

**Undergraduates who CARE: An Evaluation of Child Adult Relationship Enhancement
(CARE) training with undergraduate students**

by

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Abstract

Child-Adult Relationship Enhancement training (CARE) is an empirically-based, trauma-informed, behaviorally grounded training aimed at equipping any adult interacting with any child with the skills and benefits of parent management training (Gurwitch et al., 2016). Despite growing evidence for the effectiveness of CARE training across a variety of populations (e.g., biological parents, foster parents, social workers, pediatricians, and teachers), little research has examined dissemination elements which lead to successful training. For example, CARE does not yet have a standardized method of direct measurement of skill-use for non-caregiver adults. To add, while CARE is intended for use by any adult engaging with any child (e.g., 2-18 years of age), there have been no investigations of trainee characteristics which predict success in skill acquisition and knowledge gains following CARE training. The current study aimed to 1) evaluate CARE training among a multidisciplinary sample of undergraduate students utilizing a novel, standardized, observation-based assessment of CARE skill acquisition and 2) investigate trainee-related predictors of skill recognition, skill acquisition, and CARE training knowledge. Results revealed the feasibility of utilizing an observational method of assessment to measure trainee skill acquisition and training effectiveness for a sample of undergraduate students. Undergraduate trainees demonstrated gains in positive skill acquisition, skill recognition, and CARE knowledge from pre- to post-training. Grade point average was found to be significant as selection criterion for skill recognition and CARE skill application. Future research should continue the implementation of technology utilized in this study to enhance both training delivery and skill acquisition measurement and evaluate the effectiveness of an online training format.

Dedication

This dissertation is dedicated in loving memory to my grandfather, James A. Richey, who always valued education, hard work, and showing up for those you love. I know he would be here to celebrate this milestone, as he did for all those before it, if he could.

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List of Abbreviations

ADHD	Attention-deficit/hyperactivity disorder
ASD	Autism spectrum disorder
CARE	Child-Adult Relationship Enhancement
CBCL	Child Behavior Checklist
CDI	Child Directed Interaction
D&I	Dissemination and Implementation
DBD	Disruptive Behavior Disorders
DPICS-IV	Dyadic Parent-Child Interaction Coding System, Fourth edition
ECBI	Eyberg Child Behavior Inventory
EBP	Evidence-based practice
EBT	Evidence-based treatment
GPA	Grade point average
KBPAC	Knowledge of Behavior Principles as Applied to Children
KCDI	Knowledge of Child Development Inventory
PCIT	Parent-Child Interaction Therapy
PDI	Parent Directed Interaction
PMT	Parent Management Training

Introduction

Of the approximately 2.2 billion children and adolescents worldwide, 10–20% are affected by mental health problems (Kieling et al., 2011). Within the United States, the estimate is as high as 18% (Houtrow & Okumura, 2011). This estimate may now be even greater, with the increase of child internalizing and externalizing problems during the COVID-19 pandemic and the projected increase of these mental health issues post-pandemic (Hoagwood et al., 2020; Khoury et al., 2021). In response to these increases, the psychological research community, along with the National Institute of Health (NIH), has called for the implementation, dissemination, and scaling of evidence-based interventions to improve overall public health (Hoagwood et al., 2020). However, dissemination and implementation (D&I) research in children's mental health remains limited, with existing programs facing challenges when implementing new practices into highly-complex, established communities (Hoagwood et al., 2020; NIH RePORTER, 2020). Moreover, literature has highlighted that many of the advancements in D&I literature have concentrated on implementation and product delivery, rather than dissemination elements which may impact who implements evidence-based practices and the quality of these services (EBPs; et al., 2023; Hoagwood et al., 2020). Further, research has suggested that dissemination science is limited by insufficient tools, including unstandardized assessments and the use of self-report measures (Beidas & Kendall, 2010; Frank et al., 2020; Hatley-Cotter et al., 2023). As such, there has been emphasis placed on applying rigorous system science and mixed-methods to dissemination research in a post-COVID world (Hoagwood et al., 2020).

Even with these limitations, D&I science over the last three decades has enhanced understanding in the process of implanting effective, evidence-based psychological treatments,

preventive programs, and practices (Hoagwood et al., 2020). One evidence-based prevention program identified in research to address child mental health outcomes is parent management training (PMT). PMTs are disseminated and implemented in care settings to prevent and treat child externalizing problems (Baumann et al., 2015). Contrary to growing research in this domain, evidence-based PMT delivery and implementation is not commonplace, as an evaluation of parent-training programs in one midsized Midwestern city demonstrated that only 11% of the agencies providing services in the city had adopted EBPs (Baumann et al., 2015; Kohl et al., 2009). The low rates at which evidence-based parenting interventions are delivered indicates the importance of enhancing D&I research on evidence-based parenting interventions and prevention programs, specifically at the training level, which has the potential to improve rates of uptake in agencies (Baumann et al., 2015). Given the need for rigorous dissemination research to address child mental health problems and the barriers facing effective implementation of PMTs (e.g., client access to resources including transportation and childcare; agency access to financial resources including training and supervision of therapists; Furlong & McGilloway, 2015), this paper aims to evaluate the delivery of an existing program, utilizing a mixed-method design.

Parent Management Training

PMT is one of the most well-established evidence-based interventions for child mental health problems (Eyberg et al., 2008). PMTs aim to enhance parenting practices by providing parents with effective behavior management strategies that can be used in place of harsh and inconsistent discipline techniques. These empirically based interventions have the potential to reduce problematic child behaviors as well as the prevalence of child maltreatment and poor child outcomes (Prinz et al., 2009). Many PMTs utilize a two-stage model, with the first focusing on developing a warm, positive relationship with the child and the second focusing on utilizing

consistent, effective discipline procedures. Several parenting programs have been developed utilizing this model, including Triple P Positive Parenting Program (Sanders, 2008), Webster-Stratton's Incredible Years (Webster-Stratton & Reid, 2018), and Parent-Child Interaction Therapy (PCIT; McNeil & Hembree-Kigin, 2010), among others. These interventions have been found to be highly effective in positively changing parental behavior. Of these interventions, meta-analyses comparisons have revealed PCIT to have the largest effect, $d=1.65$ (Lieneman et. al., 2019; Menting et al., 2013; Nowak & Heinrichs., 2008).

Parent-Child Interaction Training

Parent Child Interaction Therapy (PCIT) is an empirically supported and clinically validated treatment program for young children experiencing behavioral and emotional problems and their families (Eyberg et al., 2008; Herschell et al., 2002). This parent training program is aimed at teaching caregivers specific skills that foster a secure relationship with their child along with skills that produce consistent and predictable limits and discipline (Herschell et. al., 2002). There are two modules within the PCIT treatment protocol: Child Directed Interaction (CDI) and Parent Directed Interaction (PDI). Both modules consist of initial didactic training followed by therapist coaching throughout play settings (Urquiza & McNeil, 1996). Coaching is typically conducted from an observation room, in which the therapist communicates with the caregiver via a bug-in-the-ear piece, while the caregiver and child interact in a playroom (Urquiza & McNeil, 1996).

In CDI, the first phase of PCIT, the focus is to develop and/or improve a reciprocally warm relationship between a parent and child (Eyberg & Funderburk, 2011; McNeil & Hembree-Kigin, 2010). In order to accomplish this, caregivers are instructed to "follow" the child's lead during play. Caregivers are taught specific verbal skills to use during play, including imitation,

reflections of prosocial talk, praise for specific desired behaviors, and descriptions of what the child is doing (Urquiza & McNeil, 1996). The use of these skills, termed the PRIDE skills, provides positive reinforcement for desired child behaviors and increases the likelihood that the child will continue to engage in these positive behaviors in the future (Eyberg & Funderburk, 2011). Caregivers are also taught verbalizations to avoid, including asking the child questions, giving commands, and providing critical statements, as these actions can take the focus away from the child's positive behaviors. The caregivers practice PRIDE skills in session and receive therapist feedback until they can achieve a frequency goal of 10 labeled praises, 10 reflections, and 10 behavior descriptions, along with less than 3 questions, commands, or negative statements within a 5-minute coded play session (Eyberg & Funderburk, 2011). CDI lasts approximately 7-10 sessions and by the end, parents typically progress from little to no attending to their child's positive behavior to frequently and consistently praising their child's positive behavior (Eyberg & Funderburk, 2011).

In PDI, the second phase of PCIT, the focus is to provide parents with specific and effective skills to direct their child's activity (Eyberg & Funderburk, 2011; McNeil & Hembree-Kigin, 2010). This goal is achieved through instructing caregivers to issue clear, positively stated, direct commands in a developmentally appropriate way and provide consistent follow through of consequences. Caregivers are guided to use praise for compliance, and time-out in a chair for noncompliance (Urquiza & McNeil, 1996). Parents are then encouraged to implement these skills at home through establishing and enforcing "house rules" (McNeil & Hembree-Kigin, 2010). In order to meet PDI criteria, parents must provide 4 direct commands with appropriate follow through (i.e., completing the time-out sequence for noncompliance and labeled praise for compliance) within a 5-minuted coded play session. Like CDI, the PDI phase

of treatment lasts approximately 7-10 sessions and by the end, caregivers are able to provide commands and praise child compliance in a predictable and safe manner (McNeil & Hembree-Kigin, 2010; Timmer et. al., 2005).

Although initial research focused on PCIT's effects on children with externalizing behavior disorders, research studies have expanded to examine the effects of the intervention on a wide range of populations including children with autism (Furukawa et al., 2018; McInnis et al., 2020; Scudder et al., 2019; Vetter, 2018; Zlomke & Jeter, 2019), Attention-Deficit Hyperactivity Disorder (ADHD; Ahmadi et al., 2017; Hosogane et al., 2018; Leung et al., 2017; Matos et al., 2009; Vetter, 2018; Wagner & McNeil, 2008), Separation Anxiety Disorder (SAD; Choate et al., 2005; Pincus et al., 2008; Chase & Eyberg, 2008; Puliafico et al., 2012; Carpenter et al., 2014), and Selective Mutism (SM; Carpenter et al., 2014; Catchpole et al., 2019; Comer et al., 2012; Cotter et al., 2018). PCIT has been shown to decrease child externalizing behavior problems in children with externalizing disorders, ADHD, and autism spectrum disorder (ASD), respectively (Lieneman et al., 2017; Vetter, 2018; Ward et al., 2016;). PCIT has also evinced to reduce parental stress, increase child compliance to caregiver commands, increase positive parent behavior, and reduce abusive parenting practices (Agazzi et al., 2017; Chaffin et al., 2004). In addition to these robust effects on externalizing symptoms, research has also found that PCIT can be modified to include an additional component covering brave behaviors for children with anxiety disorders. This internalizing disorder focused adaptation of PCIT has been found to significantly decrease parent and teacher-reported symptoms of anxiety, decrease the likelihood that the child would continue to meet diagnostic criteria for separation anxiety following treatment, and increase verbalizations of children with selective mutism (Carpenter et al., 2014; Catchpole et al., 2019; Chase & Eyberg, 2008; Choate et al., 2005).

The effectiveness of the skills provided to caregivers in PCIT in improving child externalizing symptoms as well as internalizing symptoms, across several populations, has led to the development of a program aimed at providing this evidence-based skill set to any adult interacting with any child in any setting, known as Child Adult Relationship Enhancement training (CARE; Gurwitch et. al., 2016). While PCIT is aimed at providing individual, evidence-based intervention for children with disruptive behavior problems and their caregivers, CARE provides a more universal, public health approach for use of the beneficial, evidence based PCIT skills with all children (see Figure 1; iCARE Collaborative, 2020).

Child-Adult Relationship Enhancement Training

CARE is aimed at equipping all adults, including non-caregivers, foster caregivers, mental health providers, health providers, and paraprofessionals, with the behavioral skills and benefits of PCIT. CARE is intended to strengthen an individual's social relationships with children and improve child compliance for minor to moderate tasks (Gurwitch et al., 2016).

While developed from PCIT, CARE is unique from PCIT in a few important ways. Firstly, whereas PCIT is a successful, evidence-based treatment program, CARE is not intended to be used as a form of treatment or therapy (Gurwitch et. al., 2016). Rather, CARE is intended for prevention purposes, for children at risk for maltreatment or with other behavioral concerns (Gurwitch et al., 2016). While PCIT is intended to treat severe behavioral problems and externalizing disorders, CARE is designed to aid in behavioral concerns or complement concurrent treatment services. Secondly, CARE is a lower-dose model, significantly shortening the training time from PCIT, which can take between 12 and 20 sessions. Specifically, CARE lasts approximately 3 to 6 hours in comparison and can be delivered in one or two sessions (Gurwitch et al., 2016). Thirdly, while PCIT has been shown to be successful in improving

outcomes for children and caregivers affected by child maltreatment (Chaffin et. al., 2004), CARE contains a trauma education component to contextualize the skill set when a child presents behaviors and problems associated with trauma exposure (Gurwitch et al., 2016). Fourthly, while PCIT targets the parent-child dyad, in CARE, information on CDI and PDI are provided to non-caregivers, specifically community health workers, and is useful for a wide range of professionals including teachers, pediatricians, nurses, and social workers. Lastly, while PCIT is limited to implementation with children from 2 to 7 years of age, CARE materials were developed for both younger children (ages 2-11) and tweens/teens (ages 12-18).

Like PCIT, the CARE program has been successfully adapted to fit the needs of a diverse range of populations, including adults interacting with autistic children, children seen in primary care and integrated settings, in classrooms, and for military families (iCARE Collaborative, 2020). CARE has additionally been updated to improve its culturally sensitive and inclusive components, including materials to improve trainee education on the impact of the pandemic, the rise in hate speech, hate crimes, and racism, and the realities and needs of LGBTQIA+ youth, increasing the program's reach to a variety of identities (Gurwitch et al., 2021; Messer, et al., 2021; Richey et al., 2023). Across these adaptations, adults learn to apply positive parenting skills ("Ps") and avoid negative parenting skills ("Qs") while following the child's lead in play. The goals of these skills are to foster a warm, social relationship with any child (Gurwitch et al., 2016).

More specifically, the "Ps" of CARE include teaching caregivers how to provide specific praise (e.g., praising the child for desired behavior), paraphrase (e.g., reflecting the child's prosocial speech back to them), and point out (e.g., verbally attending to positive actions of the child). The "Qs" of CARE include teaching caregivers to "quash" the urge to lead (e.g., follow

the child's directed play), avoid asking questions (e.g., avoiding asking questions during interactions with the child), and quieting criticism (e.g., avoid negative statements about the child or the child's present behavior). As in PDI during PCIT, trainees are provided with tools to promote child compliance (Gurwitch et al., 2016). Specifically, trainees learn to give effective commands or instructions and to use strategic attention to increase desired child behaviors (Gurwitch et al., 2016). Over the course of training, adults learn how to generalize the use of these relationship-enhancing skills to non-play interactions through use of role-play exercises, video examples, and discussion.

CARE training has been disseminated to thousands of individuals across the United States including biological, foster, kinship foster, and adoptive caregivers, health and mental health providers, medical residents and mental health graduate students, allied health professionals (including Occupational Therapists, Physical Therapists, Speech and Language Pathologists, and Child Life Specialists), and associated staff members (Gurwitch et al., 2016). Current research on the effectiveness of CARE has shown significant decreases in child internalizing and externalizing behaviors and increased positive statements made by the CARE trainees, based on both behavior observation and caregiver-report of child functioning (Messer et al., 2018; Schilling et al., 2017; Scott et al., 2021; Wood et al., 2017; Wood et al., 2021).

For example, in training caregivers of children in primary care, two randomized control trials of CARE across four pediatric primary care facilities demonstrated a reduction in parent-reported child behavior problems, in both intensity and frequency and a reduction in parent-reported stress from pre- to post-training (Schilling et al., 2017; Wood et al., 2021). Further, in training foster parents, a randomized control study involving behavioral observation and parent-report measures showed an increase in positive skills (P skills) in foster parents following CARE

training and a decrease in parent-reported trauma symptoms in foster children (Messer et al., 2018). In regard to training providers, one recent study implementing an adaptation of CARE intended for delivery during routine primary care visits (IntegratedCARE; Scott et al., 2021), demonstrated that CARE skills could be effectively disseminated via clinical social workers to parents, showing a decrease in frequency and intensity of parent-reported child behavior problems (Scott et al., 2021). To add, one study of CARE delivered across five workshop trainings to pediatricians and social workers found that trainees' knowledge of CARE skills significantly increased one day post-training and the gains in knowledge were maintained at a one-month follow up (Jimenez, 2020). CARE has recently been disseminated in a classroom setting, involving 10 teachers across five classrooms, and results suggested a significant decrease in negative child-teacher interactions (Eriksson, 2018). Results from the previously reported studies indicate that CARE holds benefits for adult-child dyads across a variety of settings, improving both relational and child outcomes.

CARE Training Workshop Elements

Since CARE's creation, there has been a call to explore new approaches to disseminate and implement the evidence-based program (Gurwitch et al., 2016). While CARE has been widely disseminated, there is limited research on the modality, measurement, and trainee characteristics which make CARE training effective in dissemination.

Measurement Characteristics

One area of need for evaluation is measurement of trainee skill acquisition in populations of non-caregivers, for whom the target population includes clientele or children in their occupational setting, rather than their own children. CARE has been shown to be effective in delivery to non-caregivers including professionals in a variety of training formats (e.g., 3.5-hour,

5 hour), according to two unpublished studies (Eriksson, 2018; Jimenez, 2020). Training outcomes across these studies have used unique methods to assess trainee skill acquisition. Across CARE trainings, skill acquisition is traditionally measured using a play-based, parent-child interaction with trainees' children (e.g., biological children, foster children; Messer et al., 2018). Parents' skills are then coded via either the Dyadic Parent-Child Interaction Coding System, Fourth Edition (DPICS-IV; Eyberg et al., 2013) or the CARE Live Feedback Coding Sheet (Messer et al., 2021). This is unique to studies in which CARE is delivered to caregivers including biological parents, foster parents, and parents of children in integrated primary CARE settings (Messer et al., 2018; Schilling et al., 2017; Scott et al., 2021; Wood et al., 2021).

The first study involving training of non-caregivers (Eriksson, 2018), included 10 teachers across 5 classrooms and utilized a 3-minute teacher-child interaction coded via the CARE Live Feedback Coding Sheet completed by a Board-Certified Behavior Analyst (BCBA) in the school to evaluate skill acquisition (Eriksson, 2018). Notably, there was no standardized method of adult-child interaction, as the study does not indicate that teachers interacted with the same child for the same period of time, in a one-on-one setting. Eriksson (2018) identified additional time in the observation and clarification of teacher's use of skills one-on-one rather than in a group-classroom format as important future research goals.

In a second recent study of non-caregivers who received CARE training (Jimenez, 2020), CARE was delivered to 141 professionals including pediatricians and social workers. Trainees were asked to self-evaluate and report their use of CARE skills at one-month follow up using a 6-item measure in which they rated their frequency of use of each of the P skills and each of the Q skills on a 5-point Likert scale (Jimenez, 2020). The results of the study found an increase in trainees' self-reported use of P skills across three time-points and a slight decrease in their self-

reported use of Q skills (Jimenez, 2020). However, as Jimenez (2020) notes, despite strong evidence for the internal consistency of the Use of CARE Skills Survey developed for the study, the measure relies upon the trainees' self-report which may not fully capture the general change in interactional style between non-caregiver trainees and the large number of children with whom trainees may interact with professionally on a day-to-day basis. As such, the author calls for the development of a direct observation paradigm to be used with non-caregiver CARE trainees in future trainings (Jimenez, 2020). Taken together, these previous studies highlight the need for development of a standardized, direct observation method to assess CARE skill acquisition at post-training.

While there is currently no research utilizing direct observation of non-caregiver CARE trainees, there has been some work using a modified PCIT training for non-caregivers. More specifically, a brief PCIT-informed training delivered to 62 undergraduate students found increased acquisition of PRIDE skills from pre- to post-training utilizing a standardized video role-play with a confederate acting as a child (Niec et al., 2020). This study used the DPICS-IV Coding System (DPICS-IV; Eyberg et al., 2013) to assess acquisition of skills. Another study assessing the delivery of brief PCIT training to undergraduates as potential pre-parents found an increase in the use of labeled praise from pre- to post-training, as measured via direct behavioral observation of a confederate acting as a child in a face-to-face role-play (Lee et al., 2011). Lee and colleagues (2011) also used the DPICS coding system to evaluate trainee's skill use during the role-play. These studies indicate the effectiveness of direct observations as a means of assessing skill acquisition in non-caregivers. Notably, both studies lacked access to a specific child for engagement in a trainee-child role-play, which was cited as a possible future direction that may enhance trainees' motivation to utilize skills (Lee et al., 2011).

Trainee Characteristics

Previous work in CARE has demonstrated that parents and foster parents are able to acquire skills successfully over the course of 3.5 hour training and that use of these skills is associated with reduction in their child's behavior problems (Messer et al., 2018; Schilling et al., 2017; Wood et al., 2021). However, there have not been any evaluations conducted to determine which trainee characteristics might predict skill acquisition, in caregivers or non-caregivers. Previous work in brief delivery of a PCIT-informed training to undergraduates determined that knowledge of behavior principles and grade point average (GPA) predicted initial acquisition of PCIT skills from pre- to post-training (Niec et al., 2020). Outside of the previously noted studies involving undergraduates, evaluations of PMT trainees have only focused on characteristics of therapists (e.g., therapy orientation, perceptions of evidence-based practices, prior exposure to PCIT) that may impact training (Chase et al., 2019; Christian et al., 2014; Hatley-Cotter et al., 2023). Little is known about non-therapist or non-caregiver characteristics which may aid in the selection of CARE trainees.

Goals of the Present Study

Although CARE training has continued to grow in evidence as a relationship-enhancing, trauma-informed, behavior management training for adults interacting with children, there has been no study to date evaluating the training elements or trainee characteristics which impact CARE training effectiveness. To add to the CARE training literature, increase the available methods of pre- and post- workshop measurement, and explore selection criteria for trainees, this study evaluated predictors of CARE trainees' skill acquisition and knowledge gains utilizing a novel, standardized video role-play. Recognition and coding of CARE skills and knowledge of CARE were evaluated pre- and post-training. Additionally, observed use of CARE skills was

evaluated pre- and post-training. While the goal criteria are 5 of each of the P skills, previous research has noted that trainees often have difficulty reaching the full criteria after initial training (Barnett et al., 2016; Niec et al., 2020). However, some studies have highlighted trainees' greater application of positive skills in comparison to negative skills during a structured CDI role-play (Niec et al., 2020). As such, it was hypothesized that trainees would demonstrate greater use of P skills and fewer Q skills from pre- to post-training. Further, based on findings from Niec and colleagues (2020), we aimed to explore predictors of CARE skill acquisition and CARE knowledge from pre- to post-training, including GPA, knowledge of behavior principles in children, knowledge of child development, social skills, and intent to work with children in the future. Based on both previous evaluations of the effectiveness of CARE training (e.g., Messer et al., 2018; Schilling et al., 2017; Scott et al., 2021; Wood et al., 2017; Wood et al., 2021) and the mixed-method study designs of Niec et al. (2020) and Lee et al. (2011), the following hypotheses were proposed:

Primary Hypotheses

1. Undergraduate CARE trainees would demonstrate a significant increase in application of P skills (positive skills) as measured by a 5-minute coded behavioral observation utilizing the Dyadic Parent-Child Interaction Coding System, Fourth Edition (DPICS-IV), from pre- to post-training.
2. Undergraduate CARE trainees would demonstrate a significant decrease in application of Q skills (negative skills) as measured by a 5-minute coded behavioral observation utilizing the DPICS-IV coding system, from pre- to post-training.
3. Undergraduate CARE trainees' identification of CARE skills, as presented in a pre-recorded parent-child observation, would increase from pre- to post-training. For this

hypothesis, undergraduates' DPICS-IV codes were compared to the codes obtained by an expert coder using Percent Agreement.

4. Undergraduate CARE trainees' knowledge of CARE, as measured by the CARE quiz, would significantly increase from pre- to post-training.

Exploratory Hypotheses

5. We also hypothesized that self-reported GPA, knowledge of behavior principles, knowledge of child development, self-reported social skills, and intent to work with children would significantly predict improvement in trainees' ability to recognize CARE skills in an adult-child interaction, acquisition of CARE skills, and knowledge of CARE from pre- to post-training:
 - a. GPA, knowledge of behavior principles, knowledge of child development, self-reported social skills, and intent to work with children would significantly predict trainees' recognition of skill use when viewing a pre-recorded video interaction of an adult and child in play.
 - b. GPA, knowledge of behavior principles, knowledge of child development, self-reported social skills, and intent to work with children would significantly predict trainees' improvement in positive skill use in an adult-child interaction from pre- to post-training.
 - c. GPA, knowledge of behavior principles, knowledge of child development, self-reported social skills, and intent to work with children would significantly predict trainees' decrease in negative skill use in an adult-child interaction from pre- to post-training.

- d. GPA, knowledge of behavior principles, knowledge of child development, self-reported social skills, and intent to work with children would significantly predict trainees' knowledge gains in CARE from pre- to post-training.
6. We further hypothesize that GPA, knowledge of behavior principles, knowledge of child development, self-reported social skills, and intent to work with children would significantly predict trainee report of the perceived effectiveness of CARE skills following training.
7. Finally, given relevance to working with children, we hypothesized that intention to work with children in the future would predict satisfaction with CARE training.

Method

Participants

A priori power analyses utilizing GPower revealed the required number of participants to detect a medium effect size with a power of .80 for the majority of analyses would be 30. Therefore, we aimed to recruit 30 undergraduate students utilizing SONA, an online credit-based system. Students enrolled in the current study through the SONA system and earned extra credit for their undergraduate Psychology courses in exchange for their time and participation. Given that CARE is intended for use with children and adolescents between the ages of 2-18, all participants were required to be aged 18 or older and speak English.

Measures

Demographics

Basic demographic information, including participant age, race/ethnicity, gender identity, college major, and college standing (e.g., freshman, sophomore, junior, senior) were included in a short demographic survey administered to participants prior to the training.

CARE Coding Sheet

The CARE Coding Sheet, modified from the CARE Live Feedback Coding Sheet (Messer et al., 2021), was utilized in the present study to evaluate participants' recognition and coding of skills pre- and post-training. More specifically, all participants were instructed to watch and code parent verbalizations for a 5-minute, pre-recorded video, which highlighted CARE skills, at pre-training and at post-training. This video consisted of a pre-recorded interaction of a parent and child in play, similar to videos typically used in PCIT trainings. To evaluate interrater reliability, Percent Agreement was calculated comparing participants' frequency counts for P and Q coding categories with frequency counts generated by an expert coder.

Dyadic Parent-Child Interaction Coding System, Fourth Edition (DPICS-IV)

The DPICS-IV is a standardized, well researched behavioral coding system, used throughout PCIT training and intervention (Eyberg et al., 2013). The “do” skills measured by the DPICS-IV include labeled praise, reflections, and behavior descriptions, which map onto the positive skills (P skills) of praise, paraphrase, and point out, respectively (Eyberg & Funderburk, 2011). The “don’t” skills measured by the DPICS-IV include questions, commands, and negative talk, which map onto the negative skills (Q skills) of questions, quashing the need to lead, and quieting criticism, respectively (Eyberg & Funderburk, 2011). The DPICS, over the course of editions, has demonstrated adequate to high interrater reliability (Cotter, 2016; Eyberg et al., 2013).

The DPICS-IV was used to code participants' skill acquisition during the CARE Skills Role-Play. Audio-recordings of trainee skill usage were coded by two research assistant coders and these DPICS codes were used for analyses. An interrater reliability check, comprised of

Percent Agreement, was calculated between the codes generated by the two undergraduate coders and found to be at least 80% for all recordings. Additionally, Percent Agreement was calculated between the primary coder, the coder with greater DPICS coding experience of the two undergraduate coders, and an expert coder for 30% of the recordings at random.

CARE Quiz

The CARE quiz is a 15-item multiple choice measure developed to evaluate trainees' knowledge of the P and Q skills taught during the CARE training. This assessment is a modified form of the PCIT quiz, a psychometrically sound measure used by PCIT researchers (Hatley-Cotter et al., 2023; Lee et al., 2011; Wilsie, 2012). The measure has previously been modified to reflect the language used in CARE trainings (Jimenez, 2020). CARE Quiz items include definitional questions, such as "CARE is an acronym that stands for...", and applied questions, such as "You are interacting with a child, and she starts to whine. An appropriate response encouraged by CARE would be..." related to CARE training content. CARE Quiz items are marked as either correct or incorrect and total scores reflect the total number of correct items. Previous study of this measure with a sample of professionals demonstrated the measure to have excellent reliability ($\alpha = .901$, $M = 5.669$, $SD = 4.400$; Jimenez, 2020).

Grade Point Average (GPA)

Given the predictive power of GPA in knowledge gains following a PMT training with undergraduates (Niec et al., 2020), GPA was measured as part of the demographic questionnaire. Participants were asked to provide their most recent transcript GPA (e.g., if in their first semester at university, it would be their high school senior GPA; if a transfer student, it would be their most recent GPA at the current university).

Intent to Work with Children

As part of the demographic survey, participants were asked to rate their likelihood of working with children or adolescents (youth 18 years of age or younger) in their future career on a Likert scale of 1 (“definitely will not work with children in the future”) to 5 (“definitely will work with children in the future”), with 2 equating to “probably will not work with children in the future,” 3 equating to “might work with children in the future,” and 4 equating to “probably will work with children in the future.”

Knowledge of Behavior Principles as Applied to Children (KBPAC)

The original KBPAC (O'Dell et al., 1979) is a 50-item multiple choice instrument that evaluates participants' knowledge of behavioral principles in terms of common child behaviors (e.g., homework completion, compliance). The questionnaire uses non-technical language and has evinced sensitivity to levels of expertise with children, adequate internal consistency, and test-retest reliability across a variety of samples (McLoughlin, 1985, Niec et al., 2020; O'Dell et al., 1979). The measure has been shortened to a 25-item measure, showing similar psychometric properties and moderate to good internal consistency (Furtkamp et al., 1982; Sturmey et al., 1987). The maximum total score is 25. As the KBPAC has been shown to increase following education on behavior management techniques (McLoughlin, 1985), the total score was used as a predictor of CARE knowledge gains, DPICS-IV coding accuracy compared to an expert coder, and acquisition of CARE skills.

Knowledge of Child Development Inventory (KCDI)

As participants may hold a variety of experience with children and/or child development or psychology coursework, a modified version of the KCDI was used to assess knowledge of child development at pre-training. This measure has previously been administered to early childhood education majors and higher scores were found to be associated with higher levels of

formal education, indicating the KCDI may be associated with greater exposure to developmental coursework (Goble et al., 2015). The original KCDI (Larsen & McCreary Juhasz, 1986) is a 56 multiple-choice item questionnaire consisting of content related to child development from birth to age 3. The modified version includes items assessing knowledge of children's emotional (14 items), cognitive (7 items), physical (4 items), and social development (8 items; Simons et al., 2022). Higher scores indicate greater understanding of child development. The original measure has been found to have a reliability measure of .93 (as measured by Cronbach's alpha) and criterion validity of .83 (Larsen & McCreary Juhasz, 1986). The modified version additionally demonstrated acceptable internal validity ($\alpha = .69$; 33 items; Simons et al., 2022).

Social Skills Inventory, Brief Form (Brief-SSI)

As application of CARE skills requires social interaction with children and adolescents, a brief, 30-item form of the Social Skills Inventory (Riggio, 1986) was used to assess participant's self-reported social skills at pre-training. The Brief-SSI is a self-report form intended to assess basic emotional and social communication skills, comprised of 6 primary scales containing 5 items each. For each item, respondents selected an answer from a 5-point Likert scale (e.g., 1=Not at all like me, 2=A little like me, 3=Like me, 4=Very much like me, 5=Exactly like me). Reliability for the original 90-item measure ranged from .64 to .89, as measured by Cronbach's alpha (Riggio, 2014). The measure has also demonstrated good convergent validity with other self-report measures of emotional communication and expression (Riggio, 2014). Previous confirmatory factor analyses have revealed support for the structure of the SSI, across multiple language modifications (Riggio, 2014).

CARE Evaluation Survey

The CARE Evaluation was developed to assess participants' perceived effectiveness of CARE following training (Jimenez, 2020). The measure includes eleven items on a four-point Likert scale ranging from 1 ("strongly disagree") to 4 ("strongly agree") and one open-ended item (e.g., "Comments:") to evaluate trainees' overall perceived effectiveness following the training. For example, the measure includes items such as, "The **3 P skills** can be useful in my setting" and "I feel comfortable implementing the CARE skills on my own" (Jimenez, 2020). Previous work has demonstrated the measure to have excellent internal reliability ($\alpha = .921$, $M = 34.386$, $SD = 4.926$; Jimenez, 2020).

CARE Satisfaction Survey

The CARE Satisfaction Survey was adapted from the CARE Evaluation Survey provided in the CARE Facilitators Manual (Messer et al., 2021), utilizing several items from the Alabama Psychological Association Program Evaluation form, to measure participants' satisfaction following CARE training. The measure includes ten items on a four-point Likert scale ranging from 1 ("strongly disagree") to 4 ("strongly agree") to evaluate trainees' overall satisfaction post-training across elements including format, length, instruction, and content. This measure has not yet been evaluated for psychometric properties. Item ratings were summed for a total score. Higher total scores indicated higher levels of satisfaction.

Procedure

Undergraduate participants were recruited to participate in a 3.5-hour long CARE training. Undergraduates enrolled in the study via an online university-based website in which they received extra credit for their courses in exchange for participating in the study. Upon enrolling in the study, participants gave IRB informed consent to participate in the study prior to completing study measures. See Figure 2 for a flow of the study procedure.

Pre-Training Data Collection

The CARE training was conducted with three separate training cohorts held face-to-face in the lecture hall of a Southeastern university campus. The training was provided by a team that included a trained CARE facilitator, a CARE-trained graduate student, and four PCIT-trained graduate students. Undergraduate research assistants provided a supportive role during the training (e.g., guiding participants to rooms, starting and stopping audio recordings). In order to increase time efficiency, trainees completed the CARE Role-Play and CARE Coding in two rotations, with approximately half of participants at each station, prior to exposure to training materials. Rotations were counterbalanced at pre- and post-training to reduce measurement bias.

Self-Report Measures

Participants completed the demographics survey, the first CARE quiz, the KBPAC (to assess their knowledge of behavior principles), the KCDI (to assess their knowledge of child development), and the SSI (to assess their self-reported social skills) online before the training. The demographics form also included questions regarding participants' current GPA and intent to work with children in their future career. Participants completed the forms virtually utilizing a Qualtrics survey prior to attending the training.

CARE Skills Role-Play

In order to measure participants' acquisition of P and Q skills, a standardized, scripted, 5-minute interactive video was pre-recorded utilizing a play setting with an adult and child dyad. The adult remained silent throughout the video, to indicate when the participant could respond with a skill. This standardized interaction was based upon previously developed standardized role-plays, created as a means of testing PCIT therapists' acquisition of CDI skills (Herschell et

al., 2009; Niec et al., 2020). The video created for this study included pauses following child verbalizations, to allow time for participants to use the CARE skills.

Participants watched the 5-minute-long video individually (i.e., in separate lab spaces with computers) and they were instructed to interact with the child in the video utilizing CARE skills to the best of their ability. Participants' use of CARE skills during the interactive video was audio and video-recorded and later coded by two research assistants familiar with the DPICS coding system. Participants' video-recordings were randomly assigned to pairs of two research assistants, blind to pre- and post-training conditions. Interrater reliability was then calculated via Percent Agreement between the codes produced by the two research assistants for each interaction and determined to be at least 80% for all of the recordings. Following this, Percent Agreement was calculated between the primary coder, the coder with greater DPICS coding experience of the two undergraduates, and an expert coder for 30% of the recordings at random.

CARE Coding

Participants watched a 5-minute video of a parent-child interaction aimed at highlighting P skills and were asked to record the skills they observed on a coding sheet. Participants completed the coding in a conference room located in the university building.

Following both rotations of participants completing each aspect of pre-training measures, they returned to the lecture hall for the CARE training.

Training

Once training began, CARE facilitators presented information about the background, structure, and skills from the CARE protocol. The training was comprised of a PowerPoint presentation, interactive activities (e.g., games to teach “point out” or “praise”), and example videos of adult-child dyads. Participants' skills were then practiced and reinforced through role-

plays between dyads of participants, each taking turns in the role of both the child and the adult during a playtime scenario.

Post-training Data Collection

Following the training, as with pre-treatment measures, the CARE Skills Role-Play and CARE Coding activities were completed by approximately half of the participants at a time, in two rotations.

Self-Report Measures

Participants were given a code following the completion of training which connected them to the second portion of the study on SONA, the online sign-up system for undergraduates to participate in research. Upon entering the code and signing up for the second portion, participants were directed to a Qualtrics survey. This survey included the second CARE Quiz along with the CARE Evaluation Survey and CARE Satisfaction Survey. Undergraduate research assistants checked to ensure that data were uploaded before participants left the research session.

CARE Skills Role-Play

Participants completed the CARE Skills Role-Play with the same standardized video from pre-treatment, individually, in separate lab spaces with computers. Undergraduate research assistants recorded the participants' use of skills, labeled the files, and following the study coded the CARE Skills Role-Play using the DPICS. As with pre-training CARE Skills Role-Play, participants' video-recordings were randomly assigned to pairs of two research assistants, blind to pre- and post-training conditions. Additionally, percent agreement was calculated among the two undergraduate coders for all recordings and subsequently between the primary coder and an expert coder for 30% of the recordings at random. Interrater reliability was determined to be at

least 80% among the two undergraduate coders and at least 80% in comparison to an expert coder.

CARE Coding

Participants were asked to code the same 5-minute video from pre-training, in a separate conference room in the same university building. Undergraduate research assistants played the video for participants, collected participant coding sheets, entered the data into an Excel spread sheet, and calculated interrater reliability for the coded skills as compared to an expert coder.

Results

Descriptive Statistics

Overall, the current study recruited 95 participants to complete online pre-training measures. However, drop out resulted in a total of 33 participants attending the in-person training across 3 different CARE workshops. Notably, two participants dropped out mid-way through CARE training in two separate workshops. These participants were excluded from analyses. A summary of descriptive statistics can be found in Table 1. Ages of participants ranged from 18–27 years old ($M = 19.9$, $SD = 2.1$) and 67.7% of the sample identified as female. Of the 31 participants, 77.4% were White, 12.9% were Black, 6.5% were Asian, and 3.2% were American Indian or Alaska Native. This sample is generally representative of the university population where the study was conducted, which consists of 79.1% White, 4.9% Black, 4.3% Hispanic students, 2.8% Asian, and 0.3% American Indian or Alaska Native students. In terms of college standing for the sample, 41.9% were freshman, 29.0% were sophomores, 16.1% were seniors, and 12.9% were juniors. Participants' GPA ranged from 2.0 to 4.0, with an average of 3.34 ($SD = 0.6$). There were 19 different majors declared across the 31 participants including

various sciences (e.g., psychological sciences, human development and family sciences, biology, laboratory sciences), multiple engineering disciplines (e.g., aerospace, software), and an array of medical-related fields (e.g., nursing, pre-medicine, pre-pharmacy, biomedicine, nutrition sciences), among others. The majority of the sample reported that they were not parents (96.8%). Regarding possible interactions with children in their careers, 25.8% of participants endorsed that they “might” work with children in the future, 25.8% endorsed that they “probably will not” work with children in the future, 22.6% endorsed that they “probably” would work with children in the future, 16.1% endorsed that they “definitely” will work with children in the future, and 3.2% endorsed that they “definitely will not” work with children in the future. Participants on average demonstrated 57.9% accuracy on the KCDI and 23.2% accuracy on the KBPAC, as seen in Table 1.

In terms of cohort effects, a multiple one-way ANOVA was conducted to assess significant differences across continuous descriptive variables (e.g., age, GPA), as seen in Table 2. The results indicated no significant differences between cohorts across age ($F(2,28) = 1.80, p = 0.184$) or GPA ($F(2,25) = 0.59, p = 0.561$). Additionally, several Pearson Chi-Square Tests of Independence were ran for each of the categorical variables across the three cohorts (e.g., gender identity, race/ethnicity, college standing, intent to work with children in the future), as seen in Table 3. No significant differences emerged between the three cohorts across gender identity ($\chi^2(2) = 5.373, p = 0.068$), race/ethnicity ($\chi^2(6) = 2.987, p = 0.810$), college standing ($\chi^2(6) = 8.526, p = 0.202$), or intent to work with children in the future ($\chi^2(8) = 9.614, p = 0.293$). However, it is notable that freshmen made up the majority of participants in the first two trainings, with 50% of participants in the first cohort and 60% in the second, while seniors made up the largest group, 40%, in the third.

Data Analysis

Prior to conducting the main statistical tests of the current study, all 12 variables, including 5 exploratory predictor variables, were examined for skewness, kurtosis, or outliers so as to not violate any assumptions. All analyses were conducted using SPSS unless stated otherwise.

The knowledge of CARE at pre-training and knowledge of CARE at post-training variables demonstrated platykurtic distributions, with approximate symmetry. Despite the violation of normality, the paired-samples *t*-test was determined to be robust enough to conduct the analyses given that the skewness was not severe and that the sample sizes were all over 30 data points (Stonehouse & Forrester, 1998). The predictor variables KCDI and intent to work with children in the future also demonstrated platykurtic distributions, with approximate symmetry. However, division of kurtosis by the standard error revealed that the variables were within ± 1.96 , indicating kurtosis falling within the range of a normal distribution. Acquisition of Q skills at pre- and post-training and acquisition of P skills at pre-training were found to be significantly right skewed. However, given the assumptions of paired *t*-tests are normality of the difference between pre- and post-tests, rather than the distributions themselves, analyses were performed. Significant outliers for all independent and dependent variables were removed ($n=3$), so as to not affect the end results of analyses.

Analysis of missing data via Little's Missing at Complete Random (MACR) test revealed data to be missing at complete random ($p=.100$). To account for missing data within the small

sample size, multiple imputation was utilized via SPSS, with 59 iterations chosen based on the ratio of the missing information to the complete data information “ λ ” (Bodner, 2008).

Psychometric Properties of the CARE Quiz, CARE Evaluation, and CARE Satisfaction

Surveys

Internal Reliability of the CARE Quiz

To add to growing CARE dissemination literature, the current study analyzed the internal reliability of the CARE training evaluation materials using pre-and post-training data. A reliability analysis was conducted on the CARE Quiz and the detailed results can be found in Tables 4 and 5, for pre- and post-training data, respectively. The measure showed excellent reliability at both pre- and post-training ($\alpha = .90$; $\alpha = .96$, respectively) and there were no items that significantly altered the Cronbach’s alpha upon removal. These results further support the CARE Quiz as a reliable measure (Jimenez, 2020).

Internal Reliability of the CARE Evaluation Survey

Reliability analyses were also conducted on the CARE Evaluation Survey at post-training. The CARE Evaluation was utilized as a measure of trainees’ perceived effectiveness of CARE skills following the training. The measure showed excellent internal reliability ($\alpha = .89$) and there were no items that greatly affected the Cronbach’s alpha with its removal. Results of the reliability analyses for the CARE Evaluation can be found in Table 5.

Internal Reliability of the CARE Satisfaction Survey

To measure the trainees’ satisfaction with CARE training, the CARE Satisfaction Survey was administered following completion of the CARE training. Reliability analyses were conducted on the CARE Satisfaction Survey and results can be found in Table 5. The survey

demonstrated excellent internal reliability ($\alpha = .90$). This provides evidence for the measure as reliable and feasible for use in future CARE trainings.

Primary Hypotheses

In order to assess whether trainees demonstrated significantly greater application of P skills (positive skills) during the CDI Role-Play task following the training, a paired samples t-test was run comparing participant's tallied P skills from pre- to post-training. A Bonferroni correction was applied for the analyses. Comparison of P skills at pre- and post-training revealed a significant difference in skills, such that on average, participants' P skills increased by 9.94 units ($t(37561) = 5.307, p < .0125$), as seen in Table 5.

In order to assess whether trainees demonstrated significantly fewer application of Q skills (negative skills) during the CDI Role-Play task following training, a paired samples t-test was run comparing participant's tallied Q skills from pre- to post-training. A Bonferroni correction was applied for the analyses. Comparison of Q skills at pre- to post-training revealed a non-significant difference in skill use by participants, when a Bonferroni correction was applied ($t(554360) = -2.291, p = .022$) as seen in Table 5.

To measure whether trainees showed a significant increase in the Percent Agreement of their DPICS coding from pre- to post-training, a paired samples t-test was run comparing the percentage reliability calculated, compared to an expert coder, at pre- and post-training. A Bonferroni correction was applied for the analyses. Results comparing the percent reliability from pre- to post-training indicated that there was a significant difference in reliability percentage, such that on average, participants' percent

reliability compared to an expert coder increased 15.48% ($t(5671) = 6.271, p < .0125$). On average, participants had 51.45% agreement with an expert coder at pre-training and 67.38% agreement with an expert at post-training, as seen in Table 5.

To test the hypothesis that trainees' knowledge of CARE skills would increase from pre-to post-training, a paired samples t-test was run comparing the scores on the CARE quiz at pre- and post-training. A Bonferroni correction was applied for the analyses. Comparison of participants total number of correct answers on the CARE quiz indicated that there was a significant difference from pre- and post-training scores such that on average, there was a 4.26-point increase in scores ($t(1859) = 2.865, p < .0125$), as seen in Table 6.

Exploratory Hypotheses

To evaluate whether GPA, knowledge of behavior principles, knowledge of child development, self-reported social skills, and intent to work with children would predict change scores in trainee DPICS coding, a multiple linear regression was run, as shown in Table 7. DPICS change scores were measured by finding the difference in Percent Agreement with an expert coder from pre- to post-training. Most recent GPA ($t = 2.209, p < .05$) emerged as a significant predictor but, knowledge of behavior principles ($t = 1.425, p = .154$), knowledge of child development ($t = -.210, p = .833$), self-reported social skills ($t = .251, p = .802$), and intent to work with children did not ($t = -.226, p = .821$), as shown in Table 7. For each unit increase in GPA, DPICS reliability increased by 9.2%.

To evaluate whether GPA, knowledge of behavior principles, knowledge of child development, self-reported social skills, and intent to work with children would predict change

scores in positive skill acquisition, a multiple linear regression was run. Positive skill acquisition was measured by the change in total score between P skills tallied pre- and post-training. Evaluation of coefficients revealed GPA ($t = 1.971, p < .05$) to be a significant predictor. Knowledge of behavior principles ($t = -.363, p = .717$), knowledge of child development ($t = -.411, p = .681$), self-reported social skills ($t = -.942, p = .347$), and intent to work with children in the future ($t = -.344, p = .731$) did not achieve significance in predicting change in P skills from pre- to post-training, as shown in Table 8. For each unit increase in GPA, positive skill acquisition increased by 6.23 units.

To evaluate whether GPA, knowledge of behavior principles, knowledge of child development, self-reported social skills, and intent to work with children would predict change scores in reduction of negative skill acquisition, a multiple linear regression was run. Reduction of negative skill acquisition was measured by the change in total score between Q skills tallied pre- and post-training. GPA ($t = .548, p = .583$), knowledge of behavior principles ($t = -.944, p = .346$), knowledge of child development ($t = -.043, p = .966$), self-reported social skills ($t = -.834, p = .405$), and intent to work with children in the future ($t = .716, p = .474$) did not achieve significance in predicting change in Q skills from pre- to post-training, as shown in Table 9.

To evaluate whether GPA, knowledge of behavior principles, knowledge of child development, self-reported social skills, and intent to work with children would predict change scores in CARE knowledge, a multiple regression was run. Change scores in CARE knowledge were measured by the change in total CARE Quiz score from pre-to post-training. GPA ($t = -.508, p = .612$), knowledge of behavior principles ($t = -.076, p = .939$), knowledge of child development ($t = .481, p = .631$), self-reported social skills ($t = .633, p = .527$), and intent to

work with children in the future ($t = -.390, p = .697$) did not achieve significance in predicting change in CARE Quiz scores from pre- to post-training, as displayed in Table 10.

To evaluate whether GPA, knowledge of behavior principles, knowledge of child development, self-reported social skills, and intent to work with children would predict perceived effectiveness of CARE skills, a multiple regression was run. Perceived effectiveness of CARE skills was measured by the CARE Evaluation Survey. GPA ($t = 1.384, p = .167$), knowledge of behavior principles ($t = 1.540, p = .124$), knowledge of child development ($t = -.917, p = .360$), self-reported social skills ($t = .496, p = .620$), and intent to work with children in the future ($t = -.263, p = .793$) did not achieve significance in predicting trainees' perceived effectiveness of CARE skills at post-training, as shown in Table 11.

To evaluate whether intention to work with children predicted satisfaction with CARE training, a linear regression was run. CARE satisfaction was measured by total score on the CARE Satisfaction Survey. Intent to work with children in the future was found to be non-significant as a predictor of CARE Satisfaction ($t = -.392, p = .695$), as shown in Table 12.

Discussion

Child-Adult Relationship Enhancement (CARE) is an evidence-based, trauma-informed training intended to provide any adult interacting with any child with effective relationship enhancement skills (Gurwitch et al., 2016). To date, CARE has been disseminated across a multitude of populations to increase the widespread reach of parent management skills (Messer et al., 2018; Schilling et al., 2017; Scott et al., 2021; Wood et al., 2017; Wood et al., 2021). However, there has been a paucity of published work examining the dissemination and implementation of CARE training workshops.

The current study sought to answer the call by CARE creators (Gurwitch et al., 2016) to investigate training delivery components which lead to successful outcomes, including both training and trainee characteristics, in a sample of undergraduate students. Following the work of Lee et al. (2011) and Niec et al. (2020), this study disseminated CARE to a sample of non-professional, undergraduate students at a university and evaluated their most recent GPA, knowledge of behavior principles of children, knowledge of child development, self-reported social skills, and intent to work with children in the future as predictors of their CARE knowledge gains, CARE skill recognition ability, and CARE skill acquisition from pre- to post-training.

There were several novel aspects of this study, including evaluation of the CARE workshop within a sample of non-professionals. Despite the intention for CARE to be delivered to any adult interacting with any child, prior to this study, effectiveness of CARE training workshops has only been demonstrated with caregivers (e.g., biological, foster, kinship foster) and a subset of professionals (e.g., teachers, pediatricians, social workers). This project is also the first to evaluate trainee variables which may impact success in the CARE training workshops (e.g., GPA, intent to work with children in the future, etc.). Further, as there is no current method of observationally measuring skill acquisition with a non-caregiver participating in CARE training, we introduced a novel pre-recorded video of a child at play that could be used to assess trainee skill acquisition. Additionally, this evaluation project contributed to CARE literature by introducing a measure of training satisfaction, the CARE Satisfaction Survey, and providing psychometric data for future use of the measure. This study is also the first to provide psychometric data for the CARE Evaluation Survey and the CARE Quiz with a sample of undergraduate students.

Overall, our evaluation demonstrated the effectiveness of CARE training with a sample of undergraduate students, the reliability of CARE-based training evaluation measures, and the feasibility of using observational means to assess skill competency. As with previous PMT trainings with non-credentialed adults (e.g., Niec et al., 2020; Lee et al., 2011), and other CARE trainings with varying populations (Messer et al., 2018; Schilling et al., 2017; Scott et al., 2021; Wood et al., 2017; Wood et al., 2021), trainees demonstrated significant increases in their skill knowledge, skill recognition, and demonstration of positive skill acquisition. Results indicate support for all primary hypotheses with the exception of the expected significant decrease in Q skills from pre- to post-training.

To elaborate, trainees demonstrated a significant increase in P skills from pre- to post-training in a standardized interaction with a video of a child at play, as predicted in the first hypothesis. This is consistent with the findings of current publications of CARE training across samples of foster caregivers and biological caregivers, throughout a variety of training settings (e.g., foster care agencies, primary care settings; social work settings; Messer et al., 2018; Schilling et al., 2017; Scott et al., 2021; Wood et al., 2017; Wood et al., 2021). Positive skill acquisition increasing from pre- to post-training is also in line with the findings of previous trainings of undergraduates (Lee et al, 2011; Niec et al., 2020).

In addition, post-analyses evaluation of P skills revealed participants, on average, demonstrated 4.00 ($SD = 5.59$) total P skills at pre-training and 14.34 ($SD = 10.02$) total P skills at post-training, as shown in Table 13. CARE training “goal criteria” in terms of skill acquisition is defined as 5 of each of the P skills and less than 3 of total Q skills in a 3-minute standardized play interaction (Gurwitch et al., 2016). Inspection of individual P skills showed that on average, participants met “goal criteria” of 5 per skill for Praise, neared criteria for Point Out, and fell

below criteria for Paraphrase, as seen in Figure 3. Notably, participants' skills were measured in a 5-minute role-play rather than 3-minute, as is standard for the DPICS-IV coding system.

However, these results in skill use are similar to those in the Lee et al. study (2011), which found praise (labeled and unlabeled) to be the only criteria for which undergraduate students demonstrated a significant difference in application from pre- to post-PMT training.

In the second hypothesis, Q skills were expected to decrease from pre- to post-training; however, analyses revealed trainees' Q skills to not decrease to a significant degree. While previous CARE trainings have found there to be a decrease in Q skills (e.g., Messer et al, 2018), these trainings have included caregivers (e.g., foster, biological) with more practical experience interacting with children on a daily basis. In a study of PMT skills disseminated to undergraduate students, as in the current sample, "don't skills" including questions, commands, and negative talk, were not found to be significantly different at pre- and post-training (Lee et al., 2011). There are numerous factors which may contribute to why a non-credentialed, primarily non-caregiver sample may not have demonstrated a significant decrease in "don't skills" including difficulty with practical experience, recall, trainer-trainee ratio, motivation, measurement characteristics, and instruction.

In a previous study (Jimenez, 2020) delivering a 3.5 hour CARE to professionals (e.g., pediatricians, social workers), it was found that CARE trainees initially decreased Q skills from pre- to post-training but increased in Q skills at a one-month follow up, as measured by retrospective self-report of skill use. Further evaluation revealed that trainees found skills related to "what to do" to be easier to remember than those related to "what not to do" (Jimenez, 2020). Therefore, non-credentialed CARE trainees may have demonstrated difficulty with this pattern of recall as well.

The Lee et al. (2011) study cited two additional reasons for this unexpected lack of decrease in “don’t skills” from pre- to post-training, which may be relevant to the current study. Firstly, it was noted that due to the large sample size of undergraduate trainees, not all trainees were provided with ample coaching time by the trainer (Lee et al., 2011). Similarly, the sample sizes in the current study differed across the three cohorts such that the ratio of trainer to trainee was as small as 3:17 and as large as 4:5 across cohorts. Thus, trainees in the 3:17 ratio group may not have received as much one-on-one coaching and feedback from the trainer, resulting in limited opportunity to reinforce desirable behaviors (e.g., “do skills”; Lee et al., 2011). However, post-hoc analyses of cohort skill acquisition revealed no significant differences across change in P skills ($p=.319$) or change in Q skills ($p=.806$), between the three cohorts. Therefore, cohort size and amount of practice and feedback on CARE skills delivered during the trainings may have been sufficient enough to reinforce P skills overall. The time limitation of 3.5 hours, however, may not have been sufficient to distinguish between the three P skills or reduce Q skills. This is supported by “Praise” proving to be the only P skill to reach training criteria (e.g., 5) at post-training and the insignificance of reduction of Q skills from pre- to post-training across all cohorts.

Secondly, the Lee et al. (2011) study highlighted motivation as a factor contributing to participants’ lack of change in “don’t skills”. Similar to the sample utilized in the Lee et al. (2011) study, the current project also included undergraduate students who participated in return for extra credits for their psychology-related courses. As stated by Lee and colleagues (2011), students who had continued interactions with a specific child or were consistently in settings in which these skills could be applied (e.g., a child-related job, a child-related volunteer opportunity), may have been more motivated to use these skills. A study delivering PCIT skills

to undergraduate students preparing to serve as one-on-one mentors to children in the community found a significant link between skill application and increased quality of the mentor-mentee relationship (Brooks, 2011), suggesting that having a target child for skill use may increase motivation to practice and maintain skills, as the benefits (e.g., having a more positive relationship with the child) are more immediate to trainees.

Further, findings from previous CARE studies also support Lee et al.'s (2011) notion that identifying a target child can increase trainee motivation to change. More specifically, decrease in CARE trainee application of Q skills at post-training was found in samples of biological and foster caregivers with target children who exhibit behavior difficulties and/or trauma-related symptoms (Messer et al., 2018; Wood et al., 2017; Wood et al., 2021). This suggests that having an identified child, and identified behavioral goals (e.g., reducing externalizing behaviors, reducing trauma-related symptoms), may aid in trainee motivation to change existing skill use. The current study included a sample of general undergraduate students, with a wide range of majors and career goals, with approximately 31% endorsing that they “probably will not” or “definitely will not” work with children in the future. Therefore, a large portion of trainees may not have had specific children to interact with in the immediate future, reducing motivation for changing skills from pre- to post- training. While this study specifically evaluated intent to work with children in the future as a motivating factor, it may not be as motivating for this sample which primarily consisted of freshmen, whom likely would not enter the workplace for several years.

Apart from the reasons cited in the previously mentioned study (Lee et al., 2011), the current study also featured unique elements which may have impacted Q skill use. Specifically, a standardized video recording of a child at play was employed for this study. Trainees were

directed to engage with the child in the video as if they were playing with them and trainee verbalizations were recorded and then coded by our research team using the DPICS (Eyberg et al, 2013), a standardized measure of behavioral assessment used in PCIT. This video had several benefits in ease, cost-efficiency, and accessibility for future training use. However, it is possible that elements of this video, including the pre-recorded nature of the video and the child's behavior in the video, may have limited trainee engagement in certain skill use.

For example, as the video created for this study was pre-recorded, participants knew the child in the video could not interact with them in real-time. Therefore, they may have been discouraged to ask questions during the interaction. In addition, as commands could not be followed through by the child, trainees may also have provided fewer commands during the interaction than they may have in a real-life interaction with a child. These factors suggest that the standardized video may be limited in its ability to provide the bi-directional interaction needed to elicit the use of Q skills to the same extent that live, face-to-face interaction would allow.

This is supported by the findings of Lee et al (2011), a study which utilized an adult confederate for measurement of participant skill acquisition following delivery of a PCIT course to undergraduates. Specifically, participants in the Lee et al. (2011) study demonstrated approximately 12.40 questions on average at pre-training, while participants in the current study demonstrated approximately 3.74 questions on average at pre-training. However, in the Niec et al. (2020) study, involving a 40-hour PCIT training delivered to undergraduates, participants asked approximately 4.13 questions on average at pre-training, along with 0.98 commands, and 0.13 criticisms, when interacting in a 5-minute role-play with an adult confederate acting as a child. These results are similar to those found for participants at pre-training in the current study,

as seen in Table 14. Given the varied results across these three studies of PMT skill use in undergraduates, it is possible that the standardized video may be limited in providing a naturalistic interaction comparable to that of a true adult-child interaction but can provide an environment similar to an adult-adult confederate interaction without the burdensome task of requiring an adult confederate to participate. In future trainings, it may be important to consider both the benefits and drawbacks when using the standardized video and evaluate resources available for the best fit for observationally measuring skill acquisition.

Regarding the child's behavior in the standardized pre-recorded video, trainees may have been less incentivized to utilize Q skills during this interaction, which are often attempts to control, direct, or stop a negative child behavior, as the child acting in the video engaged in prosocial behavior (e.g., sharing toys, asking questions to engage, showing toys to the audience). This may have elicited greater positive skills and fewer negative skills from the trainee. Future trainings may benefit from adapting the current standardized video to include problematic child behaviors to add to the naturalistic interaction and evoke true P and Q skill use of trainees.

Apart from characteristics of the novel observational measurement in this study, lack of significant change in Q skills could also be related to difficulty with instruction. Based on qualitative feedback during the training of the first cohort, from trainees and undergraduate researchers, it appeared that some trainees did not fully understand the instructions provided. Specifically, trainees in the first cohort stated they were unsure if they were to interact with the child in the video "verbally or physically". Consequently, several participants did not interact with the video verbally during pre- or post-training assessment in the first cohort ($n = 4$), resulting in scores of 0 across P and Q skills. As it could not be discerned for each individual whether lack of motivation, lack of skill knowledge, or misunderstanding of instruction were

contributing to the lack of participation with the video, these data points were kept in the analyses and may have impacted the results in Q change scores. In the subsequent cohorts, oral and written instructions were adapted to clarify that trainees were to interact with the video “verbally” and the recordings of the interaction would be watched to determine if they participated in all elements of the study. No other participants in the subsequent cohorts demonstrated 0 verbalizations across pre- and post-assessment. Overall, without comparison to a control group, it is not possible to distinguish which factors across training content, measurement characteristics, and delivery of instruction, most influenced trainees’ lack of decrease in Q skill use. This may be important to implement in future trainings to determine which elements of the CARE training workshop best support trainee skill acquisition.

In terms of the third hypothesis, results supported the initial prediction that trainees would increase in DPICS coding reliability compared to a reliable coder (e.g., a CARE and PCIT-trained graduate level student) from pre- to post-training. On average, trainees’ reliability increased approximately 15% from pre- to post-training. However, similar to the Niec et al. (2020) sample, our trainees did not meet the competency guideline of 80% interrater reliability for coding accuracy, when compared to an expert coder. This, however, is in line with findings from other PMT trainings as paraprofessionals and professionals, with related background knowledge, in lengthy 40-hour PCIT trainings, have also been shown to have difficulty meeting coding criteria (Barnett et al., 2016; Niec et al., 2020; Travis & Brestan-Knight, 2013; Wilsie, 2012). Moreover, it has been shown that it can take as many as 10 role-playing interactions of PMT skills in order to reach coding criteria for professionals (Wilsie, 2012). Standard practice in CARE training engages trainees in practicing P skills in groups of 3 to 4 and provides each trainee the chance to code an interaction with live feedback from the trainer, over the course of a

3.5-hour training. There is no standard of “goal criteria” for coding in CARE and no standard time allotted to practicing coding (Gurwitch et al., 2016). Therefore, with further training in DPICS-IV coding or greater emphasis on coding during CARE training, trainees may be able to reach 80% interrater reliability (Niec et al., 2020).

In line with CARE literature previously cited (Jimenez, 2020; Messer et al., 2018; Schilling et al., 2017; Scott et al., 2021; Wood et al., 2017; Wood et al., 2021), and predicted in the fourth hypothesis of this study, results indicated a significant increase in trainee CARE knowledge from pre- to post-training. This supports the suggestion that CARE curriculum can be delivered to “any adult,” as the current sample consisted of non-credentialed, primarily non-caregiver trainees. Findings of the current study also support CARE curricula as effective in dissemination to adults as young as 18 years of age, with a high school education level. Results of this study additionally support knowledge gains of PCIT skills delivered to undergraduate students in several other studies including Lee and colleagues (2011) and Filz (2014).

However, it is notable that in this study, participants began with scores equivalent to the grade of an “F” (36.13%; $M=5.41$, $SD=4.36$) and at post-training ended with scores equivalent to the grade of a “D” (64.53%; $M=9.68$, $SD=8.73$). Although there was a 28.40% increase in accuracy from pre- to post-training, participants maintained relatively low scores compared to other non-caregiver CARE trainees, who attained approximately “high B” grades on the CARE quiz one day post-training (e.g., 88.3% accuracy; Jimenez, 2020). Of note, the only other published evaluation of CARE skill knowledge utilizing the CARE Quiz consisted of a sample of paraprofessionals including pediatricians and social workers. The difference in findings across these two non-caregiver trainee samples may be related to the nature of the sample primarily consisting of college freshmen. More specifically, CARE Quiz scores may initially be lower than

in previous samples of CARE trainees due to the lack of experience in developmental-related coursework and the lack of overall experiential opportunities to work with children. While trainees demonstrated ability to gain knowledge through CARE training, this particular sample of non-caregiver, non-professionals may have benefited from increased lecture time and review on CARE principles. This aligns well with Niec and colleagues (2020) recommendations for trainings with natural helpers, including increasing training length and focusing on experiential and didactic material in training.

This study also examined several exploratory hypotheses, including hypotheses five through seven, evaluating selection criteria which were predictive of knowledge gains, skill acquisition, skill recognition, perceived effectiveness of CARE skills, and satisfaction with CARE training. Results for these exploratory hypotheses demonstrated support for the work of Niec and colleagues (2020) in terms of predictors of positive skill acquisition and skill recognition. Specifically, GPA was a significant predictor of an increase in P skills from pre- to post-training, as well as of increase in reliability compared to an expert coder from pre- to post-training. Notably, in contrast to Niec et al.'s (2020) finding of GPA as predictive of knowledge gains, none of the factors examined were found to be significant predictors of CARE Quiz change scores. One possible explanation is the lack of diversity in GPA scores for participating trainees, as the mode of the sample was 4.0 with 46.4% of participating trainees earning the maximum GPA. GPA also may have been limited in reflecting trainees' true knowledge ability as freshmen likely reported high school GPA scores while upperclassmen likely reported college GPA scores, which are more advanced in rigor. Therefore, while most participants reported holding 4.0 GPA, inflating the variable, differences may have existed in knowledge ability across freshmen and upperclassmen in the three cohorts. Additionally, as the majority (93%) of the

sample in the Niec et al. (2020) study had completed coursework in psychology and some in human development, it could be that the largely freshmen standing of the current sample generally lacked exposure to psychological concepts which would contribute to differences in CARE quiz performance. This is supported by the generally low scores in knowledge of child development and knowledge of behavior principles, as measured by the KCDI and KBPAC, across the sample.

Aside from positive skill acquisition and reliability coding, Q skill change scores were also evaluated with predictors. None of the predictors examined reached significance. This may be related to the previously noted non-significant differences between Q skills at pre- and post-training. Additionally, GPA may have predicted positive knowledge gains, but not change in pre-existing knowledge. As noted by Lee and colleagues (2011), training content may have also emphasized increase in positive skill application and shaping of positive skill use via coaching, rather than highlighting reduction of negative skill application. Therefore, the training content itself may have impacted Q skill change scores rather than individual trainee characteristics.

Predictors of perceived effectiveness of CARE skills were also evaluated. None of the predictors were found to reach significance. Given that the skills and psychoeducation delivered in CARE, as in all PMTs, are rooted in behavior principles of children (Gurwitch et al., 2016), it was expected that trainees who had prior knowledge of behavior principles would find the skills to be more useful. However, based on participants' KBPAC scores at pre-training, knowledge of behavior principles in the current sample may have been too limited and too little in variation to impact perceived effectiveness of CARE skills. In regard to knowledge of child development, the lack of significance may be due to the limited age range of the KCDI, which measures knowledge of child development from birth to age three. PMTs, like CARE, are typically

intended for a wider age-range, and as such, greater knowledge of infant development may not translate into viewing CARE skills as more effective. Overall, post-hoc evaluation of CARE Evaluation Survey scores revealed that participants generally perceived CARE skills as effective ($M= 34.86$, $SD =3.96$), as shown in Table 15. These findings reflect similar scores to previous CARE trainings evaluating perceived effectiveness of skills in a sample of paraprofessionals (Jimenez, 2020). Although no predictors were found to be significant, this result supports the notion that CARE skills can be useful for all adults and suggests that future CARE trainings have the potential for effective delivery to an even broader audience, including older adolescents, students in training to work with children in future careers, and young adults who may serve as caregivers in the future.

Finally, this study evaluated whether intent to work with children in the future predicted satisfaction with the CARE training. Intent to work with children in the future was not a significant predictor of satisfaction. The generalizability of CARE training to adolescents nearing adulthood (e.g., 17-year-olds) and the applicability of the skills to any social interaction may have contributed to overall satisfaction, even for trainees who did not intend to work with children in the future. In addition, examination of qualitative components of the survey revealed participants found the skills as helpful to their careers (e.g., “This helped me solidify ways I can build confidence in the children I work with,” “I found this study was very informative and I will further practice it”). The generalizability of CARE skills beyond careers with children is supported by trainees’ qualitative endorsements that they would apply these skills with “family,” “future family of [their] own,” “in [their] career,” “social settings,” with their romantic partners (e.g., “girlfriend”), and “with future co-workers.” Quantitatively, trainees overall demonstrated satisfaction with the training ($M= 34.86$, $SD =3.96$), as shown in Table 15. These results align

with previous studies which have utilized self-report and qualitative feedback on satisfaction post-training and found positive results (Eriksson, 2018; Gurwitch et al., 2016; Jimenez, 2020). Future trainings, especially those with non-credentialed trainees, may benefit from emphasizing the generalizability of these skills, as it was continually highlighted by trainees in this study on post-training satisfaction surveys.

Limitations

This study held several strengths as the first CARE study to evaluate delivery to undergraduate students and skill acquisition using a standardized video of a child at play. Utilizing a mixed-method design with evidenced-based observational and self-report measures, this rigorous study furthered CARE dissemination and implementation research. Few studies have evaluated trainee characteristics in PMTs (Niec et al., 2020), with the current project continuing this work for CARE training specifically. This training additionally delivered CARE to individuals as young as 18 with positive gains in skill acquisition and CARE knowledge, broadening the scope of CARE training.

Despite holding many strengths, there are some limitations to the current project. First, the small sample size ($n=31$) may have contributed to low power for the exploratory analyses, impacting their results. Notably, several published CARE studies have utilized similarly small sample sizes ($n=31$, Messer et al., 2018; $n=32$, Scott et al., 2021; $n=19$, Wood et al., 2019), possibly related to both attrition rates and the need to maintain a reasonable trainer-trainee ratio. Further, due to variation in sample sizes across trainings and the availability of trainers, the ratio of trainees to trainers in this study varied across cohorts from 5:4 to 17:3. Due to this variation, aspects of the training were not identical including time attributed to direct coaching feedback

for each participant, size of individual groups for role-playing, and stylistic differences in curricula delivery.

Another limitation of the current study is the lack of a true experimental design. Due to the small sample size recruited, this study did not include a control group for comparison to those receiving the standard CARE training. Future studies may benefit from incorporating a comparison group to systematically assess for variables including trainee-trainer ratio (e.g., large group lecture vs. small group lecture), dosage of training (e.g., standard 3.5-hour training vs. multi-day training), and amount of role-play practice during training (e.g., standard 3-4 role-plays per group of 3-4 versus 10 role-plays per group of 3-4).

Finally, while this study employed a new method of observationally measuring trainee skill acquisition, it is limited in providing a comparative measure to evaluate the effectiveness of the video in eliciting the trainees' true P and Q skills. It may be beneficial in future research to evaluate trainees' skills at pre-training via both interaction with a live child or adult confederate acting as a child and the standardized video, with the order randomly assigned. This could allow for researchers to determine if there is a significant difference in trainee skill use based on the modality of the observational measure.

Future Directions

In summary, the findings of this study related to selection criteria and a non-caregiver non-credentialed sample ultimately support the recommendations outlined by Niec and colleagues (2020) including recruiting from a relevant sample (e.g., individuals with previous experience with children, knowledge of behavior principles, or child-related career ambitions) for future trainings, utilizing general knowledge or ability to learn (e.g., GPA) as selection

criteria for future training group members, extending the training to include either longer sessions or more sessions (e.g., beyond the 3.5 hours covered in CARE) to mimic training for professionals, and incorporating more active and experiential exercises into training curricula (e.g., role-plays, coding exercises). In order to meet many of these goals, it is recommended that future research in CARE focus on adaptations to curricula to increase feasibility of application with a broader sample of adults (e.g., non-credentialed, non-caregiver, future parents, future paraprofessionals and professionals, older adolescents serving in childcare roles).

More specifically, when selecting future non-credentialed trainee populations, it would be beneficial to prioritize those who will interact with children or adolescents in the immediacy (e.g., camp counselors, nursing students, babysitters, education majors) and who have demonstrated a strong ability to learn or motivation to learn (e.g., achieved an above-average GPA,). In addition, it may be resource-efficient to provide the KBPAC or report of recent GPA and identify cut-off protocols when selecting non-credentialed individuals for future trainings, to increase rates of skill knowledge and acquisition along with the likelihood of future skill application.

In regard to future samples, CARE could also be disseminated as a pre-parenting module to college students or expecting parents, given its applicable skill set, as with Lee and colleagues' (2011) study. Similarly, given the efficacy of CARE with an undergraduate sample and trauma-informed skillset, it may be beneficial as pre-career course for emerging health and behavioral health providers who may engage with children in rotations, internships, or prerequisite experiences for their degree. Additionally, the current study demonstrated success with application of CARE to trainees as young as 18 years of age and may be suitable for delivery to younger populations who interact with children in their workplace, volunteer site, or

other environments (e.g., high schoolers working as summer camp counselors, babysitters, after school program workers, tutors) even prior to entering college. Examination of CARE utilizing younger populations with targeted child-related experience should be explored in future work.

In terms of dose, as with other non-credentialed samples (Lee et al., 2011; Niec et al., 2020), trainees in the current study had difficulty achieving the goal criteria outlined in the curricula. A more intensive format of CARE or an added follow-up session may promote increased skill acquisition and maintenance. It is notable, however, that even with a 10-hour training of PCIT, non-credentialed helpers were not able to reach goal criteria (Niec et al., 2020). Non-credentialed trainees may be at a disadvantage compared to other trainee samples who have met training goals in the 3.5-hour training course due to lack of foundational knowledge of children, development, and behavior principles along with lack of experience with children in a variety of settings. Extending the time afforded to CARE training, via adding segments outlined below, may aid in increasing CARE knowledge, trainees' perceived effectiveness of CARE skills, and overall satisfaction with the training.

Related to additional training content, it is recommended that curricula be modified to include greater focus on experiential content, including designated time for trainees to learn CARE coding categories and practice coding exercises with feedback from trainers. This will allow for greater familiarity with CARE skills and reflection of self-skill use for the trainee. To increase active engagement with materials, it would also be advantageous for future trainings to include content related to applicability of skills to varying relationships the trainee may encounter (e.g., camp counselor relationships, roommate relationships, workplace relationships), specific to the trainee population. Outlining where skills may be applicable and allowing role-play of trainees' real-life situations can allow for increased buy-in, motivation to learn, and

engagement with training content, as immediate benefits may be clearer to the trainees. Including an introductory segment to knowledge of child development and behavior principles for non-credentialed trainee populations may also be beneficial to trainee skill acquisition and knowledge gains.

Apart from Niec and colleagues' (2020) recommendations, the success of CARE training delivery in this study evokes important research questions to distinguish CARE from other similar training programs. This study demonstrated the feasibility of delivering CARE training to an undergraduate population, as did the shortened format of PCIT delivered in Lee and colleagues' (2011) study. CARE and the CDI-limited format of PCIT hold similar outcomes in terms of trainee knowledge and skill acquisition post-training. Additionally, both have demonstrated effective delivery in a university classroom-based format. These similarities pose the question of the effectiveness of CARE gains compared to PCIT gains in the goal of equipping non-caregiver adults with effective PMT skills. Future work should evaluate direct comparison of trainees completing a CDI-based PCIT training curricula versus CARE, to determine the utility of maintaining a separate curricula for non-parents and demonstrate CARE's benefit to this population above and beyond PCIT. CARE, PCIT, and evidence-based PMTs are continually evolving and, as such, investigation on the utility of these formats is essential to ensure effective delivery, appropriateness of fit, and feasibility of implementation.

Beyond the sample of CARE trainees, this study also evaluated a new modality of measuring skill acquisition, with some success and some notable limitations. Previous studies have historically utilized adults acting as children in skill role-plays to measure skill acquisition (Lee et al. 2011; Niec et al., 2020; Scott et al., 2024). However, adult confederates acting as children in CARE and PCIT trainings have faced challenges of participant recruitment post-

training, validity of a trainee's ability to interact with children utilizing the skills, and lack of standardization. The current study demonstrated the feasibility for using a video interaction to measure skill acquisition, to account for these difficulties. Moreover, this video not only allowed for standard interaction, but also allowed for the approximation of a child-adult interaction without the difficulty of scheduling a child to attend a training of non-caregiver or adding the burden of a child attempting to maintain a similar interaction with each trainee. This is especially important in a post-COVID world, where telehealth and online training formats are becoming more widely accessible for PMTs (Garcia et al., 2021; Jent et al., 2018; Ros-DeMarize et al., 2023). Future research should evaluate the delivery of CARE in an online training modality, which has yet to be published in literature. To add, given the noted limitations of the standardized, pre-recorded measurement of skill acquisition, researchers should apply updated means of technology, including virtual reality and artificial intelligence to mimic a realistic adult-child interaction (Jent et al., 2018).

In terms of measurement, this study was also able to implement a novel measure of satisfaction, the CARE Satisfaction Survey, which was found to have sound psychometric properties. As there is no other current evidence-based, reliable assessment of satisfaction with CARE training, it is recommended that this measure be utilized in future CARE trainings to add to CARE evaluation literature. The CARE Evaluation Survey was also administered in this study and determined to have good psychometric properties. The CARE Evaluation Survey has only been utilized in one previous study (Jimenez, 2020) and would be beneficial to deliver in future CARE trainings for both quantitative and qualitative feedback from trainees. Similarly, findings of this study related to CARE knowledge gains add to literature utilizing the CARE Quiz, which has only been utilized and assessed for reliability in one previous study. As CARE continues to

be modified and adapted for wider populations of both adults and children, it is important to continue to develop these CARE-specific self-report measures and determine the best methods for evaluation of trainee knowledge of, satisfaction with, and perceived effectiveness of CARE content and skills.

In conclusion, this study contributed to a growing body of CARE literature. The future of CARE dissemination and implementation will need to include further evaluation of observationally-based skill measurement, adaptation of curricula to increase training success for non-credentialed trainees, and continued assessment of successful implementation via CARE trainee self-report measures. It is the hope of the author of this study that CARE continues to reach greater populations of adults to truly place PMT skills “in the water” for all to benefit from.

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Appendix A Demographic Information

(Circle all that apply)

Age: _____

Gender: _____

Race/Ethnicity:

American Indian or Alaska Native
Asian
Black or African American
Hispanic or Latino
Native Hawaiian or Other Pacific
Islander
White or Caucasian
Other

College Major: _____

College Standing: Freshman
 Sophomore
 Junior
 Senior
 Graduate Student

Most Recent GPA (as indicated on transcript):

How likely is it that you will work with children and/or adolescents (individuals aged 18 or under) in your future career (Please circle)?

1

**Definitely will
not** work with
children in the
future

2

**Probably will
not** work with
children in the
future

3

Might work
with children in
the future

4

Probably will
work with
children in the
future

5

Definitely will
work with
children in the
future

Appendix B

CARE Quiz

Name: _____

Date: _____

1. CARE is an acronym that stands for:
 - a. Children and Adults Reading Emotions
 - b. Children Are Real Enigmatic
 - c. Child-Adult Relationship Enhancement
 - d. Child-Adult Relationship Enjoyment
2. You and a child are playing with toy animals and the child says, "I've got a moo cow." An example of paraphrase you could use is:
 - a. You are playing so nicely with your moo cow
 - b. What comes from cows
 - c. I have a goat
 - d. You do have a brown and white cow
3. Which of the following should you avoid doing when using the CARE skills with a child:
 - a. Doing what the child is doing
 - b. Asking the child about what they are doing
 - c. Describing what the child is doing
 - d. Being genuine
4. When using the CARE skills with a child, it is important for you to:
 - a. Lead the play
 - b. Make sure the focus is on what you are doing
 - c. Show you are interested by asking questions
 - d. Let the child know that what he or she is doing is interesting
5. What do the 3 Ps stand for?
 - a. Peace, Permission, and Plentitude
 - b. Positive, Praise, and Pointing
 - c. Praise, Paraphrase, and Pointing out Appropriate Behavior
 - d. Parents, Pointing out Any Behavior, and "Parachuting In"
6. According to CARE, which of the following **is** an appropriate statement to make during an interaction with a child?
 - a. "You are using green blocks to build a house"
 - b. "Let's play with the animals, ok?"
 - c. "The sky is not purple."
 - d. "Come play with me."
7. Which of the following is NOT a benefit derived from using the 3 Ps?
 - a. Improves children's self-esteem
 - b. Enhances children's visual acuity

- c. Enhances the relationship between the adult and child
 - d. Has a calming effect on the child
- 8. A specific praise is preferred over a nonspecific praise because:
 - a. It tells the child exactly what he or she did that was good
 - b. It sounds nicer
 - c. It is shorter
 - d. It is more enthusiastic
- 9. You are interacting with a child, and she starts to whine. An appropriate response encouraged by CARE would be:
 - a. Saying to the child, "Stop whining."
 - b. Turn away from the child until she is behaving appropriately.
 - c. Take all the toys away from the child and say, "Sit quietly while I play nicely with the toys."
 - d. Smack the child on the hand and say, "We do not whine."
- 10. Which of the following is an example of the type of praise encouraged in the CARE program?
 - a. "Excellent!"
 - b. "You are awesome!"
 - c. "Great job sitting still on the chair!"
 - d. "You are so sweet!"
- 11. In the CARE program, we allow children _____ to comply with a command.
 - a. 5 seconds
 - b. 10 seconds
 - c. 15 seconds
 - d. 30 seconds
- 12. You should give the child an explanation for your command _____.
 - a. before the command is given
 - b. after the command is given
 - c. while the child is deciding whether or not to comply with the command
 - d. A & B only
- 13. It is important that commands are _____.
 - a. Specific
 - b. Given one at a time
 - c. Provided in a neutral tone of voice
 - d. All of the above
- 14. Which of the following is a good direct command?
 - a. Would you like to sit down?
 - b. Hand me the block.
 - c. How about we clean up these toys?
 - d. Will you hand me that block?

15. If a child obeys your command, you should
- a. Give the child a sticker
 - b. Give the child another command immediately
 - c. Give the child a praise
 - d. Give the child a labeled praise

Appendix C
CARE Coding

Name _____

Date _____

Tally on the sheet each time you hear a P or Q skill. If you hear a skill, add a tally for it.

3 P's

Skill	Tallies	Total
PRAISE (Specific) appropriate behavior		
PARAPHRASE appropriate talk		
POINT OUT the child's appropriate behavior		

3 Q's

Skill	Tallies	Total
QUASH the need to lead! Avoid unnecessary commands.		
QUIT <u>Unnecessary</u> "Information" QUESTIONS QUIT "Tone-of-voice" QUESTIONS		
QUIET the criticisms: QUIT NO DON'T STOP NOT		

Appendix D

Child Adult Relationship Enhancement (CARE) Evaluation Post-Training

Please rate the CARE training by checking one number in each category.

1) The **3 Ps skills** can be useful in my future endeavors (e.g., career, family, social settings)

1	2	3	4
strongly disagree	disagree	agree	strongly agree

2) The **information about the Q's** can be useful in my future endeavors (e.g., career, family, social settings)

1	2	3	4
strongly disagree	disagree	agree	strongly agree

3) The **Ignore skills** can be useful in my future endeavors (e.g., career, family, social settings)

1	2	3	4
strongly disagree	disagree	agree	strongly agree

4) I have learned **new approaches** to using praise (i.e., making praises specific, praising behaviors I want to see more of) that I have not previously used.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

5) I have learned **new approaches** to describing a child's behavior (i.e., pointing out what the child is doing) that I have not previously used.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

6) I have learned **new approaches** to paraphrasing a child's appropriate talk (i.e., paraphrasing to enhance language skills) that I have not previously used.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

7) I feel comfortable implementing the CARE skills on my own.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

8) The elements of **giving good commands** can be useful in my future endeavors (e.g., career, family, social settings)

1	2	3	4
strongly disagree	disagree	agree	strongly agree

9) I can see myself using CARE skills on a daily basis:

1	2	3	4
strongly disagree	disagree	agree	strongly agree

10) I have learned **new approaches** to giving good commands (e.g., making commands direct, specific, positively stated, etc.) that I have not previously used.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

11) The specific setting and population I expect to interact with in my future endeavors (e.g., career, family, social settings):

12) Comments:

Appendix E

CARE Satisfaction Survey

Please rate the CARE training by checking one number in each category.

1. I feel like the training was provided in an appropriate format and time length given the content presented:

1	2	3	4
strongly disagree	disagree	agree	strongly agree

2. Regarding information I obtained during the training, I feel I have learned:

1	2	3	4
nothing	very little	several useful techniques	very many useful techniques

3. I feel the handouts that were provided were current and useful.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

4. I feel the instructors seemed knowledgeable concerning the topics covered:

1	2	3	4
strongly disagree	disagree	agree	strongly agree

5. I feel the type of program that was used to train me to more positively interact with children and adolescents was:

1	2	3	4
very poor	poor	good	very good

6. I feel that the instructors answered questions satisfactorily:

1	2	3	4
strongly disagree	disagree	agree	strongly agree

7. The training met or exceeded my expectations:

1	2	3	4
---	---	---	---

strongly disagree disagree agree strongly agree

8. I would recommend this training to others:

1	2	3	4
strongly disagree	disagree	agree	strongly agree

9. I feel this training will change the way I interact with children and adolescents:

1	2	3	4
strongly disagree	disagree	agree	strongly agree

10. I would welcome future training/consultation/feedback on my CARE skills:

1	2	3	4
strongly disagree	disagree	agree	strongly agree

Table 1. Descriptive Statistics

	<i>M/SD</i>	<i>N</i>	<i>%</i>
Age	19.85/2.05	31	
Gender			
	<i>Female</i>	21	67.7
	<i>Male</i>	10	32.3
Ethnicity			
	<i>White</i>	24	77.4
	<i>Black</i>	4	12.9
	<i>Asian</i>	2	6.5
	<i>American Indian or Alaska Native</i>	1	3.2
College Standing			
	<i>Freshmen</i>	13	41.9
	<i>Sophomore</i>	9	29.0
	<i>Junior</i>	4	12.9
	<i>Senior</i>	5	16.1
Intent to Work with Children			
	<i>Definitely Will</i>	5	16.1
	<i>Probably Will</i>	7	22.6
	<i>Might</i>	8	25.8
	<i>Probably Will Not</i>	8	25.8
	<i>Definitely Will Not</i>	1	3.2
	<i>Missing</i>	2	6.5
Parent Status			
	<i>Yes</i>	1	3.2
	<i>No</i>	30	96.8
KBPAC Percent Correct	22.32/.23	31	
KCDI Percent Correct	57.95/17.26	31	
Most Recent GPA			
	<i>4.0</i>	13	41.9
	<i>3.0</i>	12	38.7
	<i>2.0</i>	3	9.7
	<i>1.0</i>	0	0
	<i>Missing</i>	3	9.7

Note. GPA=Grade Point Average; KBPAC= Knowledge of Behavior

Principles Applied to Children; KCDI= Knowledge of Child Development Inventory.

Table 2. One-Way Analysis of Variance of Descriptive Variables by Cohort

		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Age	Between Groups	2	13.40	6.70	1.80	0.184
	Within Groups	28	104.15	3.72		
	Total	30	117.55			
GPA	Between Groups	2	0.46	0.23	0.59	0.561
	Within Groups	25	9.66	0.39		
	Total	27	10.12			

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 3. Pearson Chi-Square Test of Independence of Descriptive Variables by Cohort

	<i>df</i>	χ	<i>p</i>
Gender	2	5.373	0.068
Race/Ethnicity	6	2.987	0.810
College Standing	6	8.526	0.202
Parent Status	2	.969	0.616
Intent to Work with Children	8	9.614	.293

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 4. Internal Reliability Statistics for Pre-Training Measures

Reliability Statistics			Summary Statistics of Inter-item Correlations		
	<i>N</i>	Cronbach's α	<i>M</i>	Min/Max	Range
CARE Quiz	77	.90	.35	-.09/.92	1.01
KBPAC	68	.89	.25	-.22/.75	.97
KCDI	63	.93	.19	-.55/.79	1.33
SSI	35	.78	.11	-.55/.74	1.29

Note. CARE= Child-Adult Relationship Enhancement; KBPAC= Knowledge of Behavior Principles Applied to Children; KCDI= Knowledge of Child Development Inventory; SSI= Social Skills Inventory.

Table 5. Internal Reliability Statistics for Post-Training Measures

	Reliability Statistics	
	<i>N</i>	Cronbach's α
CARE Quiz	30	.96
CARE Evaluation Survey	30	.89
CARE Satisfaction Survey	30	.90

Note. CARE= Child-Adult Relationship Enhancement.

Table 6. Results of Pre- to Post-Training Paired Sample T-Tests

Scales Compared	<i>N</i>	<i>M</i>	<i>M Diff</i>	<i>t</i>	<i>p</i>
Pre P Skills	31	4.43	9.94***	5.31	<.001
Post P Skills	31	14.54			
Pre-Q Skills	31	4.85	-1.73*	-2.29	0.022
Post Q Skills	31	2.97			
Pre DPCIS Reliability	31	0.51	0.15***	7.17	<.001
Post DPICS Reliability	31	0.67			
Pre CARE Quiz	31	5.42	4.26**	2.87	0.004
Post CARE Quiz	31	9.68			

* $p < .05$. ** $p < .01$. *** $p < .001$

Note. CARE= Child-Adult Relationship Enhancement; DPICS= Dyadic Parent-Child Interaction Coding System.

Table 7. *Predictors of Change in DPICS Coding Reliability from Pre- to Post-Training*

Dependent Variable	Independent Variables	Unstandardized B	Standard Error	<i>p</i>
DPICS Change Score	GPA	0.092	0.042	0.028*
	KBPAC	0.006	0.004	0.154
	KCDI	-0.001	0.003	0.833
	SSI	0.000	.001	0.802
	Intent to Work with Children	-0.005	.022	0.821

* $p < .05$. ** $p < .01$. *** $p < .001$

Note. DPICS= Dyadic Parent-Child Interaction Coding System; GPA= Grade Point Average; KBPAC= Knowledge of Behavior Principles as Applied to Children; KCDI= Knowledge of Child Development Inventory; SSI= Social Skills Inventory.

Table 8. *Predictors of Change in P Skills from Pre- to Post-Training*

Dependent Variable	Independent Variables	Unstandardized B	Standard Error	<i>p</i>
P Skill Change Score	GPA	6.231	3.161	0.049*
	KBPAC	0.129	0.356	0.717
	KCDI	0.091	0.221	0.681
	SSI	-0.133	.141	0.347
	Intent to Work with Children	-0.585	1.698	0.731

* $p < .05$. ** $p < .01$. *** $p < .001$

Note. DPICS= Dyadic Parent-Child Interaction Coding System; GPA= Grade Point Average; KBPAC= Knowledge of Behavior Principles as Applied to Children; KCDI= Knowledge of Child Development Inventory; SSI= Social Skills Inventory.

Table 9. *Predictors of Change in Q Skills from Pre- to Post-Training*

Dependent Variable	Independent Variables	Unstandardized B	Standard Error	<i>p</i>
Q Skill Change Score	GPA	0.908	1.655	0.137
	KBPAC	0.201	0.213	0.346
	KCDI	-0.007	0.155	0.966
	SSI	0.062	.074	0.405
	Intent to Work with Children	0.787	1.099	0.474

* $p < .05$. ** $p < .01$. *** $p < .001$

Note. DPICS= Dyadic Parent-Child Interaction Coding System; GPA= Grade Point Average; KBPAC= Knowledge of Behavior Principles as Applied to Children; KCDI= Knowledge of Child Development Inventory; SSI= Social Skills Inventory.

Table 10. *Predictors of Change in CARE Quiz Scores from Pre- to Post-Training*

Dependent Variable	Independent Variables			
		Unstandardized B	Standard Error	<i>p</i>
CARE Quiz Change Score	GPA	-1.976	3.892	0.612
	KBPAC	-0.023	0.302	0.939
	KCDI	0.096	0.200	0.631
	SSI	0.057	0.091	0.527
	Intent to Work with Children	-0.982	2.518	0.697

* $p < .05$. ** $p < .01$. *** $p < .001$

Note. CARE= Child-Adult Relationship Enhancement; DPICS= Dyadic Parent-Child Interaction Coding System; GPA= Grade Point Average; KBPAC= Knowledge of Behavior Principles as Applied to Children; KCDI= Knowledge of Child Development Inventory; SSI= Social Skills Inventory.

Table 11. *Predictors of Perceived Effectiveness of CARE*

Dependent Variable	Independent Variables			
		Unstandardized B	Standard Error	<i>p</i>
CARE Evaluation Survey Score	GPA	1.933	1.397	0.167
	KBPAC	0.220	0.143	0.124
	KCDI	-0.093	0.102	0.360
	SSI	0.023	0.046	0.620
	Intent to Work with Children	-0.216	0.823	0.793

* $p < .05$. ** $p < .01$. *** $p < .001$

Note. CARE= Child-Adult Relationship Enhancement; DPICS= Dyadic Parent-Child Interaction Coding System; GPA= Grade Point Average; KBPAC= Knowledge of Behavior Principles as Applied to Children; KCDI= Knowledge of Child Development Inventory; SSI= Social Skills Inventory.

Table 12. *Intent to Work with Children as a Predictor of Satisfaction with CARE Training*

Dependent Variable	Independent Variables	Unstandardized B	Standard Error	<i>p</i>
CARE Satisfaction Survey Score	Intent to Work with Children	-0.318	0.919	0.730

* $p < .05$. ** $p < .01$. *** $p < .001$

Note. CARE= Child-Adult Relationship Enhancement.

Table 13. Observed Trainee P Skills at Pre- and Post-Training

Skill	Pre-Training P Skills		Post-Training P Skills	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Praise	3.39	4.94	8.17	6.58
Point Out	0.45	1.03	4.27	5.86
Paraphrase	1.29	2.65	2.90	2.75

Table 14. Observed Trainee Q Skills at Pre- and Post-Training

Skill	Pre-Training Q Skills		Post-Training Q Skills	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Question	3.74	5.06	2.47	3.42
Command	1.42	2.17	1.27	1.95
Negative Talk	0.00	0.00	0.03	0.18

Table 15**‘. Description of Evaluation of CARE Survey and CARE Satisfaction Survey**

	Min	Max	<i>M</i>	<i>SD</i>
CARE Evaluation Survey	25.00	40.00	34.86	3.96
CARE Satisfaction Survey	24.00	40.00	34.96	3.98

Note. CARE= Child-Adult Relationship Enhancement.

Figure 1.

Public Health Approach to Prevention



Figure 1. A prevention model from PCIT to CARE (iCARE Collaborative, 2020)

Figure 2.

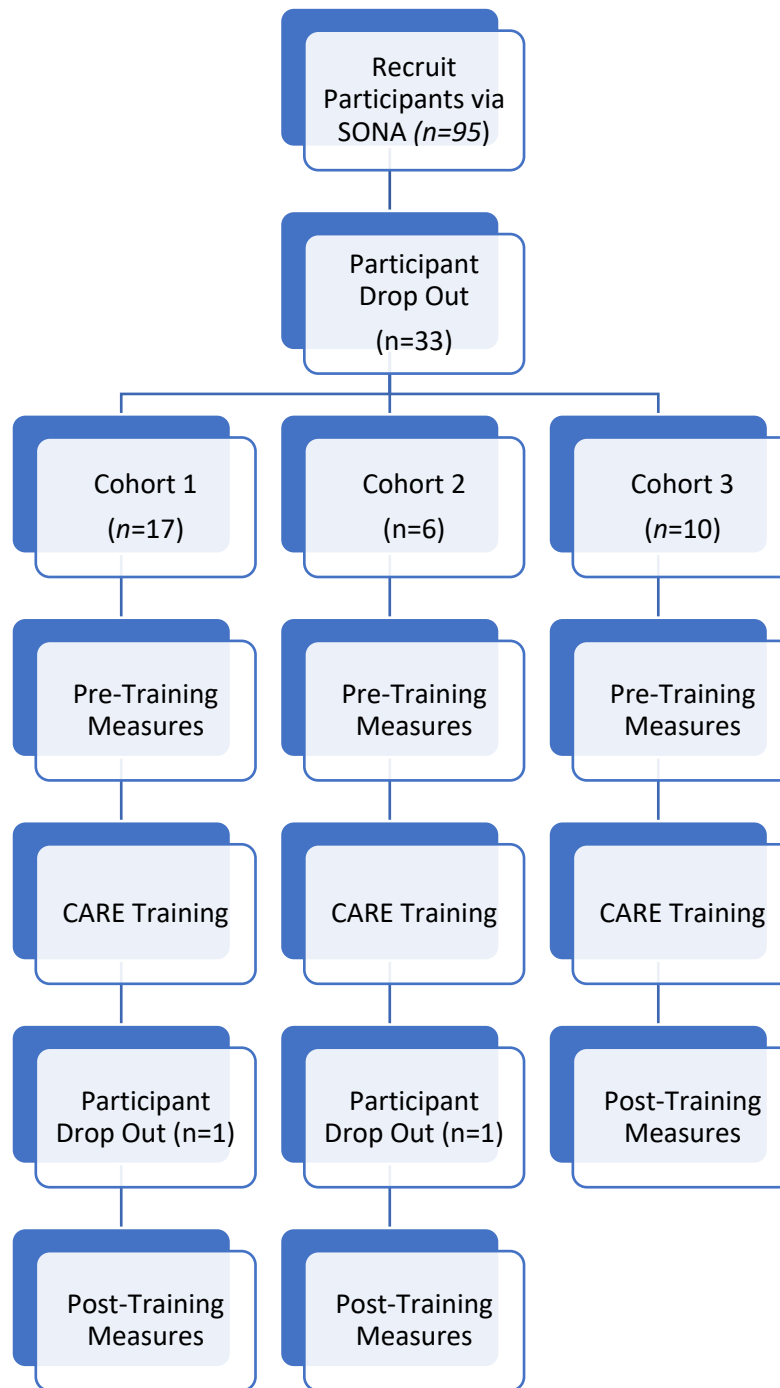


Figure 2. A flow chart of the study procedure.

Figure 3.

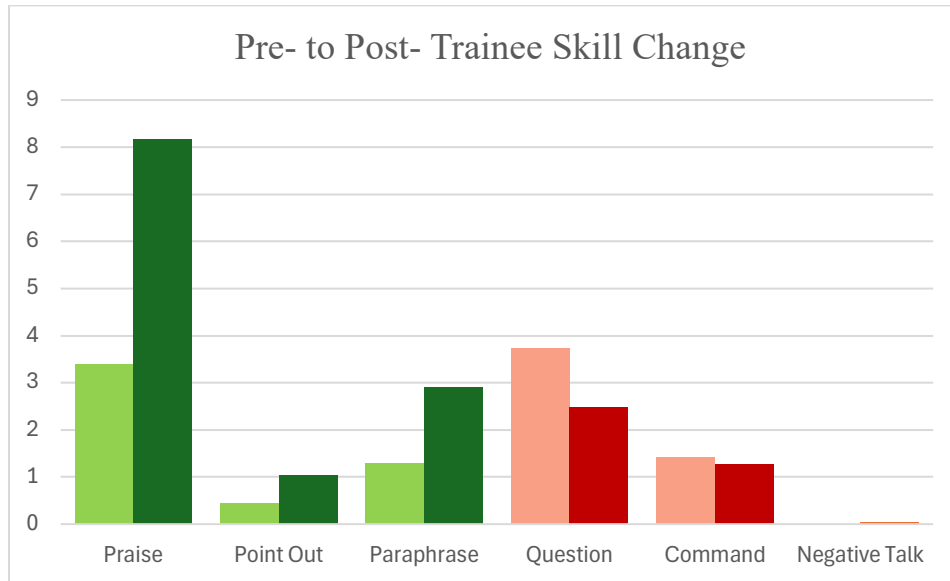


Figure 3. Changes in P and Q skills from pre- to post-training.