

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

ENVIRONMENTAL RESOURCE MANAGEMENT PROGRAM

WHAT MAKES PENN STATE STUDENTS GO GREEN?
EXAMINING 'MOST SIGNIFICANT CHANGE' EXPERIENCES IN INDIVIDUALS'
SUSTAINABILITY PERCEPTIONS

FRANCESCA RAMACCIOTTI
SPRING 2017

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Environmental Resource Management
with honors in Environmental Resource Management

Reviewed and approved* by the following:

Theodore R. Alter
Professor of Agricultural, Environmental, and Regional Economics
Thesis Supervisor

Robert D. Shannon
Associate Professor of Agricultural and Biological Engineering
Honors Adviser

* Signatures are on file in the Schreyer Honors College.

ABSTRACT

The goal of this research project is to examine what has had the most significant influence on sustainability perceptions and behaviors of students at Penn State University. While the university offers a variety of sustainability-related courses, extracurricular activities, and operations around campus, their true impact on students is not yet fully understood. Multiple theoretical perspectives, including Icek Ajzen's Theory of Planned Behavior, Intrinsic and Extrinsic Motivational Theory, and Schwartz's Integrated Value System, provided structures for developing and interpreting the research. Utilizing an interview protocol based on Rick Davies' Most Significant Change Theory and narrative inquiry theory, a group of ten sixth-semester and above students in the Community, Environment, and Development major were interviewed. Questions focused on changes in individualized perceptions with regard to sustainability, childhood influences on connections with the environment and civic engagement, effects on sustainable behavior, and specific experiences that have altered their perceptions most. The results obtained from the interviews offer insight into the current state of sustainability perceptions with a small group of environmentally-minded students at Penn State. With further research, including a broader range of students from across the university, recommendations would enhance current sustainability initiatives to more effectively influence Penn State students in their personal and professional lives upon graduation.

TABLE OF CONTENTS

LIST OF FIGURES	iv
ACKNOWLEDGEMENTS	v
Chapter 1 Introduction	1
Purpose.....	1
Significance.....	2
Research Objectives	3
Thesis Structure.....	4
Chapter 2 Literature Review	5
Sustainability.....	5
Sustainability in Higher Education	6
Sustainability at Penn State	7
Theoretical Perspectives.....	10
Ajzen’s Theory of Planned Behavior	10
Intrinsic and Extrinsic Motivation.....	14
Schwartz’s Integrated Value System.....	17
Chapter 3 Methodology	19
Overall Research Design.....	19
Sampling and Recruitment	21
Interview Protocol.....	24
Analysis.....	25
Strengths and Limitations	27
Chapter 4 Results	29
Overview	29
A Gradual Shift	30
The Meaning of Sustainability	32
Making Connections	33
Endless Possibilities and Future Potential.....	36
Noteworthy Observations.....	38
Relationships to Theoretical Perspectives.....	39
Ajzen’s Theory of Planned Behavior	39
Intrinsic and Extrinsic Motivation.....	43
Schwartz’s Integrated Value System.....	44
Chapter 5 Discussion and Implications.....	47
Chapter 6 Recommendations and Conclusions.....	53
Introduction.....	53

Recommendations54
Further Research54
Conclusion56
Appendix A Interview Protocol57
BIBLIOGRAPHY58

LIST OF FIGURES

Figure 1 Ajzen's Theory of Planned Behavior (Ajzen, 1991).....	11
Figure 2 Ryan and Deci's Self-Determination Continuum (Ryan & Deci, 2000)	15
Figure 3 Schwartz's Integrated Value System (Schwartz, 1996).....	17

ACKNOWLEDGEMENTS

I would first like to thank Dr. Ted Alter and Doug Goodstein for guiding me through this research process and helping me to design and execute a successful study. I would also like to thank everyone who participated in this research project, including Dr. Leland Glenna, Dr. Timothy Kelsey, and Dr. Katherine Zipp for helping me with the recruitment process as well as the students in the Community, Environment, and Development major that I interviewed. I would also like to thank my honors advisor, Dr. Robert Shannon, for helping me throughout my four years at Penn State. Finally, I would like to thank my family and friends, especially my parents, for supporting me throughout my entire education and especially during this thesis process.

Chapter 1

Introduction

Purpose

Over the past decade, sustainability has begun to play a much more significant role in society. Scientists have been outspoken in their emphasis of the impending threats of global climate change. Politicians have been forced to address laws and policies that consider automobile emissions, endangered species, and energy generation. Larger corporations have been gradually integrating sustainability into their acquisition of raw materials as well as their manufacturing processes. In a similar way, higher education institutions have recognized the importance of incorporating sustainability into the lives of their students and faculty. Everything from curriculum and extracurricular activities to new building construction and guest lecturers has begun to take on a sustainability viewpoint.

The primary focus of this research project is to investigate individual changes in perceptions of sustainability from students at The Pennsylvania State University. The environmental courses, sustainable organizations, and green initiatives currently in place at this institution could have a wide range of impact on students. Examining students' change in perception regarding sustainability will uncover a deeper understanding of what influences are having the greatest impact on those mindsets. Subjective norms in addition to individuals' values, attitudes, and motivations all play a significant role in shaping sustainability perceptions

and related behavioral outcomes. This research seeks to better understand these influences and how they have affected students' lives.

Significance

Penn State University, in coordination with the Sustainability Institute and a multitude of administration, faculty and staff, has increasingly emphasized the incorporation of sustainability-related initiatives into curriculum and extracurricular activities. Whether these programs and events are reaching a wide array of students and having an impact on their attitudes and behaviors is not yet fully known. In order for this university to influence all graduates in their professional and personal lives with regard to sustainability, the most impactful experiences should be identified. Once these influences are recognized, the attributes that made them so important to students can be pinpointed; those ideals can then be expanded to other programs so more students can have similarly impactful experiences. This research intends to highlight the stories and reflections of students at Penn State to identify transformative experiences, understand their impact on students, and gather information on how to improve sustainability initiatives in the future. Utilizing individualized accounts from students gives the research more comprehensive and thoughtful insight into students' perceptions of sustainability. Students will reveal first-hand, detailed accounts of the ultimate influencers on their personalized mindset. This qualitative data offers opportunities to delve deeper into specific courses, activities, and operations around the Penn State University campus that have the potential of affecting even more students.

Research Objectives

The underlying research objective in this project is determining individuals' change in their personal sustainability perceptions. In this sense, a perception of sustainability could be as simple as what characteristics define sustainability or if the concept is important enough to incorporate into their daily lives. Understanding what individuals think sustainability means, what purpose it has in their lives, and how that viewpoint has evolved is the primary research task. In addition to identifying changes in individuals' sustainability perceptions, this project also seeks to understand what factors led to this perception change as well as what consequences this mindset shift has had on the individual's life. The goals of this research are to better understand:

- changes in individuals' personal sustainability perception and the stories behind those changes
- individuals' own definition of sustainability
- how subjective norms and individuals' values, attitudes, and motivations affect an individuals' perception of sustainability
- what behavioral changes this shift in sustainability perception has caused within the individual
- what experiences, Penn State related or otherwise, have had the greatest influence on that individual's sustainability perception
- what experiences, Penn State related or otherwise, could have the greatest influence on other students' sustainability perceptions

Because this information will be self-reported, the perceptions and experiences identified will be reflective of what students found to cause the most growth within themselves. The

interview protocol within this research will correspond with these specific research objectives. The Most Significant Change Technique, in conjunction with narrative inquiry, was utilized during the interview process to gain a deeper understanding of these individuals' sustainability perceptions and to allow them an opportunity to tell their individualized story. Interview accounts were analyzed both individually and collectively for common trends as well as noteworthy experiences.

Thesis Structure

The following section of this thesis reviews some of the extensive literature available regarding sustainability and its role in higher education as well as the theoretical principles that were consulted to develop this research project. These include the Theory of Planned Behavior, the roles of Extrinsic and Intrinsic Motivations, and Schwartz's Integrated Value System. The research methodology and interview protocol developed in consultation with the Most Significant Change Technique and narrative inquiry will then be laid out. After the results of the interviews are presented, a discussion about their importance and implications will follow, including recommendations regarding educational and extracurricular initiatives for Penn State students, faculty, and staff. Finally, future directions that will result from this project, such as further research plans, will be discussed.

Chapter 2

Literature Review

Sustainability

Since the environmental movement began over forty years ago, the term sustainability has taken on a multitude of definitions. While sustainability has historically been closely associated with the conservation of the environment, more recently the term has incorporated the environment, society, and the economy into one interdisciplinary concept. Currently, the United States Environmental Protection Agency recognizes that human well-being is largely dependent on the natural environment. According to this organization, living sustainably is “to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations” (Learn About Sustainability, 2016). In a similar fashion, Penn State’s Sustainability Institute defines sustainability as “the simultaneous pursuit of human health & happiness, environmental quality, and economic well-being for current and future generations” (The Sustainability Institute, 2013). These definitions demonstrate quite similar ideals; however, each group and even every individual has their own meaning of the word sustainability, emphasizing what they find to be most important.

While sustainability definitions vary among organizations and institutions, it is clear that the ideas the word represents should be granted important consideration. As a product of the 2015 Millennium Summit, the United Nations released 17 sustainable development goals to transform the actions of all individuals. These goals seek to highlight the importance of people,

planet, prosperity, peace, and partnerships in achieving success (Assembly, 2015). The United Nations recognizes the significance of integrating these individualized concepts into intertwined and complex solutions. Ultimately, sustainability strives to reach a similar end; placing emphasis on the connections among the environment, society, and the economy helps individuals to understand problems people are facing around the world and develop more innovative solutions to address those issues.

Sustainability in Higher Education

Increasingly over the past decade, sustainability initiatives, both curriculum and extracurricular based activities, have become a major component of higher education institutions. Administrative leaders in colleges and universities across the country have come to realize that “higher education has a key role to play in the move toward a more sustainable world” (Barlett & Chase, 2013). Furthermore, students have begun to comprehend the role sustainability will play in their own futures. Those individuals who are college students today will be the business leaders, politicians, and policy makers that will make important decisions in the future. All students, not only those in environmental fields, should have a comprehensive understanding of the importance of the natural world and how the environment contributes to all aspects of society.

Historically, only those individuals who have displayed an interest in environmental issues or sustainability have experienced courses during their college career that center around sustainability. However, as climate change, habitat degradation, and species loss become more prominent issues in media and culture, more students have taken an interest in learning about

their role in the environment. Some schools have even started to mandate that in order to graduate from their university, students must take a class in environmental studies or social responsibility (Rowe, 2002). Other higher education institutions have not added a separate general education requirement for environmental science but rather attempted to “shift the dominant paradigm within the college’s curricula from nature as an unlimited set of resources to be used and conquered, to a paradigm of sustainable development and the ongoing challenge of creating a more humane and environmentally healthy future society” (Rowe, 2002). These initiatives allow students to gain an interdisciplinary education that will better prepare them to understand both the problems and solutions they will face in their careers.

Along with sustainability awareness and social responsibility, universities are also stressing the importance of civic engagement. They want to ensure they are producing graduates with a global environmental awareness in addition to a community-based outlook. Not only should students be helping to incorporate sustainability ideals in their careers but they should also be looking to assist local organizations in improving environmental quality. Volunteering for various organizations, voting in local and national elections, and simply educating oneself on topical issues are all important components of civic engagement.

Sustainability at Penn State

According to the Association for the Advancement of Sustainability in Higher Education STARS Report (Sustainability Tracking, Assessment, and Rating System), Penn State University has achieved a gold status when considering the following categories: institutional characteristics, academics, engagement, operations, planning and administration, and innovation

(Easterling et al., 2014). The report submitted on October 20, 2014 recognized 57 undergraduate and 2 graduate classes as sustainability-focused courses as well as 121 undergraduate and 10 graduate classes as those that include aspects of sustainability. Additionally, the report recognized 48 student organizations as student groups focused on sustainability. Employee and public engagement as well as dining facilities, building design, and transportation services all contributed to its sustainability rating as well. Since this gold rating was awarded in 2014, Penn State has continued to increase its sustainability initiatives around campus and associated student involvement.

A portion of these sustainability initiatives at Penn State can be attributed to the creation of the Sustainability Institute in 2013. This organization allows faculty, staff, and students to come together and incorporate sustainability into course curriculum, student organizations, and residence hall life through multiple outlets. For example, the Sustainable Communities Collaborative pairs student classes with community partners to reach their sustainability goals through semester-long projects. Additionally, the Eco-reps program places two individuals who show a passion for sustainability in each residence hall on campus to promote recycling and engage other students in sustainable campus initiatives. The Sustainability Institute has even created an intercollege minor in Sustainability Leadership with the hope of creating systems-level-thinkers that recognize the significance of integrating sustainability into their future career path. Students in the minor choose a track that focuses on one area of sustainability that interests them while developing the competencies necessary for creating a sustainable future. The minor also places importance on developing leadership qualities and having immersive experiences where students put what they learn in the classroom to real practice. Clearly, Penn State University, with the assistance of the Sustainability Institute, has demonstrated the importance of

incorporating sustainability into many aspects of its students' lives. (The Sustainability Institute, 2013)

Multiple majors at Penn State also incorporate the environment, community outreach, or other aspects of sustainability into its programming. One such major is Community, Environment, and Development, housed in the College of Agricultural Sciences. This interdisciplinary, social science major aims to prepare students to work on many of the problems occurring in society today. Students in the major chose one of three options: Community and Economic Development, Environmental Economics and Policy, or International Development. Because the program focuses on so many social, environmental, and development concerns, it has likely exposed students to a multitude of courses and experiences regarding sustainability. Thus, this research project chose to utilize students currently enrolled in the Community, Environment, and Development major as interview subjects. Not only do these students have a thorough understanding of sustainability and its role in society today, but they can also offer insight into what may affect other students around the university.

At any higher education institution, whether these sustainability advances take the form of greening the campus environment, interdisciplinary curriculum changes, or sustainability focused clubs and organizations, they all take steps to increase and improve the presence of sustainability for a university. The size and scope of these programs as well as their effectiveness at truly reaching students, faculty, staff, and administration across the university ultimately determines how successful they are. For Penn State, the question becomes, what aspects of its current sustainability education and outreach have had the biggest role in fostering individuals to continue those ideas outside the confines of this university?

Theoretical Perspectives

In order to better understand the reasoning behind certain perception and behavioral changes of the subjects, three theoretical perspectives were consulted. The perspectives of the individuals behind these concepts assist this research project in more fully developing a sound interview protocol. Furthermore, these theories offer evidence to support the analyses conducted as well as make broader conclusions with regard to their application in sustainability subject areas. Icek Ajzen's Theory of Planned Behavior, Intrinsic and Extrinsic Motivational theory, and Schwartz's Integrated Value System all provide sound structures in which the collected data was applied.

Ajzen's Theory of Planned Behavior

Many researchers have investigated the relationship between what someone thinks and what someone does; in other words, does an individual's attitude directly affect their behavior? Icek Ajzen's Theory of Planned Behavior examines this correlation and attempts to explain what factors contribute to an individuals' behavior. According to Ajzen, the following elements all influence planned behavior of an individual: attitude toward the behavior, subjective norms, perceived behavioral control, and intention (Ajzen, 1991). An attitude toward a behavior "refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" while a subjective norm refers to "perceived social pressure" to engage in that behavior (Ajzen, 1991). The factor of perceived behavioral control incorporates actual behavioral control as well as the perception towards that behavior; not only does one need the "resources and opportunities available" to perform the behavior but also the mindset to believe

they can complete the action (Ajzen, 1991). All three of these factors, attitudes toward a behavior, subjective norm, and perceived behavioral control, feed directly into an individual's intention, or likelihood, to participate in a behavior, as illustrated in Figure 1.

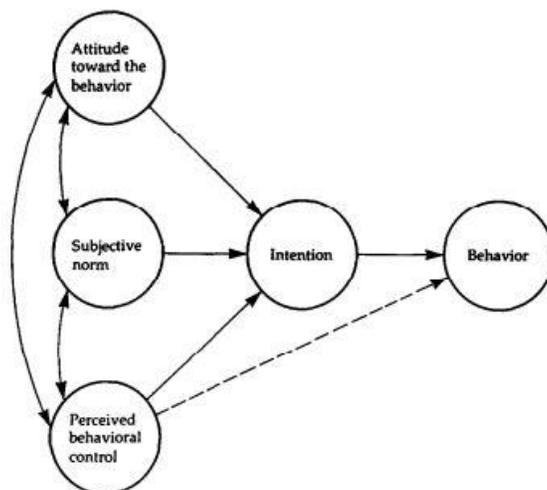


Figure 1 Ajzen's Theory of Planned Behavior (Ajzen, 1991)

The Theory of Planned Behavior has been used to explain a wide variety of behaviors individuals partake in, including predictions of effective entrepreneurial start-ups in Austria and Finland (Kautonen, van Gelderen, & Fink, 2015), successful attempts to quit smoking (Norman, Conner, & Bell, 1999), and short term weight loss in women (Palmeira, 2007). The Theory of Planned Behavior has even been applied to specific environmental behaviors; examples include buying organic foods in Finland (Tarkiainen & Sundqvist, 2005), predicting eco-friendly behaviors in high school students (de Leeuw, Valios, Ajzen, & Schmidt, 2015) and using individual beliefs to predict sustainable choices by supply chain managers (Swaim, Maloni, Henley, & Campbell, 2016). The extensive use of the Theory of Planned Behavior demonstrates its validity and application to a wide range of subject areas.

In the previously mentioned study about organic food purchases in Finland, researchers spent a week in a local hypermarket asking consumers about their purchases of organic bread and flour (Tarkiainen & Sundqvist, 2005). Customers were given a questionnaire to complete

that asked the following about both organic bread and organic flour: if they intend to buy the product in the near future, if they think that the purchase is reasonable, if people who are important to them think they should buy the product, if the price of the product is important, if personal health is a factor in the purchase, if the product is sufficiently available, and how often they buy the product (Tarkiainen & Sundqvist, 2005). Each question addressed some component of the Theory of Planned Behavior including intention, attitudes, subjective norms, and perceived control. In the analysis portion of the study, researchers correlated the responses to the statements with the frequency of purchase, or the behavior in question. The study concluded that the relationships between intentions and purchasing behavior as well as the one between subjective norms and attitudes were both significant. All other relationships were not found to be significant. Overall, this study demonstrates the versatility of the Theory of Planned Behavior as well as a practical execution of how researchers can study behavior and its related components. This study, like many others, also acknowledges that not all factors within the Theory of Planned Behavior may be significant when considering very specific behaviors. Even so, the theory can still be utilized to better understand the relationships among these factors and behaviors.

Sustainability behaviors in higher education institutions such as Penn State have recently become important components of the college student's lifestyle. For example, at Penn State, there is a campus-wide recycling and composting system, called Mobius, that all students, faculty, and staff are encouraged to understand and participate in. Similar sustainable-minded behaviors that are more common among college students include walking to class or using public transportation rather than driving one's personal vehicle, using reusable water bottles and coffee thermoses, taking reasonable shower lengths and conserving water when brushing one's teeth, and limiting food waste when eating in dining halls. All of these behaviors may seem like simple

tasks to complete; however, many individuals do not take the extra step to think about how their actions are affecting the environment. Using the Theory of Planned Behavior, these actions, that students choose to participate in or not, can be more thoroughly understood by looking at the different factors that go into the decision making process.

Within the Theory of Planned Behavior, each contributing factor (attitudes, subjective norms, perceived behavioral control, and intention) may play a distinct role when analyzing sustainable behaviors. In order for an individual to change their current behaviors to those that are more consistent with living sustainably, they likely must experience some transformation in the aforementioned categories. Which category, however, has the largest impact when influencing sustainable behavior? Some individuals may participate in these new behaviors because they now feel as though their peers would look negatively upon them if they did not. Others may now have the opportunity to complete the behavior that they did not have the option to do before. Overall, each individual student has reasons behind changing their behaviors to be more sustainable; the Theory of Planned Behavior will ultimately help to comprehend the motives behind these behavioral changes.

Within this research study, the Theory of Planned Behavior was utilized to understand how sustainability-related behaviors emerge. Specifically, which contributing factor within the theory has the largest impact on behavior change in the realm of sustainability actions? This study focused primarily on the influence of attitudes and subjective norms on sustainability perception and behavior. Understanding how attitudes and subjective norms change as a result of sustainability experiences gives a more comprehensive view of what ultimately influences sustainability behavior.

During the interview portion of this research study, subjects were asked about their sustainability perception as well as their behaviors that have changed because of their mindset shift. The answers, given in narrative form, were then mapped back to the factors within the Theory of Planned Behavior to identify which areas were affected most often. In terms of subjective norms, distinctions were made between injunctive norms and descriptive norms. Injunctive norms refer to the beliefs held by those an individual respects regarding what types of behaviors are approved or disapproved; descriptive norms refer to what actions a group typically performs (Fishbein & Ajzen, 2010). The stories given within the interview process were also analyzed for occurrences and differences between injunctive and descriptive norms. Overall, this study utilized the Theory of Planned Behavior to attempt to better comprehend sustainability-related behaviors in Penn State students. It helped to correlate individuals' changes in sustainability perceptions with the effect that their experiences and upbringing have had on their sustainability behavior.

Intrinsic and Extrinsic Motivation

An important component of the Theory of Planned Behavior is the motivation one feels to participate in a particular behavior. Both intrinsic and extrinsic motivation can play a role in an individual's participation in some experience as well as their behaviors associated with that experience. Intrinsic motivation refers to "the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn," while extrinsic motivation "refers to the performance of an activity in order to attain some separable outcome" (Ryan & Deci, 2000). Figure 2 depicts the various motivational types as well as their

accompanying regulatory styles, perceived locus of causality, and relevant regulatory processes as proposed by Ryan and Deci (2000).

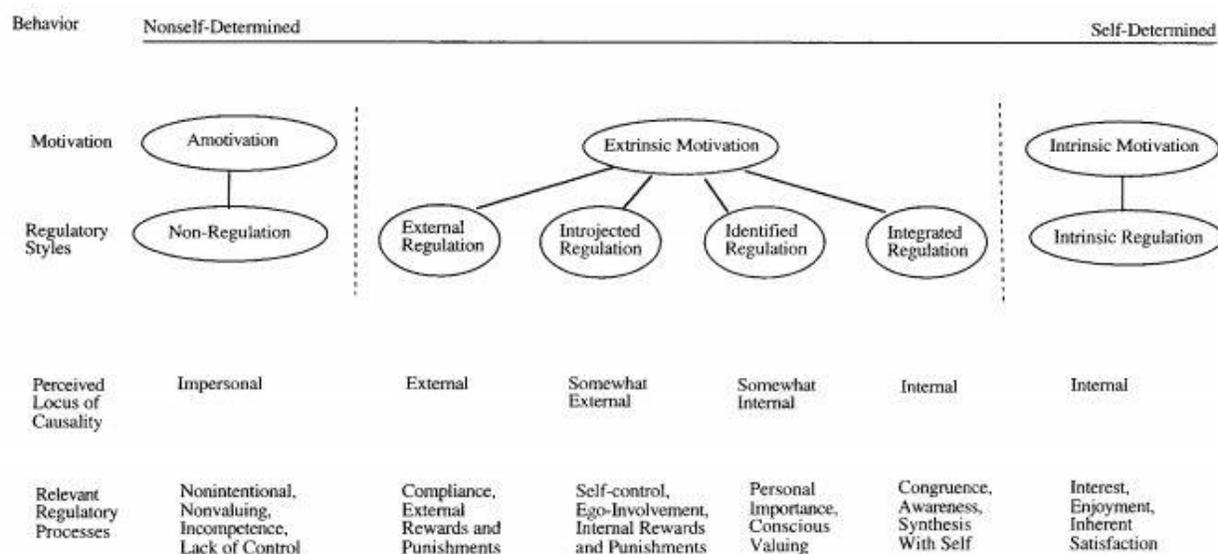


Figure 2 Ryan and Deci's Self-Determination Continuum (Ryan & Deci, 2000)

The initial motivation to participate in some experience could have an effect on the long-term impact the experience has on individuals' behaviors. Therefore, intrinsic and extrinsic motivations would affect different factors within the Theory of Planned Behavior and lead to various behavioral outcomes. Ultimately, the initial motivation to participate in an experience that leads to a change in sustainability perception could have a larger impact on how much that experience truly affects an individual's long-term mindset and behavior.

Within the realm of sustainability, a study completed by Taberero and Hernandez investigated how intrinsic motivation could affect environmental behavior (Taberero & Hernandez, 2010). The study found that both self-efficacy as well as intrinsic motivation are important components in determining participation in environmentally responsible behaviors; however, satisfaction from these behaviors "is associated with greater intrinsic motivation" (Taberero & Hernandez, 2010). Therefore, one expects that greater intrinsic motivation to

participate in a sustainability-focused experience leads to greater changes in individuals' behavior. Intrinsic and extrinsic motivations can be compared with the long-term impacts an experience has had on an individual to determine any correlations between motivation type and behavior.

In this research project, an example of an extrinsically motivated experience would be taking a course to fulfill a general education requirement that happened to talk about the environment or sustainability. Joining a sustainability or environmentally focused club, not to include it on one's resume or join something with friends (extrinsic), but rather to fulfill some moral obligation to help the environment would be considered intrinsically motivated. During the interview process of this research, subjects were asked what led them to a change in sustainability perception. This change may have occurred because of a sustainability-related class or organization they are involved with; the motivation to participate in those experiences is of significant interest. While it may be easy to deduce motivation for some experiences, others may be considered both extrinsically and intrinsically motivated. For example, a student may be required to take a certain sustainability-focused class for their major. The individual may be significantly impacted by the course content and professor, leading to a change in mindset. The necessity to take this class and succeed, translates to an extrinsic motivation. However, the ultimate decision to study that particular major needs to be taken into account as well. If the underlying reason one chose a certain major is for intrinsic motivations, those cannot be ignored, even if the experience specifically was influenced by extrinsic factors. Clearly, both intrinsic and extrinsic motivations play a significant and complex role in determining motives for participating in experiences and resulting behaviors.

Schwartz's Integrated Value System

An individual's intrinsic motivations likely stem from the way they were raised and the values that constitute their character. Shalom Schwartz developed a theory that “defines values as desirable, trans-situational goals, varying in importance, that serve as guiding principles in people's lives” (Schwartz, 1996). The theory identifies ten motivational value types: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. Each motivational value type is defined by a principal goal as well as “specific single values that primarily represent it” (Schwartz, 1996). For example, achievement is seen as “personal success through demonstrating confidence according to social standards (successful, capable, ambitious, influential)” (Schwartz, 1996).



Figure 3 Schwartz's Integrated Value System (Schwartz, 1996)

Figure 3 illustrates the complex relationships among each of the individual values in Schwartz's system. Certain values share particular characteristics, placing them in one of four domains: Openness to Change, Self-Transcendence, Conservation, or Self-Enhancement. Values depicted across from one another in the diagram demonstrate the difficulty in pursuing those values concurrently. For example, Schwartz explains that one may not equally pursue achievement and benevolence because "seeking personal success for oneself is likely to obstruct actions aimed at enhancing the welfare of others who need one's help" (Schwartz, 1996).

The interview protocol used in this study considers the importance and prevalence of values in one's life. Subjects explained their own path that has led them to a particular change in sustainability perception. The stories told reveal what individuals found important in their own lives and what their primary goals are. Key words were taken from the stories and mapped to the ten motivational value types to identify similarities among individuals. The overall goal is to understand which value types within Schwartz's system are most common in individuals that have shown a significant change in sustainability perception.

Chapter 3

Methodology

Overall Research Design

This research project draws upon aspects of ‘The Most Significant Change Technique,’ (MSC) first conceptualized by Rick Davies in 1998 and described as “a form of participatory monitoring and evaluation” that uses individuals’ stories to better understand what effect a program has on an individual (Davies & Dart, 2005). In Davies’ original experiment, researchers asked participants in a rural development program “During the last month, in your opinion, what do you think was the most significant change that took place in the lives of people participating in the PPRDP project?” (Davies, 1998). Respondents gave their answers in two distinct categories: descriptive and explanatory. First, respondents answered specific questions about the change they found most significant, such as where it occurred, who was there, and what they did. Next, researchers asked for explanations about why they believed this change was the most significant, how it had already affected them, and what further changes it could cause in the future (Davies, 1998).

A range of studies has since utilized the Most Significant Change Technique to better understand the impact of a larger program on individual participants. One such study sought to track students’ definition of sustainability before and after an environmentally related course (Zeegers & Clark, 2014). Throughout this process, students used reflective journals to write down their thoughts and experiences about sustainability. Another study used the MSC process

to analyze the impact of a “Pro-teaching” program that used peer review of teachers to better the learning process for students (Klopper & Drew, 2015). In this analysis, researchers employed a combination of interviews and focus groups with students as well as teachers to gain both individual and collective insight on the program. While variations occur among execution of the MSC technique, many researchers have utilized the process and proven its validity.

The protocol developed for this research project also draws inspiration from a type of narrative inquiry utilized in the book *Democracy and Higher Education* called practitioner profiles (Peters, Alter, & Schwartzbach, 2010). These individualized profiles emphasize the stories of interview subjects in their own words. This method of data collection is appealing because it not only extracts specific contextual experiences but it also allows for endless possibilities from the storyteller. While the stories they tell are real, showing disappointment and success, the author, interviewer, and reader are all awarded the opportunity to their own meaningful interpretation.

The use of storytelling in determination of identity and perspective has been widely researched by Laura Black. She argues that stories “draw listeners into the story world, thus helping listeners understand the storyteller’s perspective in ways that rational argumentation does not” (Black, 2008). Storytelling has also become a crucial research technique because “it is one of the few human traits that are truly universal across culture and through all of known history” (Hsu, 2008). The use of storytelling to gather information results in varied but unique data. Each individual interviewed during a particular research project may provide a distinct and diverse answer to the same question. Then, researchers and audiences interpret responses according to their own thoughts, ideas, and previous experiences, finding value in their own particular way.

In the forthcoming research, single interviews were selected as the most appropriate form of story collection as it highlights the individual experience as well as offers opportunity for continual questioning from the interviewer. Perhaps the biggest digression from the Most Significant Change Technique is that participants were only interviewed once; instead of monitoring them throughout their college career, they were interviewed toward the end of their education to reflect on their prior years spent at Penn State. The ‘program’ monitored was simply Penn State’s undergraduate education experience and the incorporation of sustainability education and other initiatives into students’ lives while they attended school. Questions asked during the interview process drew on aspects of both the Most Significant Change Technique as well as the practitioner profile and narrative inquiry method.

The research process took place throughout the Fall 2016 semester. After gathering the sample of students by the end of September, interviews took place during the month of October. Analysis of interviews was completed during the end of 2016 and beginning of 2017 with results being shared with members of the Sustainability Institute and Penn State faculty toward the end of the Spring 2017 semester. The methodology, recruitment, and interview protocol developed for this research project was submitted to the Penn State Institutional Review Board for approval. The research project, STUDY00005593, was considered “exempt” on August 25, 2016 ensuring no more than minimal risk to the subjects involved.

Sampling and Recruitment

The sample used in this research project was not random, but rather selected purposively from a group of individuals at Penn State. A group of ten students at Penn State in the

Community, Environment, and Development (CED) major were interviewed for the study. The process of obtaining this sample size was twofold.

The first step in the recruitment process was contacting three professors in the Community, Environment, and Development major at Penn State: Timothy Kelsey, Leland Glenna, and Katherine Zipp. Because these professors teach multiple courses in the CED program as well as serve as advisors for students, they have had significant contact with students in the major. They served as valuable resources to identify exemplary students that would add valuable insight to this research project. Individual meetings were set up between the professors and the researcher to identify approximately ten to fifteen students that they believed would be suitable candidates to participate in the research project. Each professor was provided a list of potential interview subjects that included all CED students listed as sixth-semester standing and above. After all three professors selected the students they believed to be fitting research subjects, each list was reviewed to note similarities among selections. If a student was selected individually by either two or three of the professors, they were added to the initial sample group.

This recruitment method utilized practices used in the Tailored Design Method, created by Don Dillman (Dillman, Smyth, & Christian, 2014). With each recruitment request, if students responded positively, they were moved to the official interview sample and replaced in the recruitment sample by others from the possible interview population. Seventeen students were initially contacted in the first recruitment sample, with the hope of fifteen students showing interest in participating. These students were contacted via email on September 25, 2016; the email explained the purpose of the research project as well as what participating would entail for the subject. One student responded positively that she would be willing to participate. One week later, on October 2, 2016, those students who did not respond to the initial request were sent a

follow-up email. Two additional students were added to the recruitment sample, based on the information provided by the CED professors. After this set of emails, six students responded positively. At this point, the seven students who had agreed to participate in the research project were sent another email asking to set up an interview time according to their schedule. October 10, 2016 was the date of the first interview, with three more taking place within the next two weeks. On October 16, 2016, the final round of interview requests was sent out to students. This recruitment sample included those students who had received the prior emails and had not yet responded, as a final reminder, as well as four additional students to act as replacements for those that had agreed to participate. After this set of emails was sent, seven students agreed to participate in the project. They were subsequently sent information about how to schedule an interview time. During the week of October 24, five of the interviews took place with the final occurring on November 7. Those students who had responded positively to the initial participation request, but did not schedule a time to be interviewed, were sent two reminders about setting up a meeting time. If they did not respond after this time, it was assumed that they no longer wished to be interviewed and communication with these potential candidates was finished.

The Community, Environment, and Development major was the only one used in the research as it presents a small group of individuals who already show some interest for sustainability. By using students in the CED major as the sample, the research attempted to ensure that students already participated in meaningful sustainability-related experiences while at Penn State as well as experienced some change in sustainability perception. The overall sample size was limited to one major to present a controlled sample; the researcher also considered constraints on both time and resources available.

Interviews were scheduled based on the availability of both the interviewer and the interviewee. A private room was reserved in the Pattee Library on the Penn State University Park campus. Subjects were reminded of their interview within a week of their specified date and were told of the location of the interview. When the student first arrived to the interview, they were asked to read the implied consent document, which informed the subject about the purpose of the research project as well as their rights as the research subject. If no questions were asked, the interview was then conducted. All interviews were recorded on an iPad recording application. After the interview was complete, the subject was asked to sign a written consent documentation that either permitted or denied access for the researcher to use the interviewee's answers as an individualized profile with their name attached to it, if the researcher chose to do so. Upon completion of all interviews, the interviewer transcribed them. The interview recordings were compiled on a singular flash drive for safekeeping while the original recordings were deleted from the iPad application.

Interview Protocol

Consistent with the Most Significant Change Technique, the initial interview question was phrased as such: "Looking back over your time at Penn State, what do you think was the most significant change in your perception of sustainability?" First identifying the perception that changed allowed the subject to create a benchmark in their own mind and better explain what led them to this specific transformation. The subject may have chosen to focus on specific experiences that led to this change or rather the culmination of the beliefs and values they were raised on that led them to this point in their lives. Questions followed ideas presented in the

research objectives, focusing on individual perceptions, behaviors, and experiences. The nature of the interview protocol questions allowed the subjects to emphasize what they found to be most important. During the interviews, follow up questions were used to have subjects elaborate on certain aspects of their experiences or give specific examples of behavior changes. Frequently, probing questions were also used to ask the subject specifically about their individual relationship with nature and civic engagement as well as how subjective norms affected their perceptions and behaviors. The full interview protocol can be found in Appendix A.

Analysis

After each interview was completed and transcribed, the results were compiled for analysis. A number was assigned to each interview that was used throughout the analysis process to maintain confidentiality of subjects while preserving the ability to identify ideas from the same individual. The researcher first listened to each interview twice as well as read the transcription. During this process, the researcher highlighted main ideas, important details, and points of particular interest. Once this process was completed for all ten interviews, the analysis of the data could begin. Separated by question, the main points emphasized by each student were listed based on their assigned number. Examination of the data took place within individual questions across all respondents as well as across all questions within a specific respondent's interview. Major themes emerged in both of these categories. Noteworthy experiences that may have not been shared by multiple subjects were still noted.

Stories given from respondents about their perception change as well as their background information were examined more closely to identify factors that may have influenced the

theoretical principles previously discussed. Specifically, the researcher analyzed for connections between the interviewee and nature as well as civic engagement or volunteerism. In addition, the researcher looked for affects from both injunctive and descriptive subjective norms and how this may have affected respondents. This information was then compared to their sustainability behavior answers and mapped to the Theory of Planned Behavior. Further analysis investigated how intrinsic and extrinsic motivation differed among participation in sustainability experiences and decisions about major life events, such as choosing a university to attend. The researcher then identified specific motivational value types utilizing Schwartz's detailed system that were the most common among individuals. After individual analysis of interviews was complete, the stories were taken collectively to identify the significant implications this information entails for the current and future state of sustainability education at Penn State.

The results and implications collected from this research study were then shared with specific stakeholders, including members of the Sustainability Institute as well as faculty in the Community, Environment, and Development major so they could gain a better understanding of what is having the greatest impact on their students. At the conclusion of this research project, the interview results led to tangible recommendations for members of the Penn State community that could expand the array of impactful sustainability experiences for students.

In addition to having recommendations for Penn State faculty and administration about their sustainability initiatives, this research pilots the most significant change technique and narrative inquiry method with respect to sustainability perception at Penn State. The developed interview protocol was tested so that it could be used in future years to expand the results of this research. A future study could develop a longitudinal study starting with a cohort of incoming freshman at Penn State or even another university. Throughout their college education, these

individuals would be monitored, through individual interviews or small focus groups, to identify all of the experiences that have had an impact on their sustainability perception. In addition to evaluating these experiences, individuals' sustainability knowledge could be assessed to identify correlations among knowledge, attitudes, and behavior. In short, the methodology developed and tested in this study will be of significant importance to those involved in future research projects involving sustainability perceptions.

Strengths and Limitations

The nature of the Most Significant Change Technique and narrative inquiry method offers significant benefits to this research study. The individual interviews allow students to share their opinions and attitudes about not only sustainability but also their related experiences in their own voice. The MSC technique also emphasizes the importance of individuals' feelings rather than the collective thoughts of a majority. With this study, thoughtful insight not normally captured through a multiple-choice assessment or survey questionnaire is emphasized.

In a similar way, one limitation with utilizing the Most Significant Change Technique is that same self-reported and storytelling nature of this research. Throughout the process, interviewees were asked about their own perceptions and experiences and what made them so impactful. This could become a disadvantage during the process because some students will be better than others when it comes to sharing details about their experiences. Those that are willing to share every important detail about an impactful experience and are passionate about what they have gone through could gain more attention in the analysis of the stories. As much as possible,

the stories were considered equally and not judged based on the abilities of students to convey a compelling story.

Limiting the sample size to only one major program offers both strengths and limitations as well. Because Community, Environment, and Development was the only major used in the sample, the results can be easily controlled to a small group of very similar students. However, it also greatly limits the results to have only significant change stories from a very environmentally minded group on campus. Given that these students are majoring in CED, one expects that they are already predisposed to be environmentally conscious and have a deeper appreciation for sustainability. In future studies, a larger sample size could be used to gather information on sustainability experiences from those across the university with varying attitudes and predispositions towards the environment.

A significant strength to this study is the use of students of at least sixth-semester standing in Community, Environment, and Development at Penn State. These students have likely experienced a multitude of classes, organizations, and speakers that have been related to the environment and sustainability. Because they have experienced so much, they can identify not only what was impactful for them but also what they think would be most beneficial to students across the university. This insight is of significant interest as Penn State looks to expand sustainability experiences for all students, not just those interested in the environment. These experiences will help to achieve the goal of ensuring all graduates have a sustainability awareness mindset as they leave Penn State.

Chapter 4

Results

Overview

This research project utilized an original interview protocol, designed specifically for this research study and developed in consultation with the Most Significant Change Technique and narrative inquiry methodology. Once created and tested, the protocol was executed with the ten individuals who agreed to participate in the research project. The ten interviews were completed between October 10, 2016 and November 7, 2016. While all participants were students in the Community, Environment, and Development major at Penn State, not all were studying the same academic option within the major. Three students were enrolled in the Community and Economic Development option, all of which were males; three students were enrolled in the Environmental Economics and Policy option, two females and one male; the remaining four students were enrolled in the International Development option, all of which were females. While some students were in their third year at Penn State, others were in their fourth or fifth; however, all students had completed at least sixth-semester standing in the CED major and had completed one, if not numerous courses and other experiences related to their academic program.

After reviewing all ten interviews, numerous themes emerged both within individual interviews as well as across all respondents. Although many common threads were identified among the interviews, considerable acknowledgement will also be granted to unique viewpoints and experiences. This research study is similar to most in that value is found in common

experience. If multiple students found a particular class, organization, or program on campus to be impactful, great consideration should be given to those ideas to better expand them for all students. However, unlike some other research projects, this study also awards significant value to those unique and noteworthy experiences only observed by one subject. With a sample size of only ten students, each story and reflection shared is important. Furthermore, the variance in results shows the expansive pathways that can be explored to increase the sustainability mindset at Penn State. Multiple and diverse avenues can and should be developed to better employ sustainability throughout campus.

The following results first describe the major themes determined from the collection of interviews completed. Then, the unique observations discovered from the results will be described. After these results, interview answers will also be applied to the theoretical perspectives consulted during project development. Overall, the results from the interviews completed represent substantial and significant data that can be used to further develop and expand the sustainability education and initiatives at Penn State.

A Gradual Shift

One of the main research objectives when starting this project was learning what specifically led this group of students to have a change in sustainability perception. After reviewing all the interviews, most students noted that their shift in sustainability perception occurred gradually. Instead of participating in a particular experience that dramatically changed their attitudes, outlook, or behavior, a compilation of various activities and experiences progressively shifted their individual perception. For some students, this shift started from a

young age while others believed the major components of this shift occurred later, when they started school at Penn State.

Four students noted that they had childhood experiences that led them to be connected to nature. Later in life, this translated into a desire to help the environment as well as people. In this case, the way these students were raised and the experiences they had as children influenced their perceptions and behaviors related to sustainability. One student acknowledged that he greatly enjoyed spending time outside as a child and later learned that “certain parts of that lifestyle...would be in jeopardy because of my own practices and the practices of my country and culture.” Therefore, his early connection to the outdoors influenced him to pursue a major degree program that considered sustainability in addition to changing his own lifestyle to coincide with what he was learning.

Another theme found across a different four students was that the gradual shift to think about sustainability more started primarily in college. With these students, there was some interest in the environment and sustainability prior to entering Penn State. However, after joining the Community, Environment, and Development major and taking courses in a wide array of subjects, these students better understood why sustainability was so imperative to their lives. In these cases, not one specific experience sparked a dramatic change in thought or behavior; rather, a compilation of classes, news events, and other activities led to slow yet substantial change. Two students also emphasized that living in the dorms at Penn State also had a gradual, yet lasting effect on their perceptions. The structuring of the Mobius recycling program, the Green2Go program used in the dining hall, and the notices about energy usage posted in the dorms had subtle influences on these students. Even though these students may not have noticed

when the change occurred, they did recognize that their perceptions with regard to sustainability have significantly changed since they started college at Penn State.

The Meaning of Sustainability

The second question asked to the subjects during the interview process was “What does sustainability mean to you?” From the answers to this question specifically, along with other responses during the entire interview, strong themes about the meaning and purpose of sustainability emerged. All respondents had slightly different definitions of sustainability; some focused on the use of resources or materials while others focused on society’s current actions and practices, how people make decisions, or simply how individuals live their lives. One major point brought up by the interviewees, however, was the incorporation of the future and future generations into the definition of sustainability. Even with those slight differences, each student emphasized that sustainability should focus on how specific practices, thoughts, or decisions today will affect those in the future. This process of thinking about others in a separate time from the present is a central theme of sustainability, as seen in the accepted definitions described earlier. Clearly, these students also believe that important consideration should be given to future generations when defining what sustainability truly means.

Furthermore, two students, one in the Environmental Economics and Policy option and one in the International Development option, spoke specifically about the importance of thinking seven generations into the future. This concept can be attributed to indigenous Native American people; their worldview considers how their actions today would affect people seven generations into the future. These two students had previous experiences learning about Native American

cultures in addition to actually spending time on their reservations and talking with members of their community. Consequently, these students incorporated some of what they learned and experienced into their own personal definition of sustainability.

Another central theme evident in the research interviews was the idea that sustainability encompasses much more than simply the environment. In their earlier thoughts of sustainability, from high school age or younger, most of the students simply considered the necessity of environmental protection so it would be viable for future generations. However, many of the respondents noted that they now believe sustainability involves multiple components, including environmental, social, and economic aspects. Other students also emphasized that communities, businesses, cultures, and food systems can all be labeled as sustainable. No longer do people simply apply the term sustainability to being good stewards of the environment or participating in recycling programs. Now, many students understand sustainability as a cultural movement that can be transferred to all aspects of individuals' lives.

Making Connections

Much of the transformations in sustainability definitions can be attributed to the connections students observe between the natural world and other areas. The importance of making these connections was another apparent theme the interviewees highlighted in their answers to the interview questions. In many cases, their ability to see connections between their actions or behaviors with their effect on the environment or society was what led them to have a change in sustainability perception. Students also felt that a lack of connection was what prevented other students from seeing the importance of sustainability. Participating in

experiences and learning new knowledge about how the environment, society, and economy work together allows connections to be made that can dramatically advance one's personal mindset.

One of the best ways students have made connections is through experiential learning. This involves more than simply learning facts and memorizing definitions in a classroom setting. Experiential learning can range from simply spending an afternoon in the woods to traveling across the globe for a semester long study abroad. Among all interviews, three noted having impactful experiences during a study abroad trip while three others had meaningful experiences with the Sustainable Student Farm. Two acknowledged having been impacted by taking a specific course Biological Science 003: Environmental Science (Bi Sci 3), that allowed them opportunities to learn outdoors in nature in addition to the classroom. Other noteworthy experiential learning opportunities included camping with family members, mentoring for the Shavers Creek Outdoor School, and participating in an internship with the Scholarship, Sustainability and Civic Engagement Program (SSCEP).

Above all, these experiences immersed students in drastically new situations from what they were accustomed to; whether it was a new environment, a new culture, or a new country, the students were able to expand their understanding of not only sustainability but also other beliefs and opinions. Learning from and interacting with people who are different from themselves, allowed expansive growth to take place. One interviewee said: "My experience with Native American people and spending time with elders and different tribal members has really made me come to this realization that the world is not separate from us as people." For this student, having an experience with Native American people allowed her to take part in a new cultural society that emphasized connections between the Earth and us as people. Additionally,

the student who took part in the SSCEP noted that his experience led him to recognize “that I could participate in things outside of just acknowledging that the world has a problem with sustainability.” Instead of simply learning about the environment and different aspects of sustainability, he now felt that he could go into a community, engage with its members, and help them to ignite change in their current practices.

When asked what type of programming they believe would have the biggest effect on changing other students’ perceptions of sustainability, the interviewees were confident that restructuring of the general education curriculum to include a sustainability requirement would be successful. Of the ten interviews, seven different students suggested a specific sustainability course or other type of interdisciplinary education that all students across the university must take. This type of education would help students draw connections among various subject areas to more thoroughly understand what sustainability actually entails.

Some noted that a course requirement is the best way to reach students because they will be mandated to participate in order to graduate. Others pointed out that a sustainability type course would expose many students to ideas they may not have previously considered. Incorporating sustainability into their individual course curriculum would allow students to think about ideas from a new perspective while applying sustainability concepts to their own area of interest. One individual suggested, “for sustainability to be relevant, it needs to be relevant to people’s everyday lives.” The student went on to suggest that it will take innovation and “possibly rebranding of what sustainability means.” Through a sustainability course, students could gain a better understanding of what sustainability actually means, significantly expanding upon their existing knowledge of the subject.

Endless Possibilities and Future Potential

During the interview process, subjects were asked if there was anything during their time at Penn State that they had not yet experienced that could have further impacted their perceptions of sustainability. While some students felt as though they had sufficiently participated in a wide variety of sustainability experiences since coming to Penn State, others noted specific examples of experiences that could expand their current mindset. One student recognized that participating in a study abroad experience during his time at Penn State would have had a drastic change on his sustainability perception. Similarly, another student acknowledged that if she lived in a different location than where she currently does, her perceptions might have changed as well. This student added that she does not necessarily see the direct effects of climate change and other environmental problems in her current living situation; however, if she lived in a place with noticeable air pollution, she may be more inclined to participate in further sustainability initiatives. Another student added that she would have liked to be more involved with sustainable organizations on campus. Likewise, two students specifically mentioned that they wished they had participated in the Student Farm Club and the initiatives that group was starting in the community and around campus. These students felt, however, that so many organizations exist on campus to be involved with, that it is difficult to participate in everything they hope to in addition to their academics. Finally, one student noted that he wished he had more environmental education. This student added that the CED major significantly covers sustainable development and the environment, but lacked a direct environmental science course requirement.

The interviewed students also felt that a wide array of experiences exist for students to get involved with around campus who are not as interested in sustainability. As noted earlier, the addition of a general education sustainability requirement and experiential learning opportunities

were common ideas among respondents to influence other students' sustainability perceptions. However, interviewees made multiple other suggestions regarding sustainability influences at Penn State. Several students suggested simply improving some of the current programs in place around campus including the Mobius recycling system, the Green2Go dining hall program, and the Eco-Reps program involving freshman. While these various programs currently affect a large number of students on campus, their potential is far greater than what they currently achieve. Students recommended making these programs easier to understand for all students and advertising them more so they are accessible to everyone. Additionally, respondents noted that changes from administration, such as taking less or no funding from fossil fuel companies or supporting more sustainable student initiatives could be imperative in changing students' mindsets as well. One student suggested more opportunities to have diverse groups, such as the multicultural community, Greek life, and arts organizations, work together towards sustainable goals. Finally, one student proposed utilizing large student events to better promote the message of living sustainably. Football games, THON, concerts, and other similar events could better incorporate sustainability initiatives into their operations, such as recycling systems, product usage, and energy consumption to further influence students and other patrons.

Clearly, an abundance of opportunities exists to bring sustainability into the lives of students at Penn State. The students interviewed already know of many specific experiences currently in place at Penn State that could simply be revamped to better influence students. Additionally, they have expansive ideas about new programs that could be implemented throughout campus. Evidently, these students understand that sustainability can be applied to almost every aspect of students' day-to-day lives. While the availability of sustainability

programming seems unlimited, serious consideration needs to be given to the feasibility and actual impact of individual programs before implementation is complete.

Noteworthy Observations

In addition to the major themes that emerged from the interviews, some students spoke of individualized and unique experiences that significantly affected their sustainability perception. One interviewee noted having multiple experiences related to sustainability since coming to Penn State. The structuring of the dining halls, taking Bi Sci 3, and acting as president of the Student's Society for Indigenous Knowledge as well as a teaching assistant for an environmental law class all influenced her attitudes and behaviors with regard to sustainability. However, she noted that above all, it was really her faith that had the most profound impact on her. The subject added, "every time I would learn something new or have a new experience, I think what made it more important to me was the fact that I believe that we should be stewards of the environment and that creation is life that we should respect too." This spirituality and personal connection between religion and sustainability was not mentioned by any other participant. Even so, this student in particular is clearly deeply connected to sustainability through her faith. Much of this is associated with how she was brought up, adding that her mother "is a big advocate of learning about the environment." This student also suggested that giving children more formalized education about the environment at an earlier age could have a deeper impact on their relationship with the environment and sustainability. Because her spiritual connection to the Earth started when she was a young child, it became better ingrained in her overall mindset as an adult.

Another student differed from her interview counterparts in that she did not have a gradual shift in sustainability perception. This student participated in a specific experience that led to a dramatic change in perceptions and behaviors with regard to sustainability. The student noted that prior to her experiences with Native American people, she gave little consideration to sustainability ideals. Once she spent significant time on Native American reservations and with people in indigenous cultures, she changed her major to CED, altered her behaviors, and transformed her life into one that considered sustainability first. For this student, the choice to participate in the trip to the Native American reservation was not connected to a desire to learn about sustainability; yet, the experience was so transformative that it had a profound and lasting impact on the student.

Relationships to Theoretical Perspectives

The results obtained from the interview process reveal important information about the theoretical perspectives from which the interview protocol was based. All three theories consulted during this project were represented in some way in the interview protocol and were addressed by participants in their answers.

Ajzen's Theory of Planned Behavior

Within the Theory of Planned Behavior, both attitudes and subjective norms play an important role in determining participation in certain behaviors by an individual. During the interview process, subjects were asked specifically "How has this change in sustainability perception impacted your sustainability related behaviors, if at all?" Subjects were also asked

about their personal background, at which time follow-up questions were added with regard to their individual connections to nature and civic engagement as well as their own perceived impact from subjective norms. All of these questions relate to some specific factor within the Theory of Planned Behavior.

When respondents were asked what factors led them to the current mindset they held with regard to sustainability, some emphasized on their own that they had felt a prior connection to nature from their childhood. Others, however, were asked directly if they had a specific connection to nature and if that had influenced them. Overall, eight of the ten interviewees acknowledged a concrete connection to nature that had an impact on their sustainability mindset. Some examples of how their connection to nature began include camping with family as a child, simply playing outside with friends, visiting national parks, or hiking and biking as a young adult. Two students noted that while they feel connected to nature now, that transition did not start as early as childhood. One individual stated that since her experience on the Native American reservation, she felt a much deeper connection to nature. The final individual stated that as a child, she did not feel any connection to the outdoors, but since coming to college, her feelings toward nature, particularly with farming and hiking have greatly increased. Although these connections to nature evolved at different times for the interviewees, it is evident that these students all recognize what impact this has on their sustainability perception.

Similar to their connection to nature, some individuals during their interview naturally brought up their relationship to civic and community engagement while others were asked about it directly. Three students specifically noted that they chose CED as a major because of its involvement with community development and civic engagement. Five others noted that they participated in volunteer activities as a child including volunteering at church or observing their

parents volunteer on political campaigns. Two other students mentioned that their involvement with volunteering and in the political movement really started once they began school at Penn State. One student in particular noted that she initially saw civic engagement as simply volunteerism but now sees it as something much greater that can be incorporated into one's everyday life. That same sentiment was not necessarily understood by all participants; many responded to the inquiry about civic engagement with their involvement in simple volunteering in more isolated instances.

Influences from subjective norms differed among interviewees. One individual stated that he does not seem to be influenced by other individuals and actually does not enjoy hearing others' opinions. Three individuals stated that professors or mentors they have had influenced their perceptions and ideals about sustainability. One student mentioned, "My professor is very passionate about the environment...so I think seeing the passion that others have for the environment...makes you feel more committed to sustainability." These influences are considered injunctive norms, or the acceptance of ideals held by those in respected positions. Conversely, five students recognized descriptive subjective norms present within the CED program environment. Some students called it "social pressure," while others said being around this specific community provided a "sense of accountability" to act in a certain way. While one student mentioned that he never felt certain behaviors or opinions were forced on him, he did add that being surrounded by a certain group of people that think a certain way does change your perspective in time. Other students also added that the CED major in general is a "supportive environment" and that it allows students to learn from one another about new interests and diverse viewpoints. One student recognized that she has been "shaped by the CED program." While these students realized that subjective norms were present within the CED major, some

also mentioned instances where they were the ones influencing others to think and act more sustainably. They understood that social norms work on all levels and in these cases, are likely benefiting people with regard to sustainability.

During the interview process, the researcher asked students what type of behavioral changes they noticed within themselves because of their change in sustainability perception. One individual noted specifically that his current behaviors do not coincide with his attitudes toward sustainability. Because he lives in a dorm room and eats at an on-campus dining hall, he feels he cannot practice all the sustainable behaviors he hopes to in the future. Five students emphasized smaller personal behaviors that were altered because of their sustainability perception including recycling more, taking shorter showers, reducing electricity usage, using reusable water bottles and thermoses, shopping at thrift stores, buying locally grown foods, and subscribing to environmental newsletters. One student noted that his primary behavior change involves trying to connect with people more and creating dialogues about important social and environmental topics. Another student said he now participates in extracurricular activities related to sustainability because of his perception change. Rather than simply accepting certain ideals about sustainability, he utilizes them in practice. Similarly, one student now recognizes that she “hold[s] myself to practicing what I preach.” She also understands that sustainability and its related behaviors are not intuitive for everyone; part of her behavior change is now working to “make sustainable living relevant and accessible to everybody.” The last student’s largest behavior change is that she now places more priority on attacking social justice issues rather than just environmental issues. This individual still participates in basic environmentally sustainable behaviors, but is more personally concerned with the people component of sustainability. The sustainable behaviors described by the subjects cover a wide range of activities, from small at

home personal changes to lasting efforts effecting one's career choice. Either way, most of the interviewees have clearly been affected in their behaviors from their sustainability perception change.

Intrinsic and Extrinsic Motivation

Throughout the subject interviews, the researcher asked respondents about the experiences they have participated in during their lives, specifically those completed while at Penn State, that have influenced their sustainability perception in some way. As previously discussed, these experiences range from semesters studying abroad and taking courses at Penn State to joining certain clubs on campus or simply living in a dorm room. No matter what type of perception change these experiences resulted in, the ultimate motivation to participate in them is also important.

In some instances, the motivation to initially participate in an impactful experience lacks clear extrinsic or intrinsic motivation. For example, one student noted that her perception change started after having taken the course Bi Sci 3 during her freshman year in college, a general education science class where she learned about one's connection to the earth. The student decided to take the course after it was recommended to her by her advisor based on other students' feedback. In this case, the student did not know what type of impact this course would have on her future. Even though she may have had no prior motivation entering the course, once she was in the class, her motivation likely changed. No mention was made during the interview about wanting to get an A in the course or wanting to impress her professor. Rather, the student acknowledged that the course opened her up to a new way of thinking; she added that the class

“had a background of learning about sustainability and climate change and that became really ingrained in my personality, in my outlook.” Clearly, this student had a drastic change in personal attitudes simply from participating in this course, likely associated with intrinsic motivations. As the student saw changes occurring within herself that were ultimately benefiting her and those around her, she was even more motivated to give her full attention to the course so that she could receive the most from it.

In most other circumstances, the overarching motivation present was clearly intrinsic. The respondents emphasized their desire to help others and the planet from a young age and throughout college. Many of the experiences they participated in, such as playing outside in the woods, joining CED Club, or studying abroad in a foreign county, were not required by their parents or for graduation but rather voluntary additions to their lives. Some extrinsic motivations may appear on the surface of certain behaviors or experiences. However, the underlying rationale for these students comes from a belief that their thoughts and actions can have a positive effect. Evidently, these students were primarily motivated by intrinsic factors that came from an internal desire to make a difference.

Schwartz’s Integrated Value System

Multiple values from Shalom Schwartz’s motivational value types were observed across the ten interviews. The primary example of motivational value evident throughout the interview subjects was universalism. Schwartz defines universalism as “understanding, appreciation, tolerance and protection for the welfare of all people and for nature;” and can be further explained using such representative values as “broadminded, wisdom, social justice, equality, a

world at peace, a world of beauty, unity with nature, protecting the environment” (Schwartz, 1996). Clearly, this motivational value is consistent with many of the ideals present in the definition and meaning of sustainability. Therefore, it would be fitting that the individuals primarily concerned with the environment and sustainability initiatives would also exhibit signs of universalism. One respondent stated that her shift in sustainability perception “led me to become more focused on the people and the outcomes that those people can produce” in addition to the environmental component. In this example, the student realized that people and nature are an interconnected system and one that she hoped to help in her future career. Another student emphasized that he selected Community, Environment, and Development as a major because it was more service-oriented and deals specifically with “engagement and involvement within your community.” Similar to displaying universalism, the students in the CED major learn about how to be good stewards of the environment and how to be productive members of society and engage in civic activities. Therefore, the motivational value of universalism is likely associated with most, if not all, individuals enrolled in the Community, Environment, and Development major.

Another value emphasized by two individuals in particular was tradition; Schwartz defines tradition as “respect, commitment and acceptance of the customs and ideas that traditional culture and religion provide the self (humble, accepting my portion in life, devout, respect for tradition, moderate)” (Schwartz, 1996). This value was evident in the two respondents that had had previous experiences with indigenous Native American people. Not only did their thought processes change while they spent time on the Native American reservations, but these two individuals carried over the values and customs adhered to by the Native people into their own lives. One student said that because of her experience with Native American people, it

“made me come to this realization that the world is not separate from us as people and when we are trying to save the river, we have to realize that we are part river.” This individual not only observed the customs followed by the Native American communities she spent time with but actually accepted some of their ideals as her own. Even though she did not grow up in that particular culture, her short time spent with indigenous people drastically altered her own sense of tradition.

A final value of Schwartz’s that was common across multiple interviews was security, defined as “safety, harmony and stability of society, of relationships, and of self (family security, national security, social order, clean, reciprocation of favors)” (Schwartz, 1996). As previously mentioned, most of the respondents indicated that the consideration of the future and future generations was an important component of sustainability. These individuals are especially concerned about people in the future and the resources and infrastructure that will be available to them. Therefore, these students have directly linked sustainability with multiple types of security, focusing specifically on how future generations within later societies will be able to live prosperous lives. For example, multiple students noted that food security was a topic of particular concern for them. They are interested in how food specifically can greatly contribute to the stability of a society and will begin to affect the United States and other countries just as national and home security do today. Overall, these students understand the value and importance of multiple facets of security, how it directly relates to sustainability, and how impactful the current society will be for those in the future.

Chapter 5

Discussion and Implications

The key findings from this research project reveal important implications for students at Penn State, students at other colleges, and the University as a whole. While the results were collected solely from Community, Environment, and Development students, certain implications can still be ascertained about the larger student body of Penn State. Based on these results, specific recommendations can be made to Penn State faculty, administration, and students to better expand sustainability initiatives and behaviors throughout the community.

As determined from the results, programs and classes currently exist at Penn State that contribute to the gradual evolution of students' sustainability perceptions. While these experiences are reaching students in the Community, Environment, and Development major, it is still uncertain whether these opportunities are equally influencing other students. Some of the experiences discussed during the interviews, such as participating in CED Club and taking prescribed major classes with similarly minded students, are specific to those students in the CED major. However, a variety of experiences, including taking Bi Sci 3, living in a dorm on campus, or studying abroad for a semester are available to most students around campus. Restrictions exist for certain students to participate in some activities due to their major program or even income level. However, in order to make sustainability relevant to every student on campus, the experiences available to them should surpass these boundaries.

As highlighted in the results section, seven of the ten interviewees suggested that mandating a sustainability course within the Penn State General Education curriculum could

provide valuable experiences for students to grow in their sustainability mindset. This potential requirement would not have to be an additional course but rather built into the new general education reform. To be most successful, this type of course should not simply take place in the classroom, where students learn basic definitions and take multiple-choice exams. Rather, this course should focus on the multiple facets of sustainability, while incorporating experiential learning opportunities into the course. For example, when learning specifically about environmental sustainability, students could take field trips to the woods, spend an afternoon fishing, or participate in a park clean-up project. Likewise, students should participate in volunteer activities and other civic engagement opportunities. A sustainability requirement could teach students about sustainability initiatives around campus and the community so they can be more involved outside of the classroom as well. In a similar way, the course could demonstrate simple sustainable behaviors that students could then practice in their own lives. In order to fully influence students in this course, how sustainability relates to their personal lives and careers should be significantly emphasized. If students were to better understand how sustainability could benefit their future job as a doctor, teacher, or business executive, the ideals they have learned have a much greater chance of making a lasting impact. This prospective course has the potential to completely change students' outlook on life by not only telling, but also showing them how sustainability relates to their lives today and the impact it will have in the future. Furthermore, the incorporation of this type of requirement surpasses those previously discussed boundaries by making interdisciplinary sustainability education not only accessible to but also mandatory for all Penn State students.

Another notable result from this research project is the connections these students had with nature and civic engagement prior to entering Penn State. Some of the students mentioned

specific examples of how they became involved with volunteer organizations in their childhood or why they felt a strong connection with nature. However, these students were likely influenced by their parents, early teachers, or other mentors to be engaged in certain activities, leading them to pursue a degree in Community, Environment, and Development. Having opportunities to travel to different areas of the country to experience nature or interact with other cultures can be due in large part to an individual's socioeconomic status and upbringing. Parental influence can also be a major factor in the activities that a particular child participates in during their childhood.

Many individuals do not have these types of experiences or mentors as young children to expose them to different ecosystems in nature or community development opportunities. Particularly, children living in cities do not have nearly as much access to green spaces to give them the opportunity to connect with nature on a deeper level. While there are efforts occurring in various cities across the country to bring parks and other green areas to large cities, their total impact on children may not be completely understood. For example, Majora Carter revitalized the South Bronx by developing the Hunts Point Riverside Park (Majora Carter, 2016). Formerly the site of illegal waste removal, the area is now home to the first open waterfront park in the South Bronx in 60 years. Carter understood the value that a park could bring to an area, transforming not only the physical space but also the people into a more sustainable and successful community. If more of these projects were developed in cities around the country, more children would have exposure to green parks and other natural areas. The ability for young children to have opportunities with nature at a young age will likely have a significant impact on the ways they value the Earth and consequently, how they treat the planet.

Upon review of the results, both positive and negative thoughts were brought up regarding the structure of operations in the Penn State dorm rooms and on-campus dining facilities. While two students in this study positively changed their perceptions and behaviors based on observations from living in the campus dorms, not all students come away feeling the same way. One student in particular, felt restricted by the current procedures, making it more difficult for him to behave in a sustainable fashion. Therefore, improvements could be made to the incorporation of sustainability in the dorms and dining halls so that all students could be equally transformed in their thoughts and actions. One aspect of the dorm, and more broadly, the campus experience that could be altered is the Mobius recycling system. Many students found the recycling bins around campus to be confusing for everyone to understand and utilize correctly. However, they also recognized that this program in particular has the potential to more significantly affect a greater range of students around campus. If the Mobius bins employed alternative signs to better communicate how they worked, they could have a broader impact on students and their resulting relationship with sustainability. Students need to feel as though sustainability can be easily incorporated into their daily lives, not as though it is some extra task that acts as a burden on their normal routine.

Furthermore, the structure of operations in Penn State's dining commons offers another opportunity to influence students with regard to sustainable food consumption. Current programs, such as the Green2Go takeout containers and trayless dining, have had a mixed reception from students. Revamping these programs in addition to more advertisement could provide further influence for students to not only participate, but also receive a direct impact in their personal lives from it. As stated earlier, these initiatives cannot be an added burden to students. Rather than giving students the option to participate in these activities and making them

seem like an added expense of their time or energy, they should be seamlessly integrated into their lives. For instance, instead of giving students the option to use a Green2Go container for take-out, why not make them mandatory? While it may take some time for individuals to adjust to a new system, eventually they will modify their behavior and unconsciously act in a sustainable way.

Results from the interviews provide insight into the use of Icek Ajzen's Theory of Planned Behavior to predict sustainable behaviors. While not all of the factors within the theory were focused on during this particular study, subjects were asked about certain attitudes, subjective norms, and behaviors. It was determined that most students had prior connections to the environment and civic engagement, which led them to pursue the Community, Environment, and Development major at Penn State. Additionally, most students felt affected by subjective norms in some way whether injunctive, based on the opinions of respected persons, or descriptive, based on the actions of the majority. However, the behaviors students participated in ranged from simple routine changes to major life alterations. While one student started using a reusable thermos for her coffee, another changed her major and entire career path. Their influences may have been similar, but their behavioral outcomes were far different. The individual factors of attitudes and subjective norms may have influenced behavior in some way, but it is uncertain as to what specifically leads to greater and lasting behavioral changes. While connections can be made among some of the factors within the Theory of Planned Behavior from this research study, more thorough research is needed among all factors to make concrete conclusions with regard to sustainable behaviors.

One of the most important results from this research project is that a majority of the students experienced gradual changes, rather than drastic ones, in sustainability perceptions.

Whether it started in early childhood or at the beginning of college, most students interviewed had many small experiences that slowly changed their understanding and viewpoints on sustainability. Whether it was living in a dorm and eating in an on-campus dining hall, taking a particular general education course, or living in another country, most students attributed their changing mindset to a variety of experiences. Therefore, as Penn State moves forward with its sustainability education and outreach, it cannot expect radical and immediate change from its students simply by adding new courses or restructuring campus programs. However, these minor changes are exactly where the university should start. By adding small modifications to students' everyday lives, Penn State has the opportunity to incrementally change both attitudes and behaviors. After attending this university for four years, students may become ingrained with the ideals of living sustainably and continue these practices as second nature following graduation. Gradually altering this large and influential university then has the potential to inspire other universities as well as secondary education schools, large corporations, and even parents to raise their children with a sustainable mindset. The shift to a sustainable world is going to happen gradually; Penn State has a clear role to play in furthering that shift by influencing its students to think and act in a way that considers the environmental, social, and economic impact of their lives. .

Chapter 6

Recommendations and Conclusions

Introduction

This thesis research aimed to better understand how students' sustainability perceptions have changed while at Penn State and what specifically caused those changes. Developing this research project relied on ideas from multiple theoretical perspectives including Icek Ajzen's Theory of Planned Behavior, Intrinsic and Extrinsic Motivational Theory, and Schwartz's Integrated Value System. Modeled after the Most Significant Change Technique and narrative inquiry methodology, an interview protocol was developed that considered perception changes, sustainability definitions, individuals' backgrounds, behavioral changes, and sustainability-related experiences. The students interviewed from the Community, Environment, and Development major represented a small, yet focused sample that provided significant insight into the current sustainability initiatives affecting the student experience. Experiential learning opportunities, connections to nature and civic engagement, and subjective and social norms were only some of the factors found to influence students with respect to sustainability mindset and behavior. Based on the collection of results determined from this study, important recommendations can be made in order to improve the Penn State experience with regard to sustainability.

Recommendations

Overall, this research project provided substantial insight into sustainability perceptions of Penn State students in the Community, Environment, and Development major. While the study was limited to a small number of students, the responses gathered still offer a range of experiences available to individuals at this university. Various environmental science and sustainability courses, clubs and organizations, and study abroad trips, in addition to the way operations are structured around campus are having a clear impact on students. The goal now, however, should be to ensure that all students, not only those in the Community, Environment, and Development major or other environmentally-focused programs, are influenced through sustainability while at Penn State. Changes can be implemented by faculty, staff, and especially administration to advance its current offerings and expand how students view sustainability. Improvements can be made to the on-campus experience through residence halls and dining locations. Furthermore, new interdisciplinary courses could be added to the general education curriculum; including experiential learning opportunities has the potential to better connect students with their environment and other cultures. Finally, incorporating sustainable initiatives in all aspects of the student experience could significantly influence students in their daily lives upon completion of their college experience at Penn State.

Further Research

Future research studies regarding students' perception of sustainability could take a similar format as this thesis and focus on what experiences are having the greatest impacts on individuals' attitudes and behaviors. Not only should a larger sample of students be interviewed

to gain a wider collection of opinions, but students should also be monitored throughout their time at Penn State. If a cohort of students were observed from the time they began college as a freshman to when they graduated, much more information could be collected about the experiences they have participated in. Additionally, predispositions to environmental behavior, major programs of study, and socioeconomic background could all be varied to gain a thorough understanding of how various experiences effect individuals differently.

Assessment tools such as the New Ecological Paradigm or the Environmental Identity Scale could also be utilized in conjunction with the Most Significant Change Technique in the future. Numerous studies using these evaluation measures have been completed that attempt to understand how individuals come to feeling a close relationship with the environment and how that affects their behavior. When analyzing students' perceptions of sustainability, it may be helpful to use a pro-environmental attitude assessment to measure the direct effect an experience has on individuals' environmental identity. Using the assessments before, directly after, and a longer time period after a particular experience, would allow researchers to gain insight into the short term and long term effects of an experience on different individuals' attitudes and even behaviors. Although this relationship between an attitude towards one's environment and their pro-environmental behavior is still uncertain, future studies using these measures could help to better understand this correlation.

The New Ecological Paradigm is "a measure of endorsement of a 'pro-ecological' world view" and utilizes individuals' agreement or disagreement to fifteen statements that assess environmental concern (Anderson, 2012). While this tool has been widely used in before and after studies to measure the effects of an experience on individuals' attitudes, there is some concern over of a lack of connection to pro-environmental behavior. Another similar instrument,

the Environmental Identity Scale (EID) developed by Susan Clayton, uses agreement or disagreement responses to twenty-four statements to better understand “how we orient ourselves to the natural world” (Clayton & Opatow, 2003). This scale, when measured simultaneously against ‘environmentally sustainable actions,’ found a significant relationship between an individual’s EID score and their behavior. However, Clayton recognizes that behavior, when associated with the Environmental Identity Scale, may reflect a connection to nature locally but fail to grasp the global need for environmental protection (Clayton & Opatow, 2003).

Both environmental scales, while not perfect, could offer great insight into the effect of sustainability experiences on individuals at Penn State. When used with the Most Significant Change Technique, these assessments may allow future studies to better understand personal changes in attitudes and behavior with regard to sustainability. These future research studies also have the potential to outline a series of characteristics gathered from actual student experiences to tailor the future of sustainability education and outreach at Penn State.

Conclusion

Penn State has the opportunity now to influence each and every one of its students with regard to living a sustainable lifestyle. Through a better incorporation of sustainable initiatives in on-campus operations, curriculum requirements, and extracurricular activities, Penn State can more comprehensively influence all its students in a transformative way. With improved efforts, Penn State University can become a leader in higher education sustainability, working to ensure that its graduates understand how to be good stewards to their environment and their society both in their personal and professional lives.

Appendix A

Interview Protocol

1. Looking back over your past three years at Penn State, what do you think was the most significant change in your perception of sustainability?
 - a. Tell me the story behind this change.
2. What does sustainability mean to you?
3. Tell me about your background. What has led you to this current mindset?
4. How has this change in sustainability perception impacted your sustainability related behaviors, if at all?
5. What experiences, Penn State related or otherwise, do you think have had the greatest influence on your sustainability perception?
 - a. What have you not experienced that you think could have influenced your sustainability perception?
6. Of the programs currently in place at Penn State, what do you think could have the greatest influence on other students to change their own sustainability perception?
 - a. Outside of the programs and experiences currently in place at Penn State, what do you think could have the greatest influence on other students' sustainability perceptions?

BIBLIOGRAPHY

- Ajzen, I. (1991, December). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Anderson, M. W. (2012). *New Ecological Paradigm (NEP) Scale*. University of Maine, Orono: Berkshire Publishing Group.
- Assembly, U. N. (2015). Transforming our world: the 2030 Agenda for Sustainable Development. *Millennium Summit* (pp. 1-35). United Nations.
- Barlett, P. F., & Chase, G. W. (2013). *Sustainability in Higher Education: Stories and Strategies for Transformation*. Cambridge: The MIT Press.
- Black, L. W. (2008). Deliberation, Storytelling, and Dialogic Moments. *Communication Theory*, 93-116.
- Clayton, S., & Opatow, S. (2003). *Identity and the Natural Environment: The Psychological Significance of Nature*. Cambridge: The MIT Press.
- Davies, R. (1998). An evolutionary approach to facilitating organisational learning: An experiment by the Christian Commission for Development in Bangladesh. *Impact Assessment and Project Appraisal*, 243-250.
- Davies, R., & Dart, J. (2005). *The 'Most Significant Change' (MSC) Technique A Guide to Its Use*.
- de Leeuw, A., Valios, P., Ajzen, I., & Schmidt, P. (2015). Using the theory of planned behavior to identify key beliefs underlying pro-environmental behavior in high-school students:

- Implications for educational interventions. *Journal of Environmental Psychology*, 42, 128-138.
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method (4)*. Somerset, US: Wiley.
- Easterling et al. (2014). *Pennsylvania State University STARS*. University Park: AASHE. Retrieved from <https://stars.aashe.org/institutions/pennsylvania-state-university-pa/report/2014-10-20/>
- Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. New York: Psychology Press.
- Hsu, J. (2008). The secrets of storytelling: Our love for telling tales reveals the workings of the mind. *Scientific American Mind*, 46-51.
- Kautonen, T., van Gelderen, M., & Fink, M. (2015). Robustness of the Theory of Planned Behavior in Predicting Entrepreneurial Intentions and Actions. *Entrepreneurship Theory and Practice*, 39(3), 655-674.
- Klopper, C., & Drew, S. (2015). Using Most Significant Change to Evaluate Impact of The Pro-Teaching Project. In C. Klopper, & S. Drew, *Teaching for Learning and Learning for Teaching* (pp. 247-259). The Netherlands: Sense Publishers.
- Learn About Sustainability*. (2016, February 26). Retrieved from US Environmental Protection Agency: <https://www.epa.gov/sustainability/learn-about-sustainability#what>
- Majora Carter*. (2016). Retrieved from TED: http://www.ted.com/speakers/majora_carter
- Norman, P., Conner, M., & Bell, R. (1999). The theory of planned behavior and smoking cessation. *Health Psychology*, 18(1), 89-94.

- Palmeira, A. L. (2007). Predicting short-term weight loss using four leading health behavior change theories. *International Journal of Behavioral Nutrition and Physical Activity*.
- Peters, S. J., Alter, T. R., & Schwartzbach, N. (2010). *Democracy and higher education: traditions and stories of civic engagement*. East Lansing: Michigan State University Press.
- Rowe, D. (2002). Environmental Literacy and Sustainability as Core Requirements: Success Stories and Models. *Teaching Sustainability at Universities*.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 68-78.
- Schwartz, S. (1996). Values Priorities and Behavior: Applying a Theory of Integrated Value Systems. In C. Seligman, J. M. Olson, & M. P. Zanna, *The Psychology of Values: The Ontario Symposium, Volume 8* (pp. 1-24). Mahwah: Lawrence Erlbaum Associates, Inc.
- Swaim, J. A., Maloni, M. J., Henley, A., & Campbell, S. (2016). Motivational influences on supply manager environmental sustainability behavior. *Supply Chain Management: An International Journal*, 21(3), 305-320.
- Tabernerero, C., & Hernandez, B. (2010). Self-Efficacy and Intrinsic Motivation Guiding Environmental Behavior. *Environment and Behavior*, 658-678.
- Tarkiainen, A., & Sundqvist, S. (2005). Subjective norms, attitudes and intentions of Finnish consumers in buying organic food. *British Food Journal*, 107(11), 808-822.
- The Sustainability Institute. (2013). *The Penn State Sustainability Strategic Plan*. University Park: Penn State Sustainability Institute.
- Zeegers, Y., & Clark, I. F. (2014). Students' perception of education for sustainable development. *International Journal of Sustainability in Higher Education*, 242-253.

Academic Vita

Francesca Ramacciotti

EDUCATION:

The Pennsylvania State University, Schreyer Honors College Class of 2017
B.S. Environmental Resource Management
Minors: Sustainability Leadership; Environmental & Renewable Resource Economics
Study Abroad: Short-term trips to New Zealand & Costa Rica focused on natural resources and the environment

University of Pennsylvania Class of 2019
Master of Environmental Studies, Environmental Sustainability Concentration

RESEARCH EXPERIENCE:

Honors Thesis in Environmental Resource Management

- “What makes Penn State students go green: examining ‘most significant change’ experiences in individuals’ sustainability perceptions”

Sustainability Leadership Capstone Independent Study, Sustainable Business Track

- Investigating positive and negative corporate interactions with wildlife, CSR initiatives related to habitat and wildlife, and beneficial relationships between non-governmental organizations and businesses

OTHER EXPERIENCE:

Office intern at the Penn State Environmental Resource Management (ERM) Office May 2016 – May 2017

- Created class schedules with incoming students during New Student Orientation and answered questions about the ERM Program
- Various duties include: completing office work, constructing a new study abroad course, creating an internship database, developing programming for PA Governor’s School and Ag Progress Days

Course Grader for ASM 327 Aug – Dec, 2016

- Graded in-class quizzes and weekly lab assignments for approximately 70 students in a Soil and Water Resource Management course; input grades into the online course system
- Assisted supervisor with data entry for related research projects

Substitute Aide and Office Assistant for the Mine Hill Board of Education May – June, 2014 – 2015

- Served as a substitute aide for children in elementary school
- Prepared financial paperwork and completed data entry for the district accountant

Day Camp Counselor at the Roxbury Recreation Department July – Aug, 2012 – 2015

- Supervised children in grades one through seven at a summer day camp; daily activities included sports, crafts, swimming, and field trips

ACTIVITIES:

Schreyer Honors College (SHC) Student Council 2013 – 2017

- Recruited new students and conducted outreach and service events for the SHC

Penn State Dance Marathon Committee Member: Operations (OPP) THON 2015 and 2016

- Planned maintenance, including set-up, tear-down, and cleaning during THON weekend
- Committee chair for TREE, THON Recycling and Environmental Effort

HONORS:

Hugh O’Brian Youth Leadership Award, 2011
Gamma Sigma Delta, The Honor Society of Agriculture, 2014
Dean’s List, 2013-2016