

TOWARD AN EXPANDED APPROACH TO EVALUATING EARLY CHILDHOOD  
EDUCATOR PROFESSIONAL DEVELOPMENT

A Dissertation

by

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Submitted to the Office of Graduate and Professional Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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May 2020

Major Subject: Agricultural Leadership, Education, and Communications

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## ABSTRACT

Early childhood educator professional development promotes positive outcomes for children, but only if educators improve their practices as a result of training. Program evaluation for these professional development programs has tended to stop short of measuring and analyzing changes in teachers' behavior. This study investigated a potential operationalization of the Cervero model for training evaluation as a framework for evaluating an early childhood professional development program at the behavior change outcome level. The Cervero model includes four classes of independent variables believed to contribute to behavior change: characteristics of the participant, characteristics of the training, characteristics of the proposed behavior change, and characteristics of the participant's social context. It also requires an outcome measure specific to the learning objectives of the training. A review of existing literature in behavior change theory and early childhood educator professional development evaluation suggested a preliminary operationalization of the four classes of independent variables in the Cervero model for use with childcare providers in Texas. In the proposed model, participant characteristics included age, ethnicity, years of experience in the field, and the type of childcare facility in which the individual works; the training characteristic of interest was asynchronous online vs. synchronous in-person delivery; characteristics of the behavior change included performance expectancy and effort expectancy; social contextual factors included adapted measures of social influence and facilitating conditions. Using the Healthy Interactions: Promoting Lifelong Nutrition

training from the Texas A&M AgriLife Extension Early Childhood Educator Training Program, the author collected self-report measures of participants' use of a set of target behaviors at baseline and approximately one month post-training. Due to the high rate of non-response, the researcher also conducted a qualitative meta-evaluation to identify strategies to better tailor data collection processes for this population. The results indicated that the training did lead to improved practices on average, provided insights to develop a revised model of change for future studies, and generated strategies evaluators can use to improve recruitment and data collection procedures for early childhood educators.

## DEDICATION

To Walter J. and Patricia Lord, better known as Grandpa Corky and Grandma Pat, who never lost sight of my dreams even when I did, and to the Big Crazy Family they created. May we continue to uphold your legacy of love for generations to come.

## ACKNOWLEDGEMENTS

This project was made possible because of the support of my committee, Dr. Scott Cummings, Dr. Robert Strong, Dr. Gary Briers, and Dr. Lakshmi Mahadevan. I would also like to thank Dr. Stephen D. Green, my supervisor and mentor, for encouraging me to use real-life issues we have encountered in our work to design and carry out my research. Special thanks also go to my colleagues in the Texas A&M AgriLife Extension Service, including Dr. Jenna Anding who reviewed the training materials for accuracy, Shawna Manning and Lynn Wenzel who supported the production and implementation of the online training component, and Family & Community Health County Extension Agents Laura Graves, Abigail Pritchard, Sandy Taylor, Karan Hefflefinger, Suzanne Rowland, Yolanda Morado, Charla Bading, Connie Sheppard, Annie Tinsley, Sally Garrett, and LouAnn Rollins who allowed me to incorporate study procedures into face-to-face early childhood educator training events in their respective communities.

I would be remiss if I did not also thank my family and friends for the lifetime of support they have provided, and especially my husband, Cody, and my daughters, Cameron and Avery who have earned this achievement right alongside me with their patience, understanding, and love.

## CONTRIBUTORS AND FUNDING SOURCES

### **Contributors**

This work was supervised by a dissertation committee consisting of Professor Scott Cummings [advisor] and Professors Gary Briers and Robert Strong of the Department of Agricultural Leadership, Education, and Communications and Professor Lakshmi Mahadevan of the Department of Educational Psychology and the Family & Community Health Unit of the Texas A&M AgriLife Extension Service.

The Family & Community Health Unit of the Texas A&M AgriLife Extension Service provided support for this project by incorporating the study procedures into the regular program activities provided by the Early Childhood Educator Training Program.

All other work conducted for the dissertation was completed by the student independently.

### **Funding Sources**

Graduate study was supported in part by the Frank W. Sheppard, Jr. Scholarship from the College of Agriculture and Life Sciences and the Texas Aggie Graduate Grant from Texas A&M University.

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## CHAPTER I

### INTRODUCTION

According to the U.S. Census Bureau, an estimated 33% of children under 5 years of age receive some form of regular childcare from one or more unrelated adults for an average of 33 hours per week (Laughlin, 2013). About five million of these children attend a formalized childcare program, such as a childcare facility, preschool, Head Start program, or family childcare home (Laughlin, 2013). Not surprisingly, the quality of programs where young children spend their time can influence their development both short-term and long-term (National Institutes of Child Health and Development [NICHD] Early Child Care Research Network [ECCRN], 2000; Peisner-Feinberg et al., 2001; Vandell & Wolfe, 2000).

Children in early care and education (ECE) settings who receive care from adults with more specialized training and education tend to receive higher quality care, and thus attain better developmental outcomes (NICHD ECCRN, 1999; Vandell & Wolfe, 2000). Accordingly, almost every state in the U.S. requires ECE professionals to complete in-service training, often called professional development (PD) (State Capacity Building Center, 2016). Along with a host of other organizations and individuals that provide ECE training, Cooperative Extension programs across the nation have established themselves as key providers of ECE PD (Durden, Mincemoyer, Gerdes, & Lodl, 2013).

The State of Texas recognizes the importance of training for the ECE workforce by requiring caregivers in licensed child-care centers and childcare homes to acquire at least 24 clock hours of PD annually (Child Care Licensing [CCL], 2017a; CCL, 2017b). In response to the need for effective ECE PD for Texas child-care providers, Texas A&M AgriLife Extension's Family and Community Health Unit (FCH) provides a variety of research-based, face-to-face and online training opportunities through the Early Childhood Educator Training Program (ECETP) (Green, 2013).

Traditionally, the ECETP has served as a conduit for economic development, aligned with the College of Agriculture and Life Sciences' Grand Challenge of Growing Our Economy, by empowering ECE employees to remain in the workforce, which provides care for the children of working parents (Texas A&M University [TAMU] College of Agriculture and Life Sciences [COALS], 2014). Providing research-based content about strategies linked to positive developmental outcomes has always been a feature of the program. In recent years, the potential to generate measurable improvements in the quality of early care and education provided by trainees has become the primary focus. This shift occurred in light of the 2017 change in the title and accompanying emphasis of Texas A&M AgriLife Extension's human sciences programming from the broader Family Development and Resource Management to the narrower Family and Community Health. Thus, the program's purpose has shifted from that of a workforce service to that of a potential intervention for improving children's lives in the present and throughout their lives. In its current form, the ECETP remains an important tool for Growing Our Economy, but also has the potential to serve the Grand

Challenges of Enriching Our Youth and Improving Our Health (TAMU COALS, 2014). To achieve these lofty goals, the ECE professionals who participate in ECETP training opportunities must change for the better in some meaningful way.

### **The Problem**

In general, ECE PD benefits children by improving ECE professionals' practices (NICHD ECCRN, 2002). Specialized training can lead to improvements in ECE professionals' knowledge, abilities, and skills (Fukkink & Lont, 2007). However, even well-planned PD programs can fail to generate anticipated improvements in participants' practice (Piasta et al., 2017). These inconsistent findings have caused leaders in the ECE field to call for additional research on the results of PD programs so practitioners can better understand the processes involved in changing participants' practices (Rhodes & Huston, 2012; Sheridan, Edwards, Marvin, & Knoche, 2009; Zaslow et al., 2010).

While measuring intermediate-term outcomes, such as behavior changes, has increased within Extension's approach to program evaluation as a whole, it is still relatively uncommon (Workman & Scheer, 2012). Among ECE PD sponsored by Cooperative Extension agencies, published evaluation data tend to emphasize the number of participants, their gains in knowledge, and, in some cases, improved care and teaching behaviors (Byington, Martin, Reilly, & Weigel, 2011; Cathey, White, Braud, & Gioe, 2009; Green, 2013; Hardison & Behnke, 2007; Jayaratne, Harrison, & Bales, 2009; Malley, 2002; Ostergren, Riley, & Wehmeier, 2011; Peterson & Prilliman, 2000). Extension-based ECE PD providers most commonly use a post-test only or a pre-test/post-test design to evaluate their programs at the time of service delivery (Durden et

al., 2013). As an intermediate-term outcome, behavior change emerges after trainees have time to implement the new strategies in their work, unlike short-term outcomes (e.g. knowledge gain) which can be measured immediately (Workman & Scheer, 2012). Thus, the propensity for the exclusive use of time-of-service evaluation measures means Extension-sponsored ECE PD programs have failed to capture changes in their participants' behaviors as a result of training, let alone to analyze factors that might contribute to such improvements in practice.

Like many other states, Texas does not have a comprehensive system to evaluate and approve training programs for ECE professionals (CCL, 2019a; CCL, 2019b; Gomez, Kagan, & Fox, 2015). Without such oversight, the responsibility for evaluating the quality and outcomes of ECE training falls to the organizations and individuals who provide ECE PD. The current ECETP evaluation protocol measures participants' pre-test and post-test knowledge of the training content but stops short of measuring practice changes. However, a preliminary short-term follow-up study with participants from a subset of ECETP online courses found that participants reported using practices learned in the training (Nerren & Green, 2017). Given the need for an expanded approach to evaluation within the ECE field at large and, perhaps especially, among Extension-based ECE PD programs, the Texas A&M AgriLife Extension ECETP represents a fertile testing ground for exploring factors associated with improvements in practice as a result of training and improved methods for gathering such information.

## **Theoretical Foundations**

The theory of diffusion of innovations offers promising suggestions for the expansion of approaches to ECE PD evaluation, to the extent PD programs exist to encourage learners to adopt certain practices. According to Rogers (2003, p. 5), “Diffusion is the process in which an innovation is communicated through certain channels over time among members of a social system” (emphasis in original). This theory suggests several factors that influence an individual’s decision about whether to adopt an innovation, or a new idea, practice, or technology. Some individuals, Rogers (2003) suggested, are more innovative than others, meaning they tend to adopt new things more readily. Adoption decisions are also influenced by the source of information whereby the individual learns about the innovation throughout the decision-making process. As they gather information, prospective adopters form perceptions about the innovation itself, which affect how they feel about the innovation and, therefore, how likely they are to adopt it. This decision-making process takes place within the individual’s social system, and influences from that system can encourage or hinder adoption, and, after adoption, can lead to sustained use or discontinuance of the innovation (Rogers, 2003).

Rooted in the theory of diffusion of innovations, the Cervero model of training evaluation emerged from the need for a systematic conceptual framework for analysis of factors influencing training outcomes (Cervero & Rotett, 1984). The model proposes four classes of independent variables to explain variations in behavioral change post-training: characteristics of the training participant, characteristics of the training program

itself, trainees' perceptions of the proposed behavior change, and characteristics of the social system in which participants are expected to apply the behavior (Cervero & Rotett, 1984). Notably, the authors acknowledge that the specific factors within each class that explain changes in trainee behavior may vary depending on the field in which the model is applied, among other factors (Cervero & Rotett, 1984).

The Cervero model has been suggested as a guiding framework for the evaluation of Cooperative Extension educational programs aimed at generating changes in participants' behavior, including ECE PD programs (Hubbard & Sandmann, 2007). A review of recently published ECE PD evaluation studies supports the potential for operationalizing the Cervero model for use in the ECE field, within and beyond PD programs situated in Extension agencies. Several studies have explored the effects of participant characteristics on training outcomes, including years of service (Yamauchi, Im, & Mark, 2013), educational attainment (Hamre et al., 2012), and whether the participant is employed by a child care program situated in a caregiver's home or in a separate facility, often called a child care center (Williford, Wolcott, Whittaker, & Locasale-Crouch, 2015). Others have looked at how characteristics of the training program itself influence outcomes (Lane, Prokop, Johnson, Podhajski, & Nathan, 2014).

Still others have looked at combinations of factors across more than one class. One group of researchers explored teacher (e.g., years of service, educational attainment, major) and program characteristics (e.g., extent of participation in the PD activities) that influenced participants' improvements in practice following a credit-bearing college course for ECE professionals (Williford et al., 2017). Another group found that



participant characteristics, like empathy, perceptions of the proposed behavior change, like compatibility with the participants' values and circumstances, and characteristics of the social system, like social support from peers and practical support from administrators, all contributed to understanding trainees' use of strategies taught in a PD program (Spies, Lyons, Huerta, Garza, & Reding, 2017). In perhaps the most promising study for movement toward an expanded framework, Trivette, Raab, and Dunst (2014) explored the influence of multiple trainee characteristics, perceptions of the training program, perceptions of the practices taught in the training, and social context of the trainees' workplaces, addressing the four classes of independent variables specified in the Cervero model. However, the dependent variables in their study consisted of the amount of participation and engagement demonstrated by trainees, rather than post-training changes in their teaching behaviors (Trivette et al. 2014). These studies suggest that the Cervero model, properly operationalized, can serve as a useful tool for expanding the approach to ECE PD evaluation.

Current ECE PD evaluation literature suggests a wide range of variables within each class which could help explain participants' use of practices taught in training. One study found that ECE teachers from non-Hispanic white backgrounds tended to implement innovative practices more thoroughly did than those from minority backgrounds, but the study did not include pre-test measures of teacher behavior (Williford, et al., 2015). Other characteristics of the participants themselves, including age, educational attainment, operation type, and years of experience, may serve as important moderators of the influences of factors in other classes of the model.

Participation in online ECE PD has accelerated in recent years (Green, 2013), making questions of the comparative effectiveness of face-to-face and online delivery modes particularly salient with respect to characteristics of the educational program. Existing literature suggests the effect of delivery mode on training outcomes may vary by age and educational attainment.

Stone-MacDonald and Douglass (2014) found that the distribution of ages among users of online PD mirrored that of the overall workforce. However, Weigel, Weiser, Bales, and Moyses (2012) and Wright and Bales (2014) found that older individuals were less comfortable with the internet and used it less often, behaviors associated with lower likelihood of valuing online training as an important feature of a website for ECE professionals. On the other hand, Weigel et al. (2012) also found that respondents with higher levels of educational attainment valued online training more highly as a website feature than did those with less education.

Similarly, Ackerman (2017) found that the distribution of educational attainment among users of an online ECE PD program mirrored that of the overall workforce. However, other studies suggest ECE professionals with higher levels of educational attainment may be more comfortable with internet usage and use the internet more frequently, both of which are associated with valuing online courses more highly (Weigel, Weiser, Bales, & Moyses, 2012; Wright & Bales, 2014).

Several studies have identified characteristics of the proposed behavior that support implementation of practices learned in training. The findings tend to emphasize the need for innovative strategies to enable teachers to perform more effectively in

achieving their professional goals (Baker, 2018; Brown & Inglis, 2013; Linder, Rembert, Simpson, & Ramey, 2016; Nasser, Kidd, Burns, & Campbell, 2013; Spies et al., 2017). These qualitative findings bear a conceptual resemblance to the performance expectancy construct defined by the Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, Davis, & Davis, 2003). Given differences in the responsibilities and training needs of home-based and center-based ECE providers, operation type may moderate PD participants' perceptions of a given innovative practice (Byington, 2017; Porter et al., 2010).

The constructs of effort expectancy, a characteristic of the innovation, and facilitating conditions, a characteristic of the social context, both as defined in the Unified Theory of Acceptance and Use of Technology, may interact to help or hinder implementation of new practices (Venkatesh et al., 2003). Effort expectancy, or the degree to which an individual expects the innovation to be easy to implement in her professional setting, may also influence implementation, according to existing literature (Lieber et al., 2009; Nasser et al., 2013). Findings by Barton et al. (2017) suggested effort expectancy may moderate the effect of facilitating conditions, or the existence of resources in the workplace that support implementation, such that participants may utilize and benefit from facilitating conditions more when an innovative practice is more difficult to use.

Social influence, as defined in the Unified Theory of Acceptance and Use of Technology, may also play a role in participants' use of innovative practices learned in training (Venkatesh et al., 2003). Supportive collaboration between co-teaching teams

(Lieber et al., 2009), from administrators (Brown & Inglis, 2013), and with colleagues in general (Shannon et al., 2015), which can be facilitated by collective participation in training programs (Zaslow et al., 2010), have all been associated with implementation of new strategies. The effects of social influence may be more important for some ECE professionals than others.

Child-care programs operating in caregivers' homes (rather than ECE centers) are subject to similar, but distinct, regulatory standards in the State of Texas, which may create important differences in these two groups' responses to training (CCL, 2017a; CCL, 2017b). As described by Child Care Licensing, ECE professionals in childcare homes may work alone or with relatively few coworkers, while ECE centers are typically licensed to care for greater numbers of children and require more staff members to be present (CCL, 2017a; CCL, 2017b). Because of this difference, workers in home-based ECE programs likely construct their perceived social systems differently than center-based ECE staff, and social influence may not be as relevant to their immediate implementation of innovative practices (Porter et al., 2010). Also, Dennis and O'Connor (2013) found evidence that younger and more educated teachers may be less susceptible to social influences in their practice. Together, these findings suggest a preliminary operationalization of the Cervero model for use with ECE PD programs.

Meta-evaluation is the process of evaluating the results and methods of an evaluation (Davidson, 2005; Patton, 2015). Considering the novelty of the proposed framework, applying a meta-evaluation approach to the methods used in this study ought

to yield insights into the methodological considerations necessary for future investigations in this area.

### **Purpose of the Study**

The purpose of this study was to explore the usefulness of an expanded approach to evaluation of ECE PD programs rooted in behavior change theories. The study used a preliminary operationalization of the Cervero model to evaluate behavior change outcomes associated with a training module within the Texas A&M AgriLife Extension ECETP. More specifically, objectives of the study were to:

1. Evaluate the effectiveness of an ECETP training module by measuring changes in participants' implementation of key behaviors taught within it.
2. Test the fit of a proposed operationalization of the Cervero model for ECE PD evaluation.
3. Understand optimal procedures for the implementation of the expanded evaluation framework.

Guiding questions for the study and associated hypotheses were:

**Research Question 1.** Do participants in this ECE PD program implement strategies taught in the training? The researcher hypothesized that participants would increase their use of strategies taught in the training.

**Research Question 2.** How well can the Cervero model of training evaluation, operationalized for use with ECE PD programs, explain variations in behavior change among ECETP participants? The researcher hypothesized that individual characteristics of ethnicity, operation type, educational attainment, years of experience, and age,

program characteristic of delivery mode, perceptions of the proposed behavior change in the form of performance expectancy and effort expectancy, and workplace characteristics of social influence and facilitating conditions would explain a significant portion of the variation in behavior change.

**Research Question 3.** What kinds of evaluation methods and procedures are necessary to successfully implement this expanded approach to ECE PD program evaluation? The researcher hypothesized that a meta-evaluative exploration of methodological issues in this study would yield information about the types of methods and procedures necessary for successfully implementing expanded approaches evaluation of ECE PD programs.

### **Key Terms**

Some of the terms used throughout this manuscript have specialized meanings within the ECE field and/or tend to be used ambiguously. For clarity, these terms will be used as described herein.

**Young children.** The mission statement of the National Association for the Education of Young Children (NAEYC) (n.d., p. 1) indicated, “NAEYC promotes high-quality early learning for all children, birth through age 8, by connecting practice, policy, and research. We advance a diverse, dynamic early childhood profession and support all who care for, educate, and work on behalf of young children.” As a leading professional association for early care and education personnel, NAEYC’s definition of young children as those 8 years old and younger has permeated the field and is the prevailing standard for understanding the timeline of early childhood.

**Infants, toddlers, preschoolers, and school-agers.** Within the early childhood period from birth to age 8, there are a few commonly used subdivisions for classifying children by age groups: infants, toddlers, preschoolers, and school-age children. CCL defines these periods according to specified cut-points, with infants comprising children from birth to 17 months, toddlers from 18 to 35 months, pre-kindergarteners (often called preschoolers) from three-to-five years of age and not attending school at any time in the current year, and school-age children from age five and beyond who currently attend school or will attend school in the fall of the current year (CCL, 2019a). In this manuscript, the terms preschooler and pre-kindergartener will be used interchangeably to represent the period defined by CCL.

**Professional development.** According to a review of literature on professional development across the realm of education, Lauer, Christopher, Firpo-Triplett, and Buchting (2013, p. 207) wrote, “Although there are varying PD definitions and delivery systems, they all concern the education of adults and are designed to produce positive change in beliefs, knowledge, skills or behaviors.” Other terms used to describe these job-oriented educational opportunities include in-service training and professional learning. The defining elements of professional development, as it is used in this study, are that it is some educational activity undertaken by an in-service professional with the objective of improving the participants’ knowledge and practices (Institute of Medicine and National Research Council, 2015).

**Child-care operation.** Child-care operations include all licensed child-care centers and licensed or registered child-care homes, as described below and defined by CCL (2019a; 2019b).

**Child-care center.** Child Care Licensing (2019a, p. 3) in Texas defines a child-care center as “a child-care facility that is licensed to care for seven or more children for less than 24 hours per day, a location other than the permit-holder’s home.” This definition differentiates child-care centers from public school pre-kindergarten programs, Early Childhood Intervention services, and other out-of-home ECE programs that lie outside the jurisdiction of CCL.

**Child-care home.** CCL (2019b) collectively refers to licensed and registered child-care operations situated in the primary caregiver’s home as child-care homes. In licensed child-care homes, the caregiver may care for up to 12 children, depending on the children’s ages, throughout the child-care home’s operational hours, whereas in a registered child-care home the caregiver may care for a maximum of six children throughout the day, and up to an additional six elementary school-aged children during after school hours (CCL, 2019b).

**Caregiver.** According to the Minimum Standards for Child-Care Centers (CCL, 2019a, p. 2), a caregiver is defined as “a person who is counted in the child/caregiver ratio, whose duties include the supervision, guidance, and protection of a child.” The CCL definition of a caregiver is used throughout this manuscript, particularly to differentiate from other ECE professionals, such as administrators or non-classroom personnel, who may not have direct, day-to-day responsibility for children. As defined



by CCL, caregivers are subject to a specific set of regulations related to ongoing professional development (CCL, 2019a; CCL, 2019b).

### **Summary**

This study evaluated behavioral implementation outcomes among participants of a selected Extension-based PD program for ECE professionals, seeking both to measure those outcomes and to analyze them using an expanded, theory-driven evaluation model.

## CHAPTER II

### THEORETICAL FRAMEWORK & LITERATURE REVIEW

Despite widespread recognition that effective ECE PD can improve teachers' practices, which can improve the quality of their ECE programs, which can improve outcomes for children across all domains of development, outcome evaluations of these programs continue to produce mixed results (NICHD ECCRN, 2000; NICHD ECCRN, 2002; Peisner-Feinberg et al., 2001; Zaslow et al., 2010). This has led many scholars to call for deeper investigations into the factors associated with the effectiveness of ECE PD programs in generating improved practices among their trainees (Rhodes & Huston, 2012; Sheridan et al., 2009; Zaslow et al., 2010). At the same time, Cooperative Extension agencies, key providers of ECE PD across the nation, have experienced increased pressure to produce evidence of longer-term outcomes among their participants (Clements, 1999; Durden et al., 2013; Workman & Scheer, 2012). Still, most Extension-based ECE PD programs use evaluation measures administered immediately upon completion of the training, making it unlikely that they are capturing data about actual changes in participants' workplace behaviors (Cathey et al., 2009). In Texas, the Texas A&M AgriLife Extension Early Childhood Educator Training Program (ECETP) uses an outcome monitoring system that includes measures of knowledge change and participants' intentions to use what they have learned. A short-term follow-up study demonstrated that ECETP PD has the potential to generate changes in participants' behavior, making it a potentially useful proving ground for an expanded

framework of ECE PD evaluation aimed at analyzing factors that contribute to changes in participants' practice (Nerren & Green, 2017). In this chapter, a review of conceptual models of the ECE PD system and effective ECE PD programs, theories of behavior change, and recent ECE PD evaluation studies coalesces into a promising framework for this expanded approach.

### **Conceptual Frameworks**

Two initial efforts to conceptualize the components of the ECE PD system (Horm, Hyson, & Winton, 2013) and effective ECE PD programs (Buysse, Winton, & Rous, 2009) have appeared in the literature in the last decade. While neither model offers an immediate theory of change to explain how ECE PD programs can mediate behavior change, both offer insights into whether and how theories of behavior change fit with the present understanding of ECE PD.

**Conceptual model of the ECE PD system.** Horm, Hyson, and Winton (2013) developed a model to conceptualize the overall system used to educate ECE professionals, including pre-service higher education and in-service professional development. Though their primary objective was to examine the position of pre-service teacher education programs within this system, it also illustrates some of the external influences widely believed to contribute to ECE professionals' use of effective practices linked to positive outcomes for children. According to this conceptualization, the providers, instructional techniques, and content are the critical elements of an in-service PD program (Horm et al., 2013). Individual learners experience these programs, influenced by their personal access and resources, and, depending on the resources and

supports available in their workplaces, they are the vehicle for delivering effective ECE practices to children and families (Horm et al., 2013). Crucially, as a representation of the large-scale system where ECE PD operates, this conceptual model does not zoom in on the decision-making process within the individual learner—the process that mediates the influence of PD on effective practices. A theory of change for ECE PD programs, then, would constitute an enlarged inset on this map of the ECE PD system, magnifying the process that occurs at the juncture of the individual learner, further explaining the links between PD programs and the use of effective practices.

**Conceptual model of effective ECE PD programs.** With a narrower lens, Buysse, Winton, and Rous (2009) developed a conceptual model intended to contribute to a common definition of ECE PD. Relative to the ECE PD system as a whole, this model represents the linkage between the critical components of a PD program and the individual learners who use it. Three core elements make up the substance of effective ECE PD programs according to this model: what, how, and who (Buysse et al., 2009). The “what” component refers to the content of the program, specifically the “knowledge, skills, and dispositions that will be the focus” (Buysse et al., 2009, p. 239). The “how” component deals with the “organization and facilitation of learning experiences” within an ECE PD program (Buysse et al., 2009, p. 239). The “who” component signifies the effect of each learner’s individual characteristics, recognizing that ECE professionals “vary widely with respect to their qualifications, professions, experience, race, culture, and ethnicity” and serve in a variety of organizational contexts (Buysse et al., 2009, p. 239). This model is depicted as a three-part Venn diagram, illustrating the importance of

aligning these components for effective ECE PD, such that instructional strategies should be selected to work with the training content, content should be selected based on professional needs of the learners, and instructional strategies should be aligned to the learning needs and experiences of the ECE PD participants (Buysse et al., 2009). This suggests that complex interactions between factors contribute to the effectiveness of ECE PD programs in attaining their intended outcomes. This framework offers a useful starting point for understanding how ECE PD can lead to changes in participant behavior but stops short of identifying specific pathways for how these elements generate such changes. Theories of behavior change provide direction with respect to how these changes might occur and may contribute to a more comprehensive framework for analyzing the relationship between ECE PD and behavioral outcomes.

### **Theories of Behavior Change**

Many different theoretical perspectives have been developed to explain facets of human behavior and decision making, including social cognitive theory (Bandura, 2005), the theory of planned behavior (Fishbein & Ajzen, 1975), the theory of diffusion of innovations (Rogers, 2003), the unified theory of acceptance and use of technology (Venkatesh et al., 2003), developed using elements of the previous theories as well as others specific to the information technology field, and adapting diffusion of innovation theory for the PD context, the Cervero model for training evaluation (Cervero & Rottet, 1984). Each of these theoretical perspectives recognizes the importance of both internal factors, such as attitudes and beliefs, and external factors, such as social expectations and supports, in the processes that shape human behavior. This section describes key

constructs from each of these theories and discusses their strengths and weaknesses relative to explaining ECE PD behavior change outcomes.

**Social cognitive theory (SCT).** SCT originated in response to earlier behavioral theories which upheld the behaviorist perspective whereby an individual's behavior is, in essence, shaped by external reinforcers which the individual experiences in response to her actions. The most novel element of SCT at the time was the emphasis of human agency, or the belief that human beings actively engage in behaviors that are simultaneously shaped by external factors and affect the environments and social systems in which they take place. Externally, this process of reciprocal determinism allows for the possibility of vicarious learning, such that an individual may learn whether to engage in a behavior based on seeing consequences experienced by someone else, a model, as well as reinforcement she experiences directly (Bandura, 2005; Edberg, 2015). Internally, a number of characteristics of the individual influence the decision about whether to engage in a given behavior, including the individual's behavioral capability, or the extent to which she knows how to carry out the behavior, expectations about the potential outcomes, expectancies, or the value placed on those expected outcomes, and self-efficacy, or confidence in carrying out the behavior (Edberg, 2015).

SCT is among the most commonly applied theories with respect to developing public health interventions (Edberg, 2015). To the extent that ECE programs are conceptualized as interventions to increase children's well-being, then, SCT can serve as a beneficial framework for the design and evaluation of these programs. However, the broad perspective of mutual influence between internal and external factors on

behavioral outcomes is perhaps too nonspecific and complex to apply easily to any particular setting or program (Edberg, 2015). For specific applications, such as the evaluation of an ECE PD program, it would help to use a model with a greater level of specificity with respect to the factors expected to influence outcomes.

**Theory of planned behavior (TPB).** The TPB represents a reformulation and renaming of the Theory of Reasoned Action, developed to account for the potential for external influences on an individual's internal decision-making processes (Edberg, 2015). The idea that individuals use information from external influences and their own internal attitudes to develop intentions about their behavior forms the central premise of the TPB (Ajzen, 1991). Crucially, it is the individual's perceptions of external factors that the TPB posits matter in deciding whether to enact a given behavior, rather than objective measures of the actual environment (Edberg, 2015). Thus, the individual's perceptions of the social norms associated with the behavior, called subjective norms, and of the amount of control he has over his ability to perform the behavior, called perceived behavioral control, comprise the individual's perceptions of the external influences included in this model (Ajzen, 1991). Internally, the individual's attitudes toward the behavior rest upon his expectations of what will happen if he enacts it, and expectancies about the value of those outcomes (Ajzen, 1991; Edberg, 2015). Together, these factors contribute to the individual's behavioral intentions, or plan for whether to enact the behavior in question, which can be used to predict the individual's actual behavior (Ajzen, 1991).

In some respects, the TPB represents a promising framework for ECE PD evaluation. It allows for understanding the attitudes individuals bring to the learning process and suggests some reasons why an individual who learns about a promising best practice might still choose not to use it, in the form of perceived behavioral control (Edberg, 2015). Still, the emphasis on measuring external factors from the perspective of the user, for all the insight it can provide, may make it difficult for program developers to unravel the actual program factors they can change to improve the behavioral outcomes of their participants (Edberg, 2015). An approach involving both subjective and objective measures of external factors would likely provide more useful information for ECE PD programs.

**Diffusion of innovations (DOI).** The theory of DOI describes the processes, intrapersonal and interpersonal, that contribute to the spread of a new idea, technology, or practice among a group of people (Rogers, 2003). Rogers (2003, p. 5) defined diffusion as “the process in which an innovation is communicated through certain channels over time among members of a social system.” The innovation itself is the new element each individual is tasked with considering whether to adopt. The theory of DOI describes stages individuals go through as they make these adoption-decisions and posits that some individuals tend to adopt new innovations more readily than others, at least in certain domains. During this process, an individual receives information about the innovation from a variety of sources, including mass media, peers within the social system, and change agents who intentionally promote the adoption of particular



innovations, and her perceptions of those sources can influence her cognitive and affective perceptions of the innovation and its potential use (Rogers, 2003).

*Perceptions of the innovation.* While Rogers (2003) specified particular perceptions of the innovation he believed would shape an individual's affective response to it—relative advantage, compatibility, complexity, trialability, and observability—use of these characteristics has generated mixed results in the empirical literature, leading scholars to develop and test a wide range of factors under the umbrella of perceptions of the innovation (Enberg, 2015; Moore & Benbasat, 1991). Relative advantage represents the extent to which the individual perceives the innovation to be better than its predecessor and to have greater benefits than costs with respect to her situation (Rogers, 2003). Of the innovation perception constructs developed by Rogers, relative advantage tends to be the most powerful predictor of the adoption-decision outcome (Venkatesh et al., 2003). Rogers (2003) defines compatibility as the extent to which the individual perceives that the innovation fits with her needs, values, and current practices. Complexity, which refers to the level of difficulty the individual perceives in using the innovation, was reverse coded by Moore and Benbasat (1991) to create the construct of ease-of-use (Rogers, 2003). An innovation's trialability is the extent to which an individual perceives she can test it, in whole or part, before committing to an adoption decision (Rogers, 2003). An innovation with greater observability is perceived by the individual to be visible when used by others within the social system, a construct that brings to mind Bandura's vicarious learning in SCT (Bandura, 2001; Rogers, 2003). An individual who perceives an innovation to have greater relative advantage, compatibility,

ease-of-use, trialability, and observability, according to DOI, will more readily adopt the innovation (Moore & Benbasat, 1991; Rogers, 2003).

In their attempt to develop an instrument to capture these constructs, Moore and Benbasat (1991) opted to add two additional constructs: image and voluntariness. Image, according to the authors, refers to how important others in the individual's social system, such as opinion leaders, perceive and reinforce use of the innovation, and bears a resemblance to elements of the social system and social norms in the TPB and SCT models (Ajzen, 1991; Bandura, 2001; Moore & Benbasat, 1991; Rogers, 2003). An individual will presumably adopt innovations that carry social benefits in the form of greater image more readily than those that do not (Moore & Benbasat, 1991).

Voluntariness refers to whether the individual's use of the innovation has been mandated or required by external entities, or whether it is purely discretionary on the part of the user, which appears to overlap with TPB's perceived behavioral control, at least in part (Ajzen, 1991; Moore & Benbasat, 1991). Rogers (2003) described this phenomenon separately from the individual's perceptions of the innovation, stating that, in fact, three types of decision-making processes can occur with respect to innovations: optional, where the individual has the freedom to decide for herself, collective, where a group of individuals have to decide whether to adopt together, and authority, where the innovation is mandated for use by the entire social system or some subset thereof. Rogers wrote that innovations mandated by an authority tend to diffuse more quickly than those adopted freely by individuals.

*A note on discontinuance.* The adoption-decision is not an endpoint. According to the theory of DOI, the individual's experience in actually using the innovation within her social system and the availability of alternatives have the potential to influence whether she continues to use the innovation or discontinues its use, either because she is dissatisfied or because she has found an option she believes will better meet her needs (Rogers, 2003).

*DOI as a framework for ECE PD evaluation.* The theory of DOI resolves some of the issues present in the use of SCT or the TPB with respect to ECE PD evaluation. Being generally broader in scope, DOI specifies with more precision the types of factors likely to be relevant in this type of application and uses an approach to external influences which can include both subjective and objective factors. The broadness of the theory of DOI represents both a strength and a weakness in terms of practical application, however. It includes details about the internal decision-making process at the individual level and the communicable spread of the innovation through social networks, and the various stages included in these processes make it a big-picture theoretical perspective, for sure. In fact, some have argued that the theory of DOI represents a description of behavioral change, rather than a theory of how to change behavior (Dearing, 2009; Edberg, 2015). However, program developers have identified avenues to leverage components of DOI to intentionally influence the diffusion process (Dearing, 2009). To offset this broadness, it is possible that elements from other theories, like TPB and SCT can be incorporated to specify a targeted evaluation model within a broader framework of DOI.

*Unified theory of acceptance and use of technology (UTAUT)*. Building upon the observed similarities between key constructs in these and other field-specific theoretical perspectives, the universal theory of acceptance and use of technology was developed for the needs of the consumer technology field using relevant constructs from SCT, TPB, its predecessor TRA, DOI, and other theories related to information technology use (Venkatesh et al., 2003). Notably, the only DOI constructs used in developing UTAUT were perceived characteristics of the innovation (Venkatesh et al., 2003). The developers did not include other elements of DOI, such as information about the source of information whereby the individual learned about the innovation (Rogers, 2003; Venkatesh et al., 2003). The UTAUT model uses performance expectancy, effort expectancy, and social conditions to predict an individual's intention to use a new technology, and subsequently uses these behavioral intentions, coupled with facilitating conditions, to predict actual usage of the innovation (Venkatesh et al., 2003). Personal characteristics of the user, such as gender, age, and experience with the new technology, serve as moderators for many of these independent variables such that, for example, social influences are more important in determining the behavioral intentions of women, particularly older women, but these influences become less important as the user becomes more experienced in using the new technology (Venkatesh et al., 2003). Contextually, UTAUT also suggests that the nature of the user's agency in choosing whether to use the innovation, a construct Moore and Benbasat (1991) termed voluntariness, will affect the factors that matter most in the adoption-decision process. Exploring these constructs in more detail offers insights into how they relate to

traditional constructs in DOI, as well as SCT and TPB, and how they might be used to operationalize an expanded model for ECE PD evaluation.

*Social influence.* The DOI construct of image, developed by Moore and Benbasat (1991), along with similar ones like subjective norms from the TPB/TRA perspective, collectively define the UTAUT construct of social influence (Venkatesh et al., 2003). UTAUT predicts that more positive perceptions of the innovation relative to social influences in the user's context will lead to greater intention to use the new technology, and intention should be associated with greater actual use (Venkatesh et al., 2003). The developers posit that social influence is moderated by a four-way interaction between age, gender, experience, and voluntariness; specifically, social influence is expected to be more salient in situations where the use of the innovation is mandated rather than voluntary, for women more so than men, for older women more so than younger women, and for those with less experience than those with more experience (Venkatesh et al., 2003).

*Performance expectancy.* According to Venkatesh et al. (2003, p. 447), "performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance." In conjunction with similar constructs from the information technology theories used in developing UTAUT, this construct envelops the SCT and TPB constructs of outcome expectations/expectancies, as well as the DOI construct of relative advantage (Venkatesh et al., 2003). In the UTAUT model, age and gender moderate the effect of performance expectancy in predicting intentions to use the innovation in a three-way interaction, in

that it ought to be more influential for men than women, and for younger men than older men (Venkatesh et al., 2003).

*Effort expectancy.* Effort expectancy in UTAUT relates to the complexity or ease-of-use of the innovation, as applied in DOI and other information technology theories, and its effect on behavior use is moderated by gender, age, and experience, with its influence being particularly powerful for women, for those who are younger versus those who are older, and for those with less experience using the innovation (Venkatesh et al., 2003). Like DOI, UTAUT predicts that easier-to-use innovations will be more readily adopted by users, generally speaking, and uses this construct as a predictor of behavioral intentions (Venkatesh et al., 2003).

*Facilitating conditions.* Facilitating conditions are the practical supports an individual perceives are in place to support his use of an innovation (Venkatesh et al., 2003). It combines elements of DOI's construct of compatibility with TPB's perceived behavioral control, along with elements from information technology theories, where the term facilitating conditions was already applied prior to the development of UTAUT (Venkatesh et al., 2003). This construct embodies the goodness-of-fit between the resources available in the context where an individual expects to use an innovation and his needs with respect to implementing the innovation (Venkatesh et al., 2003). In the UTAUT model, facilitating conditions are shown to have a direct effect on behavioral usage, rather than behavioral intentions, and to be moderated by age and experience, with older workers placing more emphasis on facilitating conditions and with the importance of facilitating conditions increasing as these users gain more experience with

the innovation and identify new questions and new sources of support with continued use (Venkatesh et al., 2003).

*Limitations of UTAUT for ECE PD evaluation.* For all its potential, the greatest emphasis in UTAUT is on explaining behavioral intentions, rather than actual behavioral usage. While some program developers have noted that behavioral intentions can serve as a useful proxy for measures of actual behavior change, particularly in cases where resource constraints make follow-up studies impractical, the relationship between behavioral intentions and actual behavior is imperfect, at best (Edberg, 2015; Lohse, Wall, Gromis, 2011). Given that ECE PD can benefit the quality of ECE programs and the outcomes attained by children only through the actual implementation of key behaviors, this emphasis on intentions as a core element may not add substantially to the understanding of how to develop effective ECE PD programs (NICHD ECCRN, 2002).

Another limitation noted by the authors is that there may be additional elements of the system, not represented in UTAUT, which could add to the overall usefulness of the model (Venkatesh et al., 2003). For example, the decision to include only perceptions of the innovation may have limited the capacity of the model to tap into the predictive power of Rogers' overall theory. While other elements of DOI are represented through the image and voluntariness constructs developed by Moore and Benbasat, which Rogers described as elements of the social system rather than characteristics of the innovation itself, characteristics of the information source(s) whereby prospective users learn about the innovation fail to appear in the UTAUT model, at least in part

because they were never considered for inclusion in the first place (Moore & Benbasat, 1991; Rogers, 2003; Venkatesh et al., 2003).

Still, the core independent constructs from UTAUT, supplemented by additional information about the prospective adopters and the process by which they learn about the innovation, could provide important data for ECE PD program developers seeking to effect behavior change.

*Cervero model of training evaluation (CMTE)*. The CMTE came about because its developers saw the need for a framework for evaluators to analyze PD outcomes, rather than simply reporting them (Cervero & Rottet, 1984). Built upon a foundation of DOI theory, this model uses four classes of independent variables to predict the transfer of skills learned in training into practice: characteristics of the individual trainee, characteristics of the training program, perceived characteristics of the innovation, and characteristics of the trainee's workplace context (Cervero & Rottet, 1984). These elements are, in essence, analyzed in the order in which they influence the adoption-decision process. The individual enters training with her own internal characteristics that influence the decision, is simultaneously exposed to the characteristics of the PD program while forming perceptions of the proposed behavior change, and then re-enters her social system where contextual influences continue to affect her decision about whether to adopt the innovation (Cervero & Rottet, 1984).

Though it has been used primarily in healthcare fields, CMTE is a conceptual framework, and the authors emphasize that it requires operationalization with relevant variables and constructs for application in a particular field of practice, making it a



viable candidate for use with a variety of program types (Brunt, 2000; Cervero & Rottet, 1984; Cervero, Rottet, & Dimmock, 1986; Farrah & Graham, 2000). In fact, it has been recommended for use by Cooperative Extension programs, where programming agendas span a wide variety of disciplines and target outcomes (Hubbard & Sandmann, 2007).

To date, no prior studies have applied the CMTE approach to evaluating ECE PD outcomes. As an initial attempt at operationalizing the model for this field, the present study applied relevant constructs from UTAUT and DOI within the CMTE framework to analyze behavior changes following an ECE PD session.

### **Review of the Literature**

While the CMTE was designed for training evaluation, it has yet to be applied specifically to training for ECE professionals. Determining whether the four classes of predictor variables prescribed in the CMTE fit the needs of the ECE PD field and whether the proposed constructs and variables provide ample coverage of factors likely to be important within each class required exploring the existing ECE PD evaluation literature for clues as to whether and how each is manifest in this setting.

A review of the ECE literature revealed that, indeed, all four classes of independent variables have been captured in some form in various ECE PD evaluation studies and found to contribute to analysis of ECE PD outcomes. Though no ECE PD studies reviewed explicitly used the CMTE framework or the proposed UTAUT and DOI constructs, findings of those studies collectively support the appropriateness of the proposed model for evaluating ECE PD behavioral outcomes.

**Characteristics of the individual.** The overall belief that characteristics of individual participants will influence their implementation of innovative behaviors taught in ECE PD is supported by qualitative findings from Lieber et al. (2009) in their evaluation of teachers' use of a new preschool curriculum following training. Participants' personal characteristics, including both attributes and attitudes, helped or hindered their implementation of the innovation. These and other findings suggest specific characteristics of the individual participant for inclusion in the expanded ECE PD evaluation approach.

***Ethnicity.*** Williford, Wolcott, Whittaker, and Locasale-Crouch (2015) tested the contributions of several individual participant characteristics on ECE teachers' implementation of an innovative behavior management technique and found that the quantity of their usage was associated with ethnicity such that white, non-Hispanic teachers implemented the technique more frequently than teachers from minority groups. While all participants were exposed to the new technique for the first time during training, the study did not include baseline measures of teachers' behaviors, leaving open the possibility that some teachers' pre-existing practices were already more aligned with the recommendations of the program, rather than uniquely representing post-training changes in behavior.

***Operation type.*** Childcare centers and childcare homes differ in important ways that likely affect how professionals in each setting experience and respond to PD opportunities. ECE providers in childcare homes view themselves as a distinct segment of the field, providing a unique service for families who choose the in-home ECE format

for their children (Lanigan, 2011). In a statewide survey of ECE professionals who had received a degree or credential within the past five years, the Texas Early Learning Council (TELC) (2013) found that respondents working in childcare homes tended to have more years of experience in the field than those working in childcare centers. A review of the literature on home-based ECE programs also found that the clientele served by childcare homes may include more at-risk families, including those with low levels of income and maternal education, and those headed by a single parent, and a higher proportion of infants and toddlers than those served by childcare centers (Porter et al., 2010). In the TELC (2013) study, respondents employed in childcare homes reported perceiving fewer opportunities for PD to be available to them than their center-based counterparts. Despite differences in perceived opportunities, the two groups reported similar rates of adoption of new techniques learned during training. Self-reported adoption at their places of work was “infrequent” for 22.1% of center-based ECE staff and 22.8% of home-based ECE providers. However, the differences between the two operation types mean that operation type may interact with other factors, especially social influence, to moderate their effects on ECE PD outcomes.

***Educational attainment.*** Educational attainment as a predictor of child-care quality is a hot topic in the ECE world, with studies generating mixed results (Rhodes & Huston, 2012). A similar pattern of contradictory evidence appears in studies of educational attainment and ECE PD. Rusby, Jones, Crowley, Smolkowski, and Arthun (2013) found that among ECE professionals employed in child-care homes, participants with higher educational attainment were more likely to voluntarily participate in the full

range of PD activities available with a social and behavioral intervention program. Hamre et al. (2012) tested a PD program with a large group of Head Start teachers and found no significant differences in effectiveness based on participants' educational attainment. Lieber et al. (2009) similarly found no association between educational attainment and participants' implementation of strategies they learned in PD. Interestingly, though, in the TELC (2013) descriptive study of recently credentialed/graduated ECE professionals, respondents with higher levels of educational attainment tended to report that adoption of techniques learned in training was "infrequent" in their workplaces at higher rates, meaning they perceived fewer of those practices to have been adopted. Only 8.2% of participants with high school diplomas or Child Development Associate certifications (CDA) responded that adoption of new techniques from training happened "never," "rarely," or "sometimes" in their program—which the authors aggregated to develop the "infrequently" category—while 27.5% of those with an associate degree or some college, 23.7% of those with a bachelor's degree, and 39.2% of those with a master's degree reported that adoption was infrequent in their settings. These mixed findings leave unanswered questions about the existence of a direct effect of educational attainment in the implementation of strategies taught in ECE PD. There is, however, reason to believe educational attainment may moderate the effects of the delivery mode on ECE PD outcomes.

*Years of experience.* Data from the National Survey of Early Care and Education indicated that the median years of experience for staff in child-care centers was ten years, and for staff in child-care homes was 13.7 years (Office of Planning, Research,

and Evaluation [OPRE], 2013). They also found, though, that there was considerable variation in the years of experience of providers in both operation types (OPRE, 2013). With respect to training, Yamauchi, Im, and Mark (2013) found that novice and seasoned ECE professionals who participated in a PD program aimed at implementation of an innovative instructional technique improved their practice to a similar degree as a result of the training. Lieber et al. (2009) also found no association between years of experience and the degree to which PD participants implemented what they learned. These results suggest there is no direct effect of years of experience on implementation of innovative ECE practices taught in PD, but, together with operation type, years of experience may moderate the effect of social influence, as discussed later in this section.

**Age.** No specific findings were identified related to direct effects of age on ECE PD outcomes, but, together with educational attainment, age may moderate the effects of delivery mode—electronic versus face-to-face—on participants’ implementation of innovative strategies taught in training (Hadley, Waniganayake, & Shepherd, 2015; Weigel, Weiser, Bales, & Moyses, 2012; Wright & Bales, 2014).

**Training program characteristics.** A number of characteristics of the PD program itself may contribute to participants’ successful transfer of learning into practice, including perceptions of the instructor and the instructional techniques used, and should eventually be tested for potential inclusion in an expanded ECE PD evaluation approach (Buisse et al., 2009; Linder et al., 2016). Of particular relevance in the modern age and to the present study, though, are effects of the delivery mode of training. Differences in outcomes among participants in online training environments

versus those in traditional face-to-face training may occur, and these differences could also be moderated by individual characteristics, such as age and educational attainment.

*Delivery mode.* Given the constant emergence of new technologies, questions have arisen about the potential for leveraging these tools as platforms or instructional supports for effective ECE PD (Gomez, Kagan, & Fox, 2015). Among users of PD offered by AgriLife Extension's ECETP, participation in online training has far outstripped participation in face-to-face training (Green, 2013). Many other PD providers have developed programs or techniques that capitalize on technological tools as well (e.g. Barton, Fuller, & Schnitz, 2015; Hemmeter, Snyder, Kinder, & Artman, 2011; Lane, Prokop, Johnson, Podhajski, & Nathan, 2014; Ostergren, Riley, & Wehmeier, 2011; Pianta, Mashburn, Downer, Hamre, & Justice, 2008; Rheingold, Zajac, & Patton, 2012; Shannon, Snyder, & McLaughlin, 2015). Online PD programs are popular with ECE professionals in child-care homes (Durden, Mincemoyer, Crandall, Alviz, & Garcia, 2016) and child-care centers (Byington, 2017; Durden et al., 2016). Despite concerns about barriers to online PD access among ECE professionals, surveys of the workforce suggest these issues are relatively uncommon. Wright and Bales (2014) found that among a large sample of ECE professionals in Georgia, a vast majority (89.68%) reported having access to the internet, and a significant majority (68.62%) reported feeling comfortable with using the internet. In a PD needs assessment for ECE professionals in Nevada, Byington (2017) likewise found that 58% of participants based in child-care homes and 69% of those based in child-care centers reported using a computer regularly, suggesting the majority of ECE professionals have the basic

technology skills necessary to engage in online PD. Comparing online and face-to-face delivery of the same content, Lane et al. (2014) found similar outcomes among both groups, suggesting online learning may be a viable delivery mode for ECE PD.

Even with these promising findings, though, one particular consideration with respect to delivery mode is whether the PD delivery is synchronous, where learners participate in the instructional activities at the same time but from different places, or asynchronous, meaning participants can complete the PD activities from different locations and at different times (Midkiff & DaSilva, 2000). There is some evidence that synchronous PD experiences have greater capacity to lead to desired outcomes than asynchronous ones. For example, participants in Shannon et al.'s (2015) qualitative study found that those who received synchronous, face-to-face coaching enjoyed having access to immediate feedback and accountability, which they felt helped them successfully implement what they learned, whereas no such findings emerged for participants who received access to asynchronous self-coaching materials. Stone-MacDonald and Douglass (2014) also found that instructor-mediated online PD courses were favored by ECE professionals over self-study online PD. Similarly, Pianta, Mashburn, Downer, Hamre, & Justice (2008) found larger improvements in practice among teachers who received both synchronous consultation and asynchronous PD resources versus those who only had access to the asynchronous component. Within the ECETP, online learning has historically been offered only in an asynchronous, self-study format, and no direct comparisons have been made across the asynchronous online and inherently synchronous face-to-face delivery modes within the program. Further

exploration of potential effects of the delivery mode on ECE PD outcomes is warranted and may involve interaction with other factors in the proposed model.

*Delivery mode x age.* There may be differences in how delivery modes function across PD users of different ages. Ackerman (2017) found that a convenience sample of online ECE PD users had an age distribution similar to that of the overall workforce, and Stone-MacDonald and Douglass (2014) found no relationship between online PD participants' comfort with technology and their ages; others have found an interaction between age and factors associated with successful use of online ECE PD. For instance, in a multi-state survey of ECE professionals, Weigel, Weiser, Bales, and Moyses (2012) found that older respondents expressed less comfort with and usage of the internet than younger ones, which is significant because respondents with greater internet usage and comfort were more likely to report that online training classes and modules were an important feature of a website designed for ECE professionals. Wright and Bales (2014) also found that internet usage and comfort varied by age among ECE professionals, with older respondents reporting less of both. In the face of conflicting evidence, this potential interaction is worth considering during the development of an expanded approach to ECE PD.

*Delivery mode x age x educational attainment.* One Australian study found that the types of PD that ECE professionals found most valuable varied by the respondents' level of educational attainment, suggesting that there may be an interaction between this participant characteristic and the characteristics of the educational program which could affect participants' PD outcomes (Hadley et al., 2015). This interaction likely extends to



the delivery mode of training. Two studies assessing ECE professionals' comfort and usage of the internet found that more educated ECE professionals tended to be more comfortable with using the internet and reported using the internet more frequently, both of which were associated with valuing online courses more highly (Weigel et al., 2012; Wright & Bales, 2014). However, Ackerman (2017) found that the frequencies of educational backgrounds of online training participants resembled those found in the overall ECE workforce. Together, these findings suggest the relationship between delivery mode, age, and educational attainment may be a rather complex one, with possible distinctions between how older, less educated ECE professionals value technology-mediated training formats versus their younger or same-age, more educated colleagues.

**Characteristics of the proposed behavior change.** Most of the ECE PD evaluation studies that have considered participants' perceptions of the practices espoused in the training have used qualitative methods to explore ECE professionals' PD subjective experiences. These studies indicate that perceptions of the usefulness (performance expectancy) and usability (effort expectancy) of innovative strategies presented in PD matter to early childhood educators as they navigate decisions about implementation (Baker, 2018; Brown & Inglis, 2013; Lieber et al., 2009; Linder et al., 2015; Nasser et al., 2013; Spies et al., 2017).

***Performance expectancy.*** Consistent with the notion of performance expectancy influencing the adoption-decision process, a focus group interview with ECE professionals following a PD program introducing strategies for working with dual-

language learners conducted by Spies et al. (2017) identified participants' expectations as a salient theme in helping or hindering their implementation of what they learned in the training. Participants emphasized the importance of the fit between the proposed strategies and their own beliefs about "good" ECE practices, and with their perceptions of administrators' expectations for their performance. Linder et al. (2015) identified a similar theme, relevance, in their study of ECE professionals' perceptions of the PD opportunities available to them. Within this theme, participants expressed a desire for PD content that connected with their real-life needs in meaningful ways and would be useful to them in their everyday work settings. Similar findings emerged from Nasser et al.'s (2013) evaluation of a PD program for Head Start teachers, who expressed satisfaction with the relevance of the program content for their classroom needs and indicated their belief that many of the strategies taught in the program would make them more effective in their work. In a comparative case study of two teachers' implementation of a pre-kindergarten curriculum after PD, Baker (2018) found that differences in the two participants' quantitative fidelity percentages were explained by qualitative information about their unique teaching contexts, such that the teacher who implemented with less fidelity was actually picking and choosing components of the program she felt would be effective in supporting her bilingual students' development, and adapting or eschewing the rest. Brown and Inglis (2013) found that the four teachers in their PD evaluation case study expressed that their continued use of the strategies they learned depended largely on whether they saw results, often in the form of improved

outcomes for the children in their programs, suggesting that performance expectancy both shapes and is shaped by teachers' implementation of innovative strategies.

*Effort expectancy.* Lieber et al.'s (2009) qualitative findings about factors affecting implementation of an innovative preschool curriculum indicated that some participants who adopted the curriculum more fully reported that it was similar to the curricular approaches they had used in the past, making it a relatively minor change. Similarly, Nasser et al. (2013) conducted a follow-up evaluation with Head Start teachers and assistant teachers who participated in a PD program emphasizing intentional teaching strategies, and found that one of the aspects with which participants were most satisfied was that the program presented strategies they could immediately and easily use in their classrooms. These findings support the hypothesis that the effort expectancy a trainee associates with the proposed behavior change will affect her decision about whether and how to adopt it. As will be discussed later, the effect of facilitating conditions on implementation may differ depending on an individual's perception of the effort it requires.

**Characteristics of the social context.** Like studies of participants' perceptions of innovative practices taught in PD, studies related to the effects of ECE professionals' contexts on their implementation of new strategies have largely used qualitative methods to explore participants' subjective experiences. These studies provide support for the value of both the social influence and facilitating conditions constructs suggested by the UTAUT as potentially important in an expanded approach to ECE PD evaluation.

***Social influence.*** Many scholars have examined the effects of interpersonal dynamics on ECE professionals' practice, at multiple levels. Indeed, an expansive review of the ECE PD literature which generated a set of common features of effective PD included the recommendation that ECE staff engage in collaborative participation in PD alongside their coworkers and, when possible, their administrators (Zaslow et al., 2010). This collaboration, the authors suggested, could create a more favorable social climate for the implementation of new strategies, particularly when program directors participate in the training and actively endorse implementation (Zaslow et al., 2010). Consistent with the view that social influence contributes to implementation of innovative, high-quality practices, Lieber et al. (2009) found that qualities of the co-teaching relationships in participants' work sites could substantially support or interfere with implementation of a new preschool curriculum. Brown and Inglis' (2013) four case study participants all expressed that having support from their administrators was critical to their implementation of the strategies they learned in PD. One of these teachers made a point of specifying that perceived support from the operation's director was more important to her use of the new practices than being able to seek technical assistance on site. These teachers also emphasized that opportunities for collaboration with colleagues helped them through the process of implementation, though they noted that such opportunities were not as frequent as they would have liked. Shannon et al. (2015) also identified a theme of social reinforcement in their qualitative study of PD outcomes for early childhood special education teachers, noting that:

When the teachers changed their practices in response to their new learning, they received natural reinforcement through interactions with people in their work environment. Positive environmental feedback reinforced the teachers' implementation, making the new practices a valued part of classroom routines; whereas negative responses or an absence of a positive response (i.e. recognition for effort) led teachers to abandon practices and materials, concluding they were ineffective. (p. 303)

Other findings suggest the effect of social influence on implementation may not be straightforward. Individual characteristics like operation type, and years of experience may moderate the relationship between social influence and implementation.

***Social influence x operation type.*** ECE professionals who work in child-care homes may or may not have other caregivers working with them, leaving these caregivers vulnerable to feelings of isolation (Porter et al., 2010). The social system in which these individuals make decisions about using new practices, then, is likely construed differently from that of center-based ECE professionals who implement innovations under the supervision of directors and have on-site colleagues with whom they can immediately communicate.

***Social influence x operation type x years of experience.*** Dennis and O'Connor (2013) found that measures of organizational climate, a construct conceptually similar to UTAUT's social influence (Venkatesh et al., 2003), interacted with years of experience to predict classroom quality, such that teachers with more experience tended to be influenced by their organizational contexts to a greater extent than less experienced

teachers. While this study did not examine changes in behavior following PD, this finding suggests the presence of some sort of relationship between classroom practices and social influence, which may be moderated by years of experience. Together, these findings suggest the possibility of a complex, interactive relationship between operation type and years of experience, with center-based professionals experiencing greater effects of social influence in their behavioral decision-making due to the immediate presence of a pool of peers, and with social influences being more influential for those with more years of experience than for those with less, particularly in center settings.

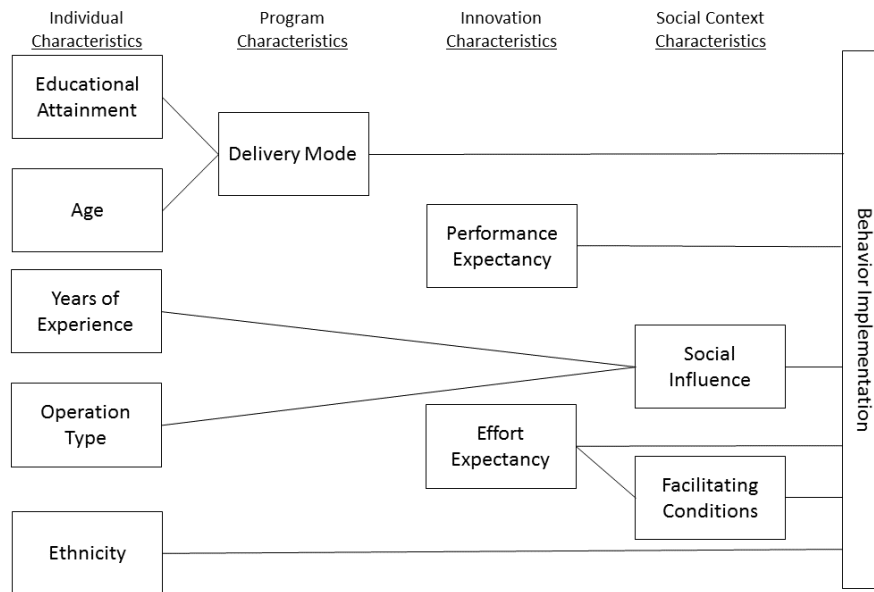
**Facilitating conditions.** When interviewing ECE professionals about factors that influenced their use of innovative strategies for working with dual-language learners, Spies et al. (2017) found that access to resources including time, materials, and human capital appeared as a crucial theme. Limitations on these resources were a common barrier to implementing the strategies. Time constraints were also identified by participants in Shannon et al.'s (2015) qualitative evaluation of PD for special education ECE professionals as a barrier to implementation. Participants in Linder et al.'s (2016) study also expressed that some of the strategies they learned in training sounded good but required resources beyond what was available in their ECE operations. These resource-oriented concerns point to the importance of facilitating conditions to empower PD participants to use what they have learned.

***Facilitating conditions x effort expectancy.*** Barton et al. (2017) found that teachers who took greater advantage of a video-based technical assistance resource had higher fidelity when implementing a new curriculum. In interviews with a subset of their

overall sample, they identified themes related to drivers and deterrents of participants' use of technical assistance. Drivers of usage included selecting videos related to topics where they needed more support, incorporating the videos into their regular preparation routines, while deterrents included lack of time and difficulty connecting the classrooms depicted in the videos to their own population of children (Barton et al., 2017). Taken together, these findings suggest that the mere presence of facilitating conditions may be helpful for implementing innovative practices, but other factors, like effort expectancies for the use of the innovation, may influence how ECE professionals perceive and access those practical supports.

### **Proposed Evaluation Model**

Based on the CMTE framework, brought to life with constructs and variables from theoretical perspectives on behavior change, UTAUT and DOI, and enhanced with additional field-specific elements from a review of the literature, a prospective model for an expanded approach to evaluation of ECE PD programs has begun to take shape. The model proposed for the present study is presented in Figure 1.



*Figure 1.* Proposed model for analyzing behavior change in ECE PD evaluation.

As shown in Figure 1, the ECE PD literature supported the use of five individual characteristics—educational attainment, age, years of experience, operation type, and ethnicity—in the proposed model, but only ethnicity was expected to have a direct effect on the outcome of behavioral implementation. All the others were expected to interact with variables from other classes. While many educational program characteristics could be considered for inclusion in later iterations of this model, evidence from studies of synchronous versus asynchronous learning experiences indicated the potential for differences in behavioral implementation depending on the delivery mode of the training (e.g. online or face-to-face). The effect of delivery mode was expected to interact with



the participant's age and educational attainment, with delivery mode having more influence among older and less educated participants than their younger and more educated counterparts. Constructs from the UTAUT, performance expectancy and effort expectancy, were selected for the innovation characteristics based on a body of predominantly qualitative findings supporting conceptually similar predictors of transfer of training among ECE professionals. In the variable class of social context characteristics, UTAUT constructs of facilitating conditions and social influence were selected, again based upon largely qualitative findings in the ECE PD evaluation literature. While a review of the ECE PD literature suggested effort expectancy as a standalone predictor of behavioral implementation, other findings also indicated it might interact with facilitating conditions such that participants with higher effort expectancy would be more greatly influenced by the presence of facilitating conditions in their work contexts. Findings related to social influence suggested a more complex interaction with both years of experience and operation type, such that social influence would be more salient for participants who work in center-based programs where they have greater access to interactions with colleagues, and that for those center-based participants social influence would have a stronger relationship with their behavioral implementation among those with more years of experience.

### **Meta-Evaluation Rationale**

Davidson (2005) asserts that a critical review of evaluation methods and conclusions, often called a meta-evaluation, ought to take place within every evaluation project. Patton (2015) expands upon this idea, noting that an effective meta-evaluation

needs to consider the purpose of the original study in order to accurately determine its value toward meeting that intended purpose. Evaluation studies are, most often, a form of applied research wherein the overarching objective is to analyze some important problem in the interest of informing potential solutions (Merriam & Tisdell, 2016; Patton, 2015). In particular, the present study began with the intention to inform the development of an improved paradigm for ECE PD evaluation, suggesting that an appropriate lens for meta-evaluation of the study would be focused on identifying the strengths and weaknesses of the methods, identified during and after the study, to allow for real-life application of the proposed improvements.

## CHAPTER III

### METHODS

#### **Participants**

The target population for the study comprised caregivers in licensed child-care centers and homes in Texas who participated in a targeted ECETP PD opportunity, and who personally care for one or more toddler or preschool age children.

**Evaluation participants.** Among the 1,576 participants in the sample, 1,414 (89.7%) took the training online, and 162 (10.3%) took the training face-to-face. Seven in-person training opportunities were offered in various locations throughout the State of Texas in conjunction with ongoing ECETP PD activities – Odessa ( $n = 26$ ), Rio Grande City ( $n = 11$ ), Seguin ( $n = 23$ ), Dallas ( $n = 29$ ), La Grange ( $n = 13$ ), Mount Pleasant ( $n = 16$ ), and Grapevine ( $n = 44$ ).

These ECE professionals worked in roles classified as caregivers by CCL, including lead teacher ( $n = 841$ ), assistant teacher ( $n = 604$ ), and primary caregiver/home administrator ( $N = 131$ ). They included 346 home-based caregivers (22.0%), 1,204 center-based caregivers (76.4%), and 26 caregivers (1.6%) who did not report the type of operation where they work. Participants were asked to indicate all the age groups for which they provide care. While all eligible participants reported caring for toddlers ( $n = 977$ ) and/or preschoolers ( $n = 1006$ ), a subset also provided care for infants ( $n = 439$ ) and/or school-age children ( $n = 240$ ).

In data analyses, ethnicity was coded as dichotomous, non-Hispanic white ( $n = 607$ ) vs. other ( $n = 969$ ), in keeping with operationalization in other ECE PD evaluation

studies. However, the training participants represented a more diverse array of ethnicities than a simple dichotomy implies with 311 (19.7%) selecting African American/Black, 513 (32.6%) selecting Hispanic/Latino, 92 (5.8%) selecting Asian/Pacific Islander, 25 (1.6%) selecting Native American, 658 (41.8%) selecting Caucasian/White, and 55 (3.5%) selecting Other. Participants were able to select multiple options when reporting their ethnic background. As a result, 1447 (91.8%) selected only one choice, 81 (5.1%) selected two choices, 12 (0.8%) selected three choices, 1 (0.1%) selected four choices, 1 (0.1%) selected five choices, and 34 (2.2%) opted not to respond to this question.

The participants reported a wide range of age, experience, and educational attainment. Participants' ages ( $n = 1493$ ) ranged from 18 to 75 years old, with a mean age of 36.5 years ( $SD = 13.3$ ). They reported ( $n = 1493$ ) a range from 0 to 50 years of experience, with a mean of 7.8 years ( $SD = 8.4$ ). When asked to report their highest level of educational attainment, 16 (1.0%) indicated having less than a high school diploma, 824 (52.3%) indicated having a high school diploma or equivalent, 201 (12.8%) indicated having a Child Development Associate credential or other professional certification, 196 (12.4%) indicated having an associate degree, 251 (15.9%) indicated having a bachelor's degree, 57 (3.6%) indicated having a graduate degree, and 31 (2.0%) declined to respond.

**Meta-evaluation participants.** After the initial data collection period, three participants completed meta-evaluation interviews about their experiences with the study methods. Interviewee A was an 18-year old Caucasian/white assistant teacher with less than a high school diploma who cared for preschool-age children in a center-based ECE

operation and had less than one year of experience in the field. Interviewee B was a 26-year-old African American/Black lead teacher with an associate degree and six years of experience in the field, who provided care for infants, toddlers, and preschoolers.

Interviewee C was a 32-year-old Caucasian/white assistant teacher in an ECE center caring for infants and toddlers, with a high school diploma and two years of experience in the field. All three interviewees took the target training online.

## **Procedures**

**Evaluation sampling procedures.** The study procedures were approved by the Institutional Review Board (IRB) at Texas A&M University prior to recruitment of participants. Participants self-selected into the purposive sample by registering for a specified training module, described later in this chapter, which was offered online and face-to-face between July 2018 and June 2019. Approximately 12,000 ECETP clients attempted to access the training, either online or in person, during the study period.

About 9,200 of those clients agreed to participate in the study. Three screening questions were included at the forefront of the pre-test instrument to determine each prospective participant's eligibility based on residency in Texas, position as a caregiver, and providing care for toddler and/or preschool children. Only online trainees who were screened as eligible and agreed to participate in the study were allowed to complete the training online during the study period, but face-to-face trainees—who had paid to attend the larger training events where the target PD session was embedded—were allowed to participate in the training without completing the study measures. Among those in both training formats who agreed to participate in the study, about 2,900 (31.5%) indicated

that they live and work in Texas. This differed from past investigations of behavior change adopted among ECETP trainees which found approximately 59% of respondents were Texans while 41% were out-of-state clients (Nerren & Green, 2017). After excluding those prospective participants deemed ineligible based on the age group(s) of children in their care (e.g. those who do not care for toddlers or preschoolers) and/or the type of position in which they work (e.g. those who do not provide care directly), the sample included 1,576 eligible participants. Participants who took the training online completed all survey measures via the Qualtrics web-based survey tool. Those who took the training in person completed the measures immediately before and after training on paper, and, if they provided an email address, were invited to complete the follow-up measure online via Qualtrics. All 95 participants who completed the follow-up measure were given the opportunity to participate in one of three free training webinars on topics identified by CCL as part of caregivers' annual PD requirements. Six participants chose to partake in this incentive.

The a priori sampling plan entailed surveying all eligible participants immediately before and after the training session, inviting all participants to respond to a time-delayed follow-up survey until a pilot group of 24 participants was established for the purposes of power analysis, then selecting a random sample of all remaining trainees (excluding the pilot group) to respond to receive an invitation to complete the follow-up measure according to sample size calculations based on the pilot group. However, given the higher-than-expected proportion of prospective participants who were ineligible for the study and the relatively low response rate for the follow-up survey (12.5% as of

March 2019), the sampling plan was revised to extend the invitation to participate in the follow-up to all of the 1,029 eligible participants who provided an email address.

Overall, 95 participants (9.2% of those invited) responded to the follow-up survey in whole or part.

Given that the dependent variable measure in this study was a previously untested adaptation of an existing measure, results from the initial pilot group were expected to provide preliminary information about expected variability and effect size in the outcome measure. Given that the value of the DV for each case was calculated using information from the follow-up survey, the sample failed to reach a size sufficient to provide the necessary power to detect relationships in the proposed model with 18 predictor variables, including interaction terms. Without knowing the anticipated effect size, existing rules of thumb were used to provide some guidance as to a range for the minimum sample size necessary for testing the full proposed model. Using the formula offered by Green (1991, as cited in VanVoorhis & Morgan, 2007),  $N > 50 + 8m$ , where  $m$  is the number of predictor variables in a multiple regression model, the minimum sample size for the a priori proposed model in this study would be 194 participants. That estimate assumes a medium effect size which, of course, may not be the case in the present investigation. VanVoorhis and Morgan (2007) note that for smaller effect sizes, as many as 30 cases per independent variable may be necessary to provide sufficient power. In that case, testing the a priori proposed model in this study would require a minimum of 540 participants. Testing the full model hierarchically in four stages, as was the a priori plan at the outset of this study, would require even larger samples

(VanVoorhis & Morgan, 2007). Given the relatively small sample available, the scope of planned analyses for this investigation was narrowed.

**Meta-evaluation sampling procedures.** Non-response was perhaps the most critical issue that arose during the evaluation process. Poor response rates are a well-known, persistent problem in survey research, and threaten the external validity of the results (Dillman, Smythe, & Christian, 2009; Newcomer, Hatry, & Wholey, 2015). Given the prevalence of this problem and the implications for non-response in ECE PD evaluations, the focus of the post hoc meta-evaluation phase of this study was to explore factors underlying the phenomenon of non-response. The Institutional Review Board at Texas A&M University reviewed and approved the meta-evaluation procedure before it was initiated. To better understand why some participants responded to the initial study materials but not the follow-up survey, the sample for the meta-evaluation was drawn from the set of participants who received an invitation to complete the follow-up survey but did not respond. This subset of participants represented what Patton (2015) called information-rich cases, or those cases which are likely to provide the greatest depth of information about the phenomenon of interest. In this case, non-responders were selected to provide insights into the phenomenon of non-response. Consistent with the qualitative research paradigm, an a priori sample size was not specified for this portion of the study. Instead, the procedure called for interviewing participants until saturation was reached, meaning subsequent cases failed to provide substantially new information about the phenomenon of interest, or until all willing participants had been interviewed. All 934 participants who received the follow-up invitation but did not complete the follow-up



survey were invited via email to participate in an interview about their experience in the study. Seven people responded to the email invitation to schedule an interview, and three completed an interview. Those who completed the interview were entered in a drawing to receive a wearable activity tracker.

**ECE PD program.** The target program evaluated during the study was a one clock hour ECE PD session entitled Healthy Interactions: Promoting Lifelong Nutrition (HI: Nutrition) (Nerren, 2018). The full trainer guide for the target PD session is available in Appendix A. Like all sessions in the ECETP repertoire, this session was designed to meet an identified need, in this case, use of ECE programs as a prevention/intervention point for early childhood obesity (CDC, 2016). It was developed by synthesizing information from a broad review of primary research literature and reputable secondary sources (e.g. American Academy of Pediatrics position statements). The learning objectives included supporting the learner's ability to describe ways to use adult-child interactions to promote healthy nutritional attitudes, self-assess and identify areas for improvement, and increase use of best practice strategies described in the course. Content was presented in the form of five core strategies. The use of each core strategy, described in detail in the session materials, encompassed multiple target behaviors. Some target behaviors assessed by the outcome measure (Ward et al., 2014b) support the implementation of more than one core strategy addressed in the PD session. The five core strategies were:

1. Let children choose whether and how much to eat from the healthy foods you provide.
2. Teach children to respect their natural feelings of hunger and fullness.

3. Don't use food to try to change children's feelings or behavior.
4. Be a good nutritional role model.
5. Create opportunities to teach healthy nutrition.

The instructional content of the training session was pre-tested with a group of ECETP clients in a face-to-face format and updated according to their feedback. During the study period, the researcher traveled to Texas A&M AgriLife Extension-sponsored ECE PD events across the state to conduct the training and collect data. Many of these events were multi-session conferences, and most charged attendees a nominal fee for participation. All of these fees were retained by the County Extension Office and/or local partners, and never handled by the ECETP program staff. During this same period, the online version of the course was available for free and highlighted on the ECETP online home page at <http://childcare.tamu.edu>. To minimize delivery mode differences due to instructor characteristics, the researcher recorded the narration for the online version and presented all the face-to-face training sessions used for data collection.

**Evaluation design.** This evaluation study employed a short-term longitudinal design to explore correlations between elements of the proposed model and the outcome variable (Field, 2013). Data were collected at three time points: pre-test (T1) immediately prior to the training session when pre-existing characteristics of the trainee and baseline implementation of target behaviors were assessed, post-test (T2) immediately following the training session when perceptions of the strategies taught in the training were measured, and follow-up (T3) approximately 30 days after the training session, when social contextual elements (e.g. facilitating conditions and social

influence) and post-training implementation of target behaviors were captured. The use of pre-test, post-test, and time-delayed follow-up measures to represent participants' progression through the adoption-decision process was consistent with other applications of the CMTE for PD program evaluation (e.g. Ryan, Campbell, & Brigham, 1999).

Recognizing that some participants enter training with pre-existing knowledge of the content and already be using some of the strategies espoused in the course, the study included a design element described by Newcomer, Hatry, and Wholey (2015, p. 145) as "Basic Value-Added Design: Regression Adjusted for a Preprogram Measure." In addition to using the actual change in implementation scores from pre-test to post-test as a dependent variable, including the pre-test score on the outcome measure as a predictor variable in the final regression model controls for pre-existing baseline differences in participants' use of the strategies espoused in the target course, providing an additional measure of support for causal attributions in program evaluation (Newcomer et al., 2015).

**Meta-evaluation design.** Given that the meta-evaluation portion of the study centered around understanding the phenomenon of non-response, the second phase of the study employed what Merriam and Tisdell (2016) dubbed a basic qualitative study, a constructivist approach to inquiry focused on understanding how people derive meaning from their experiences. Applying the constructivist paradigm to the issue of non-response gave interviewees the opportunity to share their interpretations of experiencing the study procedures from the participant perspective and offer insights into optimal methods for obtaining acceptable sample sizes. As the goal of the meta-evaluation was

to gain insights about participants' experiences with the evaluation methods, not with their experiences learning and/or using the target behaviors taught in the training session itself, this overall approach did not constitute a true mixed-methods design. However, mixed-methods research often begins with a qualitative exploration that can inform the design of subsequent efforts to quantify the phenomenon of interest (Patton, 2015). Thus, the present study could serve as a starting point for future mixed-methods research on evaluation methodology.

**Evaluation data collection procedures.** All data for the evaluation were collected via self-reported survey instruments (Appendix B-D). At T1, participants completed screening questions, measures related to participant characteristics (ethnicity, operation type, years of experience, educational attainment, age), delivery mode (online vs. face-to-face), and baseline levels of behavior implementation. At T2, participants completed measures related to characteristics of the proposed behavior change: performance expectancy and effort expectancy. At T3 participants completed measures of workplace context characteristics: social influence and facilitating conditions, as well as a repeated measure of behavior implementation. Reliability and validity information for the constructs measured in the surveys is described below. Participants who took the training in person completed the T1 and T2 measures on paper. Those who took the training online completed all study measures online via the Qualtrics survey platform. All T3 surveys were administered online using Qualtrics.

**Meta-evaluation data collection procedures.** Meta-evaluation data were collected through a semi-structured interview. All interviews were scheduled over email

and conducted via the Zoom audiovisual communications platform, with the interviewer and participant each calling into the meeting at the scheduled time. Each interviewee gave verbal consent for the interview to be recorded in the Zoom audiovisual communication platform. Preliminary transcripts of the interviews were generated using Zoom's automated transcription function, then reviewed in conjunction with the audio recordings and edited as needed to ensure accuracy.

## **Measures**

**Evaluation measures.** Collectively, the self-report survey instruments administered at T1, T2, and T3 included single-item measures of participant characteristics and training characteristics and scales measuring participants' perceptions of the innovation, social context, and use of target behaviors before and after the training. The operationalization of these variables and information about the reliability and validity of the associated measures is described in detail below.

*Characteristics of the participant.* Items capturing the predictor variables classified as characteristics of the participant, including ethnicity, age, educational attainment, operation type, and years of experience were adapted from the pre-existing ECETP evaluation instrument and included in the T1 survey instrument.

*Ethnicity.* Consistent with prior studies of ECE professionals, ethnicity was coded as dichotomous non-Hispanic white vs. other ethnicities.

*Age.* The T1 instrument captured each participant's birth year, which was used to calculate an estimated age at time of training by subtracting the birth year from the training year.

*Education level.* Participants indicated their highest level of educational attainment. More than half indicated they had completed a high school diploma or equivalent. Educational attainment was recoded as dichotomous, high school diploma or less vs. more than a high school diploma.

*Operation type.* Operation type was coded as dichotomous, centers vs. homes, combining staff from both licensed and registered homes.

*Years of experience.* Years of experience was a continuous variable recorded as entered by the respondent.

*Characteristics of the training.* The variable of interest related to characteristics of the training was the delivery mode by which the participant took the training. Delivery mode was coded as a dichotomous variable, differentiating between those who took the training online and those who took the training in-person. Participants self-selected into either the online or in-person training format.

*Perceptions of the innovation.* Predictor variables related to perceptions of the innovation, performance expectancy and effort expectancy, were measured using modified versions of the associated items used in estimating the UTAUT model, adapted with permission from the lead author and publisher (Venkatesh et al., 2003). Items were adapted to the ECE PD context by changing references to “the system,” or the technological package tested in developing these constructs, to reflect “the strategies” taught in training and by changing references to the “organization” or “business” to refer to the early childhood program. These items were adapted for the UTAUT estimation study from previously validated instruments and repackaged to create scales representing

the consolidated UTAUT constructs (Venkatesh et al., 2003). Consistent with the UTAUT estimation study, each item used a seven-point anchor range (Venkatesh et al., 2003). Internal consistency is reported for each of these scales, assessed using Nunnally's (1978) suggestion that internal consistency reliability of 0.8 or higher is adequate for most research purposes.

*Performance expectancy.* Across three longitudinal time points used to estimate the UTAUT model, the four-item performance expectancy scale presented internal consistency reliability between 0.91-0.92 (Venkatesh et al., 2003). The adapted items measuring performance expectancy exhibited internal consistency reliability of 0.74, failing to reach Nunnally's (1978) suggested threshold of 0.8. In particular, the item "If I use these strategies, I will increase my chances of getting a raise" performed differently than the other three (squared multiple correlation = 0.12). After removing the fourth item, the internal consistency reliability improved ( $\alpha = 0.83$ ) to a level meeting Nunnally's (1978) specification.

*Effort expectancy.* In the original UTAUT validation study, the four-item effort expectancy scale presented internal consistency reliability between 0.90-0.94 (Venkatesh et al., 2003). In the present study, the four-item effort expectancy scale had acceptable internal consistency ( $\alpha = 0.91$ ).

*Perceptions of the innovation – combined.* Scale scores for performance expectancy and effort expectancy were calculated by taking the mean of the three performance expectancy items and the four effort expectancy items, but later analyses found that the two scale scores had a very significant correlation ( $r_s = .70, p < 0.01$ ). As

a result, all seven items were combined and tested as an overall perceptions of the innovation scale, which exhibited high internal consistency ( $\alpha = 0.91$ ). A scale score for perceptions of the innovation was calculated for each participant by taking the mean of the seven performance expectancy and effort expectancy items.

*Characteristics of the social context.* Predictor variables related to characteristics of the social context, social influence and facilitating conditions, were also measured using modified versions of the associated items used in estimating the UTAUT model (Venkatesh et al., 2003). Like the scales for effort expectancy and performance expectancy, each item in these subscales was adapted by changing references to “the system” to “the strategies” and changing references to the “organization” or “business” to “early childhood program”. Each item, which was adapted for the UTAUT estimation study from existing measures, used a seven-point anchor range (Venkatesh et al., 2003). Internal consistency reliability for these scales was also assessed using Nunnally’s (1978) recommendation of 0.8 as an acceptable minimum level of internal consistency.

*Social influence.* In the UTAUT model estimation, internal consistency reliability for the four-item social influence scale ranged from 0.88-0.94 across these times points (Venkatesh et al., 2003). In this study, the four social influence items had acceptable internal consistency ( $\alpha = 0.81$ ) and were used to create a scale score by taking the mean of the four items.

*Facilitating conditions.* The four-item facilitating conditions scale’s internal consistency reliability ranged from 0.83-0.87 in the UTAUT estimation (Venkatesh et



al., 2003). The four items measuring facilitating conditions did not demonstrate acceptable internal consistency in the current study ( $\alpha = 0.56$ ) and were excluded from subsequent analyses.

***Behavior implementation.*** Given the emphasis of the sample PD program evaluated in this study on interactions promoting healthy nutrition among young children, behavioral implementation was measured using 15 items from the NAPSACC: Nutrition and Physical Activity Self-Assessment for Child Care, Family Child Care Edition, adapted with permission from the authors (Ward et al., 2014b). While the target population for this study consisted of caregivers, this self-assessment questionnaire was originally developed for use by early care and education administrators as part of a larger intervention program (Benjamin et al., 2007). The Family Child Care version of the questionnaire was selected for this study because the language more closely reflects the experience of caregivers, who are ECE professionals working directly with children. For example, item 21 on the Family Child Care version of the self-assessment instrument says, “I eat and drink the same foods and beverages as children during meal and snack times” (Ward et al., 2014b, p. 4), whereas the corresponding item on the center-specific version reads, “When in classrooms with children during meal and snack times, teachers and staff eat and drink the same foods and beverages as children” (Ward et al., 2014a, p. 4). Accordingly, item wording remained the same, including explanatory material accompanying some items, in the truncated measure. Only items corresponding to caregivers’ nutrition-related interactions with children via strategies promoted in the course were used in the abridged instrument, as selected by a panel of specialists within

the Extension organization which developed the PD program subject to evaluation. This approach supported the content validity of the abridged measure, with respect to the content of the PD session (Field, 2013).

The authors of the NAP-SACC self-assessment tools sought to establish the concurrent criterion validity of their instrument against a previously validated observational measure. They found that respondents' self-assessment scores were consistently higher than scores given by objective trained observers, and some self-assessment items could not be assessed during the limited observation period. Given these concerns, the authors caution that more robust measures would be useful for researchers and program evaluators (Benjamin et al., 2007). However, in a scan of the literature for measures assessing food and nutrition practices in a variety of community settings, Ohri-Vachaspati and Leviton (2010) found only three instruments appropriate for use in early care and education programs, including the NAPSACC self-assessment instrument. Of the three identified measures, one is the in-depth observational tool used to validate items on the NAPSACC instrument and is likely impractical within the scale and resource constraints of large-scale PD evaluation efforts, and the other was developed specifically for use in Head Start programs, a federally funded subset of the ECE field subject to policies and procedures not necessarily applicable in non-Head Start ECE operations (Ohri-Vachaspati & Leviton, 2010). Of the limited available options, then, an adapted NAPSACC self-assessment for family child-care was identified as the best fit for the present study.

Nine of the items included in the adapted instrument were already part of the original measure during initial reliability and validity testing, while six were added in later editions. Among these nine items, test-retest reliability ranged from Kappa = 0.14 to 1.00 and inter-rater reliability ranged from Kappa = 0.40 to 1.00 (Benjamin et al., 2007). The authors interpreted these Kappa statistics according to guidelines developed by Munoz and Bangdiwala (1997, as cited in Benjamin et al., 2007). Among the nine items selected for the adapted measure which were included in the testing process, all but one exhibited at least moderate agreement (Kappa > 0.2) with respect to test-retest reliability. The remaining item, which corresponds to item 28 on the unmodified Family Child Care self-assessment tool (Ward et al., 2014b), demonstrated fair test-retest reliability (Kappa = 0.14) according to the authors' interpretations. All nine items showed at least moderate agreement with respect to inter-rater reliability (e.g. between a director and a staff member within the same center) (Benjamin et al., 2007).

Each item on the self-assessment tool used a four-point response scale (Ward et al., 2014b). Consistent with prior intervention evaluation applications, each item was scored from one to four, where four represents the response most closely aligned with best practice and one represents the response least aligned with best practice (Battista, Oakley, Weddell, Mudd, Greene, & West, 2014). Given the adaptation of the self-assessment through the use of a limited selection of items, the fact that not all the selected items were included in initial reliability testing, and the application of the instrument to a more limited target audience (e.g. caregivers vs. directors and caregivers), no previous internal consistency reliability information was available for the

adapted measure. In this study, the 15-item adapted measure displayed high internal consistency at T1 ( $N = 1576$ ,  $\alpha = .90$ ), but less so at T3 ( $N = 95$ ,  $\alpha = .74$ ). While the analysis indicated that the removal of two items (labeled Q27 and Q31 on the T3 survey) could increase the internal consistency of the scale, the resulting internal consistency was still only  $\alpha = .76$ .

*Baseline behavior implementation.* Each participant received a scale score for their behavior implementation at baseline by taking the mean of their scores on the 15 items at T1, and, to allow for practical interpretation of the results, multiplying by the number of items.

*Follow-up behavior implementation.* The same procedure used to calculate baseline behavior implementation was used to calculate scale behavior implementation scores for the 95 participants with non-missing T3 data.

*Behavior change.* The dependent variable representing the change in each trainee's use of the target behaviors from before the training to after the training was calculated as the difference between the T3 scale score and the T1 scale score for each of the 95 T3 respondents.

**Meta-evaluation measure.** The core of the interview consisted of two questions: a) "You responded to the pre-test and post-test surveys for this study, but not the follow-up survey a month later. Why is that?"; b) "What could we have done differently to get you to fill out the follow-up survey?" The full interview protocol is available in Appendix E.

## **Data Analysis**

**Evaluation analyses.** Each evaluation question was analyzed using an appropriate statistical test. Consistent with commonly accepted standards in null hypothesis statistics testing, all null hypothesis tests were evaluated with  $\alpha = 0.05$  (Field, 2013). Statistical analyses were performed using IBM SPSS Statistics 24.

**Research Question 1.** To analyze whether significant changes in implementation occurred, scores from the pre-test and follow-up administrations of the behavior implementation measure were compared using a 1-tailed dependent samples *t*-test, with  $H_0: \mu_d = 0$  and  $H_A: \mu_d > 0$ , where  $\mu_d$  represented the mean difference between paired pre-test and follow-up scores in the population. This parametric test assumes that the dependent variable is continuous and normally distributed.

**Research Question 2.** Considering the low proportion of respondents to the T3 survey it was not possible to test the entire proposed model. However, certain questions with particularly important practical and theoretical significance were assessed using appropriate tests.

**Correlation analyses.** Analyses of the bivariate correlations between all variables of interest, including those not used in subsequent analyses due to limitations on statistical power associated with the small sample size, were conducted using Spearman's rho, a non-parametric test of association which did not require the data to meet assumptions of normality (Field, 2013).

**Mixed-model ANOVA.** Considering the relatively low cost and growing popularity of asynchronous online ECE PD, one of the most relevant associations in the

proposed model was the relationship between the training delivery mode and the change in implementation scores. To explore this question further, mixed-model analysis of variance (ANOVA) test was used to examine whether there was a significant difference between the within-subjects T1 and T3 implementation scores and the between-subjects factor of the training delivery mode. This analysis tested the interaction between the change in implementation scores across time points and the delivery mode of training, and, where appropriate, main effects of each. Hypotheses tested in this analysis included: a) For the interaction,  $H_0$ : There is not a significant interaction between implementation score measurements and delivery mode, and  $H_A$ : There is a significant interaction between implementation score measurements and delivery mode; b) For the main effect of delivery mode  $H_0: \mu_1 = \mu_2$ , and  $H_A: \mu_1 \neq \mu_2$ ; c) For the main effect of implementation score measurements,  $H_0: \mu_1 = \mu_2$ , and  $H_A: \mu_1 \neq \mu_2$ .

*Multiple regression for online participants.* Another aspect of the proposed model that carried particular practical significance was the hypothesized relationship between experience, education, and the interaction between experience and education specifically within the subset of participants who took the training online. To explore whether the present sample supported those expected relationships, multiple regression analysis was conducted to assess the contribution of each independent variable to a model with change in implementation as the dependent variable. T1 implementation scores were included in the model to control for pre-existing use of the target behaviors. Within the multiple regression model, the significance of the contribution of each predictor was evaluated using a  $t$ -test, performed automatically within the regression

operation in SPSS, testing the general hypotheses  $H_0: b = 0$ ,  $H_A: b \neq 0$ , where a  $b$  value significantly different from zero represents a measurable relationship between the predictor and the outcome contributing to the overall model (Field, 2013). For the overall model,  $R^2$  represents the amount of variation in implementation scores that can be explained by the proposed model. An  $R^2$  value significantly different from zero indicates the model provides an adequate explanation for variation in the outcome. Using the  $F$ -ratio, or the ratio of variation accounted for by the model to error, a significance test for  $R^2$  was conducted within the regression operation in SPSS to test  $H_0: R^2 = 0$ ,  $H_A: R^2 \neq 0$  (Field, 2013).

*Multiple regression using center-based participants.* While social influence is not a variable program managers can easily capitalize upon for program development, from a theoretical perspective understanding the relationship between social influence and implementation is meaningful as a way to situate the learner within the broader ECE PD system. However, social influence is likely to be a far more relevant factor in the adoption decisions of center-based ECE professionals who tend to work side-by-side with colleagues on a daily basis than for home-based ECE professionals who often work alone or with very limited assistance. Based on evidence in the literature, it was expected that experience might interact with social influence with respect to changes in implementation. Thus, a multiple regression analysis was conducted to assess the contribution of independent variables T1 implementation, experience, social influence, and the interaction between experience and social influence to the dependent variable implementation change specifically among participants who work in child-care centers.

Again, the significance of each predictor's contribution was established using a *t*-test of the general hypotheses  $H_0: b = 0$ ,  $H_A: b \neq 0$ , where a *b* value significantly different from zero represents a measurable relationship between the predictor and the outcome contributing to the overall model (Field, 2013). The amount of variation in implementation scores explained by this model was represented as  $R^2$ , such that an  $R^2$  value significantly different from zero would indicate that the model provided an adequate explanation for variation in implementation scores. The significance of the  $R^2$  value was assessed using the *F*-ratio to test  $H_0: R^2 = 0$ ,  $H_A: R^2 \neq 0$  (Field, 2013).

**Meta-evaluation analysis of Research Question 3.** Consistent with the qualitative approach selected for the meta-evaluation portion of the study, non-statistical methods were used to analyze the transcripts from the semi-structured interviews. The interview transcripts were analyzed using the constant comparative method to identify categories of data useful for generating answers to the research question. To increase the trustworthiness of the findings, two different researchers analyzed the data separately, utilizing a technique known as analyst triangulation (Merriam & Tisdell, 2016).



## CHAPTER IV

### RESULTS

This chapter describes findings related to the key research questions. It begins with a description of participants' interactions with the study itself and the results of secondary analyses which were conducted to explore the problem of non-response, followed by detailed results from the planned analyses.

#### **Participant Flow**

**Initial recruitment.** Participants were recruited through the normal marketing channels used to promote ECETP program activities. These included County Extension Agents distributing marketing flyers and press releases about the face-to-face training events in which the HI: Nutrition training was embedded and placing a small graphic and link to the HI: Nutrition online course on the homepage of the online learning site. At the outset of the training, participants received the informed consent document for the study, as approved by the IRB at Texas A&M University. In-person trainees were advised that their completion and submission of any part of the study materials constituted their agreement to participate. Those who opted not to participate were allowed to complete the training as part of the larger PD event. Online trainees were required to select a radio button indicating whether or not they agreed to participate in the study. Those who indicated that they preferred not to participate were informed that they would not be able to access the online HI: Nutrition course until after the study period had closed.

To minimize contamination across delivery modes, participants were instructed during the informed consent process to avoid taking the alternate form of the session until after the close of the study period. Child Care Licensing generally does not accept duplicate training within a caregiver's annual training period, so participants were informed that if they should choose to take the training both online and in person, they would not be able to apply both sessions to their annual PD requirements. As a further check against contamination across delivery mode each participant created an identification number consisting of their first and last initial and the last four digits of their primary telephone number. This method of generating participant identification numbers has been successfully used by other Texas A&M AgriLife Extension programs where participants need to recall their identifier for time-delayed follow-up measurements. Prior to analysis, the data were checked for duplicate identification numbers, and cases with duplicate identification numbers were discarded. These unique identifiers were also used to match participant data across time points.

Immediately before the training, participants were asked to complete the T1 survey measure. The T1 measure included survey items related to the eligibility criteria for the study. In-person trainees were advised of the eligibility criteria and asked not to return study materials if they did not meet the inclusion criteria. The online version of the T1 measure included survey logic such that ineligible trainees were directed immediately to the end-of-survey message upon a response that indicated they were not eligible to participate. The exception was for the inclusion criterion limiting participation to those caregivers who provide care to toddlers and/or preschool-age children.

Screening ineligible respondents based on this criterion required a more complex filter, which was applied after the survey data were collected. These individuals were excluded from the dataset after completing the T1 measure, the training, and the T2 measure, before receiving an invitation to respond to the T3 measure. Data from any trainees who were later determined to be ineligible was discarded as soon as those cases were identified. As described in Chapter 3, the remaining sample consisted of 1,576 eligible participants who completed the T1 measure in whole ( $n = 1,495$ ) or part ( $n = 81$ ). Within the T1 measure, participants were asked to provide an email address where they could be contacted regarding the T3 follow-up survey. Of the 1,576 eligible participants, 1,029 provided an email address. Immediately upon completing the training, participants were asked to complete the T2 measure, which 79% of the T1 participants ( $n = 1,252$ ) did.

**Follow-up recruitment.** The T3 survey link was delivered via an introductory email approximately 30 days after each participant completed the training. Following advice from Dillman, Smyth, and Christian (2009), two reminder emails were sent using the batch distribution feature in Qualtrics after the initial introduction, each formatted with a distinctly different messaging approach. The contents of each contact message are included in Appendix F. Because no systematic research could be found on the best times to send online surveys to the ECE staff population, these contacts were timed to reach participants on a variety of days of the week and during a variety of times of day (Dillman et al., 2009). The contact schedule ensured that each participant received at least one weekday contact and at least one weekend contact. In a recent follow-up evaluation with ECETP clients where surveys were delivered via Qualtrics with repeated

reminders at different times of day – 10:11 a.m., 12:03 p.m., 4:30 p.m. and 6:00 a.m. – more participants completed the survey between eight o'clock and eleven o'clock in the morning than at other times of day, both on days when contacts were sent and on days between contacts, suggesting ECE professionals may have some convenient window of time in the morning to respond to a survey (Nerren & Green, 2017). Accordingly, the initial contact was sent between 8:00 a.m. and 9:00 a.m. Among the 95 participants who completed the T3 survey, 46 responded to the invitation before the first reminder was sent. The second email was sent three days after the introductory email, between 9:00 a.m. and 10:00 a.m., serving as a thank you to those who had responded and reminding those who had not about the invitation to participate. Between the first and second reminders, 21 participants completed the T3 survey. The third email was sent three days after the first reminder, between 8:00 a.m. and 9:00 a.m., and designed to emphasize the need for a timely response. An additional 28 participants responded to the T3 survey after the third email. All three contacts included the link to the survey and a notice that T3 respondents would receive access to a free training webinar on one of their state-mandated training topics. According to Dillman et al. (2009), the use of advance incentives has the potential to invoke principles of social exchange among prospective respondents and generate higher survey response rates.

**Meta-evaluation recruitment.** Recruitment for the meta-evaluation phase of the study began with the list of 934 participants who provided an email address at T1, meaning they received the invitation to complete the T3 measure, but did not submit a T3 survey. Those participants received an invitation to complete an interview related to

their experience with the study. A reminder email was sent to each of them three days later. The full text of the recruitment emails is available in Appendix G. As described in Chapter 3, seven participants responded to the invitation to schedule an interview, but only three completed interviews.

### **Non-Response Analyses**

Given the high rate of non-response to the T3 survey, there was a notable potential for systematic error as a threat to external validity (Dillman, et al., 2009).

**Early vs. late responders.** Following recommendations from Lindner, Murphy, and Briers (2001), appropriate analyses were used to test for differences between early ( $n = 46$ ) and late ( $n = 49$ ) responders to the T3 survey across all variables of interest. Based on those recommendations, late responders were operationally defined as those who responded on or after the latest reminder which yielded a late responder group of  $n > 30$ , in this case those who responded on or after the day the first reminder email was delivered, or three or more days after the initial invitation. A 2-tailed independent samples *t*-test was used to examine differences in means between early and late responders for each of the variables age, years of experience, perceptions of the innovation, social influence, T1 implementation, T3 implementation, and implementation change. No significant differences were found between early and late responders on any of these variables. Results from those analyses are summarized in Table 1.

Table 1

*Independent Samples t-tests Comparing Early and Late Respondents*

Variable	Early	Late	$\Delta M$	95% CI for $\Delta M$	
	Respondents	Respondents		LL	UL
	$M (SD)$	$M (SD)$			
Age	43.17 (13.62)	44.24 (11.28)	-1.07	-6.21	4.06
Experience	12.50 (10.25)	9.79 (7.97)	2.71	-1.05	6.46
Perceptions	6.32 (.77)	6.02 (1.19)	.29	-.14	.73
Social Influence	5.60 (1.27)	5.74 (1.13)	-.15	-.65	.36
T1 Implementation	46.08 (5.36)	44.70 (4.55)	1.38	-.70	3.47
T3 Implementation	47.54 (5.62)	45.89 (5.37)	1.65	-.61	3.90
Implementation Change	1.74 (4.46)	.87 (4.07)	.87	-.93	2.67

*Note:* CI = confidence interval; LL = lower limit; UL = upper limit; T1 = baseline; T3 = follow-up.

The Phi statistic was used to test the strength of association between the dichotomous early vs. late respondent variable and dichotomous variables ethnicity, education level, operation type, and delivery mode. There was no significant association between early vs. late respondent status and ethnicity (Phi = .013,  $p = .902$ ), education

level ( $\Phi = -.008, p = .936$ ), operation type ( $\Phi = .016, p = .877$ ), or delivery mode ( $\Phi = .144, p = .161$ ).

**Respondents vs. non-respondents.** Another method recommended by Lindner, Murphy, and Briers (2001) to assess the potential for non-response error is to compare respondents and non-respondents on known characteristics. In this case, since non-response error was a particular concern in the T3 implementation and implementation change scores, participants were classified as respondents or non-respondents based on whether they responded to the T3 survey ( $n = 95$ ) or failed to respond to the T3 survey ( $n = 1,481$ ).

Respondents and non-respondents were compared with respect to mean age, years of experience, perceptions of the innovation, and T1 implementation using 2-tailed independent samples  $t$ -tests. Levene's test for equality of variances was not significant for the comparison of respondents and non-respondents with respect to age ( $p = .473$ ), perceptions of the innovation ( $p = .302$ ), or T1 implementation ( $p = .507$ ), so those tests were interpreted with the assumption of equal variances. However, Levene's test was statistically significant ( $p = .025$ ) for the comparison of the respondent and non-respondent groups with respect to years of experience, so that test was interpreted without equal variances assumed. The results of the 2-tailed independent samples  $t$ -tests comparing respondents and non-respondents are available in Table 2. As shown, respondents were older and had more years of experience in the field than non-respondents. No statistically significant differences were found between respondents and non-respondents in terms of perceptions of the innovation or T1 implementation.

Table 2

*Independent Samples t-tests Comparing Respondents vs. Non-Respondents*

Variable	Respondents	Non-Respondents	$\Delta M$	95% CI for $\Delta M$	
	<i>M (SD)</i>	<i>M (SD)</i>		LL	UL
Age	43.69 (12.47)	35.99 (13.20)	-7.70**	-10.45	-4.95
Experience	11.18 (9.25)	7.61 (8.26)	-3.57**	-5.51	-1.62
Perceptions	6.17 (1.01)	6.12 (1.16)	-.04	-.30	.21
T1 Implementation	45.41 (5.00)	45.12 (5.37)	-.29	-1.37	.80

*Note:* CI = confidence interval; LL = lower limit; UL = upper limit; T1 = baseline.

\* $p < .05$  (2-tailed); \*\* $p < .01$  (2-tailed).

The Phi statistic was used to test the strength of the association between respondent status and the dichotomous variables ethnicity, education level, operation type, and training delivery mode. There was a statistically significant association between respondent status and ethnicity (Phi = .106,  $p < .001$ ), with 41.1% of respondents identifying as some ethnicity other than non-Hispanic white compared to 62.8% of non-respondents. There was also a significant association between respondent status and education level (Phi = .085,  $p = .001$ ), such that 62.1% of respondents reported having attained more than a high school diploma, while only 44.6% of non-



respondents reported having attained more than a high school diploma. Another significant association was found between respondent status and operation type ( $\Phi = -.050, p = .047$ ), with participants in home-based child-care operations comprising 30.5% of respondents, but only 21.8% of non-respondents. The association between respondent status and delivery mode was also significant ( $\Phi = -.107, p < .001$ ), with a higher proportion of online trainees among non-respondents (90.5%) than respondents (76.8%). Interpreted another way, this test confirmed that the non-response rate among online trainees (94.8%) was significantly higher than the non-response rate among in-person trainees (86.4%).

**Respondents vs. non-respondents, by delivery mode.** Since participants self-selected into the study via the particular delivery mode of their choice, the difference in non-response rates among online and in-person trainees may indicate systematic differences between participants who selected each training format. Thus, it was pertinent to further examine differences between in-person and online trainees, and differences between respondents and non-respondents within each of these groups to provide insights into characteristics associated with non-response.

**Comparing overall participants, by delivery mode.** In the overall sample, 42% of in-person trainees and 38.1% of online trainees indicated their ethnicity was non-Hispanic white, while 58% of in-person trainees and 61.9% of online trainees identified with one or more other ethnicities. The relationship between delivery mode and ethnicity was non-significant ( $\Phi = -.024, p = .339$ ). The distribution of education levels was statistically similar ( $\Phi = .010, p = .680$ ) between the two delivery mode groups, with

55.9% of in-person trainees and 54.2% of online trainees reporting a high school diploma or less and 44.1% of in-person and 45.8% of online trainees reporting more than a high school diploma as their highest level of education. The relationship between delivery mode and operation type was significant ( $\Phi = .146, p < .001$ ), with home-based ECE professionals comprising 40.3% of in-person trainees and 20.3% of online trainees, while center-based ECE professionals comprised 59.7% of in-person and 79.7% of online trainees. Mean age among in-person trainees was 43.47 years old ( $SD = 15.35$ ) and among online trainees was 35.66 years old ( $SD = 12.77$ ). A two-tailed independent samples  $t$ -test indicated that this difference ( $M_d = 7.82, 95\% \text{ CI } [5.30, 10.33]$ ) was statistically significant ( $p < .001$ ). In-person trainees had an average of 11.82 ( $SD = 10.85$ ) years of experience in the ECE field, while online trainees had an average of 7.36 ( $SD = 7.89$ ) years of experience. A two-tailed independent samples  $t$ -test also showed that this difference ( $M_d = 4.46, 95\% \text{ CI } [2.70, 6.22]$ ) was statistically significant. The mean score for perceptions of the innovation was similar among in-person trainees  $M = 6.14 (SD = 1.11)$  and online trainees  $M = 6.13 (SD = 1.15)$ . Social influence scores were also similar among in-person trainees  $M = 6.08 (SD = .90)$  and online trainees averaged  $M = 5.55 (SD = 1.26)$ . At baseline, in-person trainees had an average T1 implementation score of 44.39 ( $SD = 5.46$ ) and online trainees had an average T1 implementation score of 45.24 ( $SD = 5.33$ ). In-person trainees' average implementation change was 1.80 ( $SD = 3.47$ ), while online trainees' average change in implementation score was 1.16 ( $SD = 4.52$ ). Two-tailed, independent samples  $t$ -tests failed to find significant differences in the mean scores between in-person and online trainees for perceptions of the innovation ( $M_d$

= .01, 95% CI [-.190, .211],  $p = .918$ ), social influence ( $M_d = .52$ , 95% CI [-.078, 1.12],  $p = .087$ ), T1 implementation ( $M_d = -.85$ , 95% CI [-1.730, .025],  $p = .057$ ), or implementation change ( $M_d = .64$ , 95% CI [-1.460, 2.733],  $p = .548$ ).

Certain associations between variables of interest also differed in their strength and significance between the online and in-person subgroups. Full results of Spearman's correlations between variables of interest within the in-person and online trainee subgroups are available in Appendix H. Among in-person trainees, but not among online trainees, there was a statistically significant correlation between ethnicity and operation type ( $r_s = -.167$ ,  $p = .035$ ) and between ethnicity and education level ( $r_s = .178$ ,  $p = .024$ ) with non-Hispanic white caregivers tending to work more often in home-based ECE facilities and be more likely to have more than a high school diploma than caregivers of other ethnic backgrounds among this group. Among in-person trainees, baseline implementation was positively associated with education level ( $r_s = .199$ ,  $p = .012$ ), and negatively associated with implementation change ( $r_s = -.544$ ,  $p = .009$ ). There was also a significant negative correlation between years of experience and implementation change ( $r_s = -.455$ ,  $p = .038$ ) among in-person trainees that was not present among online trainees. There were other associations which proved statistically significant among online trainees, but not among those who took the training in person. These included the correlation between perceptions of the innovation and experience ( $r_s = -.117$ ,  $p < .001$ ) and between perceptions of the innovation and age ( $r_s = -.077$ ,  $p = .012$ ). Baseline implementation was significantly associated with operation type ( $r_s = -.073$ ,  $p = .011$ ), age ( $r_s = .122$ ,  $p < .001$ ), and social influence ( $r_s = .361$ ,  $p = .003$ ) among the online

subgroup, but not the in-person subgroup. Likewise, implementation at follow-up was significantly associated with social influence ( $r_s = .417, p < .001$ ) and implementation change ( $r_s = .548, p < .001$ ) in the online subgroup.

***Comparing respondents vs. non-respondents, by delivery mode.*** Results from the 2-tailed independent samples *t*-tests used to compare means between respondents and non-respondents within the online and in-person subsamples are reported in Table 3. The mean age of respondents was significantly higher than that of non-respondents in both the in-person and online subgroups, 95% CIs [-13.52, -1.25] and [-9.53, -3.50] respectively. Among in-person trainees, no significant differences were found between respondents and non-respondents in terms of years of experience, perceptions of the innovation, or T1 implementation. In addition to age, a significant difference was identified between the mean years of experience among respondents and non-respondents in the online trainee subgroup 95% CI [-4.54, -0.63], with the average time in the field among respondents being higher than the mean age among non-respondents. Respondents and non-respondents in the online subgroup did not differ significantly with respect to mean perceptions of the innovation or T1 implementation.

Table 3

*Independent Samples t-tests Comparing Respondents vs. Non-Respondents within Delivery Mode Subgroups*

Mode	Variable	Non-		$\Delta M$	95% CI for $\Delta M$	
		Respondents	Respondents		LL	UL
		<i>M (SD)</i>	<i>M (SD)</i>			
In-	Age	49.82 (12.66)	42.44 (15.54)	-7.38*	-13.52	-1.25
Person	Experience	15.41 (10.56)	11.24 (10.82)	-4.17	-9.06	.73
	Perceptions	6.45 (.64)	6.08 (1.17)	-.37	-.88	.14
	T1 Implementation	45.56 (5.67)	44.20 (5.42)	-1.36	-3.83	1.11
Online	Age	41.82 (11.88)	35.30 (12.74)	-6.51**	-9.53	-3.50
	Experience	9.88 (8.48)	7.22 (7.84)	-2.67*	-4.54	-.79
	Perceptions	6.07 (1.10)	6.13 (1.15)	.06	-.23	.34
	T1 Implementation	45.36 (4.81)	45.23 (5.36)	-.13	-1.43	1.18

*Note:* CI = confidence interval; LL = lower limit; UL = upper limit; T1 = baseline.

\* $p < .05$  (2-tailed); \*\* $p < .01$  (2-tailed).

There was not a significant association between ethnicity and respondent status among in-person trainees ( $\Phi = 0.137$ ,  $p = 0.08$ ), but there was among the online trainees ( $\Phi = 0.100$ ,  $p < 0.001$ ). Within the online trainee subgroup, 8.0% of non-

Hispanic white participants responded to the T3 survey, while only 3.4% of participants of other ethnicities responded. Similarly, there was not a significant association between respondent status and education level among the in-person trainee subgroup ( $\Phi = 0.120, p = 0.127$ ), but there was a significant association between these variables identified in the online trainee subgroup ( $\Phi = 0.081, p = 0.002$ ). In this case, 7.3% of online trainees with more than a high school diploma responded to the T3 survey, while only 3.6% of online trainees with a high school diploma or less responded. There was no significant association between respondent status and operation type among either in-person trainees ( $\Phi = -0.005, p = 0.946$ ) or online trainees ( $\Phi = -0.042, p = 0.120$ ).

### **Descriptive Data Summary**

Preliminary analyses provided a general description of the data collected during this study, including information about the distribution of each variable of interest. This section summarizes those results, organized by the variable classification scheme inherent in the proposed evaluation model.

**Characteristics of the participant.** Five variables of interest captured information about the study participants themselves, age, years of experience, ethnicity, education level, and operation type.

**Age.** Participants' ( $N = 1,493$ ) ages ranged from 18 years old to 75 years old,  $M = 36.48, SD = 13.28$ .

**Years of experience.** Participants ( $N = 1,493$ ) had between zero and 50 years of experience in the early childhood field,  $M = 7.83, SD = 8.36$ .

***Ethnicity.*** Of the 1,576 participants, 61.5% reported their ethnicity as something other than non-Hispanic white and 38.5% reported their ethnicity as non-Hispanic white.

***Education level.*** When asked to indicate their highest level of educational attainment, 53.3% of participants reported having a high school diploma or less, 44.7% reported having more than a high school diploma, and 2% opted not to respond.

***Operation type.*** Participants who worked in ECE centers comprised 76.4% of the sample. Those who worked in home-based ECE comprised 22.0% of the sample. The remaining 1.6% opted not to respond to this item.

***Characteristics of the training (delivery mode).*** The only variable of interest measuring characteristics of the training in this study was delivery mode. During the study period, 10.3% of participants took the HI: Nutrition training in person and 89.7% took it online.

***Perceptions of the innovation.*** Descriptive statistics are reported for the standalone performance expectancy and effort expectancy scores, as well as for the combined perceptions of the innovation scale scores.

***Performance expectancy.*** Performance expectancy scores ( $N = 1248$ ) ranged from 1.0-7.0,  $M = 6.02$ ,  $SD = 1.32$ .

***Effort expectancy.*** Effort expectancy scores ( $N = 1244$ ) ranged from 1.0-7.0,  $M = 6.22$ ,  $SD = 1.15$ .

***Perceptions of the innovation – combined.*** Perceptions of the innovation scores ( $N = 1249$ ) ranged from 1.0-7.0,  $M = 6.13$ ,  $SD = 1.15$ .

**Characteristics of the social context (social influence).** Since the items used to measure facilitating conditions did not have an acceptable level of internal consistency, the remaining variable of interest pertaining to characteristics of the social context was social influence, which was measured within the T3 survey. Social influence scores ( $N = 91$ ) ranged from 1.0-7.0,  $M = 5.67$ ,  $SD = 1.21$ .

**Behavior implementation.** Descriptive statistics were used to better understand the distribution of behavior implementation at baseline and at follow-up, and to describe the outcome variable, behavior change.

**Baseline behavior implementation.** Baseline behavior implementation scores ( $N = 1410$ ) ranged from 15.0-60.0,  $M = 45.14$ ,  $SD = 5.35$ .

**Follow-up behavior implementation.** At follow-up, behavior implementation scores ( $N = 94$ ) ranged from 31.0-60.0,  $M = 46.74$ ,  $SD = 5.53$ .

**Behavior change.** Behavior change scores ranged from a decrease of 10.0 to an increase of 17.64, with  $M = 1.32$ ,  $SD = 4.28$ . More than half of the T3 respondents (53.9%) indicated an increase in their use of the target behaviors, while 12.4% reported no change in their use of the behaviors and 33.7% reported a decrease in their use of the target behaviors.

## **Results for Research Question 1**

The first research question asked, “Did participants in this ECE PD program implement strategies taught in the training?” A one-tailed paired samples  $t$ -test was used to compare mean T3 implementation scores and mean T1 implementation scores,  $N = 89$ . The test indicated a statistically significant increase in mean implementation scores



from T1 to T3,  $M = 1.32$ ,  $SD = 4.23$ , 95% CI [.42, 2.22],  $p = .0025$ . The effect size ( $d = .31$ ) for this test was small, according to the guidelines recommended by Cohen (1988). Using G\*Power statistical analysis software, a post hoc power analysis was conducted, indicating  $1 - \beta = .8956$ . Assuming the effect size remains constant, future studies will require a minimum of 66 participants to achieve statistical power of .8 with  $\alpha = .05$ .

## **Results for Research Question 2**

The second research question was “How well can the Cervero model of training evaluation operationalized for use with ECE PD programs explain variations in behavior change among ECETP participants?”

**Correlation analysis results.** Spearman’s rho, a non-parametric measure of bivariate correlation, was used to explore associations between all variables of interest. Full results are available in Table 4. There were multiple significant associations between the variables of interest. Both age and years of experience were significantly correlated with ethnicity, education level, operation type, delivery mode, perceptions of the innovation, and T1 implementation, as well as with each other. The strong correlation between age and years of experience ( $r_s = .611$ ) was highly significant ( $p < .001$ ). Given the high magnitude of the correlation, age was excluded from subsequent analyses to create more parsimonious models (Field, 2013).

Table 4

*Spearman's Correlation Coefficients Between Variables of Interest*

Variable	1	2	3	4	5	6	7	8	9	10
1. Age	—									
2. Experience	.61**	—								
3. Ethnicity	.10**	.08**	—							
4. Education	.26**	.24**	.02	—						
5. Operation	-.20**	-.15**	.00	-.03	—					
6. Mode	-.15**	-.12**	-.02	.01	.15**	—				
7. Perceptions	-.06**	-.09**	-.12**	-.01	.01	.00	—			
8. Social Influence	-.05	.51	-.10	-.06	.04	-.16	.36**	—		
9. T1 Implementation	.12**	.17**	-.02	.07*	-.05*	.05*	.25**	.33**	—	
10. T3 Implementation	-.03	.13	.14	-.02	-.05	-.05	.19	.40**	.70**	—
11. Implementation Change	-.20	-.16	.00	-.12	-.08	-.09	-.02	.10	-.27*	.44**

*Note:* T1 = baseline; T3 = follow-up.

\* $p < .05$  (2-tailed); \*\* $p < .01$  (2-tailed)

In addition to age and years of experience, ethnicity had a significant association with perceptions of the innovation ( $r_s = -.123, p < .001$ ). Additionally, operation type and training mode were significantly correlated ( $r_s = .146, p < .001$ ), as were perceptions of the innovation and social influence ( $r_s = .362, p = .001$ )

There was also a strong association between T1 implementation and T3 implementation ( $r_s = .697, p < .001$ ), supporting the use of T1 implementation as an independent variable in subsequent analyses to control for behavior implementation prior to training. As shown in Table 4, T1 implementation had statistically significant associations with every variable of interest except ethnicity. The only variables of interest significantly correlated with behavior implementation change were T1 implementation ( $r_s = -.265, p = .012$ ) and T3 implementation ( $r_s = .439, p < .001$ ).

**Mixed-model ANOVA results.** The two-way mixed-model ANOVA used within-subjects factor T1 and T3 implementation scores as a repeated measure and between-subjects factor delivery mode. There was no significant interaction between implementation\*delivery mode,  $F(1, 87) = .365, p = .548, \eta_p^2 = .004$ . The observed statistical power for this test was  $1 - \beta = .092$ . Post hoc power analysis using G\*Power software indicated that this test would require a minimum sample of 320 participants to achieve an acceptable statistical power of .8, if the observed effect size remains the same. There was also not a significant main effect of delivery mode on implementation scores,  $F(1, 87) = .127, p = .722, \eta_p^2 = .001$ . The observed power for this test was  $1 - \beta = .064$ . Post hoc power analysis indicated this test would require a minimum sample of 100 participants to achieve statistical power of .8 if the observed effect size remains the

same. Consistent with the results of the paired-samples *t*-test conducted for Research Question 1, the ANOVA results indicated a significant main effect for the within-subjects factor of implementation score,  $F(1, 87) = 7.884, p = .006, \eta_p^2 = .083$  indicating a significant difference between implementation scores at T1 and T3. The observed power for this test was  $1 - \beta = .793$ . Post hoc power analysis indicated this test would require a minimum of 18 participants to achieve statistical power of .8, all other things being equal.

**Multiple regression results.** Two different multiple regression models were tested. The first examined the contributions of T1 implementation, experience, education, and the experience\*education interaction to the change in implementation scores among online trainees. The second examined the contributions of T1 implementation, experience, social influence, and the experience\*social influence interaction to the change in implementation scores among center-based caregivers.

***Moderated multiple regression for change in implementation among online trainees.*** Prior to testing the moderated multiple regression, the interaction between experience\*education was calculated for each online trainee who responded to the T3 survey ( $N = 66$ ) and saved as a separate variable,  $M = 11.57, SD = 14.15$ . Model 1 used T1 implementation, experience, and education as predictors of change in implementation. Model 2 included the same predictors and added the experience\*education interaction term. Neither Model 1 ( $R^2 = .048, F(3, 62) = 1.044, p = .380$ ) nor Model 2 ( $R^2 = .061, F(4, 61) = .985, p = .423$ ) explained a statistically significant portion of the variation in the dependent variable. The observed statistical

power of the  $F$ -ratio test for Model 1 was .29, and for the  $F$ -ratio test for Model 2 was .32. To achieve statistical power of .8, all other things being equal, the minimum sample size for the  $F$ -ratio test with respect to Model 1 would need to be 221, and the minimum sample size for the  $F$ -ratio test for Model 2 would need to be 184. Adding the interaction term did not significantly improve the model fit ( $\Delta R^2 = .013$ ,  $\Delta F(1, 61) = .817$ ,  $p = .370$ ). The observed statistical power for the  $F$ -ratio test for  $\Delta R^2$  was .15. The minimum sample size to achieve statistical power of .8, all other things being equal, would need to be 598 participants. Additionally, none of the individual independent variables had a significant relationship with the dependent variable in Model 1 or Model 2. Full results are reported in Table 5.

Table 5

*Predictors of Implementation Change Among Online Trainees*

Variable	Implementation Change		
	Model 1 <i>B</i>	Model 2	
		<i>B</i>	95% CI
Constant	11.24	8.56	[-4.34, 21.46]
T1 Implementation	-.20	-.19	[-.43, .06]
Experience	.01	.24	[-.29, .77]
Education	-.60	.65	[-2.96, 4.26]
Experience x Education		-.14	[-.44, .17]
$R^2$	.05		.06
$F$	1.04		.99
$\Delta R^2$			.01
$\Delta F$			.82

Note: N = 66. CI = confidence interval.

***Moderated multiple regression for change in implementation among center-based caregivers.*** Prior to testing the moderated multiple regression, the interaction between experience\*social influence was calculated for each trainee who responded to the T3 survey and reported working in a center-based ECE facility ( $N = 62$ ) and saved as

a separate variable,  $M = 63.81$ ,  $SD = 60.89$ . Model 1 used T1 implementation, experience, and social influence score as predictors of change in implementation. Model 2 included the same predictors and added the experience\*social influence interaction term. Model 1 ( $R^2 = .143$ ,  $F(3, 54) = 3.011$ ,  $p = .038$ ) explained a significant portion of the variation in implementation change, but Model 2 ( $R^2 = .144$ ,  $F(4, 53) = 2.23$ ,  $p = .078$ ) did not. In Model 1, T1 implementation ( $b = -.253$ , 95% CI [-.460, -.047],  $p = .017$ ) and social influence ( $b = .316$ , 95% CI [.145, 1.731],  $p = .021$ ) both had statistically significant relationships with implementation change. The observed power of the  $t$ -tests of the significance of the coefficients of both T1 implementation and social influence was .99. The observed statistical power of the  $F$ -ratio test for Model 1 was .71, and for the  $F$ -ratio test for Model 2 was .66. To achieve statistical power of .8, all other things being equal, the minimum sample size for the  $F$ -ratio test with respect to Model 1 would need to be 70, and the minimum sample size for the  $F$ -ratio test for Model 2 would need to be 76. Adding the interaction term did not significantly improve the model fit ( $\Delta R^2 = .001$ ,  $\Delta F(1, 53) = .047$ ,  $p = .829$ ). The observed statistical power for the  $F$ -ratio test for  $\Delta R^2$  was .06. The minimum sample size to achieve statistical power of .8, all other things being equal, would need to be 7,843 participants. Only T1 implementation had a significant relationship with the dependent variable in Model 2. The observed statistical power of the  $t$ -test of the significance of the coefficient for T1 implementation in Model 2 was .99. Full results are reported in Table 6.

Table 6

*Predictors of Implementation Change Among Center-Based Trainees*

Variable	Implementation Change		
	Model 1 <i>B</i>	Model 2	
		<i>B</i>	95% CI
Constant	7.22	6.69	[-3.52, 16.89]
T1 Implementation	-.25*	-.25*	[-.46, -.05]
Experience	.03	.09	[-.50, .68]
Social Influence	.94*	1.03	[-.15, 2.21]
Experience x Social Influence		-.01	[-.11, .09]
$R^2$	.14		.14
$F$	3.01*		2.23
$\Delta R^2$			.00
$\Delta F$			.05

Note:  $N = 62$ . CI = confidence interval.

\* $p < .05$

### Results for Research Question 3

The third research question was “What kinds of evaluation methods and procedures are necessary to successfully implement this expanded approach to ECE PD



program evaluation?” One primary and two secondary themes emerged from the three completed interviews. Full texts of the interview transcripts are available in Appendix I.

**Email-based recruitment.** The primary theme that emerged was considerations in email-based recruitment. For instance, Interviewee A said the primary reason for not responding to the T3 survey invitation was, “I don’t check my email a lot. So that’s probably why” (Interview Transcript A, p. 2). Despite the issues identified with email-based recruitment, when asked if there are other, more preferred ways to contact participants, Interviewee A said, “No, I think email is fine” (Interview Transcript A, p. 2). While the limited number of interviews did not yield saturation in the data, three promising sub-themes emerged related to considerations in email-based recruitment: expectedness of recruitment emails, effective use of multiple contacts, and credibility of subject lines.

**Expected emails.** Interviewees A and C indicated they were not expecting the follow-up invitation and would be more likely to respond to the invitation if they were expecting it. For example, in response to the interview question about what researchers could do differently, Interviewee C said, “When I go into my email, I just look for what I know, you know, I’m supposed to be getting” (Interview Transcript C, p. 2).

**Multiple contacts.** Interviewee C emphasized on three separate occasions that receiving multiple emails about the study was a catalyst for participation. In one instance, Interviewee C said:

Like I said, the only reason I even looked at yours was because I got multiple ones, you know, over a couple of weeks period and I was like, okay, this one

keeps coming through. Maybe it's something I should look at. (Interview Transcript C, p. 2)

**Subject lines.** One reason Interviewee C cited for not responding to the follow-up survey invitation was that the subject line was not specific enough to yield credibility, saying, "It wasn't until I actually read it and realized that it's from Texas Ag Extension that I was like, oh, this isn't spam, you know, my bad and maybe it should be labeled differently" (Interview Transcript C, p. 2) and later added:

Instead of a survey or an interview because you get a lot of scam surveys and interviews. But if you say follow up or something like that, from Texas Ag Life. Yeah, that seems more like, "Okay, I know what that is. That's not a scam." (Interview Transcript C, p. 3).

**Data management.** A secondary theme was issues in data management. Interviewee B said, "I actually did respond. I don't know why it's stated as I didn't. Maybe I didn't finish it. I'm not sure, but I did respond. And I remember responding" (Interview Transcript B, p. 2). After the interviewer verified that Interviewee B's study ID was not among those in the T3 dataset, Interviewee B said, "I don't remember putting a number in or logging in" (Interview Transcript B, p. 2). A total of 105 responses were submitted to the T3 survey, including two without a Study ID and eight with ID entries that could not be matched to any Study IDs generated in the T1 survey.

**Time constraints.** Another secondary theme was time constraints as a barrier to participation. When asked about reasons for not responding, Interviewee C said:

Um, pretty much just because I'm in this new facility doing this new job. And it's just been kind of crazy because I run another business outside of this facility as well. So it's just been, as you saw by trying to set up this interview, I get like 10 minute breaks here and there that I have to do these things...So it's been busy. It wasn't anything y'all did. I've just been too busy (Interview Transcript C, p. 2).

## CHAPTER V

### CONCLUSIONS

Overall, the findings from this study indicated that the program participants increased their use of the target practices that were taught in the training, suggested that the basic structure of the Cervero model is appropriate for ECE PD evaluation if effective measures can be identified and the complex relationships between the variable classifications quantified, and provided critical insights into possible mechanisms related to non-response. These potential hinderances to responding were the use of email as the sole means of recruitment, the use of participant-generated IDs for data management, and time constraints on ECE professionals. This chapter provides a detailed discussion of these findings in the contexts of theory, research, and practice. This chapter begins with the presentation of key conclusions that can be drawn with respect to the three specified research questions, followed by a discussion of the limitations in this study, and then enumerates specific recommendations for both practice and research.

#### **Conclusions**

**Research Question 1.** Did participants in this ECE PD program implement strategies taught in the training? In fact, the results of the one-tailed paired-samples *t*-test indicated that they did increase their implementation of the target strategies to a significant degree. This finding was consistent with a previous evaluation of training sessions in the ECETP, which also found self-reported improvements in practice in a time-delayed follow-up survey (Nerren & Green, 2017). However, the effect size ( $\alpha =$

.31) was small-to-medium by commonly accepted standards (Cohen, 1988) and small from a practical perspective, considering the average change was 1.32 points on a scale with a potential range of 45 points, where each additional point represents an incremental improvement (not necessarily mastery of best practice) in one of the 15 target behaviors (Ward et al., 2014b). No empirical research was located to indicate the minimum increment of change in these behaviors necessary to produce benefits for children, but it stands to reason that a partial improvement in one behavior may not be enough to yield lasting positive developmental outcomes. In this study, the average baseline implementation score of 45.15 indicated there is generally room for ECE professionals to grow in the area of nutrition and feeding practices, supporting the relevance and validity of the training itself. While the maximum score at both measurements was 60 points, the minimum score increased from 15 points at baseline to 31 points at follow-up. This could be a function of non-response error, but it also indicates that those who begin with lower levels of implementation improve more than those who are already using many of the espoused strategies.

In the context of testing an expanded evaluation framework for ECE PD, a positive change in implementation from baseline to follow-up is a necessary precursor to examining factors related to that change. The small effect size means larger sample sizes will be required to achieve sufficient statistical power (Field, 2013) in order to detect the complex hypothesized relationships between the four classes of variables suggested by the Cervero model (Cervero & Rottet, 1984).

**Research Question 2.** How well can the Cervero model of training evaluation, operationalized for use with ECE PD programs, explain variations in behavior change among ECETP participants? This question was more complex and, with the limited sample size, more difficult to assess. The analyses that were possible provided insights into which variables should be included in future iterations of the model, based on the results of testing the adapted measures to operationalize them, their relationships with one another, and their relationships with the dependent variable. From these findings, a revised version of the model was developed.

***Baseline implementation of best practices.*** The adapted subset of items from the NAP-SACC self-assessment tool for family childcare homes (Ward et al., 2014b) had acceptable internal consistency at baseline and was reviewed by a panel of ECETP program staff for content validity relative to the Healthy Interactions: Promoting Lifelong Nutrition training, making it a promising step toward filling the instrumentation gap in survey measures of health practices in ECE programs at the teacher level (Ohri-Vachaspati & Levinson, 2010). Baseline implementation was proposed as a control variable for pre-existing differences in the use of best practices among participants based on guidance from Newcomer, Hatry, and Wholey (2015). The importance of baseline implementation as a control was well supported, both because it had moderate correlation with implementation change, and because it was significantly correlated with all other variables of interest except ethnicity. If, as this finding suggests, participants with certain characteristics are more likely to enter training with greater pre-existing levels of use of the behaviors taught in the training, failing to control for baseline use of

the target behaviors while using those participant characteristics as independent variables could lead to false attributions of causality and distort practical estimates of the program effects. In the multiple regression analysis for effects of social influence, years of experience, and the interaction between them on change in implementation scores among center-based participants, the correlation coefficient for baseline implementation was significant and negative. One possible explanation for the negative relationship between pre-existing use of best practices and implementation change is that those who were already using more of the target behaviors had, or at least perceived themselves as having, less room to grow in the area covered by this particular PD session. However, the relationship between the control variable baseline implementation and change in implementation was not statistically significant in the multiple regression analysis of effects of experience, education, and their interaction on implementation change among online trainees, suggesting more information is needed to fully understand the connection between pre-existing practices and practice improvements following PD.

***Ethnicity.*** Based on previous research, ethnicity was expected to have a direct effect on implementation change. Unlike the study by Williford et al. (2015) which found that non-Hispanic white caregivers tended to have higher post-training implementation levels, in this study there was not a significant relationship between ethnicity and implementation at follow-up. Ethnicity was significantly correlated with age, years of experience, perceptions of the innovation, and baseline implementation, but not with change in implementation. This finding and the extremely small correlation coefficient for the relationship between ethnicity and change in implementation suggest

that ethnicity may not be a particularly useful participant characteristic variable for explaining variations in behavior change after ECE PD in future iterations of the model.

*Delivery mode x age x education level.* While neither age, education level, nor delivery mode was expected to have a direct effect on changes in trainees' practices, they were expected to interact with one another such that among online trainees, younger and more experienced participants would have higher implementation change scores. Before discussing the findings related to the overall interaction, it is pertinent to examine findings related to each of these variables individually.

*Age and years of experience.* Age and years of experience were proposed as separate characteristics of the participant, but were very highly correlated with one another, suggesting that one of them could be eliminated from future iterations of the model in the interest of parsimony (Field, 2013). Both age and experience were significantly correlated with ethnicity, education level, operation type, delivery mode, perceptions of the innovation, and baseline implementation. The non-significant association between experience and implementation change was also consistent with previous studies (Lieber et al., 2009; Yamauchi et al., 2013). Conceptually, years of experience is the more useful of the two variables when applied to issues of professional practice because ECE professionals, who are required during their time of service to obtain continuing education and training, ought to gain more knowledge, skills, and abilities that empower them to use best practices during their time in the field than a person would simply by the natural process of aging. Considering the strong correlation between experience and age, years of experience may be able to serve as a proxy when



exploring the effects of age, especially as they are expected to interact with delivery mode and education.

*Educational attainment.* In this study, those with higher levels of education tended to have higher implementation scores at baseline, but educational attainment did not have a significant association with implementation at follow-up or with change in implementation. This could be related to the phenomenon observed by Rusby et al. (2013) who noted that home-based ECE professionals with higher educational attainment tended to voluntarily engage in more PD opportunities made available to them with an intervention. Perhaps, then, those ECE professionals with more education have previously engaged in more PD opportunities, which could have included other training related to nutrition and feeding practices. While education level and implementation change were not associated in this study, which was consistent with findings from Hamre et al. (2012) and Lieber et al. (2009), it is possible that the cumulative effect of multiple PD sessions on similar topics could lead to greater implementation over time. Notably, though non-significant, the correlation coefficients for the associations between education level and both follow-up implementation and change in implementation were negative, which loosely supports the findings from the TELC (2013) study which showed more educated ECE professionals reported “infrequent” adoption of techniques they had learned in training at higher rates than their less educated peers.

*Delivery mode.* As in the study by Lane et al. (2014), there was not a significant difference in outcomes between the online and in-person trainees in this study as

indicated by the non-significant correlation between delivery mode and implementation change and the non-significant results for the interaction effect of measurement time and delivery mode or main effect of delivery mode in the mixed-model ANOVA. This suggests that, despite preferences for characteristics of synchronous training found in prior studies (e.g. Pianta et al., 2008; Shannon et al., 2015; Stone-MacDonald & Douglass, 2014), asynchronous online ECE PD may lead to similar outcomes when compared to synchronous, in-person options, at least among trainees who choose their training format.

*Interaction between experience, education, and delivery mode.* A moderated regression analysis with implementation change as the dependent variable failed to detect any significant effects of education level, years of experience, or the expected interaction between them on implementation change among the subset of trainees who took the training online. However, the small sample provided insufficient statistical power to detect all but very large effects. The associations of age and years of experience with delivery mode were consistent with prior research, in that online trainees tended to be younger on average than in-person trainees (Weigel et al., 2012; Wright & Bales, 2014), but there was not a significant correlation between education level and training mode, contrary to what was expected (Hadley et al., 2015; Weigel et al., 2012; Wright & Bales, 2014). In analyzing patterns of non-response, it became clear that there were differences in the participants who tended to select into each delivery mode, including differing patterns of significant correlations that emerged within the online and in-person subgroups. In the online subgroup, though not in the in-person

subgroup, older and more experienced participants tended to have lower scores for perceptions of the innovation. Bearing in mind previous findings that older ECE professionals value the online learning format less highly than their younger counterparts (Weigel et al., 2012; Wright & Bales, 2014), this finding could mean that older trainees tend to value the content of online training less highly as well, even if it does not lead to differences in their levels of improvement in practice. Thus, in cases where participants choose the PD delivery mode, rather than being assigned to a particular format, the effect of the interaction between age and delivery mode may not be relevant because those older participants who would benefit less from the online format will generally opt to take their training in a face-to-face format. If trainees were assigned to their delivery modes, though, this interaction might still be an important factor in explaining differences in implementation change.

***Perceptions of the innovation.*** Prior studies that have examined the effects of perceptions of strategies taught in ECE PD programs have been predominantly qualitative and have emphasized the importance of the relevance of the strategies for the individual participant's professional context (e.g. Baker, 2018; Brown & Inglis, 2013; Linder et al., 2015; Nasser et al., 2013; Spies et al., 2017) and the participants' belief that the strategies could be quickly and easily implemented (Lieber et al., 2017; Nasser et al., 2013). In this study, the quantitative measures of performance and effort expectancy adapted from UTAUT had high internal consistency when they were combined into a single scale (perceptions of the innovation), providing a promising

measure for operationalizing qualitative findings like those in previous ECE PD studies in a quantitative form (Venkatesh et al., 2003).

Notably, the performance expectancy item related to the strategies increasing one's chances of getting a raise was removed because it tended to lower the internal consistency of both the standalone performance expectancy scale and the combined perceptions of the innovation scale. This could reflect the low-priority status given to nutrition practices in ECE PD, which is indicated by the designation of nutrition-related training as an optional topic in Minimum Standards (CCL, 2019a; CCL, 2019b). In other words, it is possible that this item might perform differently if the training topic was required by CCL and thus, presumably, reflected skills valued more highly by administrators who set the pay scale for a given facility.

Composite scores for perceptions of the innovation were significantly correlated with age, experience, ethnicity, baseline implementation and social influence scores, but not with implementation scores at follow-up or changes in implementation. Due to limitations on statistical power in the small sample, the relationship between perceptions of the innovation and changes in implementation could not be conclusively established in this study. Further testing could shed more light on whether and to what extent perceptions of the innovation contributes to ECE professionals' use of strategies they learn in training.

***Facilitating conditions.*** While previous qualitative findings suggested that facilitating conditions might be important in predicting changes in implementation of innovative strategies (e.g. Linder et al., 2016; Shannon et al., 2015; Spies et al., 2017),

the adapted UTAUT facilitating conditions scale did not exhibit acceptable internal consistency in this study (Venkatesh et al., 2003), making it impossible to replicate these findings or explore the suspected relationship between facilitating conditions and effort expectancy suggested by findings from Barton et al. (2017).

*Social influence x years of experience x operation type.* Dennis and O'Connor (2013) found that less experienced ECE professionals were less subject to social influences in implementing innovative practices than their more experienced peers. The hypothesized interaction between years of experience and social influence as a predictor of change in implementation was expected to be most salient among center-based ECE professionals, who work with a pool of peers on a daily basis. Findings related to years of experience were described earlier in this section, and preliminary findings regarding social influence and operation type are described here alongside findings related to testing the suspected interaction effect of these variables.

*Social influence.* Social influence as a contributor to behavior change outcomes in ECE PD evaluation has typically been captured through qualitative methods (e.g. Brown & Inglis, 2013; Lieber et al., 2009; Shannon et al., 2015). The adapted UTAUT social influence measure used in this study had acceptable internal consistency and could be used to quantitatively confirm these types of qualitative findings (Venkatesh et al., 2003). Social influence was significantly correlated with baseline implementation and perceptions of the innovation, but not with behavior change. However, in the multiple regression assessing the direct and interaction effects of social influence and operation

type on implementation change, the coefficient for social influence as a standalone predictor was significant.

*Operation type.* While there was a significant difference in baseline implementation scores between home-based and center-based participants in this study, with center-based caregivers having lower baseline implementation scores, there was not a significant association between operation type and implementation change. This was similar to the TELC (2013) study, which found similar patterns of self-reported adoption of practices taught in training between home-based and center-based ECE professionals.

*Interaction between social influence, experience, and operation type.* There was not a significant relationship between operation type and social influence scores in the study sample, despite previous findings that suggested the social systems in child-care homes might differ from those in child-care centers (Lanigan, 2011; Porter et al., 2010), nor was there a significant association between years of experience and social influence as suggested by Dennis and O'Connor (2013). The proposed interaction effect was tested within the sub-sample of center-based participants in this study. As the non-significant correlations would suggest, the effect of this interaction on change in implementation was found to be non-significant. However, the small sample size used for this test yielded low statistical power, and therefore should not be taken as conclusive proof that this interaction does not contribute to a comprehensive model implementation change.

*Operation type and delivery mode.* While prior studies have found that online PD opportunities are popular among both home-based and center-based ECE professionals (Byington, 2017; Durden et al., 2016), this study found a significant

relationship between operation type and the delivery mode of training selected by the participant, with a higher proportion of home-based caregivers choosing in-person training than center-based caregivers. This could be related to the finding by Byington et al. (2017) that fewer home-based than center-based ECE professionals reported using a computer regularly. This relationship was not specified in the proposed model but should be considered in future revisions thereof.

*A revised model of change.* All together, these findings suggest that the proposed model can be revised and somewhat simplified. Baseline scores on the outcome measure should still be used as a control variable. Perceptions of the innovation and social influence, as measured in this study, should be included as independent variables, as should the interaction between delivery mode, experience, and operation type. Ethnicity, age, and education should be removed, as they are unlikely to contribute unique explanatory power to the model. Similarly, facilitating conditions should be removed until and unless a more appropriate measure is identified.

**Research Question 3.** The third research question was designed to serve as an evaluation of the study procedures, a best practice in the field of evaluation (Davidson, 2005; Patton, 2015). In this case, the critical focus of the meta-evaluation was to explore factors that might contribute to the high rate of non-response found in this and other surveys of ECE professionals (e.g. TELC, 2013).

*Email-based recruitment.* The use of email as the sole means of communication to recruit prospective participants proved problematic, as supported by comments from two of the meta-evaluative interview respondents. In fact, only 1,029 of the 1,576

eligible participants provided an email address at T1, and no other forms of contact information were collected. This introduced coverage error in the T3 data at the point of recruitment, since not all members of the target population were included in the T3 sampling frame (Dillman et al., 2009). Even if the T3 response rate had been 100% of those invited, the data would be subject to bias to the extent that the participants who provided an email address differ from those who did not provide one in meaningful and systematic ways.

Though Interviewee A was asked to recommend other, more preferred means of contact, she did not have any other suggestions. Dillman et al. (2009), though, recommend contacting potential respondents by modes other than email, such as traditional mail, when other forms of contact information are available. In this study, participants were asked to provide only an email address, which severely limited the ability to recruit and remind those participants who failed to respond. However, County Extension Agents routinely collect other forms of contact information, such as mailing address and phone number, when ECETP clients register for in-person training events and clients who use the online learning platform are asked for this type of information as well. With revised informed consent procedures an evaluator, at least within this program, should be able to contact prospective respondents via multiple modes.

Within the discussion about email-based recruitment, two sub-themes emerged: credibility of the email messaging and effective use of multiple contacts.

*Credibility of the messaging.* Despite information about the study procedures given during the training, two interviewees reported that they were not expecting the



follow-up email and would not typically open an email message they did not expect. Interviewee C also indicated that the subject line of the email was important in her decision about opening it. In this case, the email subject line for each contact included some variation of the name of the target training—Healthy Interactions: Promoting Lifelong Nutrition. In the design phase for this study, the training title was selected over the agency name because of a belief among program leaders that some ECETP clients may not know that the program is housed within Texas A&M AgriLife Extension and would be more likely to recognize the name of a training they had recently completed. However, Interviewee C specifically recommended including the name of the agency to enhance the perceived credibility of the emails. This is consistent with recommendations in the tailored design method from Dillman, Smythe, and Christian (2009).

*Multiple contacts.* One participant specifically mentioned that receiving repeated contacts was a motivator for participation. This is supported by the pattern of responses to the follow-up survey. Of the 95 respondents, 46 responded between the first and second contacts, 21 between the second and third contacts, and 28 after the third contact. Each subsequent contact yielded a substantial number of additional responses. It is possible that additional reminders would have yielded even more responses. This is consistent with the recommendation by Dillman et al. to “Use multiple contacts and vary the messages across them” (2009, p. 275). Those authors add that in web-based surveys, the researcher can delay the decision of how many contacts are sufficient, effectively sending as many contacts as continue to yield substantial waves of responses.

Considering the substantial number of respondents after the third contact, it is reasonable to believe that one or more additional contacts might have led to a higher response rate.

**Data management.** One of the secondary themes that arose from the interviews was an issue of data management brought to light by Interviewee B, who believed she had completed the survey but did not recall entering her study ID. The identification numbers used to track and match each participants' data were generated using a method that has been successfully implemented by other AgriLife Extension programs: the participant's first and last initial and the last four digits of their primary phone number. This method successfully generated unique IDs for each participant in all cases except two, which were subsequently differentiated by delivery mode, training date, birth year, and position type and recoded with an additional letter at the end of each to create distinct numbers. Still, there were eight submitted responses to the follow-up survey that did not include an ID number that could be matched with any of the IDs generated at the time of training and two submitted with no ID number at all. Dillman et al. (2009) acknowledge that the use of unique identifiers comes with potential problems such as user typos, confusion with other identification codes the respondents are accustomed to using, and participants forgetting their identification number.

**Time constraints.** Interviewee C also indicated that her busy schedule was a limiting factor on her ability to participate fully in the study. Considering the frequent concerns ECE professionals have expressed about time constraints as a barrier to implementing new strategies in other studies (e.g. Barton et al., 2017; Shannon et al., 2015; Spies et al., 2017), the finding that time could also be a barrier to participating in

research was not entirely surprising. This might also have contributed to the low response rate in the meta-evaluation phase of the study since participating in an interview required setting aside a dedicated block of time in collaboration with the researcher while participants could complete the surveys at their own pace.

### **Limitations**

Non-response issues, operational definitions of the variables of interest, selection effects, and data collection methods limit the generalizability of the conclusions described above.

**Non-response.** While the non-response rate in this study was comparable to other large-scale studies with Texas ECE professionals (e.g. TELC, 2013), it still poses problems in statistical error and power. In this case, it meant that it was not possible to fit the entire proposed regression model with significant statistical power. Non-response also threatens external validity insofar as respondents and non-respondents differ in systematic ways. With guidance from Lindner, Murphy, and Briers (2001), a series of analyses was conducted in this study to explore potential differences between respondents and non-respondents. No differences were found between early and late respondents. However, comparing respondents and non-respondents on known characteristics revealed that respondents were, on average, significantly older, had more years of experience, were more likely to identify as non-Hispanic white, were more likely to have more than a high school diploma, were more likely to work in a home-based ECE operation, and were more likely to have taken the training in person than non-respondents.

Principles of social exchange, as described in by Dillman et al. (2009) suggest that the influence of delivery mode on response rate may be particularly salient. It is reasonable to believe that the social rewards for participating in the study may have been more immediately observable for in-person trainees who heard and saw the instructor describe the project, ask for help, and offer thanks in a face-to-face context. In-person trainees also saw their peers participating in the T1 and T2 surveys, creating a dynamic that Dillman et al. (2009, p. 25) called “social validation.” Engaging with the instructor in real-time may also have served to build in-person trainees’ trust that their participation in the study would, in fact, yield the promised benefits. Since participants self-selected into their training format, there was also the potential for pre-existing differences between people who opted for in-person vs. online PD. Measurable differences in the trainees who selected in-person and online training formats indicate the potential for confounding between the effects of delivery mode and the effects of characteristics of the individuals who tend to select each training format on implementation change and on non-response. With the potential influence of delivery mode on non-response in mind, further analyses were conducted to better define the differences between online and in-person trainees in the interest of a deeper understanding of factors that could contribute to the differences in non-response rates between these two groups. Among in-person trainees, older participants were more likely to respond to the follow-up survey. No other variables of interest had a significant relationship with whether a participant in the in-person subgroup responded to the follow-up survey. Among online trainees, older, more experienced, and more educated participants were more likely to respond to the follow-

up survey, as were non-Hispanic white participants compared with participants of other ethnicities. Coupled with the meta-evaluation results described previously in this section, recruitment procedure for future evaluations can be better tailored to the participants' needs and preferences as recommended by Dillman, Smythe, and Christian (2009), which has the potential to lead to higher response rates.

**Operational definitions.** The validity and usefulness of the overall proposed model is limited by the current operationalization of the model and each of the selected variables. Variables not included in the model could serve as important predictors of implementation change in ECE PD evaluation. For example, Rogers (2003) developed a classification system for an individual's propensity to adopt innovations. A participant's adopter classification could be a relevant component of a model of change for ECE PD, but it was not included in the present study because a precedent for its use was not found in the literature. Similarly, the only characteristic of the training program that was included in this study was delivery mode, but prior studies have suggested that other characteristics, such as perceptions of the instructor or perceptions of the instructional techniques included in a given PD session could also be meaningful predictors of improvements in practice as a result of training (Buysse et al., 2009; Linder et al., 2016). With respect to social influence, Zaslow et al. (2010) suggested that joint participation in ECE PD among staff and administrators from a single facility could contribute to greater improvements in practice, but in this study participants were not asked to report whether their colleagues or supervisors also participated in the target training. Thus, there is

ample opportunity for further exploration into additional factors underlying ECE professionals' use of strategies they learn in PD programs.

Variables and constructs included in the study were limited by the operational definitions used to measure and subsequently analyze them. For instance, ethnicity and education were each coded dichotomously for analyses in this investigation, but the responses indicated much more diversity of ethnicity and education than was reflected in a binomial variable. In the social contextual class of proposed predictors, the adapted UTAUT social influence scale included reference to support from supervisors among other aspects of social support. Brown and Inglis (2013) found that support from administrators may be a particularly important component of social influence, in and of itself, but in this study it was not assessed as a unique contributor to implementation change. Perhaps the most glaring example of limitations due to operationalization was that of facilitating conditions. The adapted UTAUT facilitating conditions scale used in this study failed to reach the accepted threshold for internal consistency, making it impossible to assess the contribution of facilitating conditions to the adoption-decision process or its relationship with other elements of the model. The instrument used to capture behavioral implementation at baseline and follow-up and to compute the dependent implementation change variable had inconsistent reliability between the first and second measurements. Also, not all of the items used in the measure were tested in the NAPSACC reliability and validity study (Benjamin et al., 2007). The measure was used because no other, more robust measures were available in the existing literature

(Ohri-Vachaspati & Leviton, 2010). More robust and sensitive measures would enhance the explanatory capacity of the model in future studies.

**Selection effects.** Despite efforts to control for baseline behavioral differences between participants in the target session, there is still chance that individuals who register for this particular PD session could differ in systematic and meaningful ways from ECETP clients who choose not to take this session, and that ECETP clients may differ from the broader population of ECETP professionals systematically and meaningfully, which is why the study population was explicitly defined as ECETP clients who take this particular PD course. Considering the unexpectedly high proportion of clients who selected the training but were screened as ineligible compared to estimates from previous evaluation efforts, variations between clients who chose to take or not to take the target course are a likely source of error. To more fully understand how elements of the model interact and are associated with the full range of behaviors endorsed by ECE PD programs, systematic replications of this study using a broad set of training sessions targeting different content areas and outcome measures across the scope of the ECETP content repertoire and with training content from other PD providers need to occur.

**Data collection methods.** The data collection methods used in both the evaluation and meta-evaluation portions of this study carry inherent limitations. Self-report measures are known to be subject to bias in that respondents may be motivated to answer survey questions in ways that are not consistent with the intent of the measure (Field, 2013). This phenomenon was observed in the NAPSACC validation study,

wherein the ratings ECE staff gave their own programs were often higher than ratings from an external, trained observer (Benjamin et al., 2007). Thus, while the variables of interest, particularly the scale variables such as perceptions of the innovation, social influence, and implementation, may be used to estimate the relationships and relative importance between elements in the adoption-decision process, they should not be interpreted as precise estimates of the true underlying constructs without further validation testing. The strength of the qualitative meta-analysis procedure was that it was adaptive to the participants' experiences. The drawback of this method was that without reaching saturation—a point in the research process that can be difficult to estimate a priori—it is possible there are important themes that were not uncovered among those who opted not to participate (Merriam & Tisdell, 2016). Improved recruiting procedures and attempts to triangulate the qualitative findings with quantitative data in a mixed-method design could help offset this limitation in other investigations.

### **Recommendations**

Taking into account the findings and limitations at hand, the following recommendations should be applied by practitioners and researchers to further the quality of early childhood professional development evaluation in the AgriLife Extension ECETP and beyond.

**Recommendations for practice.** Those who provide professional development for early childhood educators can implement improvements to their programs and evaluation procedures based on lessons learned in this study.



***Recommendation 1: Continue to implement the Healthy Interactions training.***

Given the significant difference in implementation scores from baseline to follow-up, the ECETP program staff should continue to use this training session to promote improvements in early childhood educators' nutrition and feeding practices. Participants who started with lower levels of use of the target behaviors showed more improvement in their practices, which suggests the program leaders can achieve the greatest impact by targeting ECE professionals who have low levels of use of the target behaviors prior to training. Considering the differences between trainees who selected the online and in-person training modes, this and other training sessions should continue to be offered in both formats to effectively serve the full range of ECETP clientele.

***Recommendation 2: Choose the appropriate measurement schedule to capture both pre-training and post-training behaviors.*** To measure changes in behavior that result from a PD program, ECE PD providers need to conduct at least two measurements of whether and how much their trainees' are using those behaviors. The recommended minimum measurement schedule is to conduct a pre-test measurement prior to exposing participants to any element of the program and a follow-up measurement after the trainee has had time to return to their workplace and potentially apply what they have learned. However, as this study found, sometimes the association between pre-test and post-test scores is in the opposite direction from that which would be expected if the program were effective. One explanation for this phenomenon is that participants do not know enough about the content to accurately assess their pre-test status. As a result they may inadvertently underestimate or—as may be the case here—overestimate their pre-

training use of best practices. If that is the case, more accurate estimates of the program effects can sometimes be obtained using a retrospective pre-test where participants are asked to report their pre-training *and* post-training behaviors after they have completed the training (Rockwell & Kohn, 1989). For example, instead of administering a traditional pre-test, an ECE PD provider could administer a retrospective pre-test at the end of the actual training session, and still conduct a follow-up measurement after the trainees have time to return to work and use what they have learned.

ECE PD program evaluators should carefully consider which method is likely to yield the most accurate data under their circumstances. However, in virtually all cases these evaluations should include some measure of participants' behaviors both before and after the training if the effects are to be attributed to participation in the program. These can be used to calculate changes in behavior by subtracting the baseline score on the outcome measure from the follow-up score. The baseline measurement, regardless of whether it is captured prospectively or retrospectively, should also be used as a control for participants' pre-existing use of the target behaviors to more accurately identify the true program effects (Newcomer et al., 2015).

***Recommendation 3: Tailor evaluation procedures for the ECE professional audience.*** Based on the findings in this study, ECE PD evaluators and others with an interest in surveying ECE professionals have much more evidence to use in adapting procedures for this audience. According to Dillman, Smythe, and Christian (2009) tailoring survey procedures based on knowledge of the population of interest is the key to getting increased response rates and high-quality data. Considering the higher rate of

non-response among online trainees, extra emphasis on tailoring may be necessary to achieve the larger samples necessary for adequate statistical power for testing complex models of change. Consistent with tailored design guidelines and the findings discussed in this chapter, ECE PD evaluators should:

- Assign unique identification codes to each participant and use some form of validation process to ensure they are recorded on all study materials as accurately as possible.
- Collect and use multiple forms of contact information, including email addresses, phone numbers, mailing addresses, and, when appropriate, other means like text messaging, push notifications from program apps, or social media messaging tools.
- Plan the contact schedule to include as many contacts as needed, until subsequent contacts do not yield a substantial quantity of new responses.
- Notify participants of when and how to expect the follow-up invitation during the training, then send a reminder via another form of communication before the invitation.
- Prominently display the organization name in correspondence, particularly email.
- Ensure the data collection procedures are short and to-the-point. Emphasize that feature in recruiting materials.

***Recommendation 4: Identify and/or develop a cadre of behavioral outcome measures.*** In order to measure and analyze changes in ECE professionals' practices related to participation in PD, the field has a critical need for an expanded set of valid

and reliable outcome measures that can be used to operationally define those intended outcomes. This study tested an outcome measure related to a specific set of ECE practices: nutrition and feeding practices that support children's development of healthy nutritional attitudes. ECE PD providers and others who evaluate ECE PD programs would be able to implement evaluation procedures at the behavior change level more readily if there was an easily accessible toolkit of outcome measures available. Unfortunately, the disjointed early childhood education system in Texas and nationwide makes it difficult to suggest one point of reference as the framework for such a repository of instruments. The best starting place might be the list of training topics described by Child Care Licensing (CCL, 2019a; CCL, 2019b) since those topics are applicable to all ECE professionals in Texas. Greater alignment between the library of available training topics, the behaviors they promote, and the measures used to evaluate their outcomes might also reduce the number of trainees who are ineligible for future evaluation studies by further clarifying the target audience for each PD session.

***Recommendation 5: Use the asynchronous online delivery mode to reach large numbers of caregivers.*** In this study, as in the broader ECETP, far more trainees participated in the online version of the training than the in-person version. The popularity of online courses as a source of ECE PD, combined with the finding that there was no significant difference in online and in-person trainees' outcomes in this study, suggests the viability of online PD as a mechanism to promote best practices among large numbers of ECE professionals. Principles of DOI suggest that the ability of asynchronous online PD to reach large numbers of ECE professionals could be an

important mechanism for normalizing the use of best practices in the field. In describing how an innovation diffuses through a social system, Rogers (2003) indicated that the process may start slowly and then reach a tipping point where the rate of adoption increases. This is the point where the innovation transitions from being something new and unfamiliar in the social system to being something most members of the system are familiar with and willing to consider. In other words, if the use of asynchronous online PD can push innovative ECE practices past the tipping point, its impact will ripple beyond the immediate participants.

Another benefit of this approach is the opportunity to monetize ECE PD programs by charging nominal fees to the large pool of prospective clients. For example, one-hour courses like Healthy Interactions: Promoting Lifelong Nutrition are typically offered for \$7 through the ECETP. As mentioned, about 12,000 clients attempted to enroll in the online version of the course. While the course was offered for free for purposes of this study, under normal circumstances this one course could have generated \$84,000 in fee-based revenue for the program. Like many other public entities, the ECETP relies heavily on external partners for funding support, so monetizing online ECE PD represents an important opportunity to enhance the sustainability of this program and others like it.

***Recommendation 5: Capitalize on the potential of social influence as an important lever to drive adoption of best practices.*** The findings in this study suggest that social influence may be a uniquely important factor in understanding ECE professionals' adoption of new strategies. In this study, the items referred specifically to

influential people, management, and the overall organization as sources of social influence. This is consistent with Zaslow et al.'s (2010) recommendation that ECE professionals should engage in PD alongside their coworkers and, ideally, their managers. Providers of ECE PD should actively promote co-participation among professionals who work together. For example, most County Extension Agents who host local ECETP events allow center directors to submit group registration for their entire staff. Some also offer discounts for larger groups of colleagues who register together. The program's online course system also offers the option for administrators to pay for courses for a group of users. Giving administrators the ability to assign and monitor their staff's participation in online courses might further support co-participation among coworkers.

Practitioners in the ECE PD field should also actively encourage buy-in for innovative practices among administrators. Providing complementary training for directors on innovative practices and how to support staff in using them could strengthen trainees' perceptions that their supervisors support their use of the strategies taught in the courses, which Brown and Inglis (2013) found was critically important in teachers' use of new practices. These PD opportunities for directors should include guidance on how to give intentional, supportive feedback as caregivers attempt to use new practices. Based on the findings from Shannon et al. (2015), caregivers who receive supportive feedback may be less likely to discontinue their use of innovative strategies compared with caregivers who receive negative feedback and those who receive no feedback at all.

**Recommendations for research.** The findings and unanswered questions brought to bear in this study can also provide future directions for researchers with an interest in expanding the understanding of mechanisms of change in ECE PD and related fields.

***Recommendation 1: Test the revised model of change in a variety of circumstances.*** One of the key limitations of this study is that the findings cannot be generalized beyond the participants who took the target training and responded to requests for evaluative data. To refine and confirm a theory-driven model of change for ECE PD, researchers need to test the model with systematic variations. For example, the present study could be replicated with the variation that participants be randomly assigned to their training format, rather than choosing it themselves, to determine whether the anticipated effect of age on implementation change among online trainees applies when participants do not have the opportunity to choose their training delivery mode. Another relevant example from the current study would be to replicate the study with a training topic required by Child Care Licensing to determine whether the performance expectancy item related to salary increases contributes to internal consistency of the performance expectancy and/or combined perceptions of the innovations scales when the training topic is mandated and, presumably, valued more highly by the administrators who set the pay scale. Ultimately, the model should be tested with a variety of audiences, instructional formats, and training contents to determine which elements are upheld under which circumstantial variations. The same

general procedures used in this study, with the improved communication strategies recommended for practitioners, can be used to apply the model in these replications.

***Recommendation 2: Conduct additional reliability and validity testing of the measures.*** The adapted measures of social influence and nutrition and feeding practices were tested for reliability and validity with other populations, as were the separate scales for performance expectancy and effort expectancy which were combined in this study to form the perceptions of the innovation scale. While they each had acceptable internal consistency in the present study, further testing would strengthen the case for their use with ECE professionals. Each of these measures could be tested against other established measures to establish their concurrent validity, similar to the validity testing conducted for the NAPSACC measure by comparison with an established observational measure (Benjamin et al., 2007). They should also each be tested at multiple measurement points with a sample of ECE professionals to establish test-retest reliability (Field, 2013).

***Recommendation 3: Identify and test additional variables in each class of variables.*** The Cervero model involves four classes of independent variables: characteristics of the participant, characteristics of the training, characteristics of the innovation, and characteristics of the social context (Cervero & Rottet, 1984). While the variables used in this study were selected based on precedent in the existing behavior change and ECE PD evaluation literature, there are many other variables that could be used to operationalize each variable class to determine the optimal model of change. Characteristics of the participant could include Rogers' (2003) adopter classification, an expanded definition of ethnicity that better represents the diversity of the population, and



expanded definition of educational attainment that reflects the full range of education levels among ECE staff. Characteristics of the training could include characteristics of the instructor and instructional techniques used in the training (Buysse et al., 2009; Linder et al., 2016). Perceptions of the innovation could be measured more extensively using Moore and Benbasat's (1991) perceptions of the innovations scales, which are more time intensive than the adapted UTAUT measure (Venkatesh et al., 2003) but may also be more sensitive due to the larger number of items and subscales included. Additional characteristics of the social context should include measuring joint participation of colleagues in the same PD sessions (Zaslow et al., 2010) and support from supervisors (Brown & Inglis, 2013), and could also include alternate measures of the adequacy of resources for implementation of strategies taught in training in place of the facilitating conditions construct that failed to achieve acceptable internal consistency in this study.

***Recommendation 4: Clarify the sources and effects of social influence on ECE professionals' adoption of best practices taught in PD.*** To fully understand the adoption-decision process that transpires as ECE professionals are faced with implementing new practices, researchers should further investigate the composition of ECE professionals' social systems and which component(s) serve as important source(s) of social influence. As suggested by existing studies and supported in this one, colleagues (Lieber et al., 2009; Shannon et al., 2015; Zalsow et al., 2010) and administrators (Brown & Inglis, 2013; Shannon et al., 2015) are probably important sources of social influence for center-based ECE professionals. However, home-based

ECE professionals often do not have colleagues or supervisors. In this study, though, there was no significant association between social influence and operation type. If home-based caregivers are indeed experiencing the same level of social influence as center-based staff, the influential people and organizational support reflected in the social influence measure might have evoked different meaning for each group. Social influence was a significant predictor of implementation change among center-based trainees, but that relationship was not tested among home-based trainees. Another noteworthy finding is that the associations between social influence and perceptions of the innovation and baseline implementation were significant among online trainees but not in-person trainees, suggesting the delivery mode itself might contain sources of social influence.

To further clarify the sources and effects of social influence in light of these findings, researchers should (a) test whether social influence is a relevant predictor of implementation change after ECE PD among both center-based and home-based caregivers with respect to this and other training topics; (b) identify sources of social influence among home-based caregivers and additional sources among center-based caregivers, such as parents, regulators, coaches, professional associations, or even the children themselves; and (c) conduct systematic studies of the effects on implementation of other sources of social influence that can be embedded within PD programs, such as collaborative instructional activities, video demonstrations, testimonials from other ECE professionals, or opportunities for trainees to engage via facilitated social networking after the training.

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## APPENDIX A

### HEALTHY INTERACTIONS: PROMOTING LIFELONG NUTRITION FULL TEXT



Welcome to “Healthy Interactions: Promoting Lifelong Nutrition.” This 1-hour training will discuss several ways you can use your interactions with young children help them develop a healthy approach to eating that will set them up for nutritional success throughout their lives. My name is Jodi Nerren, and I’m an Extension Program Specialist with Texas A&M AgriLife Extension’s Early Childhood Educator Training Program. Throughout my career in early childhood, I’ve been a teacher, a director, an Education Specialist for a multi-county Head Start program, and, most recently, a trainer. I tell you this because I’ve been where you are, and I realize how hard it is to do what you do, so in this training I’ll recommend some fairly minor things you can do that can make a major difference for the kids you work with.



## Learning Objectives

When you have finished this course, you should be able to:

- Describe several ways you can use interactions to promote healthy nutritional attitudes
- Assess and improve your current approach
- Increase your use of the nutrition education strategies described in this course

When this training is over, you should be able to:

- Describe several ways you can use interactions to promote healthy nutritional attitudes among the children in your care,
- Assess your current approach to promoting nutrition, looking for opportunities to improve, and,
- Increase your use of the strategies described in this course in your own early childhood program.



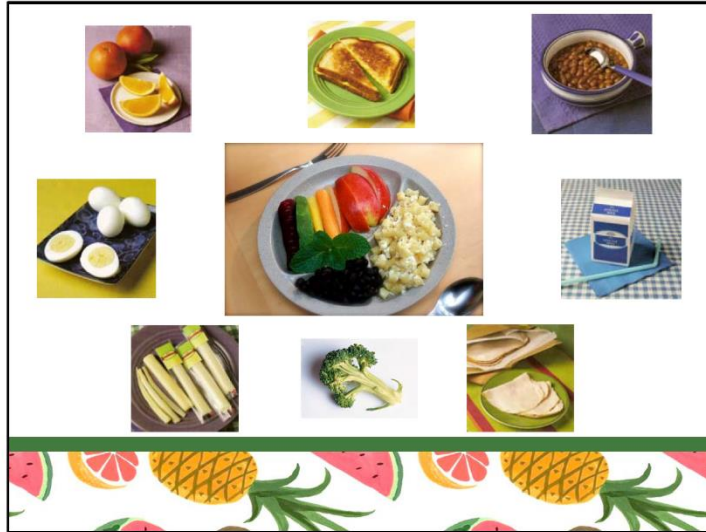
The majority of preschool-age children in the United States spend a portion of their time being cared for by someone other than their parents. In many cases, that means they are with you – early care and education professionals (Centers for Disease Control and Prevention, 2016; Laughlin, 2013). Early childhood educators are responsible for helping children grow and develop in healthy ways...



...But there's a problem. Childhood obesity and overweight are a huge public health concern. According to the Centers for Disease Control and Prevention (2016), 20% of preschool age children in the U.S. are obese or overweight, and these conditions are associated with a variety of health problems both in the present and throughout the lifespan. That's one in every five kids. Poor nutrition is one of the major contributing factors to what some experts have called the "childhood obesity epidemic" (CDC, 2016; Gavin, 2016).



The attitudes toward nutrition and food that children form in early childhood can stay with them through adulthood. (Skinner, Carruth, Bounds, & Ziegler, 2002; Skinner, Carruth, Bounds, Zeigler, & Reidy, 2002; Ventura & Worobey, 2013). There's an old saying that goes, "Give a man a fish, and he'll eat for a day. Teach a man to fish, and he'll eat for a lifetime." It's the same way with teaching a child to eat. A lot of factors influence children's nutritional attitudes, above and beyond the types of food we serve (Ammerman, Ward, Benjamin, Ball, Sommers, Molloy, & Dodds, 2007; Contento, 2008; Ventura & Worobey, 2013).



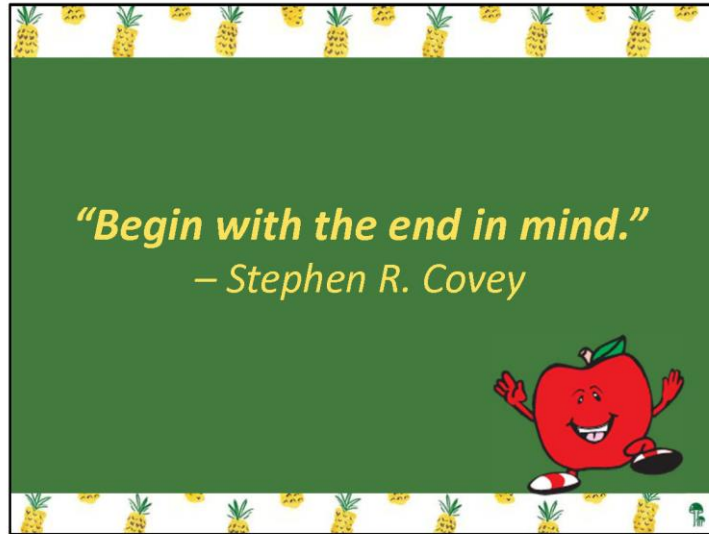
Let's be clear - the food we serve to children does affect their nutrition, now and in the future, and it's an important part of helping them stay healthy. However, giving them healthy foods *and* healthy attitudes about nutrition is the best way to ensure they can lead long, healthy lives. Minimum Standards and Federal guidelines give lots of guidance on what foods we should provide for children in early childhood programs (American Academy of Pediatrics, 2011; Texas Department of Family & Protective Services [TDFPS], 2017).

I know, though, that many of you who work directly with children don't have much say in what kinds of food the children in your program receive. In fact, in all the roles I've held in this field, the only time I got to pick the food was when I was a director. So, if you're not the one who makes those decisions, what can you do to help children learn how to eat healthy? In this course, we will examine several ways you can intentionally encourage children to develop healthy nutritional attitudes through everyday interactions. Since interactions are all about what we're "saying" (and doing) with the children, I've found a motivational saying to go along with each strategy, to help you internalize and remember it.





The first strategy is to let children choose whether and how much to eat from the healthy foods you provide.



Stephen Covey says, “Begin with the end in mind.” What does that mean for us? I always like to remind teachers and parents that someday these young children we see in front of us will be eighteen years old, and when that happens, we’re all going to want them to know how to make good decisions. The only way to make that happen, though, is to give them chances to practice making choices while they’re young, when the stakes of making a mistake are lower and we’re there to support them. That mindset applies to letting children learn how to make choices about all kinds of things, like who to play with, how to spend their free time, how to approach problem-solving tasks, and, most important for our purposes here, whether and how much to eat.



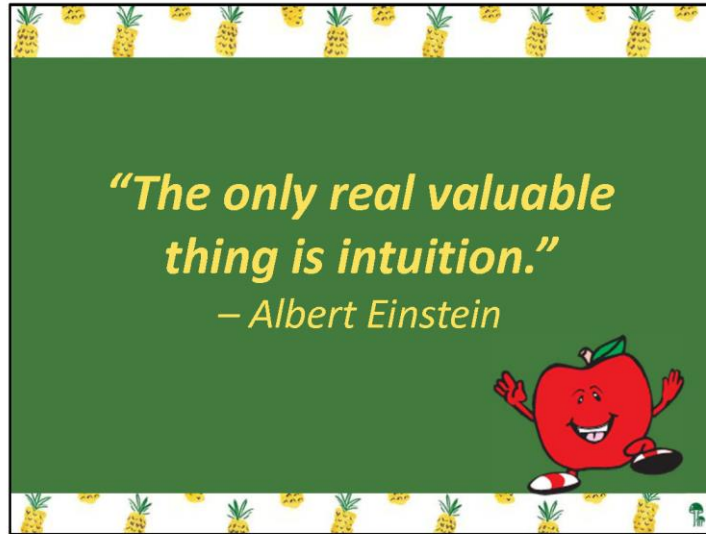
The idea here is that adults and children have different, complementary sets of responsibilities at feeding times (Satter, 2015). Adults are responsible for providing a variety of healthy foods, an appropriate feeding schedule, and a positive, safe eating environment. Children are responsible for deciding whether or not to eat, and, if they do eat, for deciding which foods and how much of each to eat from the choices they are offered. If you only offer healthy foods, you don't have to worry about children filling up on junk at the expense of more nutritious options, so you can give them the freedom to choose from what's available. When we let them practice making decisions, sometimes they'll make decisions that aren't the greatest. Sometimes they'll choose to eat a lot of one thing you offer but not much of anything else, and sometimes they might choose not to eat at all. What's the natural consequence if a child chooses not to eat? Obviously, they'll be hungry later. That's a teachable moment! When they get hungry, you can explain the cause and effect process where choosing not to eat means you'll be hungry later. Then, when it's time to eat again, you can remind them that if they choose not to eat they'll be hungry later. Letting children experience the natural consequences of their choices is exactly how we teach them to make good choices.



One of the best ways to help children practice making decisions about how much to eat is by letting them serve themselves from a common serving dish, ideally using a serving utensil that measures out an age-appropriate portion size (eXtension, 2015). This method is often called “family style” meals, and helps young children learn self-help skills, feel confident in their own independence, and think about how much food they are putting on their plates. One thing some people worry about when children decide how much to serve and eat is food waste. In fact, when children serve themselves, they tend to take less food than they would get if an adult were serving everyone, which leads to less overeating and less food waste (Sigman-Grant, Christiansen, Branen, Fletcher, & Johnson, 2007).



The second strategy is to encourage children to respect their natural feelings of hunger and fullness.



Einstein once said, "The only real valuable thing is intuition." That's not what we might expect to hear from a hardcore scientist, but it sends a powerful message about the importance of trusting your gut. How does that apply to attitudes about food? We now know that one of the benefits of family style dining is that it helps children self-regulate their eating. This taps into their bodies' innate ability to tell when they are hungry and when they are full (eXtension, 2015). When we listen to our bodies' intuitive cues about hunger and fullness, we tend to eat enough food to meet our energy needs, without indulging in the overeating that leads to weight gain and its associated health problems.



Most babies are naturally great at this. In fact, that's part of why regulations and recommendations typically say babies should be fed on-demand – they know when they need to eat, and they know when to stop. Unfortunately, some of the things we commonly do when feeding children can actually teach them to ignore their bodies' natural signals (Gavin, 2014 strategies; Swanson, 2015).

One thing we do that can lead children to ignore their feelings of hunger and fullness is to assume we know better than they do how much they need to eat at each meal and snack. If we want to teach children to trust the messages from their own bodies, we have to start by trusting those messages ourselves! (Swanson, 2015)



Instead of worrying about the quantity of food children are eating, we need to shift the focus to helping them recognize how hungry or full they feel. Think about it: Would you ever ask another adult *how much* they ate at lunch? Probably not. You'd ask them whether or not they're full. We need to apply that same pattern to interacting with children. We can do this by asking questions to get them thinking about how their bodies feel, instead of assuming we know how much they should eat.

For example, when a child polishes off their first serving of snack and requests seconds, you might be tempted to think, "Hmm, clearly he's still hungry, since he finished that so fast!" It's possible he really is still hungry, but it could also be that he ate the first helping so quickly his brain hasn't had time to register the feeling of fullness yet (eXtension, 2015). It takes time for our brains to register those signals! Instead of offering a second helping right away, ask him if he's still hungry. By giving him a chance to "check-in" with his body, you're teaching him to recognize those natural cues, and giving him more time to feel the effect of his first helping (eXtension, 2015).

Likewise, when children look like they're finished with their food, ask them if they feel full, rather than just saying something like "looks like you're all done, so go clean up." This can be particularly helpful when a child doesn't eat much at a meal or snack. Asking them to think about whether they feel full can encourage them to eat more of the healthy foods you've provided. In fact, one research study found that children in child care ate more vegetables when their teachers gave them a clear opportunity to continue eating (Gubbels, Gerards, & Kremer, 2015). Considering children in early childhood programs typically don't



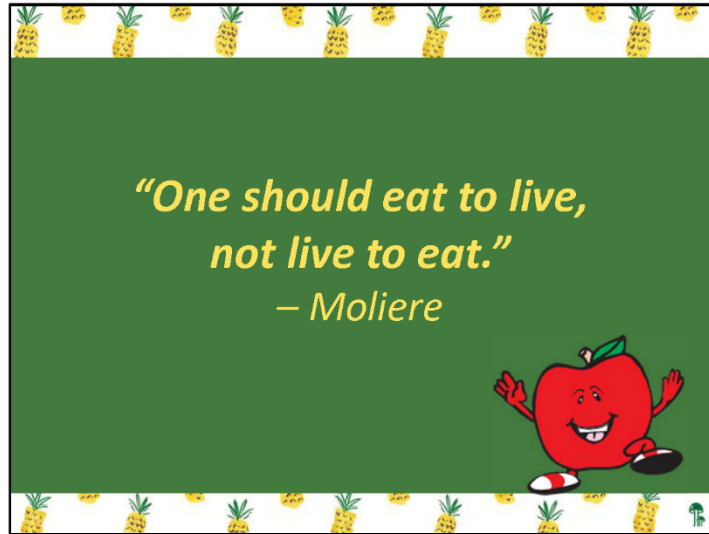
eat enough vegetables to meet dietary guidelines, this technique can help children recognize how full they are *and* get the nutrients their growing bodies need (Ball, Benjamin, & Ward, 2008; Copeland, Neelon, Howald, & Wosje, 2013; Padget & Briley, 2006).



Remember, it is not your responsibility to control how much children eat. Your job is to put healthy food in front of them, schedule meal and snack times, and, as you interact with them, to encourage them to make good decisions about whether and how much to eat (Satter, 2015). It used to be common practice for parents and teachers to encourage, or even require children to “clean their plates.” Today, we know that celebrating a clean plate or forcing children to clean their plates leads to overeating. By focusing on the quantity of food eaten, we’re teaching children to use the amount of food in front of them as the “goal” of a meal, rather than their bodies’ feelings of hunger and fullness (eXtension, 2015; Gavin, 2014 - strategies; Gavin, 2016; Swanson, 2015). Instead of emphasizing a clean plate, we should be saying things like, “Remember, it’s okay to stop eating when your tummy is full.”



The third strategy is a "what not to do". Don't use food to try to change children's feelings or behavior.



There's an old saying attributed to Moliere which says, "One should eat to live, not live to eat." The idea, of course, is that food shouldn't govern our lives. If we want to teach children that food shouldn't govern their feelings or behavior, we have to stop using food to govern their feelings and behavior! We need to help them learn that the purpose of food is to fuel their bodies.

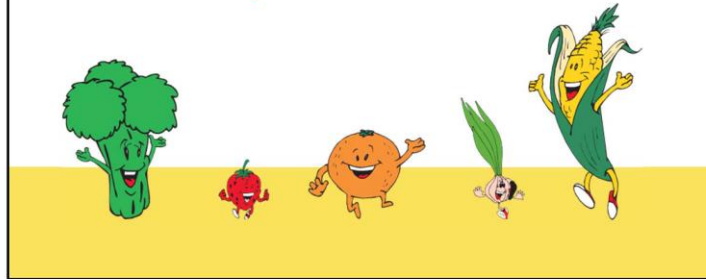


Do any of these statements sound familiar?

- "Poor thing! You're having a rough day. I bet a snack will make you feel better."
- "If you don't use your inside voice, you're not getting any fruit with your snack!"
- "Since you guys did a great job of cleaning up the classroom, we're going to have a special dessert with our lunch today!"
- "Eat your vegetables, and then you can have some chocolate milk."

Food carries powerful emotional connections for most people. In fact, social and emotional experiences related to food have a big influence over the nutritional attitudes and preferences children develop (Contento, 2008). To support healthy nutritional attitudes, our goal should be to send the message to children that eating healthy food is important to give our bodies energy, and to avoid sending unhealthy messages about food that can get in the way healthy attitudes. Whether we mean to or not, we can set children on a path to good or bad habits based on how we interact with them when it comes to food and feelings (Gavin, 2014). Let's think about the statements above again, one by one.

“Poor thing! You’re having a rough day. I bet a snack will make you feel better.”



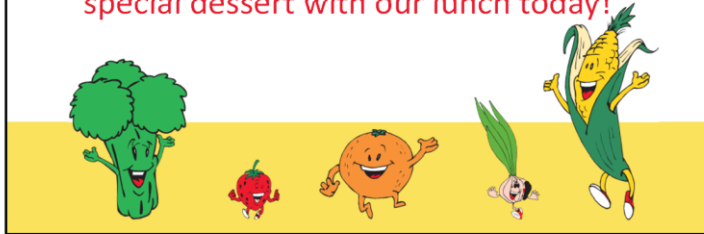
“Poor thing, you’re having a rough day. I bet a snack will make you feel better.” What are we doing when we say this?

We’re using food to comfort a child who is upset or emotional. We’re also teaching the child that food can be used to cope with (or temporarily cover up) unpleasant feelings. That is problematic for a number of reasons. First, it encourages the child to ignore hunger or fullness and eat anyway, so they’re probably taking in calories they don’t actually need. Second, it sets the stage for the child to associate negative or uncomfortable feelings with eating – and as a stress-eater myself, I can tell you that’s a tough pattern to break later in life! Third, it doesn’t actually solve the underlying problems that are making the child upset, so they’re probably still going to feel bad, even if they eat a treat (Gavin, 2014).

“If you don’t use your inside voice, you’re not getting any fruit with your snack!”

*and*

“Since you guys did a great job of cleaning up the classroom, we’re going to have a special dessert with our lunch today!”

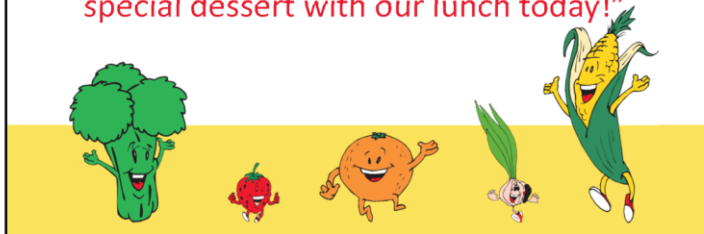


“If you don’t use your inside voice, you’re not getting any fruit with your snack.” and “Since you guys did a great job cleaning up the classroom, we’re going to have a special dessert with our lunch today!” These next two are actually two sides of the same coin. While one involves taking away a food the child likes as a punishment for undesirable behavior and the other is using food as a reward for positive behavior, the goal of both is to control children’s behavior using food. That’s not okay! In fact, Texas Minimum Standards for Child Care explicitly prohibit using food as a reward or using any punishment associated with food (DFPS, 2017a; DFPS, 2017b). This is so problematic, it’s literally against the law to do it, so that tells you it’s pretty important. One problem with using food to manage behavior is that it teaches children that some foods are more valuable than others based on how enjoyable they are, usually by how *sweet* they are, instead of based on how healthy they are for our bodies (eXtension, 2015; Gavin, 2014; Gavin, 2016). Kids, especially those who experience food insecurity at home, might feel really insecure if they feel like their food is going to be taken away or withheld in your program. If a child is afraid her food is going to be taken away or she won’t have access to food later, she’s likely to eat too much, too quickly whenever she has the chance (eXtension, 2015).

“If you don’t use your inside voice, you’re not getting any fruit with your snack!”

*and*

“Since you guys did a great job of cleaning up the classroom, we’re going to have a special dessert with our lunch today!”



“If you don’t use your inside voice, you’re not getting any fruit with your snack.” and “Since you guys did a great job cleaning up the classroom, we’re going to have a special dessert with our lunch today!” These next two are actually two sides of the same coin. While one involves taking away a food the child likes as a punishment for undesirable behavior and the other is using food as a reward for positive behavior, the goal of both is to control children’s behavior using food. That’s not okay! In fact, Texas Minimum Standards for Child Care explicitly prohibit using food as a reward or using any punishment associated with food (DFPS, 2017a; DFPS, 2017b). This is so problematic, it’s literally against the law to do it, so that tells you it’s pretty important. One problem with using food to manage behavior is that it teaches children that some foods are more valuable than others based on how enjoyable they are, usually by how *sweet* they are, instead of based on how healthy they are for our bodies (eXtension, 2015; Gavin, 2014; Gavin, 2016). Kids, especially those who experience food insecurity at home, might feel really insecure if they feel like their food is going to be taken away or withheld in your program. If a child is afraid her food is going to be taken away or she won’t have access to food later, she’s likely to eat too much, too quickly whenever she has the chance (eXtension, 2015).



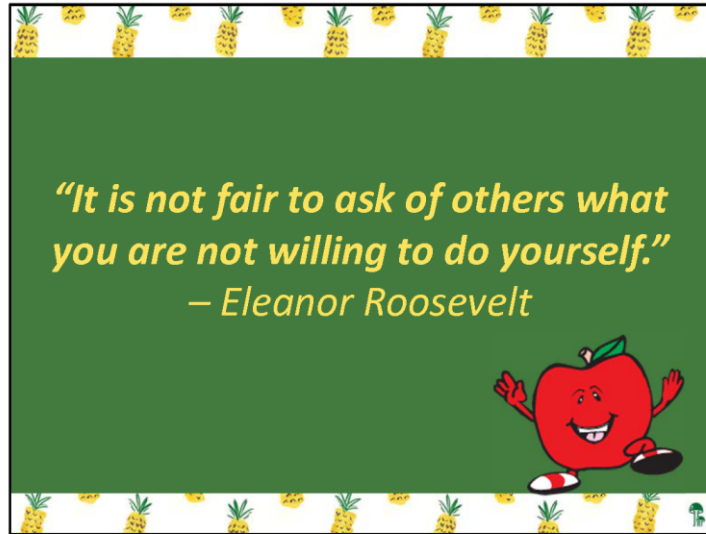


If we're in this for the long-haul, we definitely need to encourage children to eat new foods and to have variety in their diet, but we shouldn't coerce, manipulate, or force them to eat anything (eXtension, 2015; Gavin, 2014; Swanson, 2015). Think about those words – coerce, manipulate, force. Do they have a positive or a negative connotation to you? ...To me they're pretty negative. We certainly use lots of strategies to encourage and support children making good choices, but when we cross the line into manipulation, we've probably gone too far.

Like we said earlier, if you consistently provide a variety of healthy foods at every meal and snack, and don't include less healthy alternatives, you can give children the freedom to decide whether and how much of each food to eat (Satter, 2015). Over time, if they are exposed to a variety of healthy options on a regular basis, most children will learn to eat many different healthy foods (eXtension, 2015; Gavin, 2014; Satter, 2015; Swanson, 2015).



The next strategy is to be a good nutritional role model.



According to Eleanor Roosevelt, "It is not fair to ask of others what you are not willing to do yourself." Another way to say this might be "practice what you preach," and it makes perfect sense when it comes to working with young children. One of the fundamental ways children learn is by watching what other people do and the consequences they experience, especially the important adults and peers in their lives. Given the amount of time you spend with the children in your program, you have the opportunity and the responsibility to serve as a positive role model for all kinds of behaviors, including healthy eating (Contento, 2008; eXtension, 2015; Gavin, 2016; Sigman-Grant, et al., 2007; Swanson, 2015).



Modeling healthy attitudes about food is a process. The first step is to sit with the children during meals and snacks. If the children can't see you eating, they can't see you eating healthy foods. In addition to making your positive behaviors more visible, sitting with the children also allows you to engage in conversations to make eating more pleasant, to assist children who need help serving or feeding themselves, and to monitor for unsafe or inappropriate behavior at the table (like sharing food or touching the serving end of serving utensils) (eXtension, 2015; Swanson, 2015)



The next step to modeling healthy nutritional behavior is to *not* eat unhealthy food in front of the kids. Have you heard the old saying, “Monkey see, monkey do”? I’m pretty sure whoever came up with that was watching a bunch of preschoolers. What does it have to do with healthy eating? Well, when the important grown-ups in a child’s life eat fast food and sweets, children want to eat those things, too. The whole point of being a role model is to show children the behavior we want them to use. If we want them to make healthy food choices in the long run, we can’t be hypocrites (Gavin, 2014). So, instead of eating unhealthy food when children are watching, you should...



Eat the same food they are eating. Sitting with the children and eating the same food gives you a chance to demonstrate appropriate portion sizes and talk about your own feelings of hunger and fullness. You can make it even more educational by talking about the taste, texture, size, shape, color, smell, appearance, and even sound of the different foods you serve, which can make meals and snacks more engaging and appealing for the children (eXtension, 2015 – make mealtimes pleasant; eXtension, 2015 – take time to savor; eXtension, 2015; Gavin, 2014). And to be the best role model you can be, you also need to...

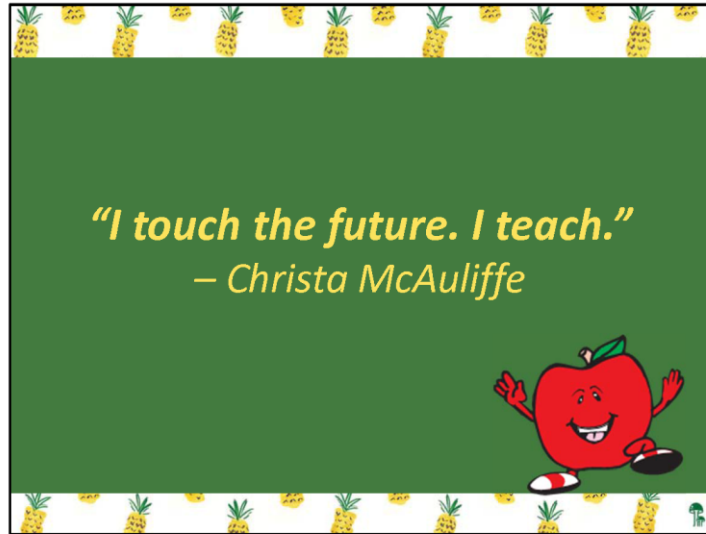


Be enthusiastic about eating healthy foods! Researchers have found that simply eating healthy foods with children at meals and snacks has less of an impact on the choices children make than how we express our feelings about those foods (Addessi, Galloway, Visalberghi, & Berch, 2006; Hendy & Raudenbush, 1999). It makes sense that children who see you eat carrots like it's no big deal will be less excited about eating carrots than children who hear you talk about how delicious the carrots are while you eat them (eXtension, 2015). Making a point of commenting on how delicious a new food is can help children get over any fears about trying it themselves, too! You probably already know that acting is an important job skill for any early childhood professional. Even if you don't love the food the kids are eating, there's no reason they need to know that. I'm not a big fan of tomatoes, but if tomatoes are part of snack, I'm going to eat them and make comments like, "Wow! Look how juicy and red our tomatoes are today! They look so fresh!" I didn't technically say I liked the taste of the tomatoes, but I still conveyed a lot of excitement that the kids will pick up on.



The last strategy we'll talk about today is to create opportunities to teach healthy nutrition.





Christa McAuliffe put our whole profession into perspective when she said, “I touch the future. I teach.” Everything you do, from the way you greet children in the morning to the way you rearrange toys at the end of the day after the last child has left sends messages to the children in your care, and many of those messages will shape them well into the future. So, no pressure, but everything you do matters. Just like everything else, when it comes to nutrition, we want to make sure we’re sending the right messages.

We need to teach nutrition just like any other topic. We don’t expect children to learn to read, write, do math, or conduct science experiments unless we actively teach them how. Helping them eat healthy works the same way. We need to be intentional about creating opportunities to teach nutrition. We can do this by using formal nutrition education lessons and by incorporating nutrition-related elements into your routines, activities, environments, and materials. As children show interest, you have a natural opportunity to reinforce and expand their healthy attitudes about food. There are a number of curriculum packages available with lesson plans focused on nutrition education, but even if you don’t have access to pre-written lessons, you can still infuse your program with nutrition education messages. Here are some examples:



Reading stories about healthy foods...

Reading stories about a particular food at circle time, and then serving that type of food during meals and snacks gives you a chance to get children talking with you and with each other. This can be a useful strategy when you want to get children excited about trying a food they haven't experienced before (eXtension, 2015). For example, the Very Hungry Caterpillar eats some healthy foods and some not-so-healthy foods. The book doesn't talk about that directly, but I sure do when I read it with kids!



Another idea is doing simple cooking activities where the children get to help prepare their food. This allows children to exercise their fine motor skills while you talk with them about the ingredients that make up what they eat. Find small jobs that young children can safely do, like stirring, pouring, sprinkling, or spreading (eXtension, 2015; Gavin, 2014). If you're worried about health department requirements, you can do these activities 1-to-1, so that each child prepares his or her own snack or meal. For example, each child could get a whole grain bagel, a small cup of tomato sauce, and a small portion of low-fat mozzarella cheese. Using an age-appropriate spreader, each person can spread the sauce on the bagel and then sprinkle the cheese to make their own bagel pizza!



Another way to get kids talking about healthy food is by growing a garden with healthy foods like vegetables, fruits, and herbs. When children get to help plant, tend, and pick their own food items, they may also be more likely to eat them (eXtension, 2016),



Talking about ingredients in your food...

Even if the children aren't preparing or growing it themselves, you can still get them talking about the ingredients in their meals and snacks (Gavin, 2014). Learning that some foods are made up of several components, and that some ingredients are better for us than others, is a critical concept if we want children to know how to make good decisions about their own food later in life,



Displaying pictures of healthy foods throughout your building also helps pave the way for teachable moments about nutrition (eXtension, 2016). When children show interest in the images around them, you have a natural opportunity to engage them in conversations about how eating healthy foods helps our bodies grow. This is similar to what we do when we post lots of words around the classroom so children start to notice them and we can talk about letters and their sounds and words and their meanings.



Incorporating the concept of healthy food choices into the centers children choose from during child-led play creates many more opportunities to promote the importance of a healthy diet. It also helps children feel familiar and at ease with a variety of healthy foods. You can add elements of nutrition in virtually every area available during free-choice play. For example, you could encourage children to draw or paint pictures of their favorite healthy foods in the art center or provide fruit shaped manipulatives for children to sort and count (eXtension, 2016). You have a handout called "Nutrition All Around" with some suggestions and spaces for you to fill in your own ideas. Take a look at that and see what you can come up with!

A slide titled "Review" with a decorative border of citrus slices (lemons and limes) on the left side. The title "Review" is in green. The content consists of five bullet points in orange text, each starting with "Strategy X:".

**Review**

- **Strategy 1:** Let children choose whether and how much to eat from the healthy foods you provide.
- **Strategy 2:** Teach children to respect their natural feelings of hunger and fullness.
- **Strategy 3:** Don't use food to try to change children's feelings or behavior.
- **Strategy 4:** Be a good nutritional role model.
- **Strategy 5:** Create opportunities to teach healthy nutrition.

Throughout this course, we have looked at several different strategies that you can use to emphasize healthy nutritional attitudes through your interactions with young children. We've learned that what we say and do in early childhood matters, because the relationship children have with food now can affect how they eat for the rest of their lives. Let's review the five key strategies we discussed, that you can use to promote healthy attitudes about food for the children in your care:

- Strategy 1: Let children choose whether and how much to eat from the healthy foods you provide.
- Strategy 2: Teach children to respect their natural feelings of hunger and fullness.
- Strategy 3: Don't use food to try to change children's feelings or behavior.
- Strategy 4: Be a good nutritional role model.
- Strategy 5: Create opportunities to teach healthy nutrition.

By applying these strategies to your interactions with the children in your program, you can set them on a path toward a lifetime of healthy eating.





Please take a few minutes to fill out the wrap-up questionnaire. Remember to enter your ID number exactly the way you did on your first packet. This section will give us more information about the types of programs where you work and how you feel about the things we've learned today. Some of you will receive a request to participate in a follow-up survey later on, to tell us about whether and how you're using the things you learned here today. That survey will be online, and should only take a few minutes to complete.




Thank you for your attention, and for your commitment to helping today's young children grow up to lead healthy lives. Please feel free to email me or contact your County Extension Agent if you have questions!




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APPENDIX B  
PRE-TEST SURVEY\*

## Dissertation Survey - Pre-test

Start of Block: Default Question Block

\*

Q1 Please create your participant identification number by writing the first letter of your first name, the first letter of your last name, and the last four digits of your primary phone number. You will be asked to remember this ID number later.

\*

Q11 Some trainees will be selected to participate in a follow-up survey about 30 days after this training. Those who are selected will be eligible to receive a free 1-clock hour training after completing the follow-up survey. The follow-up survey will be sent by email.

If you are willing to participate in the follow-up survey, please enter your email address below.

\*


Q2 Date of training

Q4 Do you live and work in the State of Texas?

Yes (1)

No (2)

*Skip To: End of Survey If Do you live and work in the State of Texas? = No*

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\*Items in this instrument were adapted with permission from the Go NAP SACC Self-Assessment. Ward DS, Morris E, McWilliams C, Vaughn A, Erinosh T, Mazzucca S, Hanson P, Ammerman A, Neelon SE, Sommers JK, Ball S. (2014). Go NAP SACC: Nutrition and Physical Activity Self-Assessment for Child Care, 2nd edition. Center for Health Promotion and Disease Prevention and Department of Nutrition, University of North Carolina at Chapel Hill. [www.gonapsacc.org](http://www.gonapsacc.org).

Q5 Are you taking this training online or in person?

- Face to face (1)
- Online (2)

*Skip To: End of Block If Are you taking this training online or in person? = Online*

\*

Q6 In what city is this training being held?

\_\_\_\_\_

End of Block: Default Question Block

Start of Block: Block 1

Q8 In this section, we'd like you to tell us about yourself as an early childhood educator. This will help us understand who participates in our trainings, so we can better meet our participants' needs.

Q14 Which age group(s) do you personally care for?

- Infants (0 to 17 months) (1)
- Toddlers (18 to 35 months) (2)
- Pre-Kindergarten (3 to 6 years) (3)
- School Age (6+ years) (4)

*Skip To: End of Survey If Which age group(s) do you personally care for? != Pre-Kindergarten (3 to 6 years)*



Q12 Which of these options best describes the type of program you work for?

- Licensed or Registered Child Care Home (1)
  - Listed Child Care Home (2)
  - Child Care Center (3)
  - Other (4) \_\_\_\_\_
- 

Q9 What is your current position?

- Lead Teacher/Caregiver (1)
- Assistant Teacher/Caregiver (2)
- Center Administrator/Director (3)
- Home Administrator/Primary Caregiver (4)
- Consultant/Trainer (5)
- Other (6) \_\_\_\_\_

*Skip To: End of Survey If What is your current position? = Center Administrator/Director*

*Skip To: End of Survey If What is your current position? = Consultant/Trainer*

---



Q15 How many years have you worked in the early childhood field?

\_\_\_\_\_

---



Q10 What year were you born? (YYYY)

\_\_\_\_\_



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Q11 What's the highest level of education you have completed?

- Less than a high school diploma (1)
  - High school diploma or equivalent (2)
  - Child Development Associate (CDA) or other professional certification (3)
  - Associate's degree (4)
  - Bachelor's degree (5)
  - Graduate degree (e.g. M.S. or Ph.D.) (6)
- 

Q13 How would you describe your race/ethnicity? (Select all that apply)

- African-American/Black (1)
- Hispanic/Latino (2)
- Caucasian/White (3)
- Asian/Pacific Islander (4)
- Native American (5)
- Other (6)

End of Block: Block 1

---

Start of Block: Block 2

Q16 In this section, we'd like you to tell us about your interactions with children, especially as they relate to food and nutrition.

Answer each question as best you can, thinking about your general practices. If none of the

answer choices seems quite right, just pick the closest fit. If a question does not apply to your program, move to the next question.

---

Q17 Meals and snacks are served to preschool children\* in the following way:

\*This refers to preschool children who are developmentally ready to choose and serve foods themselves.

- I serve children their plates with set portions of each food (1)
  - I portion out servings to children at the table (2)
  - Children serve some foods themselves, while I plate or serve other foods (3)
  - Children always choose and serve most or all foods themselves (4)
- 

Q18 I eat and drink the same foods and beverages as children during meal and snack times:

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Always (4)
-

Q19 I eat or drink unhealthy foods or beverages in front of children:

- Always (1)
  - Often (2)
  - Sometimes (3)
  - Rarely or never (4)
- 

Q20 I enthusiastically role model\* eating healthy foods served at meal and snack times:

\*Enthusiastic role modeling is when you eat healthy foods in front of children and show how much you enjoy them. For example, you might say, "Mmm, these peas taste yummy!"

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Every meal and snack time (4)
-

Q21 My program's collection of posters, books, and other learning materials\* that promote healthy eating includes:

\*Learning materials that promote healthy eating can include books about healthy eating habits, MyPlate posters, pictures of fruits and vegetables, healthy play foods, fruit or vegetable garden areas, and bowls of fruit.

- Few or no materials (1)
  - Some materials with limited variety (2)
  - A variety of materials (3)
  - A large variety of materials with new items added or rotated seasonally (4)
- 

Q22 My program's collection of posters, books, and other learning materials\* that promote unhealthy foods includes:

\*Learning materials that promote unhealthy eating can include books or games about unhealthy foods, pictures or posters of unhealthy foods, unhealthy play foods, and bowls of candy.

- A large variety of materials with new items added or rotated seasonally (1)
  - A variety of materials (2)
  - Some materials with limited variety (3)
  - Few or no materials (4)
-

Q23 I praise children for trying new or less preferred foods:

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Always (4)
- 

Q24 When children eat less than half of a meal or snack, I ask them if they are full before removing their plates:

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Always (4)
- 

Q31 When children request seconds, I ask them if they are still hungry before serving more food:

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Always (4)
-

Q25 I require that children sit at the table until they clean their plates:

- Every meal and snack time (1)
  - Often (2)
  - Sometimes (3)
  - Rarely or never (4)
- 

Q26 I use an authoritative feeding style:\*

\*An authoritative feeding style strikes a balance between encouraging children to eat healthy foods and allowing children to make their own food choices. A provider might encourage a child to eat broccoli by reasoning with him/her about its taste and benefits, instead of using bribes or threats.

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Every meal and snack time (4)
-

Q27 I use\* children's preferred foods to encourage them to eat new or less-preferred foods:

\*This can include offering a treat only if a child finishes his/her vegetables, or taking away a treat if a child does not finish his/her vegetables.

- Every meal and snack time (1)
  - Often (2)
  - Sometimes (3)
  - Rarely or never (4)
- 

Q28 I use food to calm upset children or encourage appropriate behavior:

- Every day (1)
  - Often (2)
  - Sometimes (3)
  - Rarely or never (4)
- 

Q29 I lead planned nutrition education:\*

\*Planned nutrition education can include circle time lessons, story time, and cooking and gardening activities.

- Rarely or never (1)
  - 1 time per month (2)
  - 2-3 times per month (3)
  - 1 time per week or more (4)
-



Q30 I talk with children informally about healthy eating:

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Each time I see an opportunity (4)
- 

Q33 Adapted from Ward, D., Morris, E., McWilliams, C., Vaughn, A., Erinosh, T., Mazzuca, S., ... Ball, S. (2014a). *Go NAP SACC: Nutrition and physical activity self-assessment for child care, family child care edition*. Chapel Hill, NC: Center for Health Promotion and Disease Prevention and Department of Nutrition, University of North Carolina at Chapel Hill. Retrieved from [www.gonapsacc.org](http://www.gonapsacc.org)

End of Block: Block 2

---

APPENDIX C\*  
POST-TEST SURVEY

## Dissertation Survey - Post-Test

Start of Block: Default Question Block

\*

Q1 Please enter your participant ID. Remember, your participant ID is your first initial, your last initial, and the last 4 digits of your primary phone number.

---

Q2 In this section, we'd like you to tell us what you think about the strategies presented in this training.

---

Q3 I would find these strategies useful in my job.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
- 

\*Items in this instrument were adapted with permission from the authors and publisher from V. Venkatesh, M. G. Morris, G. B. Davis, and F. D. Davis, "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly* (27:3), 2003, pp. 425-474. Copyright © 2003, Regents of the University of Minnesota. Used with permission.

Q4 Using these strategies will enable me to accomplish tasks more quickly.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
- 

Q5 Using these strategies will increase my productivity.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
-

Q6 If I use these strategies, I will increase my chances of getting a raise.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
- 

Q7 Using these strategies would be clear and understandable.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
-

Q8 It would be easy for me to become skillful at using these strategies.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
- 

Q9 I would find these strategies easy to use.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
-

Q10 Learning to use these strategies is easy for me.

- Strongly disagree (1)
- Somewhat disagree (2)
- Slightly disagree (3)
- Neither agree nor disagree (4)
- Slightly agree (5)
- Somewhat agree (6)
- Strongly agree (7)

---

Q12 Adapted from: Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478. Retrieved from <https://www.misq.org/>

End of Block: Default Question Block

---

## APPENDIX D\*

### FOLLOW-UP SURVEY

#### Dissertation Survey - Follow-Up

Start of Block: Default Question Block

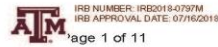
Q25 In this section, we'd like you to tell us about your interactions with children, especially as they relate to food and nutrition, since you completed the Healthy Interactions: Promoting Lifelong Nutrition training session.

Answer each question as best you can, thinking about your general practices. If none of the answer choices seems quite right, just pick the closest fit. If a question does not apply to your program, move to the next question.

Q27 Meals and snacks are served to preschool children\* in the following way:

\*This refers to preschool children who are developmentally ready to choose and serve foods themselves.

- I serve children their plates with set portions of each food (1)
- I portion out servings to children at the table (2)
- Children serve some foods themselves, while I plate or serve other foods (3)
- Children always choose and serve most or all foods themselves (4)



\*Items in this instrument were adapted with permission from the Go NAP SACC Self-Assessment. Ward DS, Morris E, McWilliams C, Vaughn A, Erinosh T, Mazzucca S, Hanson P, Ammerman A, Neelon SE, Sommers JK, Ball S. (2014). Go NAP SACC: Nutrition and Physical Activity Self-Assessment for Child Care, 2nd edition. Center for Health Promotion and Disease Prevention and Department of Nutrition, University of North Carolina at Chapel Hill. [www.gonapsacc.org](http://www.gonapsacc.org).

\*Items in this instrument were adapted with permission from the authors and publisher from V. Venkatesh, M. G. Morris, G. B. Davis, and F. D. Davis, "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly* (27:3), 2003, pp. 425-474. Copyright © 2003, Regents of the University of Minnesota. Used with permission.

Q5 I eat and drink the same foods and beverages as children during meal and snack times:

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Always (4)
- 

Q7 I eat or drink unhealthy foods or beverages in front of children:

- Always (1)
  - Often (2)
  - Sometimes (3)
  - Rarely or never (4)
- 

Q9 I enthusiastically role model\* eating healthy foods served at meal and snack times:

\*Enthusiastic role modeling is when you eat healthy foods in front of children and show how much you enjoy them. For example, you might say, "Mmm, these peas taste yummy!"

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Every meal and snack time (4)
- 

Q29 My program's collection of posters, books, and other learning materials\* that promote healthy eating includes:



\*Learning materials that promote healthy eating can include books about healthy eating habits, MyPlate posters, pictures of fruits and vegetables, healthy play foods, fruit or vegetable garden areas, and bowls of fruit.

- Few or no materials (1)
  - Some materials with limited variety (2)
  - A variety of materials (3)
  - A large variety of materials with new items added or rotated seasonally (4)
- 

Q31 My program's collection of posters, books, and other learning materials\* that promote unhealthy foods includes:

\*Learning materials that promote unhealthy eating can include books or games about unhealthy foods, pictures or posters of unhealthy foods, unhealthy play foods, and bowls of candy.

- A large variety of materials with new items added or rotated seasonally (1)
  - A variety of materials (2)
  - Some materials with limited variety (3)
  - Few or no materials (4)
- 

Q13 I praise children for trying new or less preferred foods:

- Rarely or never (1)
- Sometimes (2)
- Often (3)
- Always (4)

-----  
Q33 When children eat less than half of a meal or snack, I ask them if they are full before removing their plates:

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Always (4)
- 

Q35 When children request seconds, I ask them if they are still hungry before serving more food:

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Always (4)
- 

Q15 I require that children sit at the table until they clean their plates:

- Every meal and snack time (1)
  - Often (2)
  - Sometimes (3)
  - Rarely or never (4)
- 

Q19 I use an authoritative feeding style:\*

\*An authoritative feeding style strikes a balance between encouraging children to eat healthy foods and allowing children to make their own food choices. A provider might encourage a child to eat broccoli by reasoning with him/her about its taste and benefits, instead of using bribes or threats.

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Every meal and snack time (4)
- 

Q23 I use\* children's preferred foods to encourage them to eat new or less-preferred foods:

\*This can include offering a treat only if a child finishes his/her vegetables, or taking away a treat if a child does not finish his/her vegetables.

- Every meal and snack time (1)
  - Often (2)
  - Sometimes (3)
  - Rarely or never (4)
- 

Q21 I use food to calm upset children or encourage appropriate behavior:

- Every day (1)
  - Often (2)
  - Sometimes (3)
  - Rarely or never (4)
-

Q11 I lead planned nutrition education:\*

\*Planned nutrition education can include circle time lessons, story time, and cooking and gardening activities.

- Rarely or never (1)
  - 1 time per month (2)
  - 2-3 times per month (3)
  - 1 time per week or more (4)
- 

Q17 I talk with children informally about healthy eating:

- Rarely or never (1)
  - Sometimes (2)
  - Often (3)
  - Each time I see an opportunity (4)
- 

Q30

Adapted from: Ward D, Morris E, McWilliams C, Vaughn A, Erinosh T, Mazzucca S, Hanson P, Ammerman A, Neelon S, Sommers J, Ball S. (2014). Go NAP SACC: Nutrition and Physical Activity Self Assessment for Child Care, Family Child Care Edition. Center for Health Promotion and Disease Prevention and Department of Nutrition, University of North Carolina at Chapel Hill. Available at: [www.gonapsacc.org](http://www.gonapsacc.org).

End of Block: Default Question Block

---

Start of Block: Block 1

Q20 In this section, we'd like to hear about the process of using the strategies you learned in this training in your workplace.

---

Q21 People who influence my behavior think that I should use these strategies.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat Agree (6)
  - Strongly agree (7)
- 

Q22 People who are important to me think that I should use these strategies.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
-

Q23 The management of my child care program has been helpful in the use of these strategies.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
- 

Q24 In general, my organization has supported the use of these strategies.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
-

Q25 I have the resources necessary to use these strategies.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
- 

Q26 I have the knowledge necessary to use these strategies.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
-

Q27 These strategies are not compatible with other strategies I use.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
- 

Q28 A specific person (or group) is available for assistance with using these strategies.

- Strongly disagree (1)
  - Somewhat disagree (2)
  - Slightly disagree (3)
  - Neither agree nor disagree (4)
  - Slightly agree (5)
  - Somewhat agree (6)
  - Strongly agree (7)
- 

Q31 Adapted from: Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478. Retrieved from <https://www.misq.org/>

End of Block: Block 1

---



Start of Block: Block 2

Q29 To express our gratitude for completing this survey, we'd like to offer the chance to participate in a free 1-clock hour training webinar. The webinar link will be sent to the email address where you received the link to this survey. During the webinar, you will be asked to provide your name so we can issue a certificate verifying your completion of the webinar training, as required by Child Care Licensing. To protect your confidentiality, the name and email address you provide for your certificate will be stored in a separate location from the materials for this study, to reduce the risk that someone could link your name to your individual survey responses.

End of Block: Block 2

---

## APPENDIX E

### META-EVALUATION INTERVIEW PROTOCOL

#### Semi-Structured Interview Protocol

Thank you for agreeing to talk with me today. I know your time is valuable, and I appreciate you sharing some of it to help us improve our training program and ECE training in general. Just a reminder, your participation is totally voluntary. You don't have to answer any questions that make you uncomfortable, and you can stop the interview at any time.

Before we get to the interview questions, can you confirm your Participant ID? That's the ID code you created when you completed the Pre-Test survey when you took the Healthy Interactions: Promoting Lifelong Nutrition training. It should be the first letter of your first name, the first letter of your last name, and the last 4 digits of the phone number you use most often. Since I won't be asking for your name or any other identifiable information, your participant ID will be used to match up your interview answers with other materials from the study.

I'd like to confirm that you're okay with having this interview recorded. The recordings will only be available to researchers working on this study, and again I won't ask for your name or any other identifying information. After the interview, myself and another researcher will create a transcript of what you said. If you happen to say anything identifiable, such as your name or the name of your child care program, we'll remove that information from the written transcript. Once we both agree the transcripts of all the interviews are complete and accurate, we'll delete the audio recordings. Recording the interview will help me make sure I have an accurate record of what you have to say. If you consent to being recorded please say "I agree to have this interview recorded".

#### Interview Questions:

- You responded to the pre-test and post-test surveys for this study, but not the follow-up survey a month later. Why is that?
- What could we have done differently to get you to fill out the follow-up survey?

Thank you so much for your time and insights. Once the interviews are over, we'll do a random drawing for the Fitbit Alta. If you are chosen, I'll be in touch to get your shipping address. If you have any questions after this, you're always welcome to contact me by phone at (979) 845-1850 or email at [jodi.nerren@ag.tamu.edu](mailto:jodi.nerren@ag.tamu.edu).



IRB NUMBER: IRB2019-0624  
IRB APPROVAL DATE: 06/19/2019

## APPENDIX F

### EVALUATION RECRUITMENT EMAILS

#### Initial Contact:

Howdy! You've been selected to participate in a short follow-up survey about the Healthy Interactions: Promoting Lifelong Nutrition training you completed about a month ago through the Texas A&M AgriLife Extension Service's Early Childhood Educator Training Program. The survey can be found at [https://agrilife.az1.qualtrics.com/jfe/form/SV\\_ctKcWNyCKmF81DL](https://agrilife.az1.qualtrics.com/jfe/form/SV_ctKcWNyCKmF81DL), and should take about 5-10 minutes to complete.

Your input will help us ensure the training we provide is useful and effective. Only a limited number of trainees were selected to complete the follow-up survey, so your answers are very important! To thank you for your time and effort, you will receive access to an exclusive, free 1-clock hour webinar training after you complete the survey. Again, the survey is available at [https://agrilife.az1.qualtrics.com/jfe/form/SV\\_ctKcWNyCKmF81DL](https://agrilife.az1.qualtrics.com/jfe/form/SV_ctKcWNyCKmF81DL).

Thank you in advance for your help!

Jodi Nerren  
Extension Program Specialist – Child Health & Development  
Texas A&M AgriLife Extension, Family & Community Health

#### Reminder 1:

Howdy! A few days ago, you received an email invitation to complete a follow-up survey about the Healthy Interactions: Promoting Lifelong Nutrition training you participated in through AgriLife Extension. If you've already completed the survey, I want to express again how grateful we are for your help. Your answers allow us to better understand how to provide training that meets your needs and the needs of other early childhood professionals.

If you haven't had a chance to complete the survey yet, it's not too late to share your input. The survey is available at [https://agrilife.az1.qualtrics.com/jfe/form/SV\\_ctKcWNyCKmF81DL](https://agrilife.az1.qualtrics.com/jfe/form/SV_ctKcWNyCKmF81DL), for a limited time. Once you complete the short (5-10 minute) survey, you'll receive information about how to access a free, exclusive 1-clock hour training webinar, as my way of saying thanks.

I appreciate how busy you are, so thank you for taking the time to give us your feedback!

Jodi Nerren  
Extension Program Specialist – Child Health & Development  
Texas A&M AgriLife Extension, Family & Community Health



IRB NUMBER: IRB2019-0797M  
IRB APPROVAL DATE: 07/16/2018

Reminder 2:

Howdy! As one of a limited number of trainees selected to provide input about AgriLife Extension's Healthy Interactions: Promoting Lifelong Nutrition training, you recently received an email invitation to complete a short (5-10) minute survey. The survey is available at Again, to the survey is available at [https://agrilife.az1.qualtrics.com/jfe/form/SV\\_ctKcWNyCKmF81DL](https://agrilife.az1.qualtrics.com/jfe/form/SV_ctKcWNyCKmF81DL), and your answers are very important! Hearing from folks who have participated in our training helps us make sure the training opportunities we provide are meeting your professional needs. Having been in the classroom myself, I know how hectic things can get, and I sincerely appreciate you taking the time to fill out this follow-up questionnaire, so once you complete it, you'll receive information about how to access a free, exclusive 1-clock hour webinar training.

Thanks again!

Jodi Nerren  
Extension Program Specialist – Child Health & Development  
Texas A&M AgriLife Extension, Family & Community Health



IRB NUMBER: IRB2018-0797M  
IRB APPROVAL DATE: 07/16/2018

## APPENDIX G

### INTERVIEW RECRUITMENT EMAILS

Email invitation to participate in a phase 2 interview text:

Hello!

You recently agreed to participate in a research study called "Toward an Expanded Approach to Early Childhood Educator Professional Development Evaluation". During the *Healthy Interactions: Promoting Lifelong Nutrition* training, you were asked to fill out surveys and a month after the training you were contacted to take a Follow-Up Survey about how you've used what you learned. Unfortunately, we never received your response.

Now we're inviting you to participate in a **short phone interview** (approximately 10-15 min.) with one of our researchers. In exchange for your time, those who complete interviews will be entered in a drawing to receive a Fitbit Alta activity tracker.

**A limited number of time slots are available, so sign up early for a chance to receive a new Fitbit!** If you're willing to be interviewed, please **reply to this email** and a researcher will contact you. Before your appointment you'll receive a phone number to call for the interview. We don't need your phone number or name, but we will need your Participant ID during the call. To ensure accurate records, the interviews will be recorded.

Your participation is voluntary. Nothing negative will happen if you choose not to be interviewed. The interview questions aren't sensitive, but you don't have to answer anything you don't want to and you can end the call any time. If you are chosen in the drawing, we'll need a shipping address. We'll only use it to ship your Fitbit.

Questions? Contact Jodi Nerren at (979) 845-1850 or [jodi.nerren@ag.tamu](mailto:jodi.nerren@ag.tamu), or the Human Research Protection Program at Texas A&M University (a group of people who review research to protect your rights) at 1-979-458-4067, toll free at 1-855-795-8636 or by email at [irb@tamu.edu](mailto:irb@tamu.edu). Refer to the attached Information Sheet for more about the study and your rights as a participant.

Thank you for helping us improve how we evaluate our trainings!

Jodi Nerren, M.A.  
Early Childhood Program Specialist  
Texas A&M AgriLife Extension - Family & Community Health



IRB NUMBER: IRB2019-0624  
IRB APPROVAL DATE: 06/19/2019

Email reminder about scheduling a phase 2 interview:

Hello,

I'm following up about an invitation you got a few days ago, asking if you would be willing to do a quick 10-15 min. phone interview with me for the study "Toward an Expanded Approach to Early Childhood Educator Professional Development".

First off, THANK YOU to everyone who has already replied to schedule an interview. Your input will help us make informed decisions about our training process.

If you haven't scheduled an interview yet, it's not too late to be heard! Your opinions are very important. Reply to this email and a researcher will contact you to set up a time. Remember – if you complete an interview, you'll be entered to receive a Fitbit Alta!

Your participation is voluntary. Nothing negative will happen if you choose not to be interviewed. If you have questions, you can contact me (Jodi Nerren) at (979) 845-1850 or [jodi.nerren@ag.tamu](mailto:jodi.nerren@ag.tamu), or the Human Research Protection Program at Texas A&M University (a group of people who review research to protect your rights) at 1-979-458-4067, toll free at 1-855-795-8636 or by email at [irb@tamu.edu](mailto:irb@tamu.edu). You can also review the attached Information Sheet about the study and your rights as a participant.

Thanks for your help in this study, and for your ongoing commitment to providing quality early childhood care and education!

Jodi Nerren, M.A.  
Early Childhood Program Specialist  
Texas A&M AgriLife Extension – Family & Community Health



IRB NUMBER: IRB2019-0624  
IRB APPROVAL DATE: 06/19/2019

APPENDIX H  
SPEARMAN CORRELATION COEFFICIENTS WITHIN DELIVERY MODE  
SUBGROUPS

Variable	1	2	3	4	5	6	7	8	9	10
1. Operation	—	-.27**	-.37**	-.17*	-.08	.05	-.02	-.00	.32	.11
2. Experience	-.11**	—	.69**	.19*	.21**	.06	-.02	.25**	.27	-.45*
3. Age	-.15**	.59**	—	.21**	.21**	.02	.02	.15	-.04	-.13
4. Ethnicity	.03	.06*	.08**	—	.18*	-.19*	-.18	.04	.02	-.32
5. Education	-.20	.25**	.27**	.01	—	.06	.18	.20*	.14	-.28
6. Perceptions	-.00	-.12**	-.8*	-.12**	-.02	—	.38	.29**	.31	-.05
7. Social Influence	.08	.05	-.11	-.06	-.11	.31*	—	.07	.25	.16
8. T1 Implementation	-.07	.17**	.12**	-.02	.05	.25**	.36**	—	.75**	-.54**
9. T3 Implementation	-.15	.07	-.08	.18	-.05	.14	.42**	.67**	—	.03
10. Implementation Change	-.14	-.11	-.23	.12	-.05	-.01	.19	-.18	.55**	—

*Note:* Correlation coefficients for in-person participants ( $n = 162$ ) are presented above the diagonal and correlation coefficients for online participants ( $n = 1,414$ ) are presented below the diagonal. T1 = baseline. T3 = follow-up.

\* $p < .05$ ; \*\* $p < .01$ .



## APPENDIX I

### META-EVALUATION INTERVIEW TRANSCRIPTS

HI: Nutrition

Interview Transcript A

00:00:26.910 --> 00:02:38.760 (Greetings & Introductions)

Interviewer: Good morning.

Participant: Hi.

I: Can you hear me okay.

P: Yes.

I: Awesome. Well, thank you so much for following up and you called my office also, didn't you?

P: Oh, yes, yes I did.

I: Okay. Well, I apologize. I was out of the office and I saw your email and I thought email would be easier to response since I wasn't in the office.

P: Oh, yeah, yeah. That's fine.

I: But I appreciate your persistence and for agreeing to talk. So we'll try to make this quick and painless.

P: Okay.

I: We are, well – just a quick couple of reminders. Your participation is totally voluntary. You don't have to answer any questions that make you uncomfortable, which

hopefully aren't any, but if there are feel free to say "I don't want to answer that." And you can also stop the interview at any time.

P: Okay.

I: So, before we get the actual interview questions, when you took the healthy interactions, promoting lifelong nutrition training, in the pre-test survey you were asked to create an ID number, which was your first initial your last initial, and the last four digits of your main phone number. Do you happen to remember what that number was?

P: Yeah, probably. AM6268.

I: Okay. Awesome. Thank you. So since I won't be asking for your name or any other identifiable information in this interview your participant ID is what I'm going to use to match it up with the surveys that you took before. So, and I would like to confirm that you're okay with this being recorded. The recordings will just be available to the researchers working on the study and again you don't have to include your name or anything else identifiable. If you happen to say something about the name of, you know, your community or your program or whatever, then I'll take that information out whenever we transcribe it.

P: Okay. Okay, yeah, that's fine.

I: Okay, awesome. Thanks.

00:02:39.330 --> 00:03:20.970 (Question 1)

I: So I just have two quick questions for you this morning. So you took the healthy interactions course or training and you responded to the pre-test and post-test surveys that came with that training. But then 30 days later there was - or about a month later -

there was a follow up survey sent out via email, and you didn't respond to that one. So can you tell me why?

P: Oh, I didn't. I don't check my email a lot. So that's probably why.

I: Okay.

P: Because like I don't even know if I ever saw that.

I: Okay. That's good to know.

00:03:21.870 --> 00:03:25.290 (Question 2)

I: Um, so what do you think we could have done differently to make it where that...what, what do you think we could have done differently to get that information from you that would have made it easier or made you actually give us the follow up information.

P: Well, I like I would, I would have like done the survey if I had actually seen it so like it's nothing that like y'all did wrong. It's just that I don't like check my email.

I: Okay. Is there a better way that you think we would be able to contact you, or other people?

P: Um, Well, I check it a lot more. I'll just like - I could check it more if you were going to send me surveys, because like you see that was when I like first made my email. And when I took the course. And like I was like nobody's going to be emailing me, so like I didn't.

I: Okay. So it was a new email account. So do you think for you in particular is email an okay way to contact you for things like this?

P: Yes.

I: Okay. Are there other ways that you would prefer to be contacted?

P: No, I think, email is fine.

I: Okay. Well that's good to know. Um, do you have any other comments on the study or the training or the surveys or any of that that you want to share?

P: No, not really.

I: Okay, well, that's all I needed. I just want some insights.

00:05:01.800 --> 00:05:02.670 (Wrap Up)

P: OK, cool.

I: So once all these interviews are over, then we'll do the random drawing for a FitBit Alta. If you're chosen, then I will be in touch with you and I'll need to get a shipping address.

P: Okay.

I: If you don't want to provide a shipping address that's fine, but then obviously I can't send you the prize.

P: Yeah, yeah.

I: And if you have any questions after this you can contact me. You can call me at 979-845-1850 which you already know or email me at the email address we've been using.

P: Okay. Cool. Thank you.

I: Thank you. I hope you have a good morning.

P: You too. Bye.

I: Thanks. Goodbye.

HI: Nutrition

Interview Transcript B

00:01:02.280 --> 00:03:22.020 (Greetings & Introductions)

Interviewer: Good afternoon.

Participant: Good afternoon.

I: Can you hear me okay?

P: Yes.

I: Awesome.

I: Well, thank you so much for agreeing to talk with me today.

P: No problem.

I: I know that you're very busy and I appreciate you giving some of your time so we can hopefully help improve our training program and then also just early childhood training in general.

P: <inaudible>

I: So, a couple things before we start – again, your participation in an interview is totally voluntary. You don't have to answer any questions that you don't want to. And you can say stop at anytime

P: Okay.

I: So before I ask you any of those questions, can you confirm your ID code that you created with the study? Which was your first initial your last initial, and the last four digits of the phone number you use the most.

P: My first initial last name initial?

I: Uh huh.

P: It's AS6959.

I: Awesome. Thanks.

I: So during the interview, you don't have to give your name or any other identifiable information so that number that you just shared will be the only thing I used to match up your information with anything else. So you can feel free to speak freely.

P: Okay.

I: And I'd like to confirm that you're okay with having the interview recorded?

P: Yeah.

I: OK. So the recording will only be available to researchers in the study. And again, it won't include your name or anything else. After the interview, I'll create a transcript of what you've said. And if you happened to say anything that we think is identifiable like your name or the name of the program where you work, I'll take all that out of the written transcript so that nobody else ever sees that.

P: Okay.

I: And then my dissertation chair and I will both look at those transcripts and once we believe that all of them are complete and accurate will delete all the audio so...

P: Okay.

I: ...To make sure. So if you consent to that, will you just say for me, "I agree to have this interview recorded"?

P: I agree to have this interview recorded.

I: Thank you.

00:03:23.220 --> 00:05:14.010 (Question 1)

I: So, I just really have two questions for you and maybe a little bit follow up. The first one is: You responded to the pre-test and post-test surveys about the healthy interactions training, but when you got an email about a month later about the follow up survey, you didn't respond to that one. So can you tell me more about why that is?

P: I actually did respond. I don't know why it's stated as I didn't. Maybe I didn't finish it. I'm not sure but I did respond. And I remember responding.

I: Oh, interesting. Well, that raises more questions about things we need to look into. So you said it's possible that you might have responded, but maybe not completed it?

P: Yeah.

I: That would make sense because then it would show on my end as if you didn't respond.

P: Okay.

I: Give me one second. I'm going to pull up my dataset from that survey and see if I have any record that maybe you started it.

P: Okay.

I: Yeah, I definitely don't see your ID number in the recorded responses. Is it possible that you might have given a different number?

P: I'm not...I don't...I don't remember putting a number in or logging in.

I: Oh!

P: I remember it being a link from my email. I mean, it was a while ago so I really don't remember. I remember doing it. I remember doing a survey for it.

I: Interesting. Okay, well, that's really good to know.

00:05:20.760 --> 00:07:58.530 (Wrap Up)

I: Um, well, I guess. So my follow up question to that would have been. What could we have done differently to get you to fill out the survey, but since you attempted to fill out the survey...

P: Yeah.

I: The next step is to figure out what might have gone wrong on our end.

P: Yes.

I: That's very interesting.

P: Yeah, I think it was...I kind of remember it because it was like strongly agree, agree, and questions about like nutrition, health and all that.

I: Yeah, it was. It was questions about the practices that you're using as you are feeding children. So all the things that we talked about in that training...

P: Yeah.

I: ...as far as are you serving children their plates already made or are they you know, being served family style or what are those different practices.

P: Yes. Yes. Yes. I remember.

I: Oh, well that's very interesting. Um, okay. Well, that is all the questions that I have for you, but that raises more questions for me, so thank you so much. We are going to be drawing a random drawing for the Fitbit Alta, so if you're chosen then I'm going to contact you at the email address that I have on file and you'll have to give a shipping address. If you're not comfortable...hello? Hello, are you there?



P: Yes, I'm here.

I: Okay. So, if for some reason you're not comfortable giving a shipping address, then obviously we wouldn't be able to send you that prize. But I can tell you that as of right now there are less than 10 interviewees that have scheduled times to talk with me, so depending on how many people respond - there will be a follow up email that goes out, you can ignore that since you've already responded to me.

P: Okay.

I: It just goes out to the same mailing list that the first invitation went out to. Depending on how many people respond, you know, the odds of winning could be pretty good.

P: Okay. Thank you. Yeah, I caught because it said I didn't respond. And I remember responding.

I: Well, I appreciate that. It's very informative and that tells me that there might be some issues in our data collection program we're using so I really appreciate it. That's super helpful.

P: No problem. Thank you very much.

I: Awesome. Thank you. Have a great afternoon.

P: You too. Bye bye.

I: Bye.

HI: Nutrition

Interview Transcript C

00:05:53.850 -->

Interviewer: Good morning.

Participant: Good morning.

I: I hear some little friends.

P: You do, you do. I've got two little friends with me this morning that are keeping me company because they can't stay in the classroom.

I: That's... They're helping.

P: Yes. They are. They're helping big time. Okey dokey.

I: Thank you so much for calling in this morning and for being so flexible. I know your time is valuable. So we'll try to keep this short. And I appreciate you sharing a little bit of it to help us think about how we check on our impacts of our training. So, before we get started, just some general, I have to say things because it's a study information: Your participation is totally voluntary. You don't have to answer any questions that make you uncomfortable and you can stop this interview at any time.

Before we really get into it. Can you confirm that code, the ID code that you created in the pre-test survey when you took the healthy interactions, promoting lifelong nutrition training which shouldn't be your first initial your last initial, and the last four digits of your main phone number,

P: It would be CG3664, if that's the case.

I: Okay. So since I'm not asking for your name or anything. You don't have to say your name anytime during this interview, so it won't be associated with anything that you say. Your participant ID is the only thing that I'll use to match up your answers with anything else from the study. The last thing is I'd like to ask if you're okay with having this interview recorded. We're going to use that just for the researchers to be able to transcribe and analyze that information. If you happen to say anything that is identifiable we'll take that out of the transcript so you won't - nothing will ever tie back directly to you. And then when my colleague and I, my dissertation chair, and I agree that the transcript is complete, we'll delete the audio recording. So, if you're okay with that. If you would just say, "I agree to have this interview recorded."

P: I agree to have this interview recorded.

I: Thank you.

00:08:20.190 --> (Question 1)

I: Okay, so I really just have two main questions for you and the first one is, obviously, you took the training. You responded to the pre- and post-tests that came through that actual training. And about a month later, you got an email with a follow-up survey, but we never received a response to that survey. So, can you tell me more about why that is?

P: Um, pretty much just because I'm in this new facility doing this new job. And it's just been kind of crazy because I run a other business outside of this facility as well. So it's just been as you saw by trying to set up this interview, I get like 10 minute breaks here and there that I have to do these things. And I just, I've done a lot of training in the last

couple of months. I've done over 60 hours worth of training. So it's been it's been busy. It wasn't anything, y'all did. I've just been too busy.

I: Okay. I totally understand that I've been in the early childhood field for a while myself, so I know that feeling.

00:09:29.850 --> 00:20:46.920 (Question 2)

I: So the other question is, and this could be your personal view or the early childhood field as a whole, is there anything we might have been able to do differently to get you to fill out that survey?

P: Um, I think what really got my attention is this that you kept... (side conversation) I'm sorry. We just had a parent show up and one of the kids that I had with me is that parents child.

I: Oh,

P: Okay, so. Okay. One of the things that finally got my attention is the fact that you sent out multiple emails that I was like, wait a minute, this is something I should... And to be honest, the headline on it does look a little bit scammy. Like a spam email, you know? It wasn't till I actually read it and realized that it's from Texas Ag Extension that I was like, oh, this isn't spam, you know, my bad and maybe it should be labeled differently. And then people wouldn't just blow it off as much. Because, I mean, I get stuff all the time that say so and so, you know, wants an interview and you're like, what is this? You know? This is junk mail. So just maybe paying attention to the subject line to make it not - to make it obvious what it is. Not so much, you know, oh, it's an interview. Well, an interview for what? You know? Like that's a...I'm not...I haven't put in any applications

in or anything like that. You know what I'm saying? So maybe if it was more, you know, if it said Texas Ag Life on it or something like that, then they'd be like, oh wait, I just did that. I don't know exactly what you would put on it. I'm just those are, you know, that's just something that would maybe have got my attention a little faster. Like I said, the only reason I even looked at yours was because I got multiple ones, you know, over a couple of weeks period and I was like, okay, this one keeps coming through. Maybe it's something I should look at. And I looked at it and I was like, oh yeah, maybe I should have looked at that!

I: Okay!

P: When I go into my email. I just look for what I know, you know, I'm supposed to be getting. So that's the only, only thing I might have done. The only thing I can, I can foresee. Like I said, the testing. I will say this about the Ag Life. It's extremely easy to get on there. It's extremely easy to get to the testing and the different curriculum that you have on there for for training and whatnot. I have no problems with the website or, you know, and plus the material that you all offer is fantastic. As far as a follow up goes, you've been wonderful, the multiple emails really finally got my attention. Sorry about that. Maybe in order to keep you from having to do that they could change up that subject line with the first survey and then maybe that would make it a little bit less scam looking. But other than that, that's it.

I: So if it said something like Texas A&M AgriLife Extension follow up or something like why would that be something that maybe would be more trustworthy to you?

P: Instead of a survey or an interview because you get a lot of scam surveys and interviews. But if you say, follow up or something like that, from Texas Ag Life. Yeah, that seems more like, “Okay, I know what that is. That's not a scam.”

I: I hear you. Yeah. So, just one other follow up as you're talking about. So I'm...it sounds to me like you're primarily accessing our training through the online course system. Is that right?

P: Yes, for now. I'm looking into working on my CDA and whatnot. So, I do believe I'll be taking a few in-house courses. But I'm still looking into that. I've only been with this job since April. I'm just now learning all the ins and outs. Obviously, I'm trying to, because I do have 61 hours of certification. Which- state requirements only require you to have 30, so obviously I'm trying to get as much information as I can just so I can do my job better. Because this was a...

I: So from what I hear you saying did you move into an administrative position, then, in your new job?

P: No.

I: You're in it still in a classroom position?

P: Yes.

I: Okay.

P: But eventually, I would like to move up and that's why I'm trying to learn and okay and get as much as I can so that later on down the line when opportunities arise I'll be ready for it.

I: I hear you. So, are you familiar - and this is a little off topic so feel free to shut me up if you want to, um, but as a program I'm sort of the program manager for our training across the state, so as I hear you talking about that...Are you familiar with in person training opportunities that are offered near you through AgriLife Extension?

P: I'm not. Not with, not through Ag Life. Not through Ag Life. I did just get back from a conference that was from the Texas early childhood education learning summit in Houston. And there is, I also have a conference through Frog Street that I'll be doing and a couple of conferences through Texas Rising Star that I'm you know going to for training and whatnot. So I'm always looking for new training opportunities. I'm very open to going to any training opportunities I can get a hold of. I just have to find them.

I: Right.

P: Where and then this, this probably will need to be bleeped. Well, I'm not using any names. Um, my current employer does not do a lot of help in finding those things so a lot of that I'm on my own on. So I'm...like I said it unless it's, you know, something that Texas Rising Star tells me about...I have a mentor through Texas Rising Star that is helping me find these trainings and whatnot. So unless it's something that they would know about chances are, I'm not going to know about it. But with the Ag Life if it's on your website and I can find it then I'll find it. But that's where I'm at right now.

I: Okay. Well, in case you're ever curious, you can look up, you can just Google this, you can Google your county name and then Extension office and find your family and community health extension agent, and that would be the person who could tell you about anything that they're doing locally or anything that they know of that's happening

nearby. We do have about 35 in person training conferences or events that happen around the state each year. I don't always know about all of those in advance.

P: Can you repeat that? The page that I need to look at? I Google the County. I'm writing this down.

I: Your county name and then Extension office.

P: Okay.

I: And then once you get on their page look at, contact is the tab that you'll look for, and find your Family and Community Health Agent. And it should have an email and a phone number for that person if your county has one.

P: I'm writing this down.

I: If not, you could contact the county coordinator and ask them if anything's happening nearby.

P: Yeah. 'Cause if it's within two hours or so I'll go. Contact the County Coordinator, right? Is that what you said?

I: Yes, yeah.

P: Okay.

I: Unless you're way out in West Texas or way up in the Panhandle I'm pretty confident we have something within two hours of where you are.

P: Yeah, because even, even the Texas, Bryan-College Station is an hour and a half. So, Houston's about two, two and a half, depending on where you're going in Houston.

Lufkin's about an hour. Tyler's about an hour and a half. I mean, they're all pretty, I'm



pretty much central in East Texas. But that's actually pretty central to everything. Dallas is only, like, two hours. So everything...

I: Yeah, we have several that happen around Dallas. We have one, I know, I'm located in Bryan College Station. I know that we have one here that happens every year. We have several that happen around the Metroplex. We have one or two that happen around the Houston area. I'm actually going to Galveston in a couple weeks for one. We have several around the San Antonio kind of Central Texas area. We have one in Paris, that is, I think our main one that's in East Texas, but that might be a little far north depending on where you're at.

P: I mean, if it's if it's something that I'm finding out about, you know, a week ahead. Yeah, I need it within two hours. If it's something I found out a couple of weeks ahead, then yeah, the Paris...Paris is about four hours away, but if I knew about it ahead of time, then yeah, I can schedule to be there. And that's what I have informed my boss and stuff. When we found out about the Houston trip I found out you know several weeks in advance and I told her, I said, you know, put me on the schedule to be off these days I'm going. I think that might have gotten her attention a little bit because nobody else, you know, she has to fight with a lot of her teachers to get their 30 hours, and here I am with double it, and I'm like, I still want more. Yeah, if I can find them ahead of time, I'll travel wherever I really need to go.

I: Okay, well that's good for us to know. That's actually good program information for us to know that people, that there are people like you who are willing to make that trek. But yeah, you have my email address and if you ever have any questions related to the

program you're always welcome - that's kind of separate from our study that we're doing here – but you're always welcome to reach out and ask questions.

P: Okay

00:20:46.920 --> 00:22:12.810 (Wrap Up)

I: Okay. Well, thank you. For your time and your insight. You've given me a lot to chew on. And so once, once these interviews are over. And you might be my last one, I'm not 100% sure just yet, but I'll do a random drawing for the Fitbit Alta and if you're the person who's drawn, then I'll be in touch to get a shipping address. If you want the prize, you have to give me a shipping address obviously. If don't you want to give your address that's fine, you can just decline it at that time.

P: No, I don't have any questions about. I don't care, like, put my name in it. I'm not hiding nothing. I'm pretty wide open.

I: Well hopefully nothing is super invasive so... You did a good job of not giving anybody's names, I think.

P: Well, I appreciate it and thank you for the opportunity to participate and I have starred your email now so that it will pop up as important. So that I don't just you know, just, you know, brush it off thinking it's spam. But I appreciate it. I'm going to get back to my class, and I'll let you get back to your thing, and I will keep your email handy if I do come across any questions, and I appreciate it.

I: Yeah. Thank you so much.

P: Thank you.

I: Have an awesome day.

P: You too. Bye bye.

I: Bye.