. I observed that subjects generally seemed very comfortable completing the SSVS at the second meeting. I doubt this is because subjects remembered their responses from the first meeting. A few subjects asked me during debriefing if I was studying memory, although they had read and signed the debriefing form that explained I was studying values. Some subjects asked me if they could contact me at a later date to find out how similar their responses were at the two times which suggests to me they did not remember their responses from the first meeting. The issue of cognitive load when completing a values survey and its influence on other survey responses and experimental outcomes deserves further study. Research based on Schwartz’s Value Theory utilizing the SVS, SSVS, and Portrait Values Questionnaire is gaining popularity in the field of psychology. My experience with the SSVS suggests that even an instrument with a small number of items can engage experimental subjects in a mental process which they find very challenging.

It is also possible that subjects could be confused in terms of their value orientation. This would not be surprising. Other research suggests that the developmental stage most college undergraduates are experiencing is a time when their value orientation is in flux. Strange results on a values survey might be evidence of this formational or transformational developmental
process. This may also be why the Portrait Values Questionnaire is considered more reliable when studying subjects in this particular developmental stage (Schwartz et al. 2001).

**Implications**

If value orientations were strong predictors of attitudes or behaviors, then the policy implications are obvious. This does not appear to be the case. There are implications to the findings and non-findings in this study.

One implication is that values may not play the role that some believe exists and is reflected in a "values voters" phenomenon. This returns to the idea that values may be more justificatory than motivational- as discussed in relation to morality and moral reasoning. I do believe that the findings of this study support the idea that persuading a group of people there is a moral component to an object of consideration is more likely to activate some motivations other than those represented on the SSVS. Values may be part of a web of interconnect variables which activate, deactivate, amplify, or attenuate each other. If this is so, then values do not deserve a central place in social theory building. Sociology can safely ignore values as a meaningful construct.

People may say that their values are important to them and they may state specific connections between their values and their attitudes, beliefs, and behaviors, but if those connections are
justificatory and not motivational, then does that mean there are no policy implications to values? I think not. The justifications people give are important for social reasons even if they do not give an accurate picture of the psychological processes behind those justifications. If there is a need to be consistent in one's public statement and behaviors, then the justifications people give could be predictors of attitudes, beliefs, and behaviors after the justification has been made.

Again, longitudinal study focused on a particular topic is required to test this. I have argued that values are important for sociological reasons, not just psychological reasons. Values provide a way for people to align themselves with others and help the group negotiate shared meanings. How do I feel about X? I will look around myself to the others in my group, in my vicinity, for clues as to how others feel and then I align myself accordingly.

Even the studies which show the power of social pressure and group membership on behaviors such as Milgram's punishment experiments, Sherif's norms experiments, and Latane and Darley's bystander effect work also show that those effects do not completely determine behaviors. Are there variables which predict or explain which subjects will refuse to follow orders to dole out extreme punishments, maintain that they believe something to be the case even when facing uniform opposition, or will stop and offer help even when there is a strong diffusion of responsibility effect.
I did not make a prediction about what values would be activated by the stimulus in this experiment because I do not believe available theories pertaining to this topic make any clear suggestions as to what to expect. I thought there would be some other relationships in the intervening and control variables which would shed light on this, but that was not the case. Again, perhaps this group is simply too homogeneous for such effects to show up.

**Association of Religiosity to Perceptions of Biotechnology and Values**

The finding that religiosity was associated with perceiving a moral component to biotechnology make sense in some ways, but not in others. The only variables which were associated with the perception of a moral component to biotechnology were related to religion and spirituality. All of the subjects who described themselves as “deeply religious” were in the Morality group and all of the subjects in the Morality group said they believe in God. If values are important motivations for people, then one would expect there to be some pattern to the ratings given on the SSVS for a group of very religious or deeply religious people. Admittedly, in his early work on values Schwartz did not find evidence for spirituality as a motivational type. Still, it seems as if there should be some connection between religiosity and values. For instance, it makes sense that as a group, people who are religious would value Tradition, Conformity, Universalism, and Benevolence over Power, Hedonism, and Achievement. In the case of this experiment, the Morality group scored lower on the Self-transcendence value dimension than the other two groups.
At face value, there would seem to have to be an association between values and religiosity. Even though Schwartz and Bilsky did not find evidence for a "Spirituality" value type, most of the ten value types in the Schwartz model have religious implications to my way of thinking.

Universalism and benevolence may be positively associated with religiosity- especially in a Judeo-Christian culture like the United States. Hedonism and stimulation may be negatively associated with religiosity- especially in a culture with such strong Calvinist roots as is the case for the U.S. The Schwartz model suggests that positive associations for these four value types will be associated with negative associations for the values Power and Self-Direction and positive associations for the values Security, Tradition, and Conformity. This study did not find any of these connections or associations.

Making connections between micro and macro level variables is difficult. This study has done little to illuminate these connections. What I did learn are some things that do not connect the micro and macro. At least for this group, demographic variables were not associated with values orientations. Values are not predictors of attitudes. Values are not activated by moral reasoning as predicted.

From a policy and governance point of view, morality is an important component of public opinion. In this study it was not the case that a group of people have different moral view points,
but that different people within a group do not see morality as even being applicable to the same thing(s). For something as important as morality it is surprising that there should be a lack of consistency within a group in this area. Making arguments for or against policy or governance decisions based on morality may not produce the effect desired. If a portion of the audience doesn't perceive there to be a moral component to the issue, they may "tune out" the message. Attempts to persuade based on moral arguments could backfire on the persuader.

Theoretical Contributions

Despite the limitations due to the homogeneity of the subjects in this study, that homogeneity also leads to one of the important theoretical contributions of this dissertation. The shared context of being a college student appears to overshadow other contexts (with one exception) in terms of values and decision making. The similarities between subjects in terms of age, education, educational attainment of parents, science knowledge, science and math courses taken, and science optimism are striking.

The variables which do not fit this pattern are political orientation and religiosity/spirituality, and then only if the data is examined in a very specific way. When I consider the subjects in this study as a whole, there is no obvious polarity suggesting that there are subgroups within this group. Both political orientation and religiosity/spirituality are distributed around the least polar categories. The presence of subgroups would have produced a “clumps” around the more definitive statements of belief such as “I believe there is a God” or “I do not believe in any type
of life force or spirit.” When the subjects in the treatment group are examined in terms of their perception of a moral component to biotechnology, the Morality group was more conservative and more religious.

The most important contribution of this dissertation is identification of political orientation and religiosity/spirituality as associated with the variables of interest discussed above. Because of the limitations of this study, the nature of this association is unclear. One would expect political orientation and religiosity/spirituality to be strongly associated with certain values or value orientations. That was not the case in this study. It appears there is a connection between political orientation, religiosity/spirituality, values, and morality, but this connection is very complex. Based on the work presented in this dissertation, I am more hesitant to make predictions about attitudes, beliefs, and behavior founded on statements about political orientation or religiosity/spirituality than I was in the past. Even types of group identification which people report as being important, the mechanisms connecting these identifications to attitudes, beliefs, and behaviors are too complex to make clear predictions about how these factors interact.

Future Work

Psychology and sociology appear to be on very different tracks with respect to values. In psychology, Schwartz’s Values Theory has inspired a wave of research on values during the last twenty years. The concept of values has almost completely disappeared from the sociology literature during the same time period. I expect there will be a conversation between these two
literatures eventually. Psychologists working on values will likely become more interested in sociological topics and variables. I also expect sociology will not see a resurgence in interest in values research.

I doubt I will conduct any future research on values. Although the values literature in psychology is interesting, values do not appear to have any effect on sociological phenomena. I have argued that values could be a useful addition to the conceptual tool box of sociological theory. This dissertation casts doubt on that assertion. Simple relationships between traits or characteristics and behaviors are obviously desirable for social theory building. The world is a “messy” place, however. Eliminating concepts and relationships which may be attractive, but do not provide explanatory power is the first step toward making sense of this messy world.
BIBLIOGRAPHY


Bilsky, Wolfgang., & Marieke Koch. 2000. On the content and structure of values: universals or methodological artefacts?: Paper presented at the Fifth International Conference on


Baton Rouge, LA: Louisiana State University.


*RISORSA UOMO* 2.


APPENDIX A: The Short Schwartz Values Survey
Personal Values

Instructions:
Please ask yourself: "What values are important to ME as guiding principles in MY life, and what values are less important to me?" There is a list of values below. These values come from different cultures and have been identified as important to people around the world. In the parentheses following each value is an explanation that may help you to understand its meaning.

Your task is to rate how important each value is for you as a guiding principle in your life. Use the rating scale below:

-1 = Against or opposed to your principles.
0 = This principle is not important at all to you; Not relevant as a guiding principle for you.
4 = An important guiding principle for you.
7 = Very important as a guiding principle in your life.
8 = Of supreme importance as a guiding principle in your life.

The higher the number, the more important that value is as a guiding principle in YOUR life.

For each value select the number which best describes the importance of that value to you, personally.

1. BEFORE YOU BEGIN read through the list of values.
2. THEN look through the list of values again and assign the number 8 to the value that is MOST IMPORTANT to you as a guiding principle in YOUR life.
3. THEN look through the list of values again and assign the number -1 to the value which you would say is against your principles. If you do not feel that any of these values are against your principles, then choose the one which is of least importance to you personally and assign the number 0 or the number 1 to that value.
4. THEN assign numbers to the 8 remaining values. Try to use all of the numbers between -1 and 8. Use whole numbers only. Do not use fractions- i.e. 4½, 3.25, etc. Obviously, you will need to use some numbers more than once. You may use -1 and 8 more than once, but only when you truly cannot decide between two values which are either opposed to your principles or are of supreme importance as guiding principles in your life.
5. Try to use all of the whole numbers between -1 and 8 in your ratings (-1, 0, 1, 2, 3, 4, 5, 6, 7, 8).
6. NOW, please turn to the next page and assign numbers to the values on the list.
Personal Values

Rating Scale:

8 = Of supreme importance as a guiding principle in YOUR life.
7 = Very important as a guiding principle in your life.
4 = An important principle for you.
0 = This principle is not important at all to you; Not relevant as a guiding principle for you.
-1 = Against or opposed to your principles.

TRY TO USE ALL OF THE WHOLE NUMBERS BETWEEN -1 AND 8 IN YOUR RATINGS

(-1, 0, 1, 2, 3, 4, 5, 6, 7, 8)

LIST OF VALUES


_____ 2. Achievement: Success, capability, ambition, influence on people and events.


_____ 4. Stimulation: Being daring, to have a varied and challenging life, to have an exciting life.

_____ 5. Self-Direction: Creativity, freedom, curiosity, independence, choosing one’s own goals.

_____ 6. Universalism: Broadmindedness, beauty of nature and arts, social justice, a world at peace, equality, wisdom, unity with nature, environmental protection.


_____ 8. Tradition: Respect for tradition, humbleness, accepting one’s portion in life, devotion, modesty.


APPENDIX B: Base Questionnaire

The following pages are the questionnaire that was administered to the control group. The Short Schwartz Values Survey was inserted after the cover page. For the treatment group additional pages were added between the items asking about belief in God and thinking about the meaning of life and before the asking about personal educational attainment.
Thank you for taking this survey!
This survey is part of my dissertation research.
You answers cannot be connected to you as an individual in any way.
You do not have to answer any questions you do not wish to answer.

However, we do request that if your response would best be described as "I don't know," then please mark this option. This is useful information for the purposes of this survey.

For more information about this survey please feel free to contact:

Craig Macmillan
cwmacmil@gmail.com

INSTRUCTIONS:
Please answer the questions in the order presented.
Please mark the response that best represents your views, feeling, perceptions, or knowledge.
Indicate your response by making an "X" in the box or circling your response.
Thank you again for your participation in this survey.
The following statements are a quiz about science. For each of the following statements, please answer if it is true or false.

If you don't know the answer to the question, please say so.

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Sun goes around the Earth.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>The center of the Earth is very hot.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>The oxygen we breathe comes from plants.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>Radioactive milk can be made safe by boiling it.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>Electrons are smaller than atoms.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>The continents on which we live have been moving for millions of years and will continue to move in the future.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>It is the mother's genes that decide whether a baby is a boy or a girl.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>The earliest humans lived at the same time as the dinosaurs.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>Antibiotics kill viruses as well as bacteria.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>Lasers work by focusing sound waves.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>All radioactivity is man-made.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>Human beings, as we know them today, developed from earlier species of animals.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>It takes one month for the Earth to go around the Sun.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
</tbody>
</table>
The following are some more statements people have made about science, technology, or the environment. For each statement, please indicate how much you agree or disagree with the statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Tend to agree</th>
<th>Neither agree or disagree</th>
<th>Tend to disagree</th>
<th>Strongly disagree</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only by applying the most advanced technologies can our economy become more competitive.</td>
<td>SA</td>
<td>TA</td>
<td>NAD</td>
<td>TD</td>
<td>SD</td>
<td>DK</td>
</tr>
<tr>
<td>Scientific and technological progress will help to cure illnesses such as AIDS, cancer, etc.</td>
<td>SA</td>
<td>TA</td>
<td>NAD</td>
<td>TD</td>
<td>SD</td>
<td>DK</td>
</tr>
<tr>
<td>The benefits of science are greater than any harmful effects it may have.</td>
<td>SA</td>
<td>TA</td>
<td>NAD</td>
<td>TD</td>
<td>SD</td>
<td>DK</td>
</tr>
<tr>
<td>Some numbers are especially lucky for some people.</td>
<td>SA</td>
<td>TA</td>
<td>NAD</td>
<td>TD</td>
<td>SD</td>
<td>DK</td>
</tr>
<tr>
<td>Science and technology are responsible for most of the environmental problems we have today.</td>
<td>SA</td>
<td>TA</td>
<td>NAD</td>
<td>TD</td>
<td>SD</td>
<td>DK</td>
</tr>
<tr>
<td>Food made from genetically modified organisms is dangerous.</td>
<td>SA</td>
<td>TA</td>
<td>NAD</td>
<td>TD</td>
<td>SD</td>
<td>DK</td>
</tr>
<tr>
<td>Most people think that “all things considered” science and technology will not make our lives healthier, easier, or more comfortable.</td>
<td>SA</td>
<td>TA</td>
<td>NAD</td>
<td>TD</td>
<td>SD</td>
<td>DK</td>
</tr>
</tbody>
</table>
How often, if at all, do you think about the meaning and purpose of life?

Mark box with “X”

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Often</td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td></td>
</tr>
<tr>
<td>Rarely</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td></td>
</tr>
<tr>
<td>Don't know</td>
<td></td>
</tr>
</tbody>
</table>

Which of these statements comes closest to your beliefs?

Mark box with “X”

<table>
<thead>
<tr>
<th>Statement</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe there is a God.</td>
<td></td>
</tr>
<tr>
<td>I believe there is some sort of spirit or life force.</td>
<td></td>
</tr>
<tr>
<td>I don't believe there is any sort of spirit, God or life force.</td>
<td></td>
</tr>
<tr>
<td>Don't know</td>
<td></td>
</tr>
</tbody>
</table>
ITEMS FOR TREATMENT GROUP APPEARED HERE
What is the highest level of education you personally have achieved?

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Mark box with “X”</th>
</tr>
</thead>
<tbody>
<tr>
<td>No formal schooling</td>
<td></td>
</tr>
<tr>
<td>Some formal schooling, but less than a high school diploma or GED</td>
<td></td>
</tr>
<tr>
<td>High school diploma or GED</td>
<td></td>
</tr>
<tr>
<td>Some college (community or four-year institution)</td>
<td></td>
</tr>
<tr>
<td>Associate’s degree (completed community college, i.e. A.A.)</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s degree (completed four-year institution, i.e. B.A., B.S.)</td>
<td></td>
</tr>
<tr>
<td>Some graduate education beyond a Bachelor’s degree</td>
<td></td>
</tr>
<tr>
<td>Graduate or professional degree</td>
<td></td>
</tr>
<tr>
<td>Don’t know or refuse to answer</td>
<td></td>
</tr>
</tbody>
</table>

Regardless of where you took the class (high school, college, graduate study), please indicate if you have taken courses in any of the following areas.

<table>
<thead>
<tr>
<th>Subject</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algebra</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Geometry</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Statistics</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Biology</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Physics</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Genetics</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Physiology</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Ecology</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>What is the highest level of education your mother has achieved?</td>
<td>Mark box with “X”</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td>--------------------</td>
<td></td>
</tr>
<tr>
<td>No formal schooling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some formal schooling, but less than a high school diploma or GED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma or GED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college (community or four-year institution)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Associate’s degree (completed community college, i.e. A.A.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor’s degree (completed four-year institution, i.e. B.A., B.S.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some graduate education beyond a Bachelor’s degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate or professional degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t know or refuse to answer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What is the highest level of education your father has achieved?</th>
<th>Mark box with “X”</th>
</tr>
</thead>
<tbody>
<tr>
<td>No formal schooling</td>
<td></td>
</tr>
<tr>
<td>Some formal schooling, but less than a high school diploma or GED</td>
<td></td>
</tr>
<tr>
<td>High school diploma or GED</td>
<td></td>
</tr>
<tr>
<td>Some college (community or four-year institution)</td>
<td></td>
</tr>
<tr>
<td>Associate’s degree (completed community college, i.e. A.A.)</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s degree (completed four-year institution, i.e. B.A., B.S.)</td>
<td></td>
</tr>
<tr>
<td>Some graduate education beyond a Bachelor’s degree</td>
<td></td>
</tr>
<tr>
<td>Graduate or professional degree</td>
<td></td>
</tr>
<tr>
<td>Don’t know or refuse to answer</td>
<td></td>
</tr>
</tbody>
</table>
What year were you born? 

Mark box with “X”

Extremely liberal
Very liberal
Somewhat liberal
Neither liberal nor conservative
Somewhat conservative
Very conservative
Extremely conservative
My political orientation cannot be described in terms of liberal or conservative
Don't know
<table>
<thead>
<tr>
<th>How would you describe your religious beliefs?</th>
<th>Mark box with “X”</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am deeply religious.</td>
<td></td>
</tr>
<tr>
<td>I am religious.</td>
<td></td>
</tr>
<tr>
<td>I am very spiritual, but not deeply religious.</td>
<td></td>
</tr>
<tr>
<td>I am somewhat spiritual, but not religious.</td>
<td></td>
</tr>
<tr>
<td>I am an atheist.</td>
<td></td>
</tr>
<tr>
<td>I am neither deeply religious nor very spiritual.</td>
<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How would you describe your religious practices?</th>
<th>Mark box with “X”</th>
</tr>
</thead>
<tbody>
<tr>
<td>I attend worship services regularly.</td>
<td></td>
</tr>
<tr>
<td>I do not attend worship services regularly.</td>
<td></td>
</tr>
<tr>
<td>I rarely if ever attend worship services.</td>
<td></td>
</tr>
<tr>
<td>I do not attend formal religious services, but I make time in my life for spiritual experiences.</td>
<td></td>
</tr>
<tr>
<td>I do not attend formal religious services, nor do I make time in my life for spiritual experiences.</td>
<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What is your gender?</th>
<th>FEMALE</th>
<th>MALE</th>
<th>DECLINE TO ANSWER</th>
<th>GENDER NON-CONFORMING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C: Questionnaire for the Treatment Group

The following pages were administered to the treatment group, but not the control group. These additional pages were added between the items asking about belief in God and thinking about the meaning of life and before the asking about personal educational attainment in the basic questionnaire.
Now we would like to ask you questions about biotechnology and genetic engineering. For the rest of the survey we will use the terms “modern biotechnology” in a broad sense to include things like genetic engineering and genetically modified foods.

The following statements are a quiz about modern biotechnology. For each of the following statements, please answer if it is true or false. If you don't know, please say so.

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yeast for brewing beer or making wine consists of living organisms.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>Ordinary tomatoes do not contain genes, while genetically modified tomatoes do.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>The cloning of living things produces genetically identical copies.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>By eating a genetically modified fruit, a person's genes could also become modified.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>It is possible to find out in the first few months of pregnancy whether a child will have Down's Syndrome.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>Genetically modified animals are always bigger than ordinary ones.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>More than half of human genes are identical to those of a chimpanzee.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>It is not possible to transfer animal genes into plants.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>Human cells and human genes function differently from those in animals and plants.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>Embryonic stem cells have the potential to develop into normal humans.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
</tbody>
</table>
For the following statements please indicate whether you have ever done this activity and, if so, how frequently you have engaged in the activity.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mark box with “X”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talked about biotechnology with another person before today.</td>
<td></td>
</tr>
<tr>
<td>Searched the internet to get information about biotechnology.</td>
<td></td>
</tr>
<tr>
<td>Attended a public meeting about biotechnology.</td>
<td></td>
</tr>
<tr>
<td>Heard about biotechnology on the radio or television.</td>
<td></td>
</tr>
<tr>
<td>Read newspaper stories about biotechnology.</td>
<td></td>
</tr>
</tbody>
</table>

Which of the following views is closest to your own?

<table>
<thead>
<tr>
<th>View</th>
<th>Mark box with “X”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decisions about new technology should be based primarily on scientific evidence about the risks and benefits involved.</td>
<td></td>
</tr>
<tr>
<td>Decisions about new technologies should be based primarily on the moral and ethical issues involved.</td>
<td></td>
</tr>
</tbody>
</table>
Have you ever heard of genetically modified foods? Genetically modified foods are made from plants or microorganisms that have had one or more characteristics changed by altering their genes. For example, a plant might have its genes modified to make it more resistant to a particular plant disease, to improve its food quality, or to help it grow faster.

<table>
<thead>
<tr>
<th>How familiar would you say you are with genetically modified foods?</th>
<th>Mark box with “X”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very familiar</td>
<td></td>
</tr>
<tr>
<td>Somewhat familiar</td>
<td></td>
</tr>
<tr>
<td>Not very familiar</td>
<td></td>
</tr>
<tr>
<td>Unfamiliar</td>
<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td></td>
</tr>
</tbody>
</table>
### How confident would you say you are in the safety and regulatory approval system governing genetically modified foods?

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very confident</td>
</tr>
<tr>
<td>Fairly confident</td>
</tr>
<tr>
<td>Not very confident</td>
</tr>
<tr>
<td>Not at all confident</td>
</tr>
<tr>
<td>Don't know</td>
</tr>
</tbody>
</table>

### Overall, which of the following best describes your views about genetically modified foods?

<table>
<thead>
<tr>
<th>Option</th>
<th>Mark box with “X”</th>
</tr>
</thead>
<tbody>
<tr>
<td>I approve of genetically modified foods, as long as the usual levels of government regulation are in place.</td>
<td></td>
</tr>
<tr>
<td>I approve of genetically modified foods if they are more tightly regulated.</td>
<td></td>
</tr>
<tr>
<td>I do not approve of genetically modified foods except under very special circumstances.</td>
<td></td>
</tr>
<tr>
<td>I do not approve of genetically modified foods under any circumstances.</td>
<td></td>
</tr>
</tbody>
</table>
Some people feel very strongly about the issues concerning modern biotechnology that we have been talking about in this survey. Other people do not feel strongly at all about these things. What about you?  

Overall, how strongly would you say you feel about these things? 

Mark box with “X” 

<table>
<thead>
<tr>
<th>Extremely strongly</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Very strongly</td>
<td></td>
</tr>
<tr>
<td>Somewhat strongly</td>
<td></td>
</tr>
<tr>
<td>Not very strongly</td>
<td></td>
</tr>
<tr>
<td>Not at all strongly</td>
<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td></td>
</tr>
</tbody>
</table>
Do you agree or disagree with the following statement?

“Regardless of how a person feels about modern biotechnology, this is a moral question and morality plays a role in deciding what should be done.”

Mark box with “X”

<table>
<thead>
<tr>
<th>Agree</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td>Neither agree or disagree</td>
<td></td>
</tr>
<tr>
<td>Don't know</td>
<td></td>
</tr>
</tbody>
</table>
Do you agree or disagree with the following statement?

“Specifically concerning food biotechnology, regardless of how a person feels about food biotechnology, this is a moral question and morality plays a role in deciding what should be done.”

Mark box with “X”

<table>
<thead>
<tr>
<th>Agree</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td>Neither agree or disagree</td>
<td></td>
</tr>
<tr>
<td>Don't know</td>
<td></td>
</tr>
</tbody>
</table>