URBAN PARENTS' MOTIVATION REGARDING THEIR CHILD'S PARTICIPATION IN STEM AND AGRICULTURAL ACTIVITIES

by

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A Thesis

Submitted to the Faculty of Purdue University

In Partial Fulfillment of the Requirements for the degree of

Master of Science

Department of Agricultural Sciences Education and Communication

West Lafayette, Indiana

December 2018

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To my son, for being my motivation, and to my family and friends, for their constant love and support.

ACKNOWLEDGMENTS

Thank you Dr. Knobloch for working with me to research my passion and sharing insight into diversity and inclusion. Thank you for helping me focus my thoughts and put my words on paper.

Thank you to Dr. Gabauer for sharing a perspective outside of the field of education. I appreciate your insight in working with adults. Thank you for helping me to be confident and believe in myself and my writing. I truly appreciated your support and encouragement.

Thank you to Dr. Mentzer for insight from engineering and technology, as well as how to work with families. And thank you for helping me think through my survey design.

Thank you to Dr. Esters for helping me focus my research purpose and significance. Thank you for being my teacher and sharing advice.

Thank you to the ASEC department: faculty, staff, and graduate students. I have valued your support and encouragement throughout this process.

Thank you to all the principals, after school program leaders, and community outreach chairs that helped me find participants. Without you, I would not have a project to write about. Thank you for your support.

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ABSTRACT

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Degree Received: December 2018
Title: Urban Parents' Motivation Regarding their Child's Participation in STEM and Agricultural Activities.
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Parents play a major role in the choices their children make regarding academics, leisure activities, and college and career preparation. Parent outcome expectations and behaviors are informed by their parenting self-efficacy in a specific subject or task. Parenting self-efficacy is the confidence parents have in their abilities to influence their children's motivation, environments, and behaviors that could result in positive youth development. Parenting self-efficacy is informed by personal factors and experiences. Parenting self-efficacy can help to describe why or why not a parent engages in certain activities with their child.

The purpose of this study was to explore and describe how the motivation of parents of urban middle school students plays a role in their child's interest in agriculture or STEM-related activities. The convenience sample for this study were parents of urban middle schools in Indianapolis, IN ($N = 53$) who's children participated in afterschool programs. Quantitative data were collected using a parenting self-efficacy questionnaire, which included items related to participants' parenting self-efficacy (PSE) as it pertains to their child's academics, STEM and agricultural activities; parent outcome expectations (POE) as it pertains to their child's college and career preparation, and discussing STEM and agriculture activities with their child; and, parents' perceptions of their child's post-secondary career and educational options and intended career field. Descriptive statistics including means, standard deviations, frequencies, and percentages were used to analyze the data. Correlations were computed to explore the relationships between the variables.

There were four conclusions for this study. First, urban parents were self-efficacious regarding their child's academic performance and STEM activities, and had positive outcomes expectations regarding their child's college and career preparation and engaging their child in agriculture and STEM activities. Second, on average urban parents reported participating in four different types of activities with their child, and recreational sports, visiting museums, computer

games, and visiting the zoo were most popular. Third, urban parents agreed that their child would most likely pursue an associate or bachelor's degree in arts, humanities, and social sciences as their post-secondary options. Finally, urban parents' parenting self-efficacy for academic performance, STEM, and agriculture were positively related to parents' outcome expectations regarding agricultural activities. Moreover, parenting self-efficacy regarding agricultural activities was positively related to the number of activities parents did with their children. Implications for practice and recommendations for future research were discussed.

CHAPTER 1. INTRODUCTION

1.1 Introduction

Career exploration in middle school is an important way to further engage students in their education (Panzer, 2006). Teaching how various subjects and lessons are used in careers can help students apply what they are learning outside the classroom. Students see career exploration as an experience they can use to begin to set tentative career goals and a necessary part of their school experience (Arrington, 2000). Career exploration in middle school helps to emphasize the importance of continued education, which then reduces the number of students who would later drop out in high school (Panzer, 2006), and encourages interest in science, technology, engineering, and mathematics (STEM) (Stiles-Clarke & MacLeod, 2018).

The No Child Left Behind Act of 2001 stated parents must be active in their child's schooling in order for their child to excel in school (DePlanty, Coulter-Kern, & Duchance, 2007). Parents provide support (social, cultural, and emotional) children ages 9-17 need to do well in school (Bokhorst, Sumter, & Westenberg, 2010; DePlanty, Coulter-Kern, & Duchance, 2007). Major influences on a middle school students' career intentions and perceptions include their parents, family members, and friends (Stiles-Clarke & MacLeod, 2018). Furthermore, a person's career aspirations are determined by factors such as parental support, socioeconomic status, gender, race, academic achievement, and self-esteem (ASPIRE, 2013; Esters & Bowen, 2005).

If a parent or guardian is more interested in a STEM field, they are more likely to work with their children on STEM homework and motivate their children to challenge themselves in those fields as well. Parenting self-efficacy (PSE) influences a parent's' behavior and involvement in certain areas of their child's life which in turn can be a predictor of the child's behavior (Dumka, Gonzales, Wheeler, & Millsap, 2010; Shunow & Lomax, 2002). When parents engage and

encourage children in specific subject areas this builds the child's confidence and interest in that area (Shunow & Lomax, 2002), this can further assist the child in the development of personal and career interests.

There are many benefits to family involvement in their child's education such as the child receiving good grades, having a positive demeanor, and an increased likelihood of the child continuing their education after high school (Barton et. al, 2001). A study by Leal-Muniz and Constantine (2005) showed that parental support is predictive of career exploration and commitment, while also being correlated with the tendency to turn down certain career options. Further studies have noted people made choices based on home influences, pressure groups, school, community, socioeconomic status, and role perceptions (Talbert & Larke, 1995). The majority of the factors previously stated, such as homes influences and community, are all influences outside of the classroom.

Students need confidence and to believe that they are able to successfully overcome academic challenges. This can be achieved through parental support and encouragement of the child (Garcia, Restubog, Toledano, Tolentino, & Rafferty, 2012). Parenting self-efficacy (PSE) is a parents' belief in their ability to positively influence their child's development (Dumka, Gonzales, Wheeler, & Millsap, 2010). Bandura (1997) stated high self-efficacy is positively correlated with motivation, effort, and perseverance. Factors such as these describe one's outcome expectations and if they will initiate a task. However, Bandura's (1997) view is that self-efficacy changes due to personal development and in response to demands. Therefore, low parenting self-efficacy can be improved through intervention.

This study explored the role parents play in their child's education and career aspirations, specifically describing urban middle school parents' perceptions of their child's interest in STEM

and agricultural activities. The project surveyed urban parents that participated in afterschool and community programs about their parenting self-efficacy as it pertains to their child's academics and explaining STEM and agricultural activities; the parents' outcome expectations of discussing college and career preparation, STEM, and agriculture; and the activities that parents and children participate in together.

There is greater racial and ethnic diversity in urban settings. Federal Interagency Forum on Child and Family Statistics' (2017) an annual report highlighted conditions affecting children in the United States (U.S.). The most recent report states that ethnic and racial diversity has increased in the U.S. By the year 2020, it is expected that White will no longer be the majority of all children. In 2016, 22% of children were native-born children with at least one foreign-born parent, and three percent of children were foreign born with at least one foreign-born parent. Urban areas provide a dense and diverse population (Flowers & Flowers, 2008; Cottineau, Hatna, Arcaute, & Batty, 2017) which may with the generalizability of the study. Further, urban areas offer a variety of STEM and agriculture activities for parent and children to engage in, specifically in the Indianapolis area there are different museums such as the Children's Museum of Indianapolis and Conner Prairie.

1.2 Statement of Research Problem

There is a lack of interest in STEM and agriculture among diverse students (Ortega, 2001; Scherer, 2016). Based on literature review that informed this study, there was limited research found on the perceptions urban parents have of agriculture and STEM careers. Parents provide resources and knowledge that help students explore different careers and make decisions on what their career choice will be (Dietrich & Kracke, 2009; Ginevra, Nota, & Ferrari, 2015; Guan et al., 2016; Guan et al., 2015; Restubog, Florentino, & Garcia, 2010). Several studies have been shown that parents play a role in the choices their child will make (Baker, Lobley, Whitehead, 2016; Dorie,

Jones, Pollock, & Cardella, 2014; Lam et al., 2008; Groothuis, 2008). Parents are important to career development because they can influence their child's career choice through their expectations or by sharing their values and beliefs (Fouad et al., 2008). Knowing parents' perceptions of STEM and agriculture will help to increase knowledge of the role families plan in their child's career choice (Keller & Whiston, 2008).

Studies have also shown that barriers underrepresented minorities (URM) youth face to participate in STEM-related activities include the varied but often negative influences of significant adults, low self-perceptions of their ability to be successful in STEM classes, and little interest or aspirations towards STEM careers (Davie-Lowe, 2006; George, Neale, Horne, & Malcom 2001; Payton, 2004). In agriculture and STEM occupations, there is a large gap in the number of underrepresented minorities working in these career fields, especially Black and Hispanic minorities (Campbell et al., 2014; Perie, Grigg, & Dion, 2005; Provasnik et al., 2016; Rampey, Dion, & Donahue, 2009; O'Sullivan et al., 2003). As such, companies miss hiring a large portion of the population, which could potentially lead to the loss of innovative and/or imperative solutions to science, technology, engineering, and mathematics (STEM) problems (Komro, 2017). If parents or guardians are more interested in a STEM field, they are more likely to work with their children on homework related to STEM subjects, such as science and math, and motivate their children to challenge themselves in those fields (Komro, 2017). Exposure to agriculture and STEM related activities in the classroom has the potential to increase interest in these fields (Knobloch, Ball, & Allen, 2007) and make parents better informed of career options for their children.

1.3 Significance of the Study

This study is important for exploring educational reform and ways to incorporate the household environment with the classroom. This research is valuable for teacher professional

development as a means to develop relevant lesson plans that reflect the activities students engage in outside of the classroom. This study is important for describing ways to diversify agriculture and STEM related fields by exploring what motivates urban parents to encourage their child to participate in agriculture and STEM related activities.

1.3.1 Educational Reform

There needs to be more dynamic forms of assessment in schools than only measuring learning potential (Gonzalez, Moll, & Amanti, 2005). This would help students by Schools should allow for more cooperative learning systems, which are better equipped for children who are expected to have more highly developed social interactions. This would allow for improved development of not only the student-teacher relationship, but also the teacher-parent relationship (Gonzalez, Moll, & Amanti, 2005).

A major goal among of national science education is to promote scientific literacy for all Americans (Barton et al, 2001). Using scientific principles to make everyday decisions provides students the opportunity to gain a better understanding of the world, societal issues, and prepares students for various professional and technical careers (Barton et al, 2001). Scientific knowledge helps one make better decisions regarding their health and provides a better understanding of environmental and energy issues (Schreiner & Sjoberg, 2004). Gaining a better understanding of urban parents' perceptions and the activities they participate in with their children would allow teachers the opportunity to develop a curriculum that is relevant to the student's real world experiences. In this instance, the term relevance is used to describe strategies teachers use to design curriculum which highlights content beyond the classroom (Schmidt et al, 2018). When a subject is seem by students as being applicable outside of school, students are more engaged and persistent which improves their academic performance (Eccles, Barber, Updegraff & O'Brien, 1998; Eccles

et al., 1983; Hulleman & Harackiewicz, 2009; Hulleman, Durik, Schweigert & Harackiewicz, 2008; Keller, 1987a; Lau & Roeser, 2002; Newmann et al., 1992; Simpkins, Davis-Kean & Eccles, 2006).

1.3.2 Teacher Professional Development

Teachers may be able to more effectively integrate parents' ideas, experiences, and beliefs into their classroom instruction if they had a better understanding of how parents, who live in inner-city communities, think about agriculture and science (Barton et al, 2001). By considering the perspective of underrepresented minority parents, teachers would be more equipped to develop culturally relevant lesson plans. If educators are able to gain a better understanding of students' lives then household practices can be related to the classroom (McIntyre, Rosebery, & González, 2001). This would actively engage households and further allow for a reciprocal relationship between teachers and parents.

Prior studies have shown that student interest, motivation, and value of academic subjects decrease in middle school (Gnambs & Hanfstingl, 2016; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002), particularly in math and science (STEM fields) (Osborne, Simon, & Collins, 2003; Gottfried, Fleming, & Gottfried, 2001; George, 2000; Greenfield, 1997). By surveying parents and identifying activities that parents and children participate in, middle school teachers may find ways to motivate their students during this time of motivational decline (Schmidt et al, 2018).

Further, McIntyre, Swazy, and Greer (2001) studied two teachers in rural Kentucky who made visits to the homes of their students in order to better understand their students' lives outside of school. The teachers then designed mathematics and English lessons around a major school event, Agricultural Field Day, which reflected how the students' lived and family knowledge. This development also allowed for parent involvement as they were allowed to attend and participate

in the field day. The field day shows how activities outside of the classroom can be used to develop educational curriculum and programs for parent engagement. By surveying urban parents that participate in afterschool programs and community organization, this study gains further information about activities teachers can incorporate into their curriculum.

1.3.3 Diversity in Agriculture and STEM Fields

There are plenty of opportunities for careers and advancement in agriculture and STEM related fields though many job opening go unfilled (Carnevale, Smith, & Melon, 2011; Brown, Roberts, Whiddon, Goosen, & Kacal, 2015). In 2010, the United States Department of Agriculture (USDA) funded community agriculture projects that provided over 2,000 jobs and helped to start over 3,000 micro-businesses (Kobayashi, Tyson, & Abi-Nader, 2010). Between 2015 and 2020, in the U.S. there is expected to be an average of 57,900 annual openings for those with bachelor's or higher degrees in food, agriculture, renewable natural resources, or the environment (Goecker, Smith, Fernandez, Ali, & Theller, 2015). Though agriculture careers include such jobs as research scientists and engineers, the 2012 census of agriculture reported 95.4% of principal farm operators being White, 3.2% of Hispanic origin, 1.6% Black or African American, 1.8% American Indians or Alaska natives, 0.6% Asian, 0.1% native Hawaiian or other Pacific Islanders, and 0.5% reported more than one race (Vilsack & Clark, 2014).

STEM occupations account for 5.3% of the total workforce in the United States as of 2011 (Beede et al., 2011). Asian Americans and White students have maintained the most interest in STEM career interests from freshman year to senior year of high school (70.5% and 57.9% respectively), followed by African American (53.9%), American Indian students (53.6%), and Hispanic students (51.2%) having less interest (Herrera, Hurtado, & Chang, 2012). Overall interests in the STEM fields has declined (ACT, 2006, Carnevale, Smith & Melton, 2011; Ortega,

2011). By exploring what motivates urban parents to engage their child in agriculture and STEM activities, this could help describe a better platform for keeping students engaged in these fields throughout high school and possibly assist colleges with PK-12 programing and initiatives.

1.4 Purpose of the Study

The purpose of this study was to explore and describe how the motivation (inclusion and cooperation) of parents of urban middle school students plays a role in their child's interest in agriculture or STEM related activities. Surveying the parents of students from urban middle schools in Indianapolis, IN would help give insight on the parenting self-efficacy (PSE) that parents have as it pertains to their child's academics, STEM and agriculture activities. PSE informs parent outcome expectations and behaviors. PSE refers to parents' confidence in their ability to positively influence their child's development and environment (Dumka, Gonzales, Wheeler, & Millsap, 2010).

The study worked with two schools, one afterschool program, and two community organizations using online and paper surveys to collect data from urban parents. In doing this, the researcher attempted to have a representative sample of an urban population.

1.5 Research Questions

Four research questions guided this study following the conceptual and theoretical framework of social cognitive theory (Bandura, 1997).

1. What were urban parents' parenting self-efficacy and outcome expectations regarding college and career preparation and agricultural and STEM activities?
2. What behaviors were reported by urban parents regarding activities they did with their child?

3. What were urban parents' perceptions of their child's interest in career fields and their child's educational intentions?
4. What were the relationships among urban parents' parenting self-efficacy, parents' outcome expectations, and parent behaviors?

1.6 Limitations of the Study

The following were limitations for the study: research design, subject generalizability, age group generalizability, location, convenience sample, Hawthorne Effect, translation, and length of time to complete the questionnaire.

1. This was an exploratory descriptive study. As such, the researcher made no attempt to establish causality (Schutt, 2012).
2. The study only focused on agriculture and STEM related activities; therefore, the findings are not generalizable to other fields.
3. The study was conducted with urban middle school students' parents; therefore, the findings are may not be generalizable outside of this age group.
4. The study was conducted in Indianapolis, IN; therefore, the findings may not be generalizable outside of this city.
5. The study used a convenience sample, therefore only parents willing to participate from the chosen schools were included in the study.
6. Participation was optional, data collection was limited to only those willing to participate
7. The Hawthorne Effect posed a threat to internal validity. As such, participants could provided socially desirable responses instead of responding to the questionnaire in an authentic manner that more closely represented their beliefs and opinions (Schutt, 2012).

8. The questionnaire for the study did not include open-ended questions. Participants were only able to report on the questions asked without being able to give further explanation of their responses. Out of respect for participant's time, questions to explore their home environment were not included.

1.7 Definitions of Terms

Agriculture: "a field that encompasses the production of agricultural commodities, including food, fiber, wood products, horticultural crops, and other plant and animal products." (National Council for Agricultural Education, 2009, p. 2).

Outcome expectancy: the outcome a person expects to occur if a behavior is performed (DiIorio, Dudley, Wang, Wasserman, Eichler, Belcher, & West-Edwards, 2001)

Parent (or guardian): a person that is in the process or state of rearing and/or providing care for an offspring or child (Chan, 2004)

Parenting behavior: parental practices (Dumka, Gonzales, Wheeler, & Millsap, 2010)

Parenting self-efficacy (PSE): "parents' estimates of their abilities to influence their children and their children's environments in ways that lead to positive development" (Dumka, Gonzales, Wheeler, & Millsap, 2010, p. 522)

STEM: Science, technology, engineering, and mathematics.

Underrepresented minority in agriculture: "any ethnic group – African American, Alaskan Native, American Indian, Asian American, Hispanic American, Native Hawaiian, Pacific Islander, or any other group (National Institute of Food and Agriculture, 2014, p. 9).

Urban: A geographic area with a dense and diverse population (Flowers & Flowers, 2008; Cottineau, Hatna, Arcaute, & Batty, 2017)

1.8 Basic Assumptions

The following assumptions were made by the researcher in this study:

1. The researcher conducted the study objectively and her research bias was minimized.
2. Informed by a positivist research paradigm, the researcher assumed it was possible to address the research questions through quantitative methods supported by a conceptual and theoretical framework based on existing theories and literature (Denzin & Lincoln, 2005).
3. Participants responded to the questionnaire instrument truthfully.
4. Participants' recall accurately reflects their thoughts and feelings.
5. Participants can accurately predict their own behavior (Eastman & Marzillier, 1984).
6. The tasks for which self-efficacy is being assessed had well defined performance levels.
7. Participants have experience with subjects and tasks included in the questionnaire.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of the important role parents play in their child's education and career aspirations. This study explored urban middle school parents' perceptions of their child's interest in STEM and agricultural activities by surveying urban parents about their parenting self-efficacy, parent outcome expectations, and behaviors. This chapter reviews the literature of four primary related topic areas: 1) role of parents in their child's education, 2) parents' views of college and career preparation, 3) parents' views of STEM, and 4) urban schools. The conceptual and theoretical framework are also included in this chapter. The literature and framework inform the study design and questionnaire content. Finally, this chapter is concluded with the need for the study and a summary of the chapter.

2.2 Purpose of the Study

The purpose of this study was to explore and describe how the motivation of parents of urban middle school students plays a role in their child's interest in agriculture or STEM related activities.

2.3 Research Questions

1. What were urban parents' parenting self-efficacy and outcome expectations regarding college and career preparation and agricultural and STEM activities?
2. What behaviors were reported by urban parents regarding activities they did with their child?

3. What were urban parents' perceptions of their child's interest in career fields and their child's educational intentions?
4. What were the relationships among urban parents' parenting self-efficacy, parents' outcome expectations, and parent behaviors?

2.4 Literature Review Methods

There were several different search methods used to identify relevant literature for the study. References were from a search of Purdue University library direct search, Purdue eJournal database, Google and GoogleScholar. A search of the following journals between the years of 2000 to 2016 was also done: *The Journal of Educational Research, Journal of Extension, Journal of Research in Science Teaching, NACTA Journal, Journal of Marketing for Higher Education, Journal of Agricultural Education, Life Sciences Education, Journal of Hispanic Higher Education, Journal of Career Assessment, Educational Studies, and Black Issues in Higher Education*. The search was conducted using the following keywords: parent motivation, underrepresented minority parent influence, underrepresented minority parent influence STEM, underrepresented minorities agriculture, underrepresented minority parents agriculture, urban elementary school STEM, urban middle school STEM, middle school students interest STEM, urban parent agriculture, underrepresented minority parents perceptions of agriculture, urban parent perceptions of agriculture, and parents perception of agriculture.

2.5 Review of Literature

2.5.1 Role of the Parent in Child's Education

Parents being involved in their child's academic life has been shown to enhance how children approach achievement (Pomerantz, Grolnick, & Price, 2005). For example, activities may

include working together on schoolwork or talking about the child's day at school as well as discussing current events and going to museums with the child. Activities such as these, in addition to expressing excitement about a child's successes in school, are ways parents can assist children in building skills that lead to academic confidence (Pomerantz, Grolnick, & Price, 2005). The activities also allow for a stronger relationship between a parent and child while also communicating to the child that the parent is engaging in valuable activities giving the child a sense of purpose.

Children having a close relationship with their parents may lead them to place importance on respecting and following the wishes of their family, specifically their parents. Children of Asian and Latino descent are more likely to feel obligated to their family than those of European descent, but even children of European descent report such feelings (Pomerantz, Grolnick, & Price, 2005). Giving priority to the wishes of their parents may cause children to feel that it is their duty to achieve the competencies their parents' value giving them a sense of purpose in life (Pomerantz, Grolnick, & Price, 2005). With this in mind, children commit to being high achieving in the academic area, event, or sport that their parents place the most importance.

2.5.2 Parent Views of College and Career Preparation

"Occupational inheritance", the tendency for a child to go into the same occupation as their parent, is seem in the field of engineering, the medical field, farming community, with lawyers, politicians and in NASCAR (Groothuis, 2008; Baker, Lobley, Whitehead, 2016). Parents are a determining factor in their child's career aspirations as children understand their parents' occupation better than others (Dorie, Jones, Pollock, & Cardella, 2014). Further, parents' personal beliefs and aspirations also determine a child's academic and career aspirations (Fouad et al., 2008).

Lam et al. (2008) showed that after workshops or programs pertaining to STEM, students and parents had a better perception of STEM education and parents influence students' interest. Parental expectations determines a child's academic performance (Jacobs & Harvey, 2005). Furthermore, for students from low socioeconomic backgrounds, parents' motivation and beliefs are a significant motivator in their child succeeding in school and becoming an engineer (Dorie, Jones, Pollock, & Cardella, 2014).

Dorie, Jones, Pollock, and Cardella (2014) analyzed multiple case studies of how parents interacted with their children. The common focus of each case study was to determine how parents teach their child about engineering. From these case studies, it was noted that parents teach the basic subjects, science and mathematics, while discussing engineering is done more casually. Books about women in non-traditional occupations were important in helping kindergarten students learn of the various career options for women. Additionally, it was observed that most parents were not able to describe the difference between engineering and design or engineering and science. And prior to high school, most parents did not discuss careers, though they were supportive of whatever career choice their child desired. Only after a child expressed interest in a particular career did the parent provided their child with opportunities to further learn about the specific career. As it pertains to informal learning activities, the researchers showed parents look to schools and other parents for information on STEM activities outside of 4-H tracks, museums, and Boy and Girl Scouts (Dorie, Jones, Pollock, & Cardella, 2014).

In the STEM field of engineering, studies have been done from birth to completion of college that showcase how parents guide, stimulate, motivate, and build their child's attitude toward engineering (Dorie, Jones, Pollock, & Cardella, 2014). By acting in this way, a parent is expressing support of their child's interest and learning of engineering. However, if a parent is

unable to explain what engineering is when asked by their child, they may discourage further interest or share incorrect information (Dorie, Jones, Pollock, & Cardella, 2014). A similar statement can be said about the field of agriculture, which is a field that applied STEM concepts in real-world contexts regarding nature, plants, animals, and food (Nadelson & Seifert, 2017). If people are misinformed or unaware of what all that can be done through agriculture, then this can turn them away from seeing it as a career option. If parents are misinformed about agriculture then it could turn their child away from the field as a career goal.

2.5.3 Parent Views of STEM

Harackiewicz, Rozek, Hullerman, and Hyde (2012) conducted a longitudinal study of U.S. high school students and their parents using an intervention over a 15-month period. The intervention consisted of researchers mailing informational brochures to home to parents that shared with them ways to help their child find value in school. Additionally, parents were given access to a website that contained information about STEM fields and careers. The results of this intervention showed an increase in communication between parent and child about STEM course, an increase in perceived importance of STEM courses, and an increased number of STEM courses taken by students their junior and senior year of high school (Harackiewicz, Rozek, Hullerman, & Hyde, 2012). Furthermore, the study showed, parents will become more engaged in their child's schooling if given the proper resources. Theoretically-based motivational intervention methods such as this could be helpful in promoting important academic choices.

In a longitudinal study of science and career aspirations, children age 10-14 reported a positive view of science and scientist and also reported that their parents valued science, though very few children aspired to be scientist (ASPIRES, 2013). The strongest factors that influenced student's science aspirations were parental attitudes to science and their personal attitudes and

understanding of science. Additional factors were science-related activities outside of school, cultural capital, gender, and ethnicity. The study also observed that families who were able to see how science was used in the workforce placed more value on studying science (ASPIRES, 2013).

2.5.4 Urban Schools

Urban can be defined as a geographic area with a dense and diverse population (Cottineau, Hatna, Arcaute, & Batty, 2017; Flowers & Flowers, 2008). Schools located in urban areas often have a high population of students and limited funding. This causes teachers and staff to be overworked which leads to high turnover rates (Wenner, 2017).

The achievement gap also plays a role in the education at urban schools. The achievement gap is "the observed disparity in a number of educational measures in academic performance between different groups of students, especially groups defined by race/ethnicity, gender, and socioeconomic status" (Clark, 2014a, p. 3). African Americans and Latino students are not performing well in science compared to White and Asian students. There is also a difference in science achievement between low- and high-income students (Darling-Hammond, 2014). Groups that do not perform well in science are underrepresented in the STEM workforce (Clark, 2014b).

Middle school aged children are in a state of transition. Between elementary and high school children gain more independence from their parents and become more interested in socializing among their age group (Constantino, 2007; Hill & Tyson, 2009). During this time, the lessons and interactions a child has had with their parents plays a role in the behavior and choices the child exhibits while away from their parents (Hill & Tyson, 2009). Middle school aged children are also at a crossroads when preparing for high school. At this point in their education, they are gaining more control over the classes they take and have to decide which educational choices and

activities will best prepare them for life after high school (Rudolph, Lambert, Clark, & Kurlakowsky, 2001).

2.6 Conceptual Framework

Bandura's (1997) constructs of self-efficacy, behavior, and outcome expectations informed the conceptual framework for this research. The model examines how self-efficacy determines the behavior chosen to achieve a specific outcome (Figure 2.1). The independent variables for the study were demographics, parenting self-efficacy, and parent outcome expectations. The dependent variables for the study were parent behaviors, parent perceptions of child's interest in career fields, and parent perceptions of child's educational intentions (Figure 2.2)

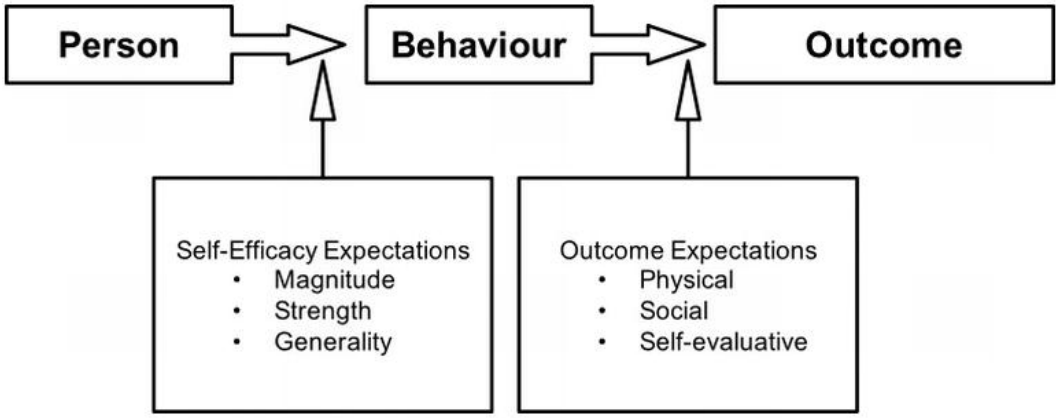

Figure 2.1 Self-Efficacy, Outcome Expectancies, and Control (Bandura, 1997, figure 1.3)

2.6.1 Demographics

Coleman and Karraker (1997) outlined four possible mechanisms that develop parental self-efficacy: childhood experiences, level of mental and behavioral preparation, external messages, and personal experiences of mothering. Demographic information were collected to gain further insight into the participants' background.

2.6.2 Parenting self-efficacy

For this research, parenting self-efficacy was the focus within the operational framework (Figure 2.2) because this informs parent outcome expectations and parent behaviors. PSE being the focal point would also inform parents' perceptions of their child's education and career interest by helping to describe parent outcome expectations and parent behaviors.

Parenting self-efficacy (PSE) refers to a parents' confidence in their ability to positively influence their child's development and environment (Dumka, Gonzales, Wheeler, & Millsap, 2010); or confidence in one's child rearing ability (Jones & Prinz, 2005). PSE consist of how strongly one believes in themselves as well as how they interpret their capability, while also being dependent on the situation, task, and context (Wittkowski, Garrett, Calam, & Weisberg, 2017).

PSE is strongly associated with a healthy environment that encourages the development of positive social, academic and psychological well-being (Wittkowski, Garrett, Calam, & Weisberg, 2017).

High levels of parenting self-efficacy are associated with an increase in: engagement and quality of engagement, parental responsiveness and monitoring, and parental involvement (DiIorio, 2011). Parents with high parenting self-efficacy also have high parental competence which informs the outcome expectations they have about their child's development (DiIorio, 2011).

2.6.3 Parent outcome expectations

Outcome expectations can be defined as the results that are expected after participating in or executing a specific behavior (DiIorio et al, 2001). This study specifically looked at parents' outcome expectations about college and career preparation, and agriculture and STEM activities. Outcome expectations for these specific areas can be informed by the parent behavior and behaviors can also be informed by outcome expectations. With a specific outcome in mind, based on prior knowledge and experiences, a parent is likely to participate in certain activities with their child to achieve the desired outcome from their child (DiIorio, 2011).

2.6.4 Parent behavior

Parent behavior can be defined as parenting practices, such as visiting museums with your child or participating in a sporting event with your child (Dumka, Gonzales, Wheeler, & Millsap, 2010). For this study, we focused on parent behaviors that involved parent and child interactions, to further explore parenting self-efficacy and parent outcome expectations. If a parent is confident in their knowledge and skills set about a topic, they are more likely to interact with their child in this area. Parent behaviors can also inform a parent's outcome expectations, and vice versa (Johnson, Chen, Hughes, & O'Connor, 2015). For example, a parent may read to their child with the expectation that it will expand their language skills. While a parent may also have the

expectation that their child will do better in school and classes such as English, if they read to them so the parent then reads to their child.

2.6.5 Parent perceptions

For this study, parents' perceptions of their child's career interest and educational intentions were dependent variables informed by parents' behaviors. Though parents have their own outcome expectations for their child, when a child expresses an interest in a subject area this better informs the parent in how to further interact with their child (Giallo, Treyvaud, Cooklin, & Wade, 2013). Parents who have regular interactions with their child are more likely to have an understanding of their child's likes and dislikes while also being aware of what their child aspires to be when they grow up (Giallo, Treyvaud, Cooklin, & Wade, 2013). Based on these every day interactions between parent and child, a parent can form an opinion of their child's career goals as well as the level of education they will need to achieve their goals. However, some parents may be unaware of the educational requirements needed for specific career fields or may have the expectation that their child will obtain a certain level of education regardless of their career choice (Shunow & Lomax, 2002).

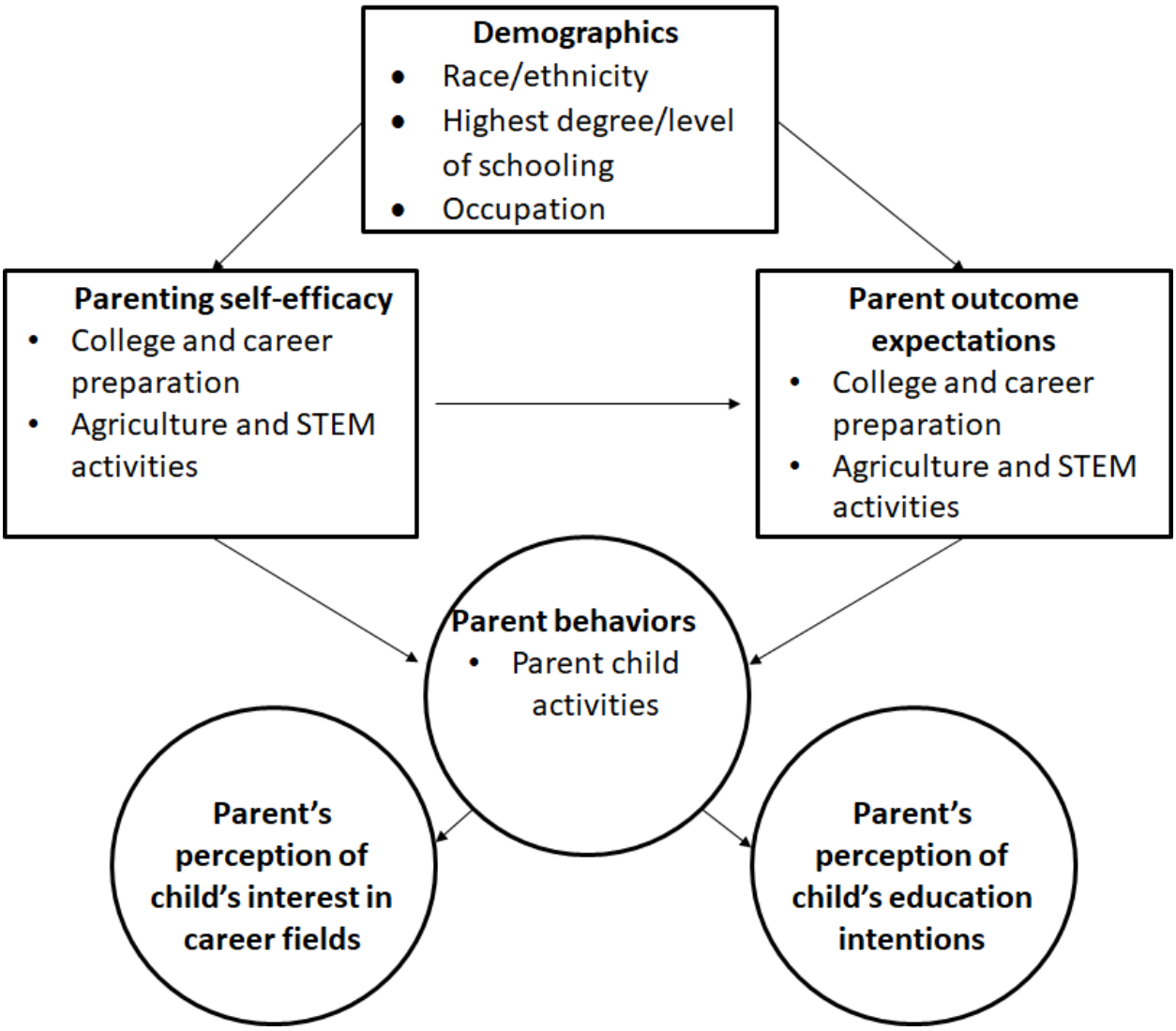

Figure 2.2 *Operational Framework*

2.7 Theoretical Framework

In this study, social cognitive theory was used (Bandura, 1997). Social cognitive theory proposes that one's inner personal factors, behavior, and environment interact to determine outcomes. For example, how a parents' self-efficacy, parenting practices, and family network influence a child's development. Those with high self-efficacy have are more likely to perform well, initiate difficult tasks, investment more effort, and perseverance when faced with an obstacle.

These factors describe if one with initiate a task in order to achieve a desired outcomes. Bandura (1997) described self-efficacy as a trait that changes as needed in response to challenges and personal development.

People are more likely to engage in performing a task if they believe they will achieve their desired outcome (Bandura, 1997, 2006; Lent, Brown, & Hackett, 1994). Beliefs describe people's goals, motivation, and whether they are able to overcome challenges. A person's self-efficacy shapes their outcome expectations, if they believe their actions will provide them a favorable outcome or not. Efficacy beliefs also describe how one views new opportunities and challenges. Occupational development and pursuits are also determined from personal efficacy (Bandura, 1997, 2006; Lent, Brown, & Hackett, 1994).

Parenting self-efficacy is derived from self-efficacy, which is the confidence one has in their ability to successfully perform a given task (Bandura 1997, 2006). Self-efficacy informs what a person does, how much effort they put forth, and if they will persist in the face of adversity (Bandura 1997, 2006). Self-efficacy is derived from one's own performance, watching others perform a task, social persuasion, and one's physiological and emotional states (Bandura & Adams, 1997).

In a study of adolescent outcomes and parent behavior (Shunow & Lomax, 2002), parental efficacy was examined as it describes parent behaviors and the expectations they have of their child's development. Parental efficacy was described in this study as parents' believing that they were capable of parenting their child to successfully overcome negative peer influences and being a positive impact for schools and community youth groups. The results found that parental efficacy described how involved a parent was in their child's academics and how closely the parent monitored their child. Additionally, data was analyzed separately by ethnic or racial groups

because family backgrounds and experiences may vary. From this analysis, results suggested that neighborhood conditions influence parental efficacy (Shunow & Lomax, 2002).

A study of Mexican Americans by Dumka, Gonzales, Wheeler, and Millsap (2010) evaluated the connection between parenting self-efficacy and parenting practices that predict adolescent conduct problems. The researchers noted that the relationship between PSE, parenting, and adolescent's behavior can be influenced by participants' ethnic backgrounds. Self-efficacy can describe one's confidence in their parenting skills and practices to encourage their child to follow familial cultural values that may differ from American values and keep their child away from negative neighborhood influences (Halgunseth, Ispa, & Rudy, 2006). Furthermore, there may be a difference in European American adolescents and Mexican American adolescents' views of their parents' positive control practices (Dumka, Gonzales, Bonds, & Millsap, 2009). The study results indicated that Mexican American parenting practices were influenced by their parenting self-efficacy (Dumka, Gonzales, Wheeler, & Millsap, 2010).

2.8 Need for Study

The study is unique as it focuses on urban parents and parenting self-efficacy that informs their behavior towards agriculture and STEM related activities, a factor outside of the classroom that influences students' interests. This might help to fill the research gap by further describing the role of parenting self-efficacy as it pertains to the children's behavior, specifically with agriculture and STEM, and helps to gain a better perspective of how factors outside the classroom play a role in agricultural and STEM career interest. Studies have been conducted to describe adolescent's perspective of agriculture and STEM (Ortega, 2011; Scherer, 2016) however this study will gain the perspective of parents.

African Americans have turned away from farming and many other agricultural related career options (Moon, 2007). Their academic interests and ideal lifestyle are different than anything they associate with agriculture (Alston & Crutchfield, 2009). People hold negative opinions of traditional agriculture (Talbert & Larke, 1995; Ortega, 2011; Scherer, 2016) while interests in the STEM fields have been declining (ACT, 2006, Carnevale, Smith & Melton, 2011; Ortega, 2011). A study on current perceptions of STEM fields among the faculty at Illinois State University by Brown (2011) showed that 18.4% of participants were unsure of whether they believed STEM education was important, and 6.7% believed STEM education to be unimportant. Additionally, there continues to be a lack of diversity in the field of agriculture although Agricultural Education stakeholders have encouraging the expansion of urban programs since the 1980s (Brown, Roberts, Whiddon, Goosen, & Kacal, 2015). Because the field of agriculture is tasked with feeding a growing world population, Student populations enrolled in agricultural majors should more closely reflect the demographics of society because the field of agriculture is tasked with feeding a growing and increasingly more diverse population (White & Linhardt, 1991). The lack of diversity is causing the United States to miss out on a large number of perspectives on innovative solutions to agriculture and STEM problems (Komro, 2017). To achieve this, underrepresented minority students and nontraditional students in urban areas should be made aware of the career opportunities in agriculture and STEM related fields.

For years, studies have been conducted to address the lack of urban interests and diversity in agriculture. There have been studies to explore urban students' career choices, perceptions, enrollment influences, and beliefs about agriculture (Anderson, 2013; Esters, 2007; Esters & Bowen, 2005; Fraze, Wingenbach, Rutherford & Wolfskill, 2011; Frick, Birkenholz, Gardner & Machtmes, 1995; Pate, 2011; Talbert, 1996, 1997; Thompson & Russell, 1993; Trexler, 2000;

White, Stewart, & Linhardt, 1991;). These prior studies have found that career aspirations affects curriculum choice, that urban students and families do not have a personal connection or interest in agriculture, and that there is a lack of opportunity and experiences with agriculture in urban areas. These studies supported recent findings of Ortega (2011) and Scherer (2016), which also state that urban students do not have a personal connection to agriculture nor do they see agriculture as offering any opportunities relevant to them. Recent findings further explain that URM students expressed an interest in science and working with people, they perceived agriculture as unable to provide them with the lifestyle they desired. However, after participation in an agriculture and STEM pre-college program, students were more open to and interest in agriculture as a possible career. Furthermore, several studies have noted that parents an important role in motivating their child to pursue a career in STEM but may lack the support and knowledge to do so (Harackiewicz, Rozek, Hullerman, & Hyde, 2012 Hill & Tyson, 2009; Hyde, Else-Quest, Alibali, Knuth, & Romberg, 2006).

Studies have also shown urban students determine if they will pursue a degree in agriculture based on their previous experiences with agriculture and their family's attitude about agriculture (Boekeloo et al., 2015; Fleming & Grace, 2015; Martin, Erete, & Pinkard, 2015**;** Ortega, 2011**;** Outley, 2008; Scherer, 2016). However, even when students and parents have positive attitudes toward STEM, food and agricultural sciences there is still a lack of students pursuing science and agriculture careers (Wildman & Torres, 2001; Faulkner, Baggett, Bowen, & Bowen, 2009).

2.9 Summary

The results of the review of literature were presented as well as studies that described the role parents play in their child's educational and career aspirations. The conceptual model of

factors that describe parent motivation to engage in agriculture and STEM activities was presented, including the independent variables of demographics, parenting self-efficacy, and parent outcome expectations. The theoretical framework, as informed by the social cognitive theory, was presented to explain how it informed the study.

While several studies have been done to better understand the role parents play in their child's education and leisure activities, there seemed to be little literature that was found on parents' perceptions of their child's interest in agricultural and STEM activities. Parents' beliefs and behaviors shape their children's values and motivation (Fouad et al., 2008). Experimental research specifies that through simple interventions providing students with information about the importance of a topic it is possible to increase their value and interest (Durik & Harackiewicz, 2007; Shecter, Durik, Miyamoto, & Harackiewicz, 2011). Therefore, further research is needed to understand how parents play a role in their child's interest in agriculture.

CHAPTER 3. METHODS

3.1 Purpose of Study

The purpose of this study was to explore and describe parents' motivation of urban middle school students regarding their child's interest in agriculture or STEM related activities.

3.2 Research Questions for the Study

The research questions for this study include the following:

1. What were urban parents' parenting self-efficacy and outcome expectations regarding college and career preparation and agricultural and STEM activities?
2. What behaviors were reported by urban parents regarding activities they did with their child?
3. What were urban parents' perceptions of their child's interest in career fields and their child's educational intentions?
4. What were the relationships among urban parents' parenting self-efficacy, parents' outcome expectations, and parent behaviors?

3.3 Research Design

The researcher sought to explore and describe how the motivation of parents of urban middle school students plays a role in their child's interest in agriculture or STEM-related activities. As such, the researcher aimed to determine to what extent there were correlations among the independent variables of demographics, parenting self-efficacy and parents' outcome expectations, parents' behaviors, and the parents' perceptions of their child's career and educational intentions.

The researcher was informed by a positivist paradigm. Therefore, the researcher assumed it was possible to address the research questions through quantitative methods supported by a

conceptual and theoretical framework based on existing theories and literature. Positivist research strategies helped to establish internal and external validity allowing the study results to be generalizable to the larger population being studied (Denzin & Lincoln, 2005).

A survey of middle school parents was conducted from September through October, 2018. In-person questionnaires were distributed during afterschool programs and an online questionnaire link was shared to parents' groups and schools. The online questionnaire link was distributed to parents by school's parent coordinators or parent group leaders. Surveys as a form of self-reporting have been used in recent studies to collect data on parent and student perceptions (Jean-Philippe, Richards, Gwinn, & Beyl, 2017; Wittkowski, Garrett, Calam, & Weisberg, 2017; Strickland, 2015; ASPIRE, 2013). However, this study was novel as it collected data from parents of more than one classroom and age group regarding STEM and agricultural activities.

3.4 Participants

The participants for the study consisted of parents of urban middle school students (grades 3-8). Middle school grades were chosen because parental involvement levels decline as children get closer to high school (Constantino, 2007). Therefore, parents with children in this age group would still be able to recall the various activities in which they participated in as a family. One charter school, two public middle schools, and two parent groups participated in this study. Each school and group was located in Indianapolis, IN. The city of Indianapolis was a convenient location to conduct research because of the various agriculture and STEM-related career opportunities that are available in an urban context. For example, Eli Lilly and Company, Corteva, and the National FFA Organization as well as having attractions such as the Indianapolis Children's Museum and the Indianapolis Zoo.

During the proposal process for this research project, three public schools in Indianapolis, IN agreed to participate in the study. Purdue University IRB approval for the project was received while the schools were on summer break. When the researcher followed up with the schools at the beginning of school year and shared the IRB approval, none of the schools agreed to participate in the study for reasons such as a change in staff causing there to no longer a person to coordinate the survey, the school did not consider their grade levels to be middle school and felt the survey would not be relevant to their parents, and the school did not have a way to contact parents electronically to distribute the questionnaire. The researcher then spoke with people she knew through work and leisure activities about needing schools or parent groups to participate in a study of parent motivation, as well as personally calling and emailing public middle school principals in the Indianapolis area. From this, one charter school, two public middle schools, and two parent groups agreed to participate. Therefore, a convenience sample of parents who had a child enrolled in an afterschool programs and parents who were active in community organizations, especially regarding youth, were used for this survey. It is important to note that these parents were not representative of all parents in the Indianapolis community, but they may provide insights to parents with similar levels of education and behaviors in doing afterschool and out-of-school activities with their child. For example, over half of the parents had completed associates, bachelors or graduate degrees and parents reported doing at least four different activities with their child.

For the 2018-2019 school year, the state of Indiana has a reported enrollment of 516,192 public school students in grades 3-8. Of the three middle schools that chose to participate, each had over 50% of their student populations receiving free or reduced lunch with majority of their students being underrepresented minorities. The overview of the ISTEP+ 2017-2018 scores for

two of the schools involved are 80% pass (20% did not pass), 21.8% pass (78.2% did not pass), and 12% pass (88% did not pass).

The two parent groups are active in building community relations, promoting education, and encouraging engagement with youth. This information helps to describe the socioeconomic status of participants, which can contribute to parenting self-efficacy (Dumka, Gonzales, Wheeler, & Millsap, 2010). One parent group is exclusively for moms in the greater Indianapolis area who actively contribute to their households' decisions, financial or family-related matters. Their mission is to build a network of moms by connecting women through in-person activities and social media. The second parent group is exclusively for men of a similar cultural background in the Indianapolis area. This group focuses on youth development by offering mentoring-based educational programs.

The online questionnaire link was sent to every member of the two parent groups. For one school, the parent recruitment letter with the survey link was printed and distributed during an afterschool open house event. For two schools, the researcher attended afterschool programs and distributed paper copies of the questionnaire to parents willing to participate. One afterschool program focused on engaging students and parents in activities such as cooking, art, and science as well as offering the families' dinner. The second afterschool program was a breakfast for moms which gave the parent and student a chance to share a meal, converse with the teachers and principals, and listen to a keynote speaker. A research cover letter was included during in-person distribution of the questionnaire. Completion of the questionnaire was optional and participants could select not participate at any time. However, participants were offered entry into a raffle for a $25 gift card to encourage completion the questionnaire. Only parents who completed the questionnaire were included in the study results.

The survey was completed by 53 parents. Of which, 42 parents identified as mom or female guardian, and 8 parents identified as dad or male guardian. The intent of this survey was to have one parent per household participate. These parents represented 76 students in grades pre kindergarten to high school. The most reported grades for school aged children was third (12 students), sixth (10 students), and fourth and third grade (8 students each). Additionally, these parents represented seven high school aged students. A majority of parents reported their highest degree of schooling was some college credit (no degree) (n = 12), bachelor's degree (n = 9), and an equal number of parents with master's degrees, associate degrees, or a high school graduate (diploma or GED) being their highest degree of schooling (7). Over half of the participants (82%) reported having some college credit, vocational training, or a degree beyond a high school diploma. Table 3.1 shows the demographic information of parents that participated in the study. A full list of occupations reported by participants can be found in Appendix C.

Table 3.1 Participants demographic information

Category	**Response Options**	***f %***
Race/ethnic group	Black or African American	32 (61%)
n = 52	Hispanic American	6 (11%)
	White or European American	12 (23%)
	Asian/Pacific Islander	0 (0%)
	Native American	1 (1%)
	Other	1 (1%)
Gender	Mom or female guardian	42 (84%)
n = 50	Dad or male guardian	8 (16%)
Education	No schooling completed	0 (0%)
n = 50	Elementary to 8th grade	1 (2%)
	Some high school (no diploma)	1 (2%)
	High school graduate (diploma or GED)	7 (14%)
	Some college credit (no degree)	12 (24%)
	Trade/technical/vocational training	3 (6%)
	Associate degree	7 (14%)
	Bachelor's degree	9 (18%)
	Master's degree	7 (14%)
	Professional degree	0 (0%)
	Doctorate degree	3 (6%)

3.5 Instrumentation

Data collection consisted of a questionnaire that measured demographics, parenting self-efficacy, parents' outcome expectations, parents' behaviors regarding activities they did with their child, and parents' perceptions of their child's career and educational intentions. Because participation was optional, data collection was limited to only those willing to participate. All participants, schools, and groups remained anonymous.

3.5.1 Questionnaire

The questionnaire gathered information on the parents' perceptions of agriculture and STEM-related activities. Parenting self-efficacy (PSE) is assessed using self-report measures because PSE reflects the parents' confidence in their ability to successfully raise their child (Wittkowski, Garrett, Calam, & Weisberg, 2017). The independent variables included parenting self-efficacy and parents' outcome expectations. Parenting self-efficacy was measured in general while also being measured as it pertains to self-efficacy about college and career preparation and parenting self-efficacy about agriculture and STEM activities. This was also done with parent outcome expectations. Parents' outcome expectations were measured generally as well as how they related to college and career preparation and agriculture and STEM activities. The questionnaire also measured demographic items such as race/ethnic group, current occupation, and household activities in which the family participated were adapted from an Agricultural, Food, Natural Resources Interest Survey. This instrument was developed for 5th and 6th graders in an elementary school in Indianapolis. The dependent variables were parents' behaviors (i.e., resources and parent child activities), parents' perceptions of child's career interest, and parents' perceptions of child's educational intentions.

The questionnaire had five parts with a total of 58 items. Part one of the questionnaire was adapted from DiIorio (2011), which was informed by social cognitive theory. This source also informed the word choice and five-point unidirectional rating scale used throughout the questionnaire. The scale ranged from 1 = None, 2 = Very Little, 3 = Some, 4 = Quite a Bit, 5 = A Great Deal. Part two, three, and four of the questionnaire were adapted DiIorio, Dudley, Wang, Wasserman, Eichler, Belcher, and West-Edwards (2001). The original questionnaire was designed to gain a better understand of parenting self-efficacy and outcome expectancy as it pertains to parent child conversations about sex. Part three of the questionnaire was also adapted from Dumka, Gonzales, Wheeler, and Millsap (2010). The questionnaire was original designed to measure the parenting self-efficacy and parenting practices of immigrant Mexican American over time. Part four of the questionnaire was additionally adapted from Scherer's (2016) thesis. Scherer's questionnaire was given to high school students after participation in a pre-college agriculture summer program to measure motivation and views of agricultural careers and agriculture. The final section, part five, was adapted from Gonzalez, Moll, and Amanti (2005), Ortega (2011), and the U.S. Census (2018). Gonzalez, Moll, and Amanti used open-ended questions to better understand the home environment (i.e., parents' occupation and household activities) of elementary school students to explore the family demographics. Ortega measured demographic information in his study of motivation and career interest of a participants in a life sciences pre-college summer program for high school students. The complete instrument can be found in Appendix A, item 3.

Content validity of the instrument was established by a panel of experts who reviewed it to determine if the intended variables were measured. The panel consisted of faculty who had expertise in career and technical education, STEM education, agricultural education, social

cognition and motivation, and educational research. Recommendations were made by the panel of experts and appropriate modifications were made to the instrument. Face validity was established by conducting a pilot test of the instrument to determine if it was understandable by the intended audience, later a field test was done to see if it was operationalized to measure the appropriate constructs. The pilot test was first done by having the online questionnaire completed by Marion County 4-H parents who were similar to the target audience, being in Indianapolis, IN, but were not included in the sample. The field test was completed by 33 parents using an online survey tool (i.e., Qualtrics). Following the field test appropriate alterations of the instrument were completed based on the online comments provided by parents after taking. Computer formatting alterations were made to the online questionnaire that allowed for participants to select multiple answers to questions that gave the option to "select all" as well as making the question of "What age is your child?" an open ended question to allow participants to report the ages of all their children.

Reliability of the instrument was established by calculating the Cronbach's *alpha* coefficient for each metric variable. Part one measured the perceptions of the parents' influence on their child. To measure this, parenting self-efficacy about school and leisure activities with their child were measured. Part two measured parenting self-efficacy about agricultural and STEM activities. Throughout the questionnaire, STEM activities were described as activities related to science, technology, engineering and mathematics. For example, participants were asked to "select the corresponding number that aligns with how confidently you can explain to your child how robotics is a STEM activity." Agricultural activities were described throughout the questionnaire as they could be applied in an urban setting and in relation to STEM. For example, participants were asked to "select the corresponding number that aligns with how confidently you can explain to your child how animal care is a STEM activity." Part one of the questionnaire assessed

participants' parenting self-efficacy regarding school and leisure activities (PSE-Academics). There were nine items (1-9) in this section measured on the five-point unidirectional rating scale previously mentioned. In part one, participants were asked to "Please select the corresponding number that aligns with your thoughts on school performance and leisure activities." Examples of this sections items included statements such as, "How much can you do to make your child see school as valuable?", "How much can you do to show your child that working hard at school influences later success?", and "How much can you involve yourself with your child in their leisure activities?"

Part two of the questionnaire assessed parenting self-efficacy about agriculture (PSE-Agriculture) and STEM activities (PSE-STEM). There were 16 items in this section measured on the same five-point unidirectional rating scale used in part one, 8 items related to STEM (10-15) and 8 items related to agriculture (16-23). In part two, participants were asked to "Please select the corresponding number that aligns with how confidently you can explain to your child." Examples of this sections items included statements such as, "What a scientist does," "How gardening is a STEM activity," and "How learning STEM can help prepare your child for college."

Part three and four of the questionnaire assessed parents' outcome expectations of college and career preparations (POE-CCP) and parents' outcome expectations of STEM (POE-STEM) and agricultural activities (POE-Agriculture). Part three contained 11 items (26-36) focusing on college and career preparation, and followed the five point unidirectional rating scale used in parts one and two. Part three asked participants to "Please select the corresponding number that aligns with if you talk with your child about college and career preparations." Examples of statements in this section include, "You feel like a responsible adult if you talk with your child about college and career preparation," and "He/she will likely follow your suggestions if you talk with your child

about college and career preparation." Part four contained 14 items which focused on agricultural and STEM activities, 8 items on STEM (37-40, 47-50) and 5 items on agriculture (41,43-46), following the five-point scale used throughout prior sections. Part four asked participants to "Please select the corresponding number that aligns with if you talk with your child about STEM and agriculture activities." Examples of statements in this section include, "If you talk with your child about STEM activities, it will help prepare your child for college," and "If you talk with your child about agricultural activities, it will help your child think about a career."

Part five of the questionnaire assessed demographics of study participants and parents' perceptions of their child's educational and career intentions. There were eight items in their section measured on various scales. Examples of items in this section include highest degree of schooling completed and current occupation. At the end of this sections, the question "To what extent would your child be likely to have a career in [career field]" was presented with options to select career fields such as Agriculture, Education, and Business. Responses to this question were measured on the five-point unidirectional scale used previously in the questionnaire.

3.6 Research Setting

The purpose of this study was to explore and describe how the motivation of parents of urban middle school students plays a role in their child's interest in agriculture and STEM-related activities. Specifically, the researcher wanted to explore the parenting self-efficacy that urban parents have about agriculture and STEM-related activities.

Indianapolis, Indiana was chosen as a context because it is an urban center with a number of STEM and agricultural related careers in the metropolitan region. Indianapolis, IN is the 13th largest state in the U.S. with a metropolitan population of over 1,900,000 people, with the two largest age groups being under 20 (27.9% of the population) and between the ages of 45-65 (26%

of the population) (Nosler, 2017). According to the 2010 census, Indianapolis' ethnic and racial composition was 58% white, 27% Black or African American, 2% Asian, 2% two or more races, and 10% Hispanic or Latino of any race (U.S. Census Bureau, 2010). Based on this information the city of Indianapolis is classified as urban, a geographic area with a dense and diverse population (Flowers & Flowers, 2008; Cottineau, Hatna, Arcaute, & Batty, 2017)

Indianapolis, specifically Marion County, is home to the national headquarters of several major companies such as Eli Lilly and Company, and Corteva formerly Dow AgroScience. Both of these companies offer opportunities to work with agriculture and STEM. Additionally, based on the 2012 Census of Agriculture, Marion County has 231 farms with only five of those farms being operated by Blacks or African Americans and two farms by a person of Spanish, Hispanic origin. Among those 231 farms, 77 had women operators.

While the Indianapolis area has 100 public elementary, middle, and high schools, their college readiness score (6.2/10.0) is lower than average for a metropolitan area of that size. This score was calculated with data from the Federal Bureau of Investigation, the United States Census Bureau, the U.S. News' own internal resources and the Department of Labor (Nosler, 2017).

As of 2017, the high school graduation rate for Indianapolis, IN was 86.93%. The graduation rate by student demographic was 89.35% White, 88.01% Asian, 84.14% Multiracial, 83.33% Native Hawaiian or Other Pacific Islander, 83.29% Hispanic, 79.50% American Indian, and 77.89% Black (Graduation Rate Data, 2018).

3.7 Data Collection

The middle school parent coordinators and parent group leaders distributed the link to complete the online survey through email. The researcher distributed surveys in-person during afterschool programs at two school as parents signed into the program. Parents returned the survey

to the researcher at the sign in table after completion. Surveys were returned throughout the program or at the end of the program. A total of 53 parents participated in the study. Collection of the data took place from September 25, 2018 to October 26, 2018. Completion of the questionnaire took participants about 10 minutes. Throughout the duration of the data collection, participant information was maintained using Qualtrics. Data were analyzed using SPSS.

The online questionnaire link was emailed with a research recruitment letter explaining the study and the need for participation in greater detail and information to complete the questionnaire online using Qualtrics. The letters were printed on Purdue College of Agriculture Department of Agricultural Sciences Education and Communication template. The paper questionnaire was distributed with the same recruitment letter, excluding the link to the online questionnaire. The recruitment letter of the questionnaire also mentioned that those who returned a completed questionnaire would have their email address entered into a drawing for a $25.00 gift card. Survey distribution was done with no prior information provided to the participants. During afterschool events, the program coordinators introduced the researcher and the study while the researcher handed parents the questionnaire. A copy of the research recruitment letters can be found in Appendix A, items 1 and 2. Each returned and completed questionnaire was properly recorded using Qualtrics.

3.8 Validity Threats

Measurement validity or being sure that the questionnaire collected the appropriate data to accurately addressed the research questions was a possible threat. To control for the measurement validity threat, a pilot test and field test were conducted. The pilot test established face validity of the instrument and the field test established content validity. Also, allowing theory and prior questionnaires to guide the research process increased the content validity of the study. All of the

above methods helped to increase the instrument's measurement validity thus it was not regarded as a significant threat.

3.9 Reliability

Reliability describes if an instrument can the same results for different occasions (Thomas, 2009). Reliability of the measures of parenting self-efficacy, outcome expectations, and behavior were established by researchers in previous studies. An acceptable reliability of parenting self-efficacy instrument (α = 0.88) was reported by Bohman, Nyberg, Sundblom, and Elinder (2014). Parenting self-efficacy also reported an acceptable reliability (α = 0.86) by Dumka, Gonzales, Wheeler, and Millsap (2010). Johnson, Chen, Hughes, and O'Connor (2015) reported the reliability for parent outcome expectations (α = 0.82). Reliability coefficients for the current study were computed using Cronbach's alpha coefficient (Table 3.2). According to (Hopkins, 2000), reliabilities above 0.70 are considered acceptable.

The pilot test was completed by 33 parents using an online survey tool (i.e., Qualtrics). Reliabilities from the pilot test were for part 1 measured parenting self-efficacy as it pertains to their influence on their child's school performance and leisure activities, PSE-Academics (give α = .89). A Cronbach's alpha coefficient reliability of 0.90 or greater is excellent, 0.80 or greater is good, 0.70 or greater is acceptable, and less than 0.70 is questionable (George & Mallery, 2003). Part 2 measured parenting self-efficacy as it pertains to STEM and agricultural activities: PSE-STEM (α = .87), PSE-Agriculture (α = .93). Part 3 measure parent outcome expectations pertaining to college and career preparation POE-CCP (α = .61) and Part 4 measured parent outcome expectations regarding agriculture and STEM activities, POE-Agriculture (α = .94) and POE-STEM (α = .87). Though reliability for POE-CCP was questionable, parent knowledge pertaining to college and career preparation could be low due to the ages of their children. A child is eligible

to participate in the Cloverbud 4-H program at five years of age (National 4-H Council, 2018) and the pilot test was sent to a listserv of all 4-H parents.

For the research project, the researcher received a total of 53 returned questionnaires with 50 of them being usable for analysis. Post hoc reliability of the instrument was calculated for each metric variable using the Cronbach's alpha coefficient. Part 1 measured parenting self-efficacy as it pertains to their influence on their child's school performance and leisure activities, PSE-Academics (give $\alpha = .83$). Part 2 measured parenting self-efficacy as it pertains to STEM and agricultural activities: PSE-STEM ($\alpha = .88$), PSE-Agriculture ($\alpha = .93$). Part 3 measured parent outcome expectations pertaining to college and career preparation POE-CCP ($\alpha = .83$) and Part 4 measured parent outcome expectations regarding agriculture and STEM activities, POE-Agriculture ($\alpha = .97$) and POE-STEM ($\alpha = .94$).

Table 3.2 *Reliabilities for the scales in the current study*

Scale	Cronbach's α
PSE-Academic	.83
PSE-STEM	.88
PSE-Agriculture	.93
POE-CCP	.83
POE-STEM	.97
POE-Agriculture	.94

3.10 Researcher's Bias

The researcher's prior experiences in the Indianapolis community allowed for comfortability in the environment as well as an understanding of the community's history. The researcher was born and raised in Indianapolis, IN. She learned to play golf at a historically black golf course on the east side of Indianapolis, and later worked at the golf course during the summer. The researcher was employed at the historically black golf course during the summer for three years (2015-2018). Though the researcher was from an urban area, she learned about agriculture, food and natural resources during her undergraduate career while majoring in animal sciences. She also held an officer position (e.g., Secretary, First Vice-President, and President) in the Purdue chapter of Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS). Furthermore, the researcher completed a course to teach STEM through Agriculture, Food, and Natural Resources (AFNR) as a graduate student and during the study was an active member of the advisory board for Purdue Extension in Marion County, Indiana. However, the researcher

monitored her biases by having the study reviewed by a panel of experts, and peer debriefing with her research adviser on a weekly basis.

3.11 Data Analysis

Data for the study were organized and managed using Statistical Package for the Social Sciences (SPSS) and simple linear regression analysis was completed (Strickland, 2015). The independent variables of parenting self-efficacy and parent outcome expectations (i.e., college and career preparation and agriculture and STEM activities) consisted of several items that were measured on a 5-point scale of 1 = None, 2 = Very Little, 3 = Some, 4 = Quite a Bit, 5 = A Great Deal. The independent variable of demographics was categorical and measured at the nominal level. The dependent variables of parent perceptions of child's college and career interest consisted of nine items that were measured on a 5-point scale. The dependent variable of parent perceptions of child's educational intentions were measured at the ordinal level. The relationship between the independent variables and dependent variable of parent behaviors were analyzed using correlations. Pearson Product Moment correlation coefficients were used for interval and interval variables, while Spearman Rank correlation coefficients were used for ordinal and interval variables. Point bi-serial correlations coefficients were used for nominal and interval variables.

The level of measurement, central tendency, variance, and inferential statistics were identified for each independent variable and the dependent variable can be seen in Table 3.3. Means, standard deviations, associations, and effect sizes were rounded to the nearest 1/100th. In addition, SPSS excluded any missing data. The statistical tests used to determine relationships between variables are listed in Table 3.4 and relationships were then described using Hopkin's (2000) conventions.

Table 3.3 Research Questions, Variables, Scale of Measurement, and Statistical Analysis Utilized

Research Questions	**Independent Variables**	**Dependent Variables**	**Scale of Measurement**	**Analysis**
What were urban parents' parenting self-efficacy and outcome expectations regarding college and career preparation and agricultural and STEM activities?	Parent self-efficacy Parent outcome expectations		Interval	*M* *SD*
What behaviors were reported by urban parents regarding activities they did with their child?	Parent self-efficacy Parent outcome expectations	Parent behaviors	Nominal Sum of activities was ratio	Frequencies Percentages *M* *SD*
What were urban parents' perceptions of their child's interest in career fields and their child's educational intentions?		Parent behaviors Parent perceptions	Ordinal	Frequencies Percentages
What was the relationship between urban parents' parenting self-efficacy, parents' outcome expectations, and parent behaviors?	Parenting self-efficacy Parent outcome expectations	Parent behaviors	N/A	Correlations

Table 3.4 *Statistical Tests Used to Describe Each Relationship*

Dependent and Independent Variable Relationships	**Statistical Test**	**Measure of Association**
Parenting self-efficacy/Parent behaviors	Pearson's correlation & effect size	Linear
Parent outcomes expectations/Parent behaviors	Pearson's correlation & effect size	Linear
Parent behaviors/Parent's perception of child's career interest	Spearman Rank & effect size	Linear
Parent behaviors/Parent's perceptions of child's educational intentions	Spearman Rank & effect size	Linear

CHAPTER 4. RESULTS

4.1 Introduction

This chapter will present the finding of the study findings of this study with data analyzed using SPSS. The chapter will also presenting the findings for each of the four research questions.

4.2 Purpose of Study

The purpose of this study was to explore and describe parents' motivation of urban middle school students regarding their child's interest in agriculture or STEM related activities.

4.3 Research Questions for the Study

The research questions for this study include the following:

1. What were urban parents' parenting self-efficacy and outcome expectations regarding college and career preparation and agricultural and STEM activities?
2. What behaviors were reported by urban parents regarding activities they did with their child?
3. What were urban parents' perceptions of their child's interest in career fields and their child's educational intentions?
4. What were the relationships among urban parents' parenting self-efficacy, parents' outcome expectations, and parent behaviors?

4.4 Demographic Characteristics of Participants

Demographic characteristics of the participants in this study were used to describe those represented the convenience sample. Previous studies (Shunow & Lomax, 2002; Dumka, Gonzales, Wheeler, & Millsap, 2010) suggested that parenting self-efficacy was a psychological consequence

of the neighborhood conditions. Additionally, social cognitive theory suggests that inner personal factors, the environment, and one's behavior interact to determine outcomes (Bandura, 1997).

Demographics for this study included parents' race/ethnicity, gender, and level of education. The majority of participants were Black or African America (61%) and majority also reported being a mom or female guardian (84%). The three most reported levels of education were some college credit, no degree (25%), bachelor's degree (18%), associate degree (14%) and high school graduate (diploma or GED) (14%). Table 4.1 displays the frequencies and percentages of responses for the demographic characteristics of participants.

Table 4.1 *Demographic Characteristics of Participants*

Category	**Response Options**	***f* (%)**
Race/ethnic group	Black or African American	32 (61%)
***N* = 52**	Hispanic American	6 (11%)
	White or European American	12 (23%)
	Asian/Pacific Islander	0 (0%)
	Native American	1 (2%)
	Other	1 (2%)
Gender	Mom or female guardian	42 (84%)
***N* = 50**	Dad or male guardian	8 (16%)
Education	No schooling completed	0 (0%)
***N* = 50**	Elementary to 8th grade	1 (2%)
	Some high school (no diploma)	1 (2%)
	High school graduate (diploma or GED)	7 (14%)
	Some college credit (no degree)	12 (24%)
	Trade/technical/vocational training	3 (6%)
	Associate degree	7 (14%)
	Bachelor’s degree	9 (18%)
	Master’s degree	7 (14%)
	Professional degree	0 (0%)
	Doctorate degree	3 (6%)

4.5 Results for Research Question 1

Research Question 1: *What were urban parents' parenting self-efficacy and outcome expectations regarding college and career preparation and agricultural and STEM activities?*

4.5.1 Parenting self-efficacy

To describe parenting self-efficacy, participants were asked specifically about parents' perceptions of their influence on their child's school and leisure activities (i.e., parenting self-efficacy of school and leisure activities; PSE-Academics), parents' knowledge of STEM activities (i.e., parenting self-efficacy of STEM activities; PSE-STEM), and parents' knowledge of agricultural activities (i.e., parenting self-efficacy of agricultural activities; PSE-Agriculture). A five-point scale was used: 1 = none, 2 = very little, 3 = some, 4 = quite a bit, 5 = a great deal. Means and standard deviations were calculated for each of the three variables: (1) PSE-Academic; (2) PSE-STEM; and (3) PSE-Agriculture.

For PSE-Academics, participants reported they had "a great deal" of influence on their child (M = 4.52; SD = .45). For PSE-STEM, participants reported to have "quite a bit" of parenting self-efficacy with STEM activities (M = 3.68, SD = .85), and "some" parenting self-efficacy with agriculture (PSE-Agriculture) (M = 3.38, SD = 1.09). Table 4.2 displays the means and standard deviations of parenting self-efficacy. Table 4.3 shows the frequencies and percentages for the participants' parenting self-efficacy of academic and leisure activities, and Table 4.4 shows the frequencies and percentages for participants' parenting self-efficacy of STEM and agricultural activities.

Table 4.2 *Means and Standard Deviations of Parenting Self-Efficacy*

Variables	**M (SD)**
PSE-Academics	4.52 (.45)
PSE-STEM	3.68 (.85)
PSE-Agriculture	3.38 (1.09)

Note. Means were calculated using a 5-point scale (1 = none, 2 = very little, 3 = some, 4 = quite a bit, 5 = a great deal).

Table 4.3 Frequencies and percentages of parenting self-efficacy of academic and leisure activities

Please select the corresponding number that aligns with your thoughts on school performance and leisure activities	**None f (%)**	**Very Little f (%)**	**Some f (%)**	**Quite a bit f (%)**	**A great deal f (%)**
1. How much can you do to make your child see school as valuable?	0 (0%)	0 (0%)	4 (8%)	12 (23%)	36 (69%)
2. How much can you do to help your child do their homework?	0 (0%)	0 (0%)	4 (8%)	16 (31%)	32 (61%)
3. How much can you do to help your child work hard at their schoolwork?	0 (0%)	0 (0%)	4 (8%)	17 (33%)	31 (60%)
4. How much can you do to help your child get good grades in school?	0 (0%)	0 (0%)	9 (17%)	12 (23%)	31 (60%)
5. How much can you do to teach your child to enjoy school?	0 (0%)	1 (2%)	5 (10%)	16 (31%)	30 (58%)
6. How much can you do to show your child that working hard at school influences later successes?	0 (0%)	0 (0%)	0 (0%)	16 (31%)	36 (69%)
7. How much can you do to get your child into activities outside of school (for example, music, art, dance, lessons, sports activities)?	0 (0%)	1 (2%)	1 (2%)	14 (27%)	36 (69%)
8. How much can you do to help your child keep physically fit?	0 (0%)	2 (4%)	3 (6%)	17 (33%)	29 (56%)
9. How much can you involve yourself with your child in their leisure activities?	0 (0%)	2 (4%)	4 (8%)	13 (25%)	33 (63%)

Table 4.4 Frequencies and percentages of parenting self-efficacy of STEM and agricultural activities

Please select the corresponding number that aligns with how confidently you can explain to your child …	**None f(%)**	**Very Little f(%)**	**Some f(%)**	**Quite a bit f(%)**	**A great deal f(%)**
1. What a scientist does.	0 (0%)	1 (2%)	14 (28%)	21 (42%)	14 (28%)
2. What a technologist does.	2 (4%)	5 (10%)	19 (38%)	12 (24 %)	12 (24 %)
3. What an engineer does.	0 (0%)	4 (8%)	19 (38%)	15 (30%)	12 (24 %)
4. What a mathematician does.	0 (0%)	6 (12%)	10 (20%)	19 (38%)	15 (30%)
5. What an agricultural professional does.	2 (4%)	9 (18%)	17 (34%)	13 (26%)	9 (18%)
6. What a STEM professional does.	5 (10%)	9 (18%)	14 (28%)	10 (20%)	12 (24 %)
7. How gardening is a STEM activity.	6 (12%)	10 (20%)	10 (20%)	13 (26%)	11 (22%)
8. How food preparation is a STEM activity.	3 (6%)	8 (16%)	12 (24 %)	11 (22%)	16 (32%)
9. How animal care is a STEM activity.	6 (12%)	10 (20%)	9 (18%)	13 (26%)	12 (24 %)
10. How observing nature is a STEM activity.	5 (10%)	7 (14%)	13 (26%)	13 (26%)	12 (24 %)
11. How robotics is a STEM activity.	9 (18%)	6 (12%)	10 (20%)	9 (18%)	16 (32%)
12. How learning STEM can help prepare your child for college.	4 (8%)	3 (6%)	14 (28%)	14 (28%)	15 (30%)
13. How to find STEM summer programs.	4 (8%)	9 (18%)	15 (30%)	12 (24 %)	10 (20%)
14. How to prepare to go to college.	2 (4%)	1 (2%)	10 (20%)	13 (26%)	24 (48%)
15. What careers align with your child’s current interests.	1 (2%)	3 (6%)	15 (30%)	15 (30%)	16 (32%)
16. Salaries for careers your child is interested in.	1 (2%)	3 (6%)	13 (26%)	17 (34%)	16 (32%)

4.5.2 Parent outcome expectations

To describe parent outcome expectations, participants were asked specifically about parents' perceptions of their influence on their child's college and career preparation (i.e., parents' outcome expectations of college and career preparations; POE-CCP), parents' influence on their child participating in STEM activities (i.e., parents' outcome expectations of STEM activities; POE-STEM), and parents' influence on their child participating in agricultural activities (i.e., parents' outcome expectations of agricultural activities; POE-Agriculture). A five-point scale was used: 1 = none, 2 = very little, 3 = some, 4 = quite a bit, 5 = a great deal. Means and standard deviations were calculated for each of the three variables: (1) POE-CCP; (2) POE-STEM; and (3) POE-Agriculture.

For perceptions of parent's influence on their child's college and career preparation (POE-CCP), participants reported they had "quite a bit" of influence on their child's college and career preparation (M = 3.97; SD = .59). Participants reported that they had "quite a bit" of influence as it regards to talking with their child about STEM activities (POE-STEM) (M = 3.97, SD = .90) and agricultural activities (POE-Agriculture) (M = 3.63, SD = .94). Table 4.5 displays the results for the means and standard deviations of participants' outcome expectations. Table 4.6 shows the frequencies and percentages of parents' outcome expectation regarding college and career preparation, and Table 4.7 shows the frequencies and percentages for the participants' outcome expectations regarding STEM and agriculture activities.

Table 4.5 Means and Standard Deviation of Parent Outcome Expectations

Variables	**M (SD)**
POE-CCP	3.97 (.59)
POE-STEM	3.97 (.90)
POE-Agriculture	3.63 (.94)

Note. Means were calculated using a 5-point scale (1 = none, 2 = very little, 3 = some, 4 = quite a bit, 5 = a great deal).

Table 4.6 Frequencies and percentages of parents' outcome expectations regarding college and career preparation

If you talk with your child about college and career preparation …	None f (%)	Very Little f (%)	Some f (%)	Quite a bit f (%)	A great deal f (%)
17. You feel like a responsible parent if you talk with your child about college and career preparation.	1 (2%)	0 (0%)	4 (8%)	12 (24%)	33 (66%)
18. You feel that you did the right thing if you talk with your child about college and career preparation.	1 (2%)	0 (0%)	3 (6%)	11 (22%)	35 (70%)
19. You will be proud if you talk with your child about college and career preparation.	2	0 (0%)	3 (6%)	11 (22%)	34 (68%)
20. You will be confident if you talk with your child about college and career preparation.	1 (2%)	0 (0%)	4 (8%)	10 (20%)	35 (70%)
21. You would find some topics you are unsure about if you talk with your child about college and career preparation.	1 (2%)	8 (16%)	15 (30%)	13 (26%)	13 (26%)
22. He/she will listen if you talk with your child about college and career preparation.	1 (2%)	1 (2%)	5 (10%)	19 (38%)	24 (48%)
23. He/she will be likely to follow your suggestions if you talk with your child about college and career preparation.	1 (2%)	1 (2%)	18 (36%)	17 (34%)	13 (26%)
24. He/she will be able to successfully apply to college if you talk with your child about college and career preparation.	1 (2%)	0 (0%)	7 (14%)	25 (50%)	17 (34%)
25. He/she will attend a two-year college if you talk with your child about college and career preparation.	2 (4%)	4 (8%)	16 (32%)	13 (26%)	15 (30%)
26. He/she will attend a four-year college if you talk with your child about college and career preparation.	2 (4%)	1 (2%)	14 (28%)	12 (24%)	21 (42%)
27. Your child will do what he/she wants no matter what you say.	4 (8%)	12 (24%)	16 (32%)	8 (16%)	10 (20%)

Table 4.7 Frequencies and percentages of parents' outcome expectations regarding STEM and agricultural activities

If you talk with your child about STEM and agricultural activities…		None f (%)	Very Little f (%)	Some f (%)	Quite a bit f (%)	A great deal f (%)
28.	If you talk with your child about STEM activities, he/she will listen.	0 (0%)	6 (12%)	7 (14%)	22 (44%)	15 (30%)
29.	If you talk with your child about STEM activities, he/she will be likely to follow your suggestions of STEM activities.	0 (0%)	6 (12%)	12 (24%)	18 (36%)	14 (28%)
30.	If you talk with your child about STEM activities, it will help prepare your child for college.	2 (4%)	4 (8%)	11 (22%)	14 (28%)	19 (38%)
31.	If you talk with your child about STEM activities, he/she will see STEM as a skilled, educated workforce.	0 (0%)	5 (10%)	13 (26%)	8 (16%)	24 (48%)
32.	If you talk with your child about STEM activities, he/she will see STEM as having a lot of career opportunities.	0 (0%)	4 (8%)	10 (20%)	9 (18%)	27 (54%)
33.	If you talk with your child about STEM activities, he/she will see STEM as having a lot of high paying careers.	0 (0%)	6 (12%)	9 (18%)	13 (26%)	22 (44%)
34.	If you talk with your child about STEM activities, he/she will see STEM offers exciting career options.	1 (2%)	5 (10%)	9 (18%)	13 (26%)	22 (44%)
35.	If you talk with your child about agricultural activities, he/she will listen.	0 (0%)	8 (16%)	13 (26%)	12 (24%)	17 (34%)
36.	If you talk with your child about agricultural activities, he/she will be likely to follow your suggestions of agricultural activities.	0 (0%)	7 (14%)	19 (38%)	12 (24%)	12 (24%)
37.	If you talk with your child about agricultural activities, it will help your child think about a career.	0 (0%)	9 (18%)	16 (32%)	14 (28%)	11 (22%)
38.	If you talk with your child about agricultural activities, he/she will see agriculture as a skilled, educated workforce.	0 (0%)	7 (14%)	16 (32%)	14 (28%)	13 (26%)
39.	If you talk with your child about agricultural activities, he/she will see agriculture as having a lot of career opportunities.	0 (0%)	7 (14%)	17 (34%)	14 (28%)	12 (24%)
40.	If you talk with your child about agricultural activities, he/she will see agriculture as having a lot of high paying careers.	0 (0%)	7 (14%)	16 (32%)	14 (28%)	13 (26%)
41.	If you talk with your child about agricultural activities, he/she will see agriculture offers exciting career options.	1 (2%)	6 (12%)	17 (34%)	14 (28%)	12 (24%)

4.6 Results for Research Question 2

Research Question 2: *What behaviors were reported by urban parents regarding activities they did with their child?*

4.6.1 Parent behaviors

Participated were given 10 items to select from that best described the household activities their family participated in with the option of writing in three other activities not listed. The question allowed participants to select multiple activities they did with their children. Regarding the most reported activities, recreational sports was reported by 37 (17%) of the 50 participants as the activity their family participated in, visiting museums was reported by 33 (16%), and computer games were reported by 29 (14%). Regarding the least reported activities, operating a family business was reported by 2 (1%), visiting a greenhouse was reported by 6 (3%), and visiting a farm was reported by 9 (4%). Table 4.8 shows the full list of activities and their reported frequencies. A total of 41 participants reported other activities not listed. These included such activities as board games, reading, and traveling for a total of 20 different written responses for “other types of activities.” A full list of the other types of activities listed by participants can be found in Table 4.9.

Table 4.8 Frequencies and percentages of activities participants reported they did with their child

Activities	***f***	**%**
Observing wildlife at the zoo	25	12%
Visiting a greenhouse	6	3%
Gardening	16	8%
Visiting museums	33	16%
Visiting farms	9	4%
Camping	13	6%
Computer games	29	14%
Recreational sports	37	18%
Operating a family business	2	1%
Other types of activities	23	11%
Other types of activities	12	6%
Other types of activities	6	3%

Note. Participants could select more than one activity.

Table 4.9 Frequencies of reported other types of activities mentioned by participants

Activities	***f***
Games (board games, card)	5
Arts and crafts (painting)	4
Travel (travelling)	4
More time (random)	3
Movies (entertainment)	3
Reading	3
Cook (try new foods)	2
Hiking	2
Home activities	2
Theatre (dance & drama)	2
Anything outdoors	1
Ballet & gymnastics	1
Church	1
Girl Scouts	1
Group fitness	1
Play soccer	1
RC planes	1
Recreational dance	1
Science experiments	1
Walking	1

Note. Participants had three spaces to write in activities and could write in more than one activity.

4.7 Results for Research Question 3

Research Question 3: *What were urban parents' perceptions of their child's interest in career fields and their child's educational intentions?*

4.7.1 Perceptions of child's interest

Participants were asked their perceptions of their child's interest in the form of two questions, "How likely will your child attend one of the following after high school?" with a list of educational and career options. The second question asked was, "To what extent would your child be likely to pursue a career in…" with a list of general career fields. A five-point scale was used: 1 = none, 2 = very little, 3 = some, 4 = quite a bit, 5 = a great deal and participants were asked to select a response for each option listed.

Of the 50 recorded responses, for the likelihood of "a great deal" their child would pursue one of the secondary educational and career options listed, 18 (36%) reported that their child would get a full-time job after high school, 3 (6%) for their child enlisting in the military, 8 (16%) for their child attending a technical or vocational school, 14 (28%) for their child to graduate from a two-year college program, and 28 (56%) reported that it was "a great deal" likely their child would graduate from a college/university (four-year program).

For the likelihood of "quite a bit," 6 (12%) of participants reported that their child would get a full-time job, 3 (6%) for their child enlisting in the military, 11 (22%) for their child attending a technical or vocational school, 14 (28%) for their child to graduate from a two-year college program, and 14 (28%) reported that it was "quite a bit" likely their child would graduate from a college/university (four-year program).

Participants reported for "a great deal" likelihood of their child pursuing a career in one of the listed career fields, 11 (22%) would likely pursue a career in education, 10 (20%) reported that

their child would likely purse a career in art, humanities, and social sciences, engineering and technology, business, or other, 9 (18%) reported their child would likely pursue a career in sciences, 8 (16%) medicine, and 6 (12%) agriculture.

Table 4.10 Frequencies and percentages of participants' perceptions of child's interest

Item	Response options	None f (%)	Very Little f (%)	Some f (%)	Quite a bit f (%)	A great deal f (%)
1. How like will your child attend one of the following after high school	Get a full time job	5 (10%)	9 (18%)	12 (24%)	6 (12%)	18 (36%)
	Enlist in the military	21 (42%)	18 (36%)	5 (10%)	3 (6%)	3 (6%)
	Attend technical or vocational school	7 (14%)	11 (22%)	13 (26%)	11 (22%)	8 (16%)
	Graduate from a two-year college program	4 (8%)	7 (14%)	11 (22%)	14 (28%)	14 (28%)
	Graduate from a college/university (four-year program)	0 (0%)	1 (2%)	7 (14%)	14 (28%)	28 (56%)
2. To what extent would your child be likely to pursue a career in	Agriculture	4 (8%)	17 (34%)	17 (34%)	6 (12%)	6 (12%)
	Education	3 (6%)	16 (32%)	15 (30%)	5 (10%)	11 (22%)
	Arts, Humanities, and Social Sciences	4 (8%)	9 (18%)	11 (22%)	16 (32%)	10 (20%)
	Engineering and Technology	5 (10%)	3 (6%)	20 (40%)	12 (24%)	10 (20%)
	Sciences	7 (14%)	6 (12%)	15 (30%)	13 (26%)	9 (18%)
	Business	7 (14%)	9 (18%)	16 (32%)	8 (16%)	10 (20%)
	Medicine	4 (8%)	12 (24%)	17 (34%)	9 (18%)	8 (16%)
	Other	8 (16%)	6 (12%)	17 (34%)	9 (18%)	10 (20%)

4.8 Results for Research Question 4 Correlations

Research Question 4: *What were the relationships among urban parents' parenting self-efficacy, parents' outcome expectations, and parent behaviors?*

4.8.1 Correlations among Variables

In the following tables, the independent variable of parenting self-efficacy is represented by parents' perceptions of their influence on their child's school and leisure activities (i.e., parenting self-efficacy of school and leisure activities; PSE-Academics), parents' knowledge of STEM activities (i.e., parenting self-efficacy of STEM activities; PSE-STEM), and parents' knowledge of agricultural activities (i.e., parenting self-efficacy of agricultural activities; PSE-Agriculture). The independent variable of parent outcome expectations is represented by parents' perceptions of their influence on their child's college and career preparation (i.e., parents' outcome expectations of college and career preparations; POE-CCP), parents' influence on their child participating in STEM activities (i.e., parents' outcome expectations of STEM activities; POE-STEM), and parents' influence on their child participating in agricultural activities (i.e., parents' outcome expectations of agricultural activities; POE-Agriculture). The dependent variable of parent behavior is represented as the total of household activities (ACT). For Table 4.11, independent variables are noted as (Item[1]) while the dependent variables are notes as (Item[2]).

Relationships were reported based on the relationship being 0.3 or higher, showing a moderate or high correlation (Hopkins, 2000), which would be a medium or large effect size for an r-squared coefficient (Cohen, 1988). PSE-Agriculture had a positive large relationship with PSE-STEM (r =.85, r^2 = .72) Therefore, the more confident a parent is in discussing agricultural activities with their child, the more likely they are to talk with their child about STEM activities. POE-STEM had a positive large relationship with PSE-STEM (r = .58, r^2 = .34) and PSE-

Agriculture (r = .62, r^2 = .38). Parents' who agreed if their child did STEM activities were more likely to feel confident in their abilities to help their child engage in STEM and agricultural activities. Additionally, POE-Agriculture had a positive moderate relationship with PSE-STEM (r = .49, r^2 = .24) and PSE-Agriculture (r = .49, r^2 = .24). Parents' who agreed if their child did agricultural activities were more likely to feel confident in their abilities to help their child engage in STEM and agricultural activities. Finally, there was a positive large relationship between POE-Agriculture and POE-STEM (r = .77, r^2 = .59). A parent who agreed that engaging their child in agricultural activities would be more likely to agree that engaging their child in STEM activities would be positive, and visa-versa.

Table 4.11 Correlations among the independent and dependent variables

Variables	1	2	3	4	5	6	7
1. PSE-Academic[1]	---						
2. PSE-STEM[1]	.18	---					
3. PSE-Agriculture[1]	.17	.85*	---				
4. POE-CCP[1]	.16	.12	-.03	---			
5. POE-STEM[1]	.23	.58*	.62*	.17	---		
6. POE-Agriculture[1]	.41*	.49*	.49*	.16	.77*	---	
7. ACT[2]	.13	.22	.36*	.04	.15	.12	---

*Medium/large effect size
Item[1] = independent variables, Item[2] = dependent variables
Note. PSE-Academic= parenting self-efficacy of school and leisure activities. PSE-STEM= parenting self-efficacy of STEM activities. PSE-Agriculture= parenting self-efficacy of agricultural activities. POE-CCP= parents' outcome expectations of college and career preparations. POE-STEM= parents' outcome expectations of STEM activities. POE-Agriculture= parents' outcome expectations of agricultural activities. ACT= total of household activities participants reported.

Table 4.12 shows the correlation between the dependent variables of parent behavior (ACT) and parents' perception of their child's secondary education and career interests there were no moderate or large positive relationships between the household activities participants reported and the perceptions of their child's secondary education and career interests. There was a negative moderate relationship between the likelihood that the participant's child would attend a technical or vocational school and parent behaviors (r = -.34, r^2 = .12) and a positive moderate relationship between the likelihood that a child would attend technical or vocational school and the likelihood a child would get a full-time job (r = .53, r^2 = .28). There was a positive moderate relationship between the likelihood that a child would attend a two-year college program and join the military (r = .31, r^2 = .10) and a positive large relationship between the likelihood that a child would attend a two-year college program and a child attending technical or vocational school (r = .71, r^2 = .50).

Table 4.12 Correlations among parents' behaviors and parents' perceptions of their child's post-secondary intentions

Variables	1	2	3	4	5	6
1. ACT	---					
2. Full-time job	-.15	---				
3. Military	.03	.27	---			
4. Tech/vocational school	-.34*	.53*	.29	---		
5. Two-year program	-.16	.46*	.31*	.71*	---	
6. Four-year college/university	-.04	.07	-.07	.15	.23	---

*Medium/large effect size
Note. ACT = total of household activities participants reported

Table 4.13 shows the correlation between the dependent variable of parent behavior (ACT) and parents' perception of their child's career field interests. There were no moderate or large

relationships between parent behaviors and any of the given career field options. However, there were positive large relationships between education and agriculture (r = .53, r^2 = .28), sciences and engineering and technology (r = .54, r^2 = .29), business and art (r = .52, r^2 = .27) as well as business and engineering and technology (r = .61, r^2 = .37), and last medicine and business (r = .60, r^2 = .36)

Participants' characteristics (i.e., race/ethnicity; gender; level of education) were studied to see if they were related to parenting self-efficacy and parents' outcome expectation variables. As such, participants' race/ethnicity were regrouped into two groups, underrepresented minorities (URMs) and non-URMs. URMs were Black or African American, Hispanic, Native American, and Other. The relationship between URMs, participants' gender, participants' education, parenting self-efficacy, and parent outcome expectations is displayed in Table 4.14. There was no moderate or large relationship between URMs, parenting self-efficacy, and parent outcome expectation. No moderate or large relationship between participants' gender and their parenting self-efficacy or parent outcome expectations. There also was no moderate or large relationships between the participants' levels of education and their parenting self-efficacy or parent outcome expectations.

Table 4.13 Correlations among parents' behaviors and parents' perceptions of their child's intended career field

Variables	1	2	3	4	5	6	7	8	9
1. ACT	---								
2. Agriculture	.09	---							
3. Education	.16	.53*	---						
4. Arts/Humanities/Soc. Sciences	.11	.43*	.42*	---					
5. Engineering and Technology	.00	.25	.14	.41**	---				
6. Sciences	.11	.47*	.46*	.35*	.54*	---			
7. Business	-.01	.23	.30*	.52*	.61*	.48*	--		
8. Medicine	.18	.28	.25	.44*	.31*	.43*	.60*	--	
9. Other	-.21	.14	-.03	.23	.27	.35*	.39*	.28	--

*Medium/large effect size

Note. ACT=total of household activities participants reported

Table 4.14 Correlation among URM, mom/dad, highest degree of schooling participants parenting self-efficacy and parent outcome expectations

Variables	1	2	3	4	5	6	7	8	9
1. URMs	---								
2. Highest Degree	-.02	---							
3. Mom/Dad	.22	.04	---						
4. PSE-Academic	.04	.07	-.11	---					
5. PSE-STEM	-.14	.07	.20	.18	---				
6. PSE-Agriculture	-.26	-.03	.12	.17	.85*	---			
7. POE-CCP	.13	.16	.07	.16	.12	-.04	---		
8. POE-STEM	-.11	-.08	-.11	.23	.58*	.62*	.17	---	
9. POE-Agriculture	.05	-.24	-.13	.41*	.49*	.49*	.16	.77*	---

*Medium/large effect size

Note. URMs=underrepresented minorities. Highest Degree=highest degree of schooling completed. Mom/Dad=participants'' identified gender. PSE-Academic= parenting self-efficacy of school and leisure activities. PSE-STEM= parenting self-efficacy of STEM activities. PSE-Agriculture= parenting self-efficacy of agricultural activities. POE-CCP= parents' outcome expectations of college and career preparations. POE-STEM= parents' outcome expectations of STEM activities. POE-Agriculture= parents' outcome expectations of agricultural activities

CHAPTER 5. CONCLUSIONS AND DISCUSSION

5.1 Conclusions and Discussion

This chapter will discuss the four conclusions from the study addressing parents' parenting self-efficacy and outcome expectations regarding college and career preparation and STEM and agricultural activities, urban parents' behaviors regarding activities they did with their child, urban parents' perceptions of their child's career and educational interests, and the relationships among parents' parenting self-efficacy, outcome expectations, and behaviors. Each conclusion is followed by a discussion of implications for practice and the contribution to the knowledge base. Finally, the chapter concludes with recommendations for future research.

5.2 Conclusion 1: Parenting self-efficacy and parent outcome expectations

Urban parents were self-efficacious regarding their child's academic performance and STEM activities, and had positive outcomes expectations regarding their child's college and career preparation and engaging their child in agriculture and STEM activities.

5.2.1 Discussion

In examining urban parents' parenting self-efficacy, participants were asked specifically about parents' perceptions of their influence on their child's school and leisure activities (PSE-Academics), parents' confidence in knowing about STEM activities (PSE-STEM), and parents' confidence in knowing about agricultural activities (PSE-Agriculture). Parents reported that they had "a great deal" of influence on their child's school and leisure activities. Parents also reported they had "quite a bit" of confidence in themselves regarding discussing STEM activities with their

child, and “some” confidence in themselves regarding discussing agriculture activities with their child.

Although parents were self-efficacious in their role as parents, there were differences in parenting self-efficacy regarding academic and leisure activities, STEM activities, and agricultural activities. The difference of means between PSE-Academics and PSE-STEM had a large effect size (d = 1.2). A difference in means that is between 0.2 to 0.5 is considered a small effect size, 0.5 to 0.8 is considered to be a moderate effect size, and 0.8 and above is considered to be a strong effect size (Cohen, 1988). Further, the difference in means between PSE-Academics and PSE-Agriculture had a large effect size (d = 1.4), and the difference in means between PSE-STEM and PSE-Agriculture had a small effect size (d = .3). Parents reported being more confident in discussing school and leisure activities with their child than they are discussing STEM and agricultural activities. An expert should be able to see that parents were more confident discussing STEM activities than they are agricultural activities.

In examining urban parents’ outcome expectations, participants were specifically asked about parents’ perceptions of their influence on their child’s college and career preparation (POE-CCP), parents’ influence on their child participating in STEM activities (POE-STEM), and parents’ influence on their child participating in agricultural activities (POE-Agriculture). Parents reported that they had “quite a bit” of influence in the outcome of their child’s college and career preparation. Parents also reported they had “quite a bit” of influence regarding the outcomes of if they spoke with their child about STEM and agricultural activities.

This conclusion shows that parents were confident in their abilities to help their child and believe they have influence on their child. This supported previous studies which indicated that parents have a major influence in a students’ career intentions and perceptions (Stiles-Clarke &

MacLeod, 2018; ASPIRE, 2013; DePlanty, Coulter-Kern, & Duchance, 2007; Esters & Bowen, 2005). Further, PSE determines a parents' behavior and involvement in certain areas of their child's life, which in turn can be a predictor of the child's behavior (Dumka, Gonzales, Wheeler, & Millsap, 2010; Shunow & Lomax, 2002). When parents engage and encourage children in specific subject areas, this builds the child's confidence and interest in that area (Shunow & Lomax, 2002). However, parents reported that they only had "some" confidence regarding talking with their child about agricultural activities. A majority of participants in this study identified as Black/African American (61%). Previous studies have stated that African American students turn away from or lack interest in agriculture or related career options (Scherer 2016; Ortega, 2011; Alston & Crutchfield, 2009; Moon, 2007). This study contributed to the knowledge base because it focused on parents and not students. Knowing that parents are a major influence in their child's education and career choice, and that parenting self-efficacy determines parents' behavior, helping parents be more informed and engaged in regards to STEM and agricultural activities could increase student interest in STEM and agriculture career fields. Helping parents to connect to STEM and agricultural activities in the local urban context could help parents and youth make connections between academics and careers. In doing so, parents and educators can help provide youth more college and career readiness activities and programs.

5.3 Conclusion 2: Urban Parents' Activities

On average urban parents reported participating in four different types of activities with their child, and recreational sports, visiting museums, computer games, and visiting the zoo were most popular. Specially, agricultural activities, such as visiting a farm and greenhouse, were least popular.

5.3.1 Implications for Practice

The four most popular types of activities were recreational sports, visiting museums, computer games, and visiting the zoo. None of the most reported activities were directly related to production agriculture. However, urban agriculture, food, nature, and STEM can be experienced in museums, the zoo, and possibly computer games. Further, these activities allow for the parent and child to interact independently of one another while still being together, particularly recreational sports. When a child participates in a sport, parents are most likely the spectator or, at most, the coach. Visiting museums and zoos lets the family be together while exploring and learning about a variety of subjects. However, computer games are similar to recreational sports. Most parents may be aware of their child playing on the computer but may not participate in the game themselves. The least reported activities were visiting a greenhouse (3%) and visiting a farm (4%). Parents did not report doing many activities with their child that related directly to agriculture. Perhaps parents do not have opportunities to engage in agricultural activities in the urban context. Previous studies have shown that after students engage in agriculture and STEM activities, they are more open to and interested in agriculture as a possible career (Scherer, 2016; Ortega, 2011). Studies have also shown that parents are important to motivate students to pursue STEM careers (Harackiewicz, Rozek, Hullerman, & Hyde, 2012 Hill & Tyson, 2009; Hyde, Else-Quest, Alibali, Knuth, & Romberg, 2006). Moreover, parents were given an opportunity to report if they did ten different types of activities with their child. They were also given an opportunity to list three additional “other activities.” The most reported activities reported as “other activities” were games, arts and craft, travelling, and spending more time together. This study adds to the knowledge based because it describes the different activities urban parents do with their children.

When considering the finding of this study, there are two implications for practice related to engaging parents and families in agriculture activities: (1) planning and marketing more

agriculture programs to parents, and (2) providing family programs that explore STEM and agriculture together.

First, parents reported having an influence in their child's school and leisure activities, having positive outcome expectations regarding talking with their child about STEM and agriculture activities, and reported to participate in an average of four different activities with their child. Perhaps if parents were involved in STEM and agricultural activities with their child, this would increase the child's interest and further their parenting self-efficacy related to discussing STEM and agriculture activities with their child. Showcasing the connections between agriculture and STEM careers, and highlighting how agriculture is a practical application of STEM could also help to increase parenting self-efficacy. Additionally, if pre-college programs or summer programs that engage student in STEM or agriculture were marketed to the parents instead of the students, there would be more parents discussing STEM and agriculture with their student and more interest. Several studies have shown that family attitudes about career choice are major factors affecting whether urban students will go on to college (Scherer, 2016; Boekeloo et al., 2015; Flemming & Grace, 2015; Martin, Erete, & Pinkard, 2015**;** Ortega, 2011**;** Outley, 2008).

Further, this study has shown that urban parents want to engage with their children in STEM and agricultural activities. Urban students and families do not have a connection or interest in agriculture and there is a lack of opportunity and experiences with agriculture in urban areas (Anderson, 2013; Fraze, Wingenbach, Rutherford & Wolfskill, 2011; Pate, 2011; Trexler, 2000), which would possibly explain why visiting a greenhouse and farm were two of the least reported activities. The parents that participated in this study were interested in afterschool programs or active in community groups and majority of parents reported having an associate degree or higher. Perhaps to increase a broader representation of participants, more parents need to have access to

afterschool programs. For example, parents with fewer resources may not be able to afford afterschool programs or have flexibility to transport their child to an afterschool program if the parent is working. Greater accessibility would allow for a sample that better represented the diverse backgrounds of parents in urban settings. If there were more family programs, or parent and student programs, related to agriculture urban students and families could begin to see and understand agriculture. Highlighting agriculture in an urban setting would also be an opportunity to highlight the different agricultural careers that utilize various STEM fields.

5.4 Conclusion 3: Urban Parents' Perceptions

Urban parents agreed that their child would most likely pursue an associate or bachelor's degree in arts, humanities, and social sciences as their post-secondary options. One out of two parents agreed their child would pursue a STEM-related career, and one out of four agreed their child would pursue a career in agriculture.

5.4.1 Discussion

In order of most likely to least likely, when asked what their child would do after high school, parents reported their child would graduate from a college/university (four-year program), graduate from a two-year college program, get a full-time job, attend technical or vocational school, and last enlist in the military. When asked what their child's likely career field would be, in order of most likely to least likely, parents reported their child would likely pursue a career in arts, humanities, and social sciences, engineering and technology, sciences, education, business, and last agriculture.

Parents reported the likelihood of their child attend one of the following after high school: get a full-time job (48%), enlist in the military (12%), attend technical or vocational school (38%),

graduate from a two-year college program (56%), and graduate from a college/university (four-year program) (84%). Parents also reported the likelihood of their child pursuing a career in one of the following fields: agriculture (24%), education (32%), arts, humanities, and social sciences (52%), engineering and technology (44%), sciences (44%), and business (26%). Perhaps parents' connect their child's secondary educational intentions with the educational requirements of the career field they believed their child was most interested in.

Agriculture was reported to be "quite a bit" or a "great deal" likely to be their child's intended career field by only 24% of urban parents. This supports previous studies that stated there is a lack of interest in agriculture from those in urban areas (Anderson, 2013; Fraze, Wingenbach, Rutherford & Wolfskill, 2011; Ortega, 2011; Pate, 2011; Scherer, 2016; Trexler, 2000). Perhaps if agriculture were marketed in a way that highlighted the variety of STEM fields within agriculture, as well as the art and social sciences within agriculture, urban parents and students would be more interested in the agriculture as a career field.

This study focused on STEM and agriculture in order to gain insight on better ways to increase youth interest in STEM and agriculture. Within in agriculture, you can find majors that incorporate education, arts, humanities, and social sciences, engineering and technology, sciences, and business. For example, within Purdue's College of Agriculture if a student were interested in education they could major in agricultural education and learn about teaching hands-on application of the STEM fields through agriculture. If a student were interested in art, humanities, and social sciences, they could major in agricultural communication or agricultural economics. If a student were interested in engineering and technology, they could major in agricultural engineering, biological engineering, environmental and natural resources engineering, landscape architecture, or plant genetics, breeding and biotechnology. If a student were interested in sciences, they could

study agronomy, animal sciences, applied meteorology and climatology, aquatic sciences, biochemistry, crop science, food science, natural resources and environmental science, plant science, pre-veterinary medicine, soil and water sciences, turf management and science, and wildlife. If a student were interested in business, they could study agribusiness or sales and marketing. All of these majors and more are offered within the College of Agriculture at Purdue University (Purdue University, 2015). These majors are the real-world application of each career field urban parents' perceived their child to be more interested in than agriculture. Based on the findings of this study and the various majors available within the College of Agriculture at Purdue University, STEM and agriculture is relevant in urban settings. Agriculture can be used as a practical application of STEM; connecting agriculture and STEM careers to classroom lessons can show students real-world application of what they're learning. Afterschool STEM and agriculture programs are likely to be successful if provided because parents want to engage their child and have positive outcome expectations of STEM and agricultural activities. Urban parents and urban students should be given opportunities to learn about agriculture in an urban setting so they can learn how agriculture is a part of their everyday life and how studying agriculture can lead into a wide array of different career fields. Agriculture applies many other content areas in real-world applications. For example, the largest sector of careers in agriculture are in business, management and marketing (Goecker et al., 2015). Animal sciences have similar applications as the health and human sciences field. Plant sciences apply concepts at the molecular level (i.e., biochemistry) to the ecological scale (i.e., environmental and ecological sciences).

5.5 Conclusion 4: Relationships Among Urban Parents' Parenting Self-efficacy, Parents' Outcome Expectations, and Parent Behaviors

Urban parents' parenting self-efficacy for academic performance, STEM, and agriculture were positively related to parents' outcome expectations regarding agriculture activities. Moreover, parenting self-efficacy regarding agriculture activities was positively related to the number of activities parents did with their children.

5.5.1 Discussion

Urban parents' outcome expectations regarding agriculture activities showed a positive relationship to PSE in regards to their child's academic performance, STEM activities, and agriculture activities. Parents' confidence in their ability to talk with their child about academics STEM and agriculture activities expected their child to listen and engage in agricultural activities. This study showed that parents believed they were able to influence their child by talking with them about their academics, STEM and agriculture activities.

Urban parents' parenting self-efficacy regarding agriculture activities showed a positive relationship to parent behaviors. Parents who were confident in their ability to talk with their child about agricultural activities reported they were more likely to participate in more activities with their child. This supported previous studies which stated that PSE describes a parents' practices and skills in caring for their child's development, academic and psychological well-being (Wittkowski, Garrett, Calam, & Weisberg, 2017). Additionally, parenting self-efficacy describes parental responsiveness, the quality of parent-child interactions, parental monitoring of adolescents, and parental involvement (DiIorio, 2011).

This study also showed a positive relationship between urban parents' outcome expectations regarding discussing agriculture activities and PSE in academics; PSE in agriculture

and STEM, POE in STEM, and activities; and PSE with STEM activities and POE in STEM. Urban parents' outcome expectations regarding talking with their child about agricultural activities was connected to their parenting self-efficacy and the activities they do with their child. Prior studies have shown that, with a specific outcome in mind, based on prior knowledge and experiences, a parent is likely to participate in certain activities with their child to achieve the desired outcome from their child (DiIorio, 2011). Further, if a parent is confident in their knowledge and skills set about a topic, they are more likely to interact with their child in this area. Parent behaviors can also inform a parent's outcome expectations, and vice versa (Johnson, Chen, Hughes, & O'Connor, 2015).

The results of this study supported social cognitive theory (Bandura, 1997). Social cognitive theory proposes one's inner personal factors, behavior, and the environment interact to determine outcomes. Parenting self-efficacy was derived from self-efficacy, the confidence one has in their ability to perform a task well (Bandura 1997, 2006). Self-efficacy describes whether a person will attempt a task, their behavior, how much effort they put forth, and how long they persevere in the face of obstacles. Self-efficacy comes from and can be improved through one's own performance, their response to social persuasion, watching others perform a task, and their physiological and emotional states (Bandura 1997, 2006). Parents had quite a bit of self-efficacy in discussing school activities and STEM activities with their child. Parent were somewhat self-efficacious in discussing agricultural activities with their child. The more activities a parent engages with their child would provide the parent with more mastery experiences, which could lead to higher parenting self-efficacy. Parents who have more opportunities to participate in STEM and agriculture activities or programs with their child could result in greater parenting self-efficacy regarding STEM and agricultural activities.

This study adds to the knowledge base because a positive relationship was found between PSE about agriculture and STEM as well as POE about agriculture and STEM. This suggests that urban parents see the connection between agriculture and the STEM fields. If more marketing were done to further showcase the relationship with agriculture and the STEM fields, marketing specifically to parents, urban parents would engage in more activities to motivate their child to pursue a career in agriculture and one of the STEM fields.

5.6 Recommendations for future studies

Recommendations were organized into three categories: research methods and participants, role of parent and child programs, and opportunities to study regional and cultural differences.

5.6.1 Research Methods and Participants

With an increased number of participants, future research regarding urban parents' motivation regarding their child's perceptions of STEM and agricultural activities would have greater generalizability of the results and validity of the instrument. The convenience sample for this study was small due to the willingness and availability of urban parents that participated in afterschool and extracurricular programs. Future researchers should consider using more in person data collection at afterschool programs and family events. Though an online survey was used for this study, most of the data was collected from in person distribution. The online survey may be more useful with schools and organizations that have an established and active email list.

To further expand participation, future researchers could partner with various community and youth organizations such as Girls and Boys Scouts, Boys and Girls Club, youth sport leagues, the local Extension office, Children's Museums, or zoos. This too would help to expand the survey sample to be more representative of an urban area by reaching a wider range of parents from

different backgrounds. The current study focused primarily on afterschool programs and working with various organizations will be able to include parents with varied motivations that can be observed from the activities they have their child participate in.

The research design was another limitation of this study because the questionnaire used a rating system. The rating system only allowed participants to respond to specific ideas presented in a specific way. To triangulate the data, future researchers could include more open-ended questions in the questionnaire, such as asking parents to give their definition of STEM and agriculture, and do follow-up interviews with parents. Further, parents and children could be surveyed and the responses be paired and reviewed. In doing this, future researchers would be able to connect the parents' expectations and perceptions with their child's interpretations of the parents' behavior.

Surveying parents and children would allow future researchers to measure engagement. The additional variable of engagement could be measured, but how often and what types of activities the families participate in. This could be measured in the questionnaire and further by observation of participants at events and programs. Moreover, the children's perceptions of the role of the parent in activities would provide an additional perspective to help better understand how the child is interpreting parental involvement.

5.6.2 Role of Parent and Child Programs

Future research could provide more insight into the activities urban parents participate in with their child, and also increase participation, by collaborating with school-based parent programs and afterschool programs to engage parents. This would allow future researchers to have a definite group and number of participants. Future studies could use this sample to focus on the frequency, duration, and intensity of the activities parents participate in with their child. Researchers can observe breadth and depth of conversations parents have as well as the role of the

parent. For example during, a sporting event, the researcher can observe if the parent is spectator or coach. Moreover, the level of involvement (i.e., passive vs. active) in a specific role could also be studied.

Collaborating with school-based programs would allow future researchers to study 21st century skills that are connected to college and career readiness. Future studies should include methods to observe which activities best teach students these skills and what organizations best teach this skills. Researchers should then note which activities parents are motivated to engage in with their child in order to develop these skills. Additionally, this collaboration can observe what organization parents are using to engage their child outside of the classroom. Conner Prairie or the Indianapolis Children's Museum are examples of organizations in Indiana. This could also allow for researchers to study differences in parent motivation. By comparing the activities parent and child participate in, they could identify what skills motivate the parent to participate.

5.6.3 Opportunities to study regional and cultural differences

Future studies could expand the number of participants by studying urban parents in different regions of the United States. Each region of the U.S. differs in their natural resources and agricultural production. Land-grant colleges in each state may offer varied programs to their communities. Future researchers would be able to observe the different ways STEM and agriculture are presented in urban areas based on the regional demographics and resources.

The activities parents and children participate in can vary based on region due to geography. While one parent may be able to go outdoors with their child all year long, another may need to do indoor activities due to colder temperatures. Regions can also vary in what knowledge and family practices are most common. For example, states near the coast may offer more aquatic activities and have more access to fresh seafood. This could also lead to more

discussion with about careers with marine wildlife and having seafood specific culinary skills. STEM and agricultural activities can vary based on regional resources and if there are concentrations of specific industries and careers.

Additionally, the majority of participants for this study were Black/African American (61%). Future researchers may want to study the role of culture in STEM and agriculture by getting participants from different culture events and organizations. Studying cultural similarities and difference pertains to views of STEM and agriculture could be helpful in addressing the lack of diversity and inclusion in the fields of STEM and agriculture. Observing the different cultural practices, perhaps building from the different regional practices, researchers may be able to note the utility of STEM and agriculture to urban families. By helping urban families see how they are using STEM and agriculture in their own culture, by highlighting practices shared between various cultures, they may help to increase interest in these fields.

5.7 Summary

The role of parents and their motivation regarding their child's educational experiences is important to help students be academically successful and prepare for college and careers. This study found that parents were self-efficacious in their role as parents and saw the value having discussions about STEM and agricultural activities, which could help their children prepare for college and careers. Although many parents were not engaged in doing agricultural activities with their children, they could see the value in doing them and the connections to STEM and academic activities. This study shows there are opportunities for teachers and outreach educators to engage parents and children in STEM and agricultural activities, and more intentional marketing to create awareness of these opportunities would likely provide youth and families more and broader college and careers readiness experiences.

APPENDIX A. ITEM 1: RESEARCH RECRUITMENT LETTER INCLUDING LINK TO SURVEY

PURDUE UNIVERSITY | Agricultural Sciences Education and Communication
COLLEGE OF AGRICULTURE

Research Recruitment Letter
Urban Parents' Motivation Regarding Their Child's Participation in Agriculture and STEM Activities
Agricultural Sciences Education and Communication
Purdue University

Dear Parent/Guardian:

My name is Alexandria Pettigrew, a graduate student in Agricultural Sciences Education and Communication at Purdue University working with Dr. Neil Knobloch. I am writing to ask your help with an important study on parent motivation as it applies to agriculture, science, technology, engineering and mathematics (STEM) related activities. Below is a link and QR code to participate in this study by answering questions about your involvement in your child's college and career preparation.

Please note that this research can only be successful with the help of people like you. Each online questionnaire will take no more than 10 minutes to complete and parents will receive the option to participate in a drawing* to win a one twenty five-dollar ($25) gift card. I would truly appreciate your help with my research project. If you have any questions about this project, please contact us using the information below.

https://purdue.ca1.qualtrics.com/jfe/form/SV_5pCIAdfMAhQtZqJ

Sincerely,

Alexandria Pettigrew
(317) 373-0851
apettig@purdue.edu

Neil Knobloch, Ph.D
(765) 494-8439
nknobloc@purdue.edu

Odds of winning the drawing are equal for each participant who returns a completed questionnaire.

IRB: 1803020401

Lilly Hall of Life Sciences, Room 3-230 • 915 W. State St. • West Lafayette, IN 47907 •
(765) 494-8423 • FAX: (765) 496-1152 • asec@asec.purdue.edu • ag.purdue.edu/ASEC

Item 2: Research recruitment letter without link to survey

PURDUE UNIVERSITY | Agricultural Sciences Education and Communication
COLLEGE OF AGRICULTURE

Research Recruitment Letter
Urban Parents' Motivation Regarding Their Child's Participation in Agriculture and STEM Activities
Agricultural Sciences Education and Communication
Purdue University

Dear Parent/Guardian:

My name is Alexandria Pettigrew, a graduate student in Agricultural Sciences Education and Communication at Purdue University working with Dr. Neil Knobloch. I am writing to ask your help with an important study on parent motivation as it applies to agriculture, science, technology, engineering and mathematics (STEM) related activities. Please complete the attached survey to participate in this study by answering questions about your involvement in your child's college and career preparation. Keep this letter for future reference.

Please note that this research can only be successful with the help of people like you. Each online questionnaire will take no more than 10 minutes to complete and parents will receive the option to participate in a drawing* to win a one twenty five-dollar ($25) gift card. I would truly appreciate your help with my research project. If you have any questions about this project, please contact us using the information below.

Sincerely,

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apettig@purdue.edu

Neil Knobloch, Ph.D
(765) 494-8439
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**Odds of winning the drawing are equal for each participant who returns a completed questionnaire.*

IRB: 1803020401

Item 3: Survey instrument

Questionnaire

This questionnaire is designed to help us gain a better understanding of your thoughts on parenting and discussing future careers in STEM (science, technology, engineering and mathematics) and agriculture with your child. Please indicate your opinion about each of the statements below by circling the appropriate number. Your answers will be kept strictly confidential and you will not be identified.

Part 1: Perceptions of parent's influence on their child

For this section, please select the corresponding number that aligns with your thoughts on *school performance and leisure activities*	None	Very Little	Some	Quite a Bit	A Great Deal
1. How much can you do to make your child see school as valuable?	1	2	3	4	5
2. How much can you do to help your child do their homework?	1	2	3	4	5
3. How much can you do to help your child work hard at their schoolwork?	1	2	3	4	5
4. How much can you do to help your child get good grades in school?	1	2	3	4	5
5. How much can you do to teach your child to enjoy school?	1	2	3	4	5
6. How much can you do to show your child that working hard at school influences later successes?	1	2	3	4	5
7. How much can you do to get your child into activities outside of school (for example, music, art, dance, lessons, sports activities)?	1	2	3	4	5
8. How much can you do to help your child keep physically fit?	1	2	3	4	5
9. How much can you involve yourself with your child in their leisure activities?	1	2	3	4	5

Part 2: Perceptions of parent's knowledge

For this section, please select the corresponding number that aligns with *how confidently you can explain to your child ..*	None	Very Little	Some	Quite a Bit	A Great Deal
10. What a scientist does.	1	2	3	4	5
11. What a technologist does.	1	2	3	4	5
12. What an engineer does.	1	2	3	4	5
13. What a mathematician does.	1	2	3	4	5
14. What an agricultural professional does.	1	2	3	4	5
15. What a STEM professional does.	1	2	3	4	5
16. How gardening is a STEM activity.	1	2	3	4	5
17. How food preparation is a STEM activity.	1	2	3	4	5
18. How animal care is a STEM activity.	1	2	3	4	5
19. How observing nature is a STEM activity.	1	2	3	4	5
20. How robotics is a STEM activity.	1	2	3	4	5
21. How learning STEM can help prepare your child for college.	1	2	3	4	5
22. How to find STEM summer programs.	1	2	3	4	5
23. How to prepare to go to college.	1	2	3	4	5
24. What careers align with your child's current interests.	1	2	3	4	5
25. Salaries for careers your child is interested in.	1	2	3	4	5

Part 3: Perceptions of parent's influence on college and career preparation

For this section, please select the corresponding number that aligns with *if you talk with your child about college and career preparation*	None	Very Little	Some	Quite a Bit	A Great Deal
26. You feel like a responsible parent if you talk with your child about college and career preparation.	1	2	3	4	5
27. You feel that you did the right thing if you talk with your child about college and career preparation.	1	2	3	4	5
28. You will be proud if you talk with your child about college and career preparation.	1	2	3	4	5
29. You will be confident if you talk with your child about college and career preparation.	1	2	3	4	5
30. You would find some topics you are unsure about if you talk with your child about college and career preparation.	1	2	3	4	5
31. He/she will listen if you talk with your child about college and career preparation.	1	2	3	4	5
32. He/she will be likely to follow your suggestions if you talk with your child about college and career preparation.	1	2	3	4	5
33. He/she will be able to successfully apply to college if you talk with your child about college and career preparation.	1	2	3	4	5
34. He/she will attend a two-year college if you talk with your child about college and career preparation.	1	2	3	4	5
35. He/she will attend a four-year college if you talk with your child about college and career preparation.	1	2	3	4	5
36. Your child will do what he/she wants no matter what you say.	1	2	3	4	5

Part 4: Perceptions of parent's influence on STEM and agricultural activities

For this section, please select the corresponding number that aligns with *if you talk with your child about STEM and agricultural activities*	None	Very Little	Some	Quite a bit	A great deal
37. If you talk with your child about STEM activities, he/she will listen.	1	2	3	4	5
38. If you talk with your child about STEM activities, he/she will be likely to follow your suggestions of STEM activities.	1	2	3	4	5
39. If you talk with your child about STEM activities, it will help prepare your child for college.	1	2	3	4	5
40. If you talk with your child about STEM activities, he/she will see STEM as a skilled, educated workforce.	1	2	3	4	5
41. If you talk with your child about STEM activities, he/she will see STEM as having a lot of career opportunities.	1	2	3	4	5
42. If you talk with your child about STEM activities, he/she will see STEM as having a lot of high paying careers.	1	2	3	4	5
43. If you talk with your child about STEM activities, he/she will see STEM offers exciting career options.	1	2	3	4	5
44. If you talk with your child about agricultural activities, he/she will listen.	1	2	3	4	5
45. If you talk with your child about agricultural activities, he/she will be likely to follow your suggestions of agricultural activities.	1	2	3	4	5
46. If you talk with your child about agricultural activities, it will help your child think about a career.	1	2	3	4	5
47. If you talk with your child about agricultural activities, he/she will see agriculture as a skilled, educated workforce.	1	2	3	4	5
48. If you talk with your child about agricultural activities, he/she will see agriculture as having a lot of career opportunities.	1	2	3	4	5
49. If you talk with your child about agricultural activities, he/she will see agriculture as having a lot of high paying careers.	1	2	3	4	5
50. If you talk with your child about agricultural activities, he/she will see agriculture offers exciting career options.	1	2	3	4	5

Part 5: Perceptions of child's interest

51. How likely will your child attend one of the following after high school	None	Very Little	Some	Quite a bit	A great deal
Get a full-time job	1	2	3	4	5
Enlist in the military	1	2	3	4	5
Attend technical or vocational school	1	2	3	4	5
Graduate from a two-year college program	1	2	3	4	5
Graduate from a college/university (four-year program)	1	2	3	4	5

52. To what extent would your child be likely pursue a career in	None	Very Little	Some	Quite a bit	A great deal
Agriculture (e.g. Horticulture, Food Science, Agronomy, Animal Science, Veterinary Medicine)	1	2	3	4	5
Education (e.g. Elementary Education, Secondary Education)	1	2	3	4	5
Arts, Humanities, and Social Sciences (e.g. Psychology, Sociology, Economics, History, Fine Arts)	1	2	3	4	5
Engineering and technology (e.g. Mechanical Engineering, Chemical Engineering, Agricultural Engineering, Computer Science)	1	2	3	4	5
Sciences (e.g. Chemistry, Biology, Physics, Mathematics)	1	2	3	4	5
Business (e.g. Accounting, Marketing, Management)	1	2	3	4	5
Medicine (e.g. Human Medicine, Pharmacy)	1	2	3	4	5
Other (e.g. Architecture, Government, Hospitality and Tourism, Law, Military, Public Safety, Transportation, Athletics, Music)	1	2	3	4	5

Part 6: Demographic information

53. What is your race/ethnic group? (Select one or more)	Black or African American
	Hispanic American
	White or European American
	Asian/Pacific Islander-American
	Native American
	Other
54. What best describes you?	Mom or female guardian
	Dad or male guardian
55. What is the highest degree or level or schooling you have completed?	No schooling completed
	Elementary to 8th grade
	Some high school (no diploma)
	High school graduate (diploma or GED)
	Some college credit (no degree)
	Trade/technical/vocational training
	Associate degree
	Bachelor's degree
	Master's degree
	Professional degree
	Doctorate degree
56. What is your current occupation?	
57. What household activities does your family participates in? Such as hobbies or events the family does together. (Select all that apply)	Observing wildlife at the zoo
	Visiting a greenhouse
	Gardening
	Visiting museums
	Visiting farms
	Camping
	Computer games
	Recreational sports
	Operating a family business
	Other types of activities:_____
	Other types of activities:_____
	Other types of activities:_____
58. What grade is(are) your child(ren) in?	

Gift card drawing (option)

Thank you for completing the questionnaire. Your insight is truly appreciated. If you would like to be entered into a drawing to win a $25 gift card please answer the questions below. Participation in the drawing is optional.

Email address	
Phone number	
From what group or organization did you hear about this survey?	

APPENDIX B. IRB APPROVAL FORM

PURDUE
UNIVERSITY

HUMAN RESEARCH PROTECTION PROGRAM
INSTITUTIONAL REVIEW BOARDS

To:	KNOBLOCH, NEIL APETTIGREW, ALEXANDRIA L
From:	DICLEMENTI, JEANNIE D, Chair Social Science IRB
Date:	06/04/2018
Committee Action: (2) (3)	Determined Exempt, Category (2) (3)
IRB Action Date:	06 / 01 / 2018
IRB Protocol #:	1803020401
Study Title:	Urban Parents Motivation Regarding Their Childs Participation in Agriculture and STEM Activities

The Institutional Review Board (IRB) has reviewed the above-referenced study application and has determined that it meets the criteria for exemption under 45 CFR 46.101(b).

Before making changes to the study procedures, please submit an Amendment to ensure that the regulatory status of the study has not changed. Changes in key research personnel should also be submitted to the IRB through an amendment.

General

- To recruit from Purdue University classrooms, the instructor and all others associated with conduct of the course (e.g., teaching assistants) must not be present during announcement of the research opportunity or any recruitment activity. This may be accomplished by announcing, in advance, that class will either start later than usual or end earlier than usual so this activity may occur. It should be emphasized that attendance at the announcement and recruitment are voluntary and the student's attendance and enrollment decision will not be shared with those administering the course.
- If students earn extra credit towards their course grade through participation in a research project conducted by someone other than the course instructor(s), such as in the example above, the students participation should only be shared with the course instructor(s) at the end of the semester. Additionally, instructors who allow extra credit to be earned through participation in research must also provide an opportunity for students to earn comparable extra credit through a non-research activity requiring an amount of time and effort comparable to the research option.
- When conducting human subjects research at a non-Purdue college/university, investigators are urged to contact that institution's IRB to determine requirements for conducting research at that institution.
- When human subjects research will be conducted in schools or places of business, investigators must obtain written permission from an appropriate authority within the organization. If the written permission was not submitted with the study application at the time of IRB review (e.g., the school would not issue the letter without proof of IRB approval, etc.), the investigator must submit the

written permission to the IRB prior to engaging in the research activities (e.g., recruitment, study procedures, etc.). Submit this documentation as an FYI through Coeus. This is an institutional requirement.

Categories 2 and 3

- Surveys and questionnaires should indicate
  - only participants 18 years of age and over are eligible to participate in the research; and
  - that participation is voluntary; and
  - that any questions may be skipped; and
  - include the investigator's name and contact information.
- Investigators should explain to participants the amount of time required to participate. Additionally, they should explain to participants how confidentiality will be maintained or if it will not be maintained.
- When conducting focus group research, investigators cannot guarantee that all participants in the focus group will maintain the confidentiality of other group participants. The investigator should make participants aware of this potential for breach of confidentiality.

Category 6

- Surveys and data collection instruments should note that participation is voluntary.
- Surveys and data collection instruments should note that participants may skip any questions.
- When taste testing foods which are highly allergenic (e.g., peanuts, milk, etc.) investigators should disclose the possibility of a reaction to potential subjects.

You are required to retain a copy of this letter for your records. We appreciate your commitment towards ensuring the ethical conduct of human subjects research and wish you luck with your study.

APPENDIX C. LIST OF OCCUPATIONS

Complete list of occupations reported by parents

• Customer Care	• Housekeeper
• School Principal	• Manager
• Entrepreneur	• Medical Assistant
• Health Administration	• Educator
• Community Health Network	• Homemaker/Mom 24/7
• Collections	• Healthcare in Pharmacy
• Teacher	• Retail Manager
• Customer Care	• Physician
• Psychologist	• Stay at Home Parent
• IT Service Delivery Change Manager	• Food Pantry Manager
• Fundraiser	• Analyst
• Academic Advisor	• Prep Cook
• Small Business Owner	• Salon owner/Stylist
• Art Teacher	• Dept Manager
• School bus driver/Homeschooling mom	• Medical Assistant
• Mom	• Escrow Payment Analyst
• Chef	• Cashier
• Server (Mexican restaurant)	• Senior Business Analyst
• Construction Administrator	• Mortgage Banker
• Factory	• Nonprofit management
• CDL Truck Driver	

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