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# Strengthening children's roots of resilience: Trauma-responsive early learning☆

Shannon T. Lipscomb[a,*], Bridget Hatfield[b], Hillary Lewis[b], Emiko Goka-Dubose[a], Philip A. Fisher[c]

[a] Oregon State University-Cascades, United States
[b] Oregon State University, United States
[c] University of Oregon, United States

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ABSTRACT

With the majority of children in the United States attending early care and education (ECE) prior to kindergarten (National Survey of Early Care and Education, 2016), the opportunity to reach children early, and strengthen resilience in the context of everyday life, is profound. Yet, ECE teachers often lack professional supports to meet the needs of children impacted by trauma (Cummings, Addante, Swindell, & Meadan, 2017; Loomis, 2018). The Roots of Resilience program was designed to address this issue through an online course and video-based coaching. Recognizing the importance of feasibility and of balancing rigor with relevance to create wide-spread change (Glasgow & Chambers, 2012), this preliminary study of Roots of Resilience focuses on feasibility and examines teachers' learning and application of practices consistent with trauma-responsive care. Seventeen ECE teachers from family child care homes, centers, and Head Start programs participated. The majority (69%) had less than a Bachelor's-level education. Qualitative and quantitative data sources included teacher surveys, quizzes, discussion board entries, workbook entries, coach ratings, and observations. Findings indicate that the program is feasible for ECE teachers and offer preliminary evidence that it may help teachers strengthen their knowledge and application of practices to identify and respond to children's needs. An iterative development process and a strengths-based approach were identified as critical program attributes.

## 1. Introduction

Given the widespread use of early care and education (ECE) in the U.S. (Survey, 2016), ECE programs may offer a practical, non-stigmatizing avenue to support young children impacted by trauma and their families. Trauma, "*results from an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or life threatening and that has lasting adverse effects on the individual's functioning and mental, physical, social, emotional, or spiritual well-being,*" (Substance Abuse and Mental Health Services Administration (SAMHSA), 2014, p. 7). One increasingly recognized way of conceptualizing events that tend to be traumatic is Adverse Childhood Experiences (ACEs). ACEs include abuse and neglect, violence in the household, family/household member(s) with mental illness, substance abuse or incarceration, as well as parental separation, divorce, or death (Bethell et al., 2017; Felitti et al., 1998).

ECE programs, including home- and center-based child care, preschool, and Head Start, are called upon to support children's development as well as to promote parental employment and self-sufficiency. Yet, the growing trauma-informed schools movement (e.g., in K-12 schools; Baweja et al., 2016) has reached few ECE programs. Trauma-informed organizations, programs, and systems are aware of the widespread impacts of trauma, recognize its signs, integrate knowledge about trauma into policies, procedures, and practices, and resist re-traumatization (SAMSHA, 2014). Being trauma-responsive requires integration of trauma-informed principles into staff behavior and practices, and partnership with professionals who provide trauma-specific treatment (Bloom, 2016).

In addition to responding to the needs of children in their care who have experienced trauma, early childhood teachers (a term used to refer to adults caring for children in licensed or regulated ECE programs) often face adversity and stress in their own lives. Moreover, many lack professional supports to meet the needs of children impacted by trauma (Cummings, Addante, Swindell, & Meadan, 2017; Loomis, 2018). This

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* Corresponding author at: Human Development and Family Sciences, Oregon State University – Cascades, 1500 SW Chandler Ave, Bend, OR 97702, United States.
*E-mail address:* Shannon.Lipscomb@osucascades.edu (S.T. Lipscomb).

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paper articulates the opportunities of ECE to be trauma-responsive and introduces an innovative, scalable professional development program for ECE teachers to support young children impacted by trauma.

### 1.1. Early care and education (ECE) among children impacted by trauma

One in four preschool-aged children experience traumatic events (Finkelhor, Turner, Ormond, & Hamby, 2009; Jimenez, Wade, Lin, Morrow, & Reichman, 2016). In the absence of national estimates of their ECE attendance, a growing body of evidence sheds some light regarding utilization of ECE among subgroups of children impacted by trauma. For example, close to 30% of children in the Child Welfare System attend center-based ECE by age 5 years (Ringeisen, Casanueva, Smith, & Dolan, 2011); this is similar (slightly higher) to the rate for other young children (Survey, 2016). Broadening the lens to children with ACEs, a recent analysis of data from the Fragile Families and Child Wellbeing Study found that more than 50% of the children attending ECE (including home-based and center-based programs) had at least one ACE by the time they were three years old; 12% had three or more (Lipscomb, Goka-Dubose, Hur, & Henry, 2018).

Thus, teachers working in a wide variety of ECE programs are likely to encounter children impacted by ACEs and/or trauma. Including home-based ECE in studies and intervention efforts is particularly important because it is more widely available, and accessible across demographic groups, than center-based care (Survey, 2016). The current study includes licensed but not unlicensed home-based programs because providing professional supports for unregulated ECE may be more similar to parenting education than to professional development for early childhood teachers.

### 1.2. Strengthening resilience within early care and education

Resilience provides a useful framework for examining the potential of ECE to support the development of young children impacted by trauma. Resilience is a dynamic process of positive adaptation in the face of adversity (Masten, 2018) that unfolds within socio-ecological contexts (Liu, Reed, & Girard, 2017).

Resilience is nurtured over time through supportive relationships and environments. More specifically, protective factors of individuals, their social relationships, and their communities help to buffer or protect people from negative effects of adversity (Development Services Group, 2013; Ungar & Liebenberg, 2011). Individual skills and perspectives (e.g., self-efficacy, growth mindset, adaptability, social competence) help children persist, engage in learning, and interact prosocially with others. They set children up for success in school (Dweck, Walton, & Cohen, 2014; Reynolds & Ou, 2016). Relational protective factors (e.g., supportive caregivers, siblings, peers, teachers, and others) help children feel safe and valued, develop skills, cope with stress, solve problems, engage in learning, and access resources (Hayakawa, Englund, Warner-Richter, & Reynolds, 2013; Masten, 2018; Oxford & Lee, 2012). Community factors support children and families through neighborhood safety, social cohesion, access to resources, and culturally and linguistically responsive/specific supports (Komro, Flay, Biglan, & the Promise Neighborhoods Research Consortium, 2011; Ungar & Liebenberg, 2011).

Early childhood is an important developmental stage for strengthening resilience in the face of adversity (Wright, Masten, & Narayan, 2013). Due to high-enrollment (Survey, 2016), ECE programs in particular may offer a practical and non-stigmatizing avenue of supporting children impacted by trauma. Quality ECE supports young children's learning and development, and although benefits of ECE tend to be modest in size, they are often larger for children from disadvantaged backgrounds (e.g., Magnuson, Ruhm, & Waldfogel, 2007; Peisner-Feinberg et al., 2001). More specifically, an emerging body of evidence indicates that high quality ECE can strengthen protective factors and nurture resilience for young children facing adversities such as maltreatment and unstable homes lives. Findings point to less harsh parenting, fewer behavior problems, and increased school readiness (Dinehart, Manfra, Katz, & Hartman, 2012; Lipscomb, Pratt, Schmitt, Pears, & Kim, 2013; Zhai, Waldfogel, & Brooks-Gunn, 2013).

To nurture resilience, ECE programs may need to be responsive to potential trauma in children's lives. There is a growing recognition that ECE is an important context for trauma-responsive care and education (Cummings et al., 2017; Loomis, 2018). Neuroscientific evidence suggests that some of the negative effects of early stress and trauma can be reversed (Bruce, Gunnar, Pears, & Fisher, 2013), and that supportive interventions for caregivers hold promise to positively impact children's development (Fisher, Frenkel, Noll, Berry, & Yockelson, 2016). Indeed, early childhood programs appear to exert much of their positive impacts by strengthening protective factors in children's lives (Reynolds, Ou, Mondi, & Hayakawa, 2017). For example, one study detected larger effects of preschool teacher-child closeness on development for children living in non-parental care than for other children from families with low-income (Lipscomb, Schmitt, Pratt, Acock, & Pears, 2014).

### 1.3. Need for professional development to support trauma-responsive ECE

Unfortunately, even within high quality ECE programs, few teachers receive training or support to address the needs of children impacted by trauma who exhibit challenges in behavior, language, and communication (Jimenez et al., 2016; Marie-Mitchell & O'Connor, 2013). Professional development opportunities related to trauma tend to be either very light touch, such as a single lecture or workshop, or resource-intensive and thus limited in scalability, such as mental health consultation (Perry, Allen, Brennan, & Bradley, 2010), therapeutic preschools, and Head Start Trauma Smart (HSTS; Holmes, Levy, Smith, Pinne, & Neese, 2015). Resource-intensive programs have shown promise. For example, mental health consultation has been consistently associated with reductions in children's externalizing behavior problems and often also with increased prosocial behavior (Perry et al., 2010). In an initial study of HSTS, which includes training for teachers, staff, administrators and parents, as well as trauma-focused interventions, mental health consultation, and peer mentoring, was associated with reductions in children's behavior problems (Holmes et al., 2015). However, HSTS is designed specifically for the wrap-around context of Head Start and may not be applicable to other center- or home-based ECE programs.

Hence, there is a pressing need to provide in-depth, trauma-informed professional development for ECE teachers beyond the HSTS program. Even in K-12 schools committed to trauma-informed education, teachers report the need for more training and support to address trauma in the classroom (Alisic, 2012; Baweja et al., 2016). In K-12 education, there is a growing recognition that all staff need professional development to create a school environment that is sensitive to the needs of students who have experienced trauma (Zakszeski, Ventresco, & Jaffe, 2017). Professional development often occurs through workshops, presentations, videos, online modules, and research briefs (Anderson, Blitz, & Saastamoinen, 2015; Thomas, Crosby, & Vanderhaar, 2019). Yet, trauma-informed schools are relatively new, and school staff report needing much more support and training, such as how to respond to children who have experienced trauma (Alisic, 2012) and how to implement practices they learn in workshops (Anderson et al., 2015). Educators also report that professional development opportunities do provide an important outlet for them to reflect upon and strengthen their knowledge and practices with children impacted by trauma (Anderson et al., 2015). Although this body of research remains quite new, it suggests the need to support adults working with children in all roles and learning contexts. Moreover, when considering the wide variety of early childhood settings children attend, professional development must be appropriate for teachers in both home- and center-based ECE programs, and accessible in remote locations where professional supports are scarce.

### 1.4. Conceptual foundations of the roots of resilience program

Roots of Resilience is a new, online professional development program for ECE teachers in home- and center-based programs to strengthen resilience with children impacted by trauma. Through an online course and coaching, Roots of Resilience aims to support trauma-responsive practice. The conceptual foundation of the program is outlined in the following sections.

***Strengthen resilience through responsive interactions during everyday moments.*** Decades of research point to the importance of sensitive and responsive adult-child interactions to children's healthy development, and to resilience processes that help children overcome stress and trauma (Masten, 2018; Shonkoff, 2011). Over time, these moment-by-moment interactions in which adults notice and respond sensitively to children's needs build supportive relationships and promote self-regulation and health (Fisher et al., 2016; Shonkoff, 2011). Roots of Resilience, therefore, takes a microsocial approach, encouraging teachers to notice and utilize small moments with children, as well as with parents or other caregivers, to strengthen resilience.

***Support early childhood teachers as "gardeners" who tend to children's roots of resilience.*** Adults' own mental health, well-being, and self-regulation affect their responsivity to young children (Bridgett, Burt, Edwards, Deater-Deckard, & Albarracín, 2015; Jennings, 2015). Early childhood professionals may have experienced trauma in their own lives, secondary traumatic stress (e.g., vicarious trauma resulting from working with others impacted by trauma) as well as compassion fatigue (West, Berlin, & Harden, 2018), all of which may interfere with their well-being and responsivity to children. The Roots of Resilience program draws upon emerging evidence from a study of elementary school teachers that mindfulness-based professional development can help teachers reduce their emotional reactivity, and improve their perspective-taking about children's challenging behavior, and their interactions with children (Jennings et al., 2017). Consequently, a foundation of Roots of Resilience is strength-based support for early childhood teachers to nurture their own self-regulation, self-care, and mindfulness.

***Overlay a trauma-informed perspective on best practices in ECE.*** Roots of Resilience layers a trauma-informed perspective on the skills, knowledge, and practices of ECE teachers. For example, a module in the online course reviews basic principles of child development and then illustrates how trauma affects development and behavior. By building directly upon prior knowledge, the program is designed to facilitate learning and application (Zull, 2004). Modules also embed high-quality teaching practices in ECE, established by the National Center on Early Childhood Development, Teaching, and Learning and the Center on the Social and Emotional Foundations for Early Learning, such as assessing children to individualize learning, partnering with families, and responding sensitively to children's needs. Roots of Resilience reinforces these concepts and aims to help teachers apply them with a trauma-informed perspective. For example teachers are encouraged to consider trauma as a possible reason driving child or parent behavior, to identify and reduce triggers to avoid re-traumatization, and to create an emotionally safe environment that empowers children to engage and explore.

***Provide online, relationship-based professional development.*** Roots of Resilience is delivered online, which is likely to be more scalable and cost effective than in-person models. ECE teachers show engagement in online professional development (Durden, Mincemoyer, Crandall, Alviz, & Garcia, 2015; LoCasale-Crouch, Hamre, Roberts, & Neesen, 2016). Yet, it is important that professional development also be relationship-based, especially for home-based providers who often work in isolation (Bromer & Korfmacher, 2017). Coaching teachers on specific skills coupled with resources and exemplars is a promising model of professional development (Hamre, Partee, & Mulcahy, 2017). For example, My Teaching Partner (MTP), an online, video-based coaching program focused on effective teacher-child interactions has been shown to strengthen both teacher practices and child outcomes (Early, Maxwell, Ponder, & Pan, 2017; Pianta et al., 2017; Pianta, Mashburn, Downer, Hamre, & Justice, 2008). Further, targeted video review of interactions coupled with coaching has also been effective for home-based providers (Groeneveld, Vermeer, van IJzendoorn, & Linting, 2011). Thus, the Roots of Resilience program is relationship-based (1–1 coaching; course uses a cohort model with instructor support) and focuses on specific skills.

### 1.5. Roots of resilience program description

The Roots of Resilience program consists of two parts (online course and online video-based coaching) that are complementary, but that were also created in a way that they can be completed independently. The online course includes 6 modules covering the following topics: trauma and resilience, how trauma effects development, identifying children's needs with a trauma-informed perspective, partnering with families and specialists, building restorative relationships in early learning settings, and guiding behavior and self-regulation. There are a total of 27 learning outcomes (4–5 learning objectives per module) ranging from identifying sources of trauma and resilience in early childhood to planning and practicing self-care to using a trauma-informed perspective to observe children's self-regulation. The Roots of Resilience team collaborated with e-learning partners to develop an interactive online format. The course is self-paced and includes a workbook to practice and reflect in between modules. Discussion boards aim to create community and spur reflection about applying trauma-responsive practices.

The video-based online coaching program was developed in partnership with Filming Interactions to Nurture Development (FIND), a strength-based microsocial model to support caregivers in serve and return interactions (Fisher et al., 2016). FIND focuses on identifying brief and precise caregiver-child interactions in which the caregiver is demonstrating developmentally supportive behavior towards the child, including sharing the child's focus of attention, responding with words or actions, and extending the back-and-forth process. The approach is consistent with both social learning and attachment models of elements of the caregiver-child relationship that contribute most to healthy social-emotional and cognitive development. Moreover, by isolating only moments of supportive interaction, FIND is truly strength-based in nature. FIND is fully manualized, and fidelity of implementation is built into the model, with coaches receiving training and ongoing consultation.

In partnership with FIND, and in consultation with an external early childhood trauma expert, the Roots of Resilience team created a coaching program that adapted the FIND model to support early childhood teachers working with preschool-aged children impacted by trauma. The Roots of Resilience coaching retains the focus on serve and return interaction, but adds several components: 1) six sessions focused on self-regulation during serve and return interaction, 2) discussion of trauma in both coach training and coaching sessions with teachers, and 3) adaptation for the early learning context, such as expanding discussion of group dynamics as well as 1–1 interactions. The Roots of Resilience team created materials for implementation and fidelity (coaching guide, editing guide, fidelity rubric, handouts) using the FIND materials as models. The Roots of Resilience coaching was initially designed to be added to the core FIND elements but was then modified for implementation as its own 6-session coaching program (rather than 12 sessions).

Teachers film themselves weekly for 20 min of regular interactions with children and upload the film into a secure cloud server. Films are edited by the Roots of Resilience team to highlight microsocial teacher-child interactions to review in coaching sessions. The Roots of Resilience coaching sessions focus on self-regulation in three primary ways: (1) they hone-in on interactions in which children's serves show self-regulation (less-regulation or more-regulation) in the moment (2)

teachers exhibit self-regulation when returning children's serves (3) teachers return children's serves in ways that support children's growing self-regulation. Sessions include discussion of self-regulation in emotion, behavior, and cognition.

***Iterative Development Process.*** Testing and revision of both the online course and coaching utilized an iterative process akin to "fast cycle innovation", a guiding principal of the IDEAS Impact Framework of Frontiers of Innovation (Schindler, Fisher, & Shonkoff, 2017). This approach, which is also aligned with other innovation models, such as the "road test" phase of Learn Innovate Improve (McCay, Derr, & Person, 2017), utilizes a series of small scale pilot tests over the course of weeks or up to a year.

For the online course, three cycles of testing and revision occurred: (a) with students on the Roots of Resilience team who had experience in the ECE field, (b) a first cohort of early childhood teachers in 2016–2017 ("pilot 1") and (c) a second cohort of early childhood teachers 2017–2018 ("pilot 2"). Revisions between each cycle included improvements in technology, images, language in the narration of the course, discussion boards, workbook, and adding a series of "memes" sent out via email in pilot 2.

The Roots of Resilience team examined data from coaching sessions weekly. Based on feedback from participants and coaches, as well as impressions of consultants who watched video-recorded coaching sessions to monitor fidelity, revisions were made (e.g., clarifying language in coaching scripts, strengthening technology support for teachers filming themselves, refining criteria for selecting and editing films) to continuously improve the intervention. More examples of revisions to both the course and coaching programs are integrated within the Results section.

***Theory of change.*** The Roots of Resilience theory of change (Fig. 1) posits that participating teachers will gain knowledge and perspective-taking, improve their own self-efficacy and self-regulation, and adopt more trauma-responsive practices. In turn, teachers' interactions and relationships with children and families will improve, children's stress will decrease and their engagement will increase, leading to learning, positive development, and wellbeing. Teacher engagement in the program and readiness to change are expected to moderate program impacts.

### 1.6. Current study

This paper presents the first phase of evaluation of Roots of Resilience, which drew upon implementation science and fast-cycle innovation and evaluation frameworks (McCay et al., 2017; Schindler et al., 2017). Widespread change in practice requires not only programs that produce positive outcomes in highly controlled trials but also those that can be implemented in the context of everyday life, that can be successfully implemented with fidelity, and that can be generalized for maximum reach (Bowen et al., 2009). In other words, evaluation research must balance rigor with relevance (Glasgow & Chambers, 2012). Feasibility studies help identify interventions that show potential to be effective and are therefore strong candidates for efficacy trials. A program should demonstrate feasibility in areas such as acceptability, demand, implementation, practicality, adaptation, integration, and/or limited efficacy (Bowen et al., 2009). Methods should be both quantitative and qualitative for greater depth of understanding (Glasgow & Chambers, 2012).

Through two years of implementation research, this study examines the extent to which Roots of Resilience is feasible for early childhood teachers in home- and center-based programs. The study also examines teachers' learning and application of trauma-responsive practices. In line with best practices in program implementation (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005), this study also examines teachers' perspectives on aspects of the program that are most helpful to learning and applying trauma-responsive practices with young children.

## 2. Method

### 2.1. Participants

A total of 17 early childhood teachers participated in Roots of Resilience from September 2016 to June 2018. Participants, referred to as "teachers", reported various roles in their ECE programs: 10 identified as teachers, 2 identified as providers/owners of family child care homes, 4 indicated that they were assistants/aids, and 1 reported "other". They worked in Head Start (n = 6), family child care (n = 7), center-based child care/preschool (n = 3), and other (n = 1). They had worked in their current programs from 2 to 276 months ($M$ = 53.13, $SD$ = 68.98), for an average of 41.65 h per week ($SD$ = 8.62). Sixteen (94%) teachers identified as female. Four (24%) teachers identified as non-White or both White and non-White; 13 (76%) identified as White. All reported English as their primary language. Education levels were: 24% high school degree or some college, 35% AA degree, and 41% Bachelor's degree. Fourteen (82%) had engaged in online professional development previously but only six (35%) in coaching or mentoring. Teachers reported an average of 6.12 ACEs (range from 3 to 11, $SD$ = 2.64) on 17 indicators of maltreatment, parent substance abuse and mental illness, loss of a family member, family separation or divorce, neighborhood violence, racism, incarceration, harassment/bullying, and life-threatening illness. Of the 17 teachers, 5 participated in pilot 1 and 12 participated in pilot 2. Further, 11 enrolled in the course only, 6 in both coaching and course, and none only enrolled in coaching.

The primary difference between teachers who enrolled in coaching compared to the course was that teachers from home-based programs comprised 67% of participants in coaching but only 41% of participants in the course (across pilots 1 and 2, combined). Data from the pilot 2 subsample of 12 teachers (2017–2018) were utilized for a mixed-methods analysis of teachers' learning and application in the online course; these teachers did not appear to differ from the full sample based on survey demographics. This research was conducted in accordance with American Psychological Association guidelines; informed consent was obtained from participants and the study was approved by the first author's Institutional Review Board.

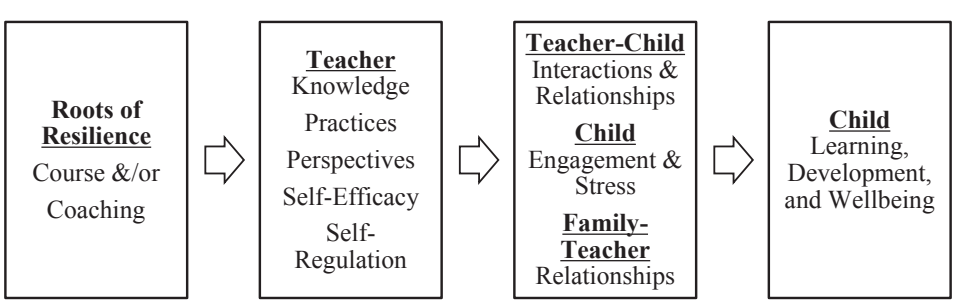


**Fig. 1.** Roots of resilience theory of change.

**Table 1**
Feasibility of course and coaching, rated by teachers.

| Course | Pilot 1 M (SD) | Pilot 2 M (SD) |
|---|---|---|
| ***Acceptability*** | | |
| *Rated after each module and aggregated across modules* | **(n = 4)** | **(n = 12)** |
| The information in this module was relevant to my work with children. | 5.16 (0.30) | 5.70 (0.55) |
| The case studies and examples were applicable to my work with children. | 4.89 (1.24) | 5.60 (0.74) |
| This module was interesting. | 4.95 (1.35) | 5.57 (0.58) |
| The pre-reading provided a helpful introduction to the topic. | n/a | 5.51 (1.12) |
| The workbook activities helped me to apply the content. | n/a | 5.62 (0.61) |
| The discussion board helped me to reflect and connect with others. | n/a | 5.13 (1.06) |
| I am confident that I can use what I learned in my work with children. | 5.33 (1.19) | 5.74 (0.49) |
| *Rated after completion of full course* | **(n = 3)** | **(n = 9)** |
| I had appropriate background knowledge to benefit from this class. | 5.67 (0.58) | 5.75 (0.71) |
| I was comfortable with using the technology for this course. | 5.67 (0.58) | 5.38 (0.92) |
| The information was difficult to understand.* | 1.67 (0.58) | 1.63 (1.06) |
| ***Practicality*** *(rated after completion of full course)* | | |
| The technology for this course worked well. | 3.00 (1.00) | 4.88 (0.99) |
| One module a week seemed feasible. | 4.33 (2.08) | 5.00 (1.78) |
| The overall time commitment was reasonable | 4.67 (1.53) | 5.00 (1.42) |
| Coaching | Pilots 1 and 2 (n = 6)M (SD) | |
| ***Acceptability*** *(rated after completion of coaching program)* | | |
| The first five elements are very relevant to my work [elements listed]. | 6.00 (0.00) | |
| The second five elements are very relevant to my work [elements listed]. | 6.00 (0.00) | |
| I received the support I needed to be successful in this coaching program. | 5.17 (2.04) | |
| My coach helped me feel comfortable watching myself in the video clips. | 5.16 (2.04) | |
| I felt comfortable sharing my ideas/thoughts with the coach. | 5.16 (2.04) | |
| I felt awkward to be coached online, not meeting the coach in-person.* | 1.00 (0.00) | |
| ***Practicality*** *(rated after completion of coaching program)* | | |
| I could see and hear the film shown during coaching sessions.+ | 5.75 (0.50) | |
| Uploading video in box.com worked well.+ | 4.75 (1.50) | |
| There were technical challenges because coaching was online.* | 1.66 (1.21) | |
| It was difficult for me to meet with the coach.* | 2.83 (1.72) | |
| Video-recording was challenging.* | 3.50 (1.38) | |
| My children had a hard time adjusting to the camera/tablet.* | 2.67 (2.25) | |

Note: Items rated on a scale from 1(*strongly disagree*) to 6 (*strongly agree*).
* Item worded such that higher scores represent less feasibility.
\+ Item only measured in coaching pilot 2, n = 4.

### 2.2. Measures

#### 2.2.1. Feasibility

Indicators of feasibility included completion, acceptability, and practicality.

***Course.*** Completion was assessed by both the overall rate of completion of the course and the time it took to complete each module, reported by teachers immediately after the module, with options of "*< 1 h,*" "*1 to < 2 h,*" "*2 to < 3 h,*" and "*3 or more hours.*" Acceptability was assessed at the end of each module, with 7 items about relevance, interest in content, helpfulness of course components, and confidence in being able to use what they learned, on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*; items listed in Table 1). They also responded to one question after each module about difficulty on a sliding scale from 0 (*way too easy*) to 50 (*just about right*) to 100 (*way too hard*). At the end of the entire course, teachers responded to 6 questions about the practicality of technology and time commitment, on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*; items listed in Table 1). Open-ended questions supplemented the closed-ended questions, "Please tell us what you thought about the online format, schedule, and technology," "What did you like best?" and "What suggestions do you have for improvement?"

***Coaching.*** Participants rated four items related to feasibility after each coaching session on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*): "I found [coaching element] to be relevant to my work," "The examples made me think and reflect on my practice," "I felt supported by my coach," and "The technology worked smoothly." After the full coaching program, participants also responded to 12 items about feasibility, including relevance, acceptability, and practicality (items listed in Table 1). Teachers also responded to open-ended questions: "Please describe how technology helped or hindered the coaching process for you," "What did you like best?" and "What suggestions do you have for improvement?"

#### 2.2.2. Learning and application

***Course.*** Teachers' learning and application of course material was assessed through self-reports, quizzes, and qualitative analysis of discussion boards and workbooks.

*Self-reports.* At the end of each module, participants estimated the percent of the information they learned well, on a sliding scale from 0% to 100%. After each module, teachers also responded to the item, "I am confident that I can use what I learned in this module in my work with children," from 1 (*strongly disagree*) to 6 (*strongly agree*). After course completion, participants used a 6-point scale, from 1 (*not at all*) to 6 (*very much*), to rate 11 items measuring the extent to which the online course helped them to learn and apply practices consistent with trauma-responsive care. Sample items include: "Understand how trauma affects children's development," "Consider possible reasons for children's behaviors," "Create an emotionally supportive environment," "Respond to children sensitively," "Build supportive relationships with families," and "Connect families with resources." This scale showed good internal reliability ($\alpha = 0.93$) with the full sample of 17 teachers in the study. Finally, teachers responded to open-ended questions about how the course affected their work with children, such as, "In your own words, please describe how this online course affected your work with children and families."

*Quizzes.* Participants completed a total of 10 quizzes with 7–12 questions each (89 total questions). Some of the longer modules had

more than one quiz. Participants' scores on quiz questions were summed for each module. Additionally, for pilot 2, quiz data were categorized by learning objective and examined alongside qualitative data from discussion boards and workbooks for a mixed methods analysis of learning and application.

*Qualitative data from discussion boards and workbooks (pilot 2 only).* In each module, participants responded to 1–6 discussion board prompts and 7–13 workbook prompts. Discussion board prompts asked participants to reflect on module content (e.g., what makes it hard to keep calm and regulated), and their experiences trying out suggested practices (e.g., specific activities to strengthen relationships with children). Workbook prompts asked participants to take notes, complete activities within the modules (e.g., reflect on aspects of the environment, activities or interactions that can be triggering for children), and record their applied practices (e.g., make a plan to strengthen a child's resilience). Participant responses were organized into digital files in ATLAS.ti (Friese, 2014) and examined with summative content analysis (Hsieh & Shannon, 2005). Structural codes organized responses by learning objective. Each response was then coded as comprehensive (at least three sentences, elaborates and includes detail), adequate (less than three sentences, lacking detail), or inadequate (no response, or response did not address the prompt). Responses were also coded for whether or not they included at least one key term for the learning objective, and whether or not the response to the question/prompt/workbook activity included an example of the learning objective. For example, the response, "*keeping this open communication will build trust and rapport with parents and let them know we are trying to make the child have the best experience they can at school and at home*" illustrates the learning objective "*practice strategies to build partnerships with families.*" One research assistant coded all responses, and another coded 50%. Coders exchanged content memos and reached consensus through discussion.

***Coaching.*** Three data sources measured teachers' learning and application from coaching: self-reports, coach-reports, and observations.

*Self-report.* At the end of each coaching session, participants rated two items: "I have a clear understanding of [element from the session]," and, "I know how to apply what I learned today to my work with children," on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*). After the entire coaching program, participants complete the same 11 item-scale about learning and application, as well as the open-ended question, as participants did for the online course.

*Coach-report.* After each session, the coach rated the teacher on 6 items, on a scale from 1 (*poor*) to 4 (*excellent*). Two items focused on review of the element from the prior session: "understanding of previous element," and "application of previous element." The other four items were: "understanding of new element," "reflects during discussion," "asks relevant questions," and "overall engagement." After each participant finished the entire coaching program, the coach rated eight items about teachers' engagement, understanding of content, and application of practices, such as "Teacher shared own experiences and ideas," and "Teacher implemented what she learned in the coaching sessions." It was not possible to test internal reliability for an overall scale because of the small sample size and limited variability.

*Observations.* To examine teacher-child interactions, researchers coded two films of approximately 10 min each from before, as well as after, coaching for each teacher using the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2008). The CLASS includes 10 dimensions, organized into three domains of Emotional Support, Classroom Organization, and Instructional Support. Each dimension is scored on a 7-point scale, with 1–2 representing *low*, 3–5 representing *moderate*, and 6–7 representing *high*. The codes across the two videos before coaching were averaged to create one score for each of the 10 CLASS dimensions (and then for each of the 3 domains) for the 20 min of film at 'pre'. This process was repeated at 'post'.

Other studies have used similar amounts of video to code with the CLASS and found associations with teacher skills (Jamil, Sabol, Hamre, & Pianta, 2015). This was one of the motivating factors for selecting the CLASS as a measurement tool. Additionally, the CLASS measure is of high relevance for ECE program directors and teachers who participate in Quality Rating and Improvement Systems that utilize the CLASS (Build Initiative & Child Trends, 2017), and for those who utilize the CLASS for quality improvement. Moreover, the CLASS was developed through the lineage of the ORCE, which was designed to measure sensitive and responsive adult-child interactions in both home-based and center-based ECE (National Institute of Child Health and Human Development, 1996). Recent evidence indicates that an underlying *responsive teaching* factor remains (Hamre, Hatfield, Pianta, & Jamil, 2014), and that it may be appropriate to utilize the CLASS in home-based programs; the CLASS does not appear to be biased in favor of center-based programs (Joseph, Feldman, Brennan, Naslund, Phillips, & Petras, 2011; Lipscomb, Weber, Green, & Patterson, 2016, 2019). There is some consistency in measurement structure across home-based and center-based programs (Lipscomb, Weber, Green, & Patterson, 2019)

Videos were masked for pre versus post status prior to coding. To test for feasibility and reliability, 25% of films were double coded by certified CLASS coders (rater agreement 93%). The lead coder's (a certified CLASS trainer) scores were analyzed. Scores were examined preliminary through descriptives (e.g., means), and were tested for significant differences before and after coaching via paired sample t-tests.

## 3. Results

### 3.1. Feasibility

#### 3.1.1. Overall roots of resilience program

Fifteen (88%) out of the 17 teachers who started the program finished one or both parts: course only (n = 9), coaching only (n = 2), or both (n = 4). One of the two teachers who did not finish stopped completing the course due to a personal injury. The other stopped after the first few modules that provided background knowledge because her role with children shifted to less direct teaching/caregiving practices, which were the focus of the latter modules. Evaluation data (feedback forms, quiz scores, comprehensiveness of discussion board posts) for the two participants who did not complete the program were very similar (for the modules that they did complete) to those who did complete the program.

#### 3.1.2. Course

Acceptability of the online course was high. Participants reported that the level of difficulty was just about right ($M = 51.27$, $SD = 8.49$), that the content was relevant and interesting, that they felt confident being able to use it, and that they had sufficient background knowledge and comfort with technology to benefit from the course (Table 1). Responses to open-ended questions noted the utility of features such as case studies (*"The case study examples were very similar to what I see in a few of my students")*, the variety of learning modalities ("*I enjoy the way the module is laid out. Audio presentation, video and some interaction*"), and practical strategies ("*concrete ways to build resilience in children facing trauma"*).

Ratings of practicality were mixed in pilot 1 and improved in pilot 2. Although participants were comfortable using the technology in both years, they only somewhat agreed that the technology worked smoothly in pilot 1 (Table 1). Suggestions for improvement in pilot 1 centered on technology ("*I had some technical difficulties towards the end … audio was muffled, and sounds were slow and overlapping*"). After refining some technological specifications, and switching learning management platforms, pilot 2 participants reported that the technology worked smoothly (Table 1).

Completion rates and the time it took teachers to complete modules were also mixed in pilot 1 and improved by pilot 2. Participants who completed the entire course reported that the overall time commitment

was reasonable and that it was feasible to complete approximately one module per week during both pilot 1 and pilot 2 (Table 1). Yet, four teachers were not able to complete the full course for reasons such as injury, family emergencies, and employment changes. Two of these four teachers had already completed coaching and were thus included in the count of 15 teachers who completed the course, coaching, or both.

In pilot 1, 70% of the modules completed by participants took two or more hours (25% took three or more hours). A few participants commented that modules 2 and 3 were too long, which informed revisions to streamline content between pilot 1 and pilot 2. By pilot 2 only 52% of the modules completed by participants took two or more hours (15% took three or more hours), and open-ended comments indicated feasibility, "*This course was definitely feasible for me to accomplish within the designated time frame.*" Several teachers expressed appreciation for the format (e.g., *"the self-paced schedule helped me to get the discussions and video viewing done on my days off, and apply the practices in a reasonable time frame"*).

### 3.1.3. Coaching

For coaching, data from pilots 1 and 2 were examined together because (a) fewer teachers participated in coaching, and (b) the iterative development process was ongoing, and seamless across the two years (see Section 1.5). All six participants who began coaching completed it. Five completed the 12-session version (5 elements of serve and return followed by 5 elements focused on self-regulation in the context of serve and return, plus an orientation and a wrap-up). The last teacher completed the abbreviated 6-session version focused on self-regulation in the context of serve and return.

Participants' feedback about acceptability and practicality was strongly positive after each coaching session ($M = 5.98$, $SD = 0.11$), and after the entire coaching program (Table 1). The only item that indicated any difficulty was, "*video recording was challenging,*" rated 3.5. The last four teachers who participated rated this item more positively ($M = 3.25$) than the first two teachers ($M = 4.0$); it is possible that the iterative development and revision cycle reduced the video recording challenges but this cannot be determined from the sample size and research design. Open-ended comments mirrored these difficulties. For example, "*Occasionally the videos would record without sounds and would need to be re-recorded … even with the sound issue it was great.*" Another teacher pointed to strengths of the online format, "*Online coaching was a wonderful tool. I was able to meet with my coach during quiet time while staying on site with my class.*" Throughout the two years, the research team refined technology protocols and support for teachers, including an in-person orientation.

## 3.2. Learning and application

### 3.2.1. Course

Quiz scores and self-reports indicated that teachers gained an understanding of the vast majority of the content in both pilot 1 and pilot 2 (Table 2). In their open-ended comments, teachers described their learning. For example, "*I learned new concepts that I wasn't aware of, such as reasons why a child acts defiantly … helped me understand them more.*" At the end of the entire course, teachers reported that the course helped them learn and apply trauma-responsive practices across 11 items (Table 2). The only item with an average score less than 5.0 was "*connecting families with resources.*" Their comments also illustrated application: "*I have a stronger relationship with some children that I use to have difficulty with prior to this course. I'm working hard everyday to do my best and try new techniques with them.*"

Findings from the more in-depth mixed methods analysis in pilot 2 indicate strong overall learning and application, with some variability. Table 3 shows an example of synthesis of quantitative data from quizzes and qualitative data from discussion board and workbook prompts for Module 2. Module 2 was selected for illustrative purposes.

Analysis of all modules revealed that participants demonstrated evidence of the 27 learning objectives through quizzes and/or responses to discussion board and workbook prompts. This pattern can be seen in Table 3, as learning objectives 1 and 2 were demonstrated through quiz scores only, and objective 3 was demonstrated in the discussion board and workbook prompts only. Objectives 4 and 5 were assessed and demonstrated through both quantitative and qualitative sources. Generally, when a learning objective was directly assessed by one or more prompts in the discussion board or workbook, participants used key terms and examples of the learning objective in their responses. For example, the response, "*he might feel a lack of power or control, which is why he hits and yells when he doesn't get the care he wanted from his friend,*" exemplifies the learning objective, "*practice using a trauma-informed perspective in observations of children's behavior*."

In later modules (5 and 6), participants occasionally skipped discussion board and/or workbook prompts, which resulted in somewhat lower percentages (e.g., 78%-89%) of comprehensive or adequate responses, although only one learning objective fell below 80%. Generally, when teachers engaged at a *comprehensive* or *adequate* level with the prompts, they demonstrated understanding and application of the material, through key words and examples. For example, in response to discussion board prompts to reflect on their experiences trying out the recommended practices, teachers described using them with children ("*I have just started the connecting jar … really helps me to pause, take time with each child in an intentional way,")* and/or themselves ("*I have been able to find myself stepping outside of each situation to assess why this child might be acting in a non-regulated way.")*

**Table 2**
Summary findings of teacher learning and application.

| Course | Pilot 1 (n = 4) M (SD) | Pilot 2 (n = 12) M (SD) |
|---|---|---|
| Quiz scores (aggregated across modules) | 94.61% (4.55) | 94.75% (4.23) |
| ***Teacher ratings*** | | |
| Percent of content teachers reported learning well (aggregated across modules) | 87.59% (4.55) | 90.79% (4.62) |
| How much the course helped teachers learn and apply practices* (11-items) | n = 3 5.11 (0.87) | n = 9 5.47 (0.76) |
| Coaching | | Pilots 1 and 2 (n = 6) M (SD) |
| ***Coach ratings***: teacher understanding, application, and engagement | | |
| After each session (6 items, aggregated across coaching sessions)+ | | 2.89 (0.12) |
| After completion of entire coaching program (8 items)* | | 5.32 (0.68) |
| ***Teacher ratings***: understanding and use of the coaching elements | | |
| After each session (2 items, aggregated across all sessions)* | | 6.00 (0.00) |
| After completion of entire coaching program (2 items)* | | 5.90 (0.32) |
| How much the coaching helped teachers learn and apply practices (11-items)* | | 5.12 (1.27) |

* Rated on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*).
\+ Rated on a scale from 1 (*poor*) to 4 (*excellent*).

### 3.2.2. Coaching

The coach's ratings of teachers' learning and application after each session corresponded to "*very good*" (Table 2). After all sessions were complete, the coach's ratings of teachers' understanding, engagement, and application of the coaching elements were also high (Table 2). Items with the highest ratings reflected teacher engagement (sharing and reflecting).

Teachers rated their learning and application very highly (Table 2). A theme that emerged from teachers' responses to open-ended questions was that the strengths-based approach increased their confidence. One teacher explained, "*It helps to give you more confidence when you see*

**Table 3**
Mixed methods findings of learning and application: Module 2.

| Learning Objectives (LO) | Discussion Board and/or Workbook | | | Quiz |
|---|---|---|---|---|
| | Adequate or Comprehensive Response | Used LO key terms | Example of LO | |
| **Module 2** | | | | |
| 1. Identify brain structures and functions. | n/a | n/a | n/a | 93% |
| 2. Explore attachment and self-regulation. | n/a | n/a | n/a | 94% |
| 3. Develop a statement of how trauma affects children's development. | 100% | 100% | 100% | n/a |
| 4. Practice noticing when children are in survival, emotional, and integrated brain modes. | 100% | 91% | 91% | 92% |
| 5. Examine possible triggers of children's prior trauma in your early learning environment. | 100% | 91% | 100% | 89% |

*that these are some things you already did but maybe didn't realize why it was important."* Similar to teachers who completed the course, teachers who completed coaching also reported high scores across 11 items about how well coaching helped them learn and apply trauma-responsive practices (Table 2). Teachers' comments illustrate practices such as increased attention to children's individual needs ("*Coaching helped me focus on … each student's individual needs and their home life,"*) and responsivity to children ("*Coaching helped draw my attention to the small moments … the tiny moments we are completing each day have greater value than we recognize."*) Follow-up analysis of item-level scores revealed good discriminant validity in that the three survey items not directly aligned with the coaching elements (observing and tracking children's development over time, building supportive relationships with families, and connecting families with resources) had noticeably lower scores for coaching ($M$ = 4.50, 3.83, 3.67, respectively) than for the course ($M$ = 5.16, 5.25, 4.91, respectively).

*Observation.* Analysis of teacher-child interactions were primarily descriptive and aimed at exploring learning and application from another lens. Descriptive data indicate a possible increase in two CLASS dimensions: Regard for Student Perspectives ($M_{pre}$ = 3.90, $M_{post}$ = 4.50), and Language Modeling ($M_{pre}$ = 2.40, $M_{post}$ = 3.30), but not in the three domains. Despite limited statistical power, the increase in Language Modeling was statistically significant ($t$ (4) = 2.99, $p$ = .031). Other differences between pre- and post- CLASS dimension scores were minimal in size (< 0.03). Results should be interpreted with caution given the limited sample size; they simply serve to supplement teachers self-reports in which they described applying some of their learnings from the coaching program to their interactions with children. Further research is required before conclusions about changes in practice can be drawn.

## 4. Discussion

The question of how to promote trauma-responsive care in ECE is gaining increasing attention (Cummings et al., 2017; Loomis, 2018). With the overwhelming majority of children in the United States attending ECE prior to Kindergarten (U.S. Department of Education, 2016), the opportunity to strengthen resilience prior to kindergarten is profound. Roots of Resilience was designed to address a need for professional development for ECE teachers that is accessible for home- and center-based ECE programs, including those in remote locations. Findings from this preliminary study indicate that both the course and coaching components of Roots of Resilience appear to be feasible for practicing early childhood teachers of varying ages and education levels. Teachers report that the content is relevant and useful, that they feel comfortable with the technology, and that the program affects their thought processes, interactions with children, and children's behavior. Some teachers experienced challenges with technology, which highlighted the importance of an iterative development process and studying feasibility to strengthen implementation prior to testing efficacy. Although the sample size for this study was small and the results are preliminary, the development and evaluation of Roots of Resilience are relevant to other efforts to create scalable interventions to support trauma-responsive care.

### 4.1. Overlaying a trauma-informed perspective on best practices in early care and education (ECE)

The current study indicates that one feasible model of trauma-responsive professional development for early childhood teachers may be to layer a trauma-informed perspective on the skills, knowledge, and practices that ECE teachers are already developing in the field. The intent is that, as teachers practice using a trauma-informed perspective for observing children's behavior in Roots of Resilience, they also expand their prior knowledge of children's development, and strengthen the foundational skill of observing and assessing children to meet individual needs. Challenges to this approach include variation in teachers' existing skill sets, and differences in the environments in which they work. The current study provides initial evidence that this approach appears to be acceptable to early childhood teachers and is feasible within the structure of both a course and coaching. Teachers across all ECE settings in this study (licensed home-based and center-based programs, including Head Start) reported that the program was relevant and useful to their work with children and families.

The initial success of Roots of Resilience in terms of feasibility (acceptability and practicality) is consistent with other online professional development programs (LoCasale-Crouch et al., 2016). Roots of Resilience fills an important gap, by focusing on trauma, and by designing the program for both home- and center-based teachers. Although much more research is needed before conclusions regarding effectiveness can be drawn, professional development programs, such as Roots of Resilience, may have promise to complement other models of supporting children impacted by trauma in ECE, such as Mental Health Consultation (MHC; Perry et al., 2010). Professional development offers an alternative support for teachers who lack access to MHC, and could also supplement MHC for teachers to strengthen their own knowledge, perspectives, and skills. Further, since 2017, Head Start programs are required to use research-based coaching; if research ultimately supports the theory of change, Roots of Resilience may provide a good fit, given high rates of adversity among children in Head Start (Blodgett, 2014). In this initial study, however, home-based teachers sought out the coaching option of Roots of Resilience at higher rates than did center-based teachers, perhaps because they lack access to other forms of coaching. Access to professional development in ECE is inequitable, but individualized professional development (e.g., coaching) and technology hold promise to improve equity (Gomez, Kagan, & Fox, 2015).

### 4.2. Strengths-based support for teachers may promote responsivity

Findings from the current study indicated that the strengths-based approach of Roots of Resilience, which emphasized what teachers already know and do to support children, and which encouraged their self-care, may have promoted teachers' acceptance of this new program. By encouraging teachers to notice and reflect upon children's behavior and their responses to children, programs such as Roots of Resilience,

and the FIND program upon which coaching is built, aim to support teachers' self-regulation, including attentional and inhibitory control (Fisher et al., 2016). Additionally, Roots of Resilience explicitly focuses on teachers' own self-regulation. Some teachers commented that their self-regulation and perspective taking with children improved, but future research is needed to test this more rigorously, and to examine if teachers who increase their self-regulation are in turn also more responsive to young children, as outlined in the theory of change, and suggested by prior research (Bridgett et al., 2015; Jennings, 2015).

### 4.3. Strengths & limitations of this study

The use of multiple perspectives (teachers, coach, and observers) and both quantitative and qualitative data sources increases confidence in findings derived from the small sample. Although the sample was small, particularly for coaching, it included teachers from a wide variety of ECE settings, and of varying ages and education levels. Yet, few identified as Non-White race/ethnicity because of the location in which the research took place. It will be critical for future research to test the extent to which teachers from diverse backgrounds find the Roots of Resilience program relevant and representative of the children and families they serve. Consistent with trauma-informed approaches, Roots of Resilience was designed to avoid bias, but teachers' experiences must be tested to inform continuous improvement.

### 4.4. Current and future directions

Additional research is needed to test the theory of change that Roots of Resilience should strengthen teachers' knowledge, practices, and self-regulation, improve teacher-child interactions and relationships, and support children's stress, engagement, learning and development. Such research would not only evaluate Roots of Resilience but would also provide important information about underlying mechanisms of change that may be relevant to a wide array of professional development programs, and to efforts to strengthen trauma-responsive care for young children in general. Tests of efficacy will need to utilize rigorous designs and larger and more diverse samples. Future research should also examine how dosage and modes of delivery (e.g., a hybrid of face-face and online) affect both feasibility and effectiveness of Roots of Resilience and other professional development programs.

Another important focus of future research is scalability. To fulfill the potential of ECE to nurture resilience among the large numbers of children attending ECE programs prior to kindergarten (Survey, 2016), programs must be scalable. Roots of Resilience was designed for scalability, through a self-paced course, and personalized coaching sessions that allow teachers to participate during times that fit into their schedules, as well as through online formats to reduce cost and geographic barriers.

It will also be important for future research to examine how teacher-level supports like Roots of Resilience and organizational-level trainings and initiatives focused on policies and procedures collectively support a fully trauma-informed environment. Successfully implementing changes in practice at the teacher level often requires administrative support and alignment with organizational policy, particularly in larger center-based programs. None-the-less, models like Roots of Resilience that allow teachers to enroll as individuals may be an accessible model for home-based teachers, who often work alone, as well as for teachers in larger programs who can participate either as a cohort or as individuals, such as when a new teacher joins a program in which other staff have already participated. Further research is needed to test teacher- and organizational-level supports in unison.

### 4.5. Conclusion

The current study provides initial evidence that online professional development may be a feasible approach to supporting early childhood teachers to increase their knowledge and application of practices consistent with trauma-responsive care. Demonstrating feasibility prior to testing impact is critical to widespread change in practice (Bowen et al., 2009; Glasgow & Chambers, 2012). Findings indicate that the iterative development process and a strength-based approach contributed to the initial success of Roots of Resilience in supporting ECE teachers. Developing and evaluating scalable professional supports, such as Roots of Resilience, holds promise to increase the responsivity of ECE to children and families impacted by trauma. It will be important for future research to examine efficacy of these types of individual-level professional supports, and to investigate how they may complement organizational-level trauma-informed policies and practices for maximum benefit.

## Declaration of Competing Interest

Dr. Lipscomb is the lead developer of the Roots of Resilience program.

## Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.childyouth.2019.104510.

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