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# Building Young Children's Emotional Competence and Self-Regulation from Birth: The *begin to…ECSEL* approach

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Neuroscientific advances and child development studies show 0-6 years represents a sensitive period for the development of emotional competence—the ability to identify, understand, express and regulate emotion, all foundational to self-regulation. Research suggests optimum teaching of emotional competence and self-regulation skills from birth is through interventions emphasizing co-regulation. This study aimed to examine *begin to…ECSEL*, an emotional cognitive and social early learning approach that promotes emotional competence and self-regulation by teaching emotion knowledge and emotion regulation through causal talk and causal talk in the emotional experience. The study collected data over three years from 100 students, aged 2-6, receiving *begin to…ECSEL*. Study goals were to: (1) examine growth over one academic year among students receiving *begin to…ECSEL* on measures of attachment/relationship, initiative, self-regulation, emotion knowledge, emotion regulation, and related constructs involving empathy, prosocial skills, positive reactions to frustration, negative emotions and aggressive behaviors; (2) examine differences between these students and national normative samples on measures of attachment/relationship, initiative, and self-regulation; and (3) explore differences between these students and normative samples on all the aforementioned constructs. Results demonstrated students significantly improved over time in these constructs and outperformed normative samples on emotionally regulated/prosocial skills, empathy, self-regulation, attachment and initiative.

**Keywords:** emotional competence, self-regulation, empathy, social emotional learning

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## Introduction

A child's early years are critical for mental health, lifelong learning and future success. Neuroscience shows children are born ready to acquire knowledge and skills and that their earliest years are foundational to their neural development. In fact, brain growth is most rapid within the first three years during a period of neuroplasticity (Cohen, 2017; Perry, 2000; Winter & Luddy, 2010), in which the flexibility of neural cells and pathways alter their structure and function in response to environmental stimuli (Nelson, Kendall, & Shields, 2013). During this time, nurturing relationships are essential for the development of neural pathways that are prerequisites for learning, effective brain development, social-emotional functioning and overall health (Cohen, 2017; Nelson et al., 2013; Winter & Luddy, 2010). More specifically, the quality, repetition and consistency of the young child's learning experiences in the context of emotional and social security are essential for supporting the effective growth of the brain's architecture (Winter & Luddy, 2010). Repeated use of neural circuits strengthen synaptic connections, creating neural and behavior patterns that persist throughout life, adding credence to the foundational role of social and emotional experience in early childhood for long-term development (Schore, 2003).

Recent advances in neuroscience suggest social-emotional learning is most optimal prior to age 6 (Cohen, 2017; Shonkoff & Richmond, 2009; UNICEF, 2014). This sensitive period is fundamental for the growth of *emotional competence*, defined as emotional experience and expressiveness, emotion regulation, and emotion knowledge (Denham et al., 2012a). Emotion knowledge includes recognition and identification of emotion and emotional understanding; emotion regulation includes verbal and non-verbal expression and the management of emotion.

### *Emotional Competence and Self-Regulation*

The development of *self-regulation*—the ability to control and manage emotion, cognition, and behavior (Diamond, 2006)—is closely related to the growth of emotional competence, whereby children use the skills of emotional competence to regulate themselves (Saarni, 1997). In fact, emotional competence can be understood to undergird self-regulation, as emotion regulation is a core component of self-regulation (Ferrier, Bassett, & Denham, 2014; Murray, Rosanbalm, Christopoulos, & Hamoudi, 2015). Moreover, both emotional competence and self-regulation are instrumental in learning, evidenced by studies demonstrating that children's understanding of and ability to regulate emotion is clearly linked with school success, as are emotion knowledge and positive social behavior (Cohen, 2017; Denham, Bassett, Brown, Way & Steed, 2015; Denham, Bassett, Zinsser, & Wyatt, 2014; Hernandez et al, 2016). Studies also show self-regulation is essential for learning and fundamental for one's emotional, social and academic success (Denham, Bassett, Sirotkin, Brown, & Morris, 2015; Jones, Greenberg, & Crowley, 2015; Moffitt et al., 2011; Murray et al., 2015).

### *Caregiver-as-Socializer*

The growth of emotional competence and self-regulation does not happen automatically, but evidence shows

these competencies can be promoted, developed and strengthened in the context of an adult-child relationship (Cohen, 2017; Murray et al., 2015; Shonkoff & Phillips, 2000). Attachment theory suggests that secure attachment—whereby the child views their caregiver as stable, attentive, and loving—is predictive of future relational success and that caregivers can foster secure attachment through sensitive, responsive and attuned interactions with the child (Ainsworth, Blehar, Waters & Wall, 1978; Honig, 2014). Through forming a secure attachment, the adult caregiver also strengthens the child's emotional competence, self-regulation, empathy, and prosocial skills (LeBuffe & Naglieri, 2012; Sroufe & Siegel, 2011). Importantly, secure and high-quality relationships between teachers and students that incorporates positive responses, learning, and emotional guidance are positively correlated with students' emotion regulation; help children deal more positively and successfully with their own and others' emotions; and aid children in being more receptive to teachers' lessons about emotions (Curby, Brock, & Hamre, 2013; Denham, Bassett, & Zinsser, 2012b; Osher, Cantor, Berg, Steyer, & Rose, 2017; Spivak & Farran, 2016).

*Begin to…*ECSEL

*Begin to…*ECSEL[2], a unique emotional, cognitive and social early learning approach, systematically leverages trained caregivers within the context of the relationship to support the growth of emotional competence, self-regulation and associated skills within the first six years of life. The premise behind *begin to…*ECSEL, namely that early childhood is an opportune time to support the growth of emotional competence and self-regulation, is supported by numerous studies showing foundational skills associated with emotion and self-regulation competencies begin to emerge from birth (Murray et al., 2015). The rationale behind the approach is supported by research showing that children initially communicate through expression of emotions (Tronick, 1989; Vallotton, 2008) and by research showing that through the caregiver relationship, children can learn to develop the ability to experience, constructively express and cope with a variety of emotions (Cohen, 2017). As such, *begin to…*ECSEL aims to promote children's ability to recognize and identify, understand, express and regulate their own emotions and those of others in the development of emotional competence on the path toward self-regulation. A distinguishing feature of *begin to…*ECSEL is how the caregiver teaches children these foundational competencies and how to effectively utilize them during heightened states of emotion arousal (Housman, 2017).

B*egin to…*ECSEL also draws on empirical research demonstrating that development in early childhood is influenced by a primary caregiver through a process known as *co-regulation,* in which parents and caregiving adults facilitate a child's ability to understand, express, and modulate their thoughts, behaviors, and feelings through support, coaching, and modeling in warm, responsive interactions (Murray et al., 2015; Schore, 2003). Self-regulation develops from co-regulation and recent research yields specific guidelines for early interventions that leverage co-regulation to enhance the development self-regulation (Housman, 2017; Murray et al., 2015; Murray, Rosanbalm, & Christopoulus, 2016). These guidelines include (a) a more intentional and targeted focus on self-regulation, in which cognitive and emotion regulation skills

[2] Formerly known as ECSEL

and their integration are systematically taught, (b) support for caregiver's own self-regulation, and (c) instruction for caregivers in co-regulation through modeling, coaching, reinforcing and supporting children's self-regulation within the context of a nurturing, sensitive and responsive relationship (Murray et al., 2016).

Interestingly, studies show that teaching children the connection between feelings and behavior can provide the basis for understanding appropriate ways of resolving conflicts and solving problems, while also helping in the development of self-regulation (Jones & Bouffard, 2012). The evidence-informed teacher-student paradigm of *begin to…*ECSELthereby utilizes the teacher-as-socializer model of caregiver support, coaching and modeling, with a view to increasing emotion knowledge and emotion regulation on the path toward self-regulation (Housman, 2017).

Particularly unique to *begin to…*ECSEL is this use of the teacher-as-socializer model to implement techniques that utilize *Causal Talk* (CT) about emotion and more distinctly, *Causal Talk in the Emotional Experience* or CTEE (Housman, 2017). CT, sometimes referred to as emotion talk, is described as adult-child conversations based around emotions. Recognizing the direct link between emotion words used in causal-explanatory conversations of children's life events and the importance of labeling emotional experiences (Nelson, 2007; Salmon et al., 2013), *begin to…*ECSEL uses CT in the classroom during circle time and teacher-directed reading time. Evidence suggests that children's language skills developed through adult-child conversations is directly associated with their emotion knowledge (Salmon et al., 2013). In *begin to…*ECSEL, teachers also use CTEE to help children while in emotionally aroused states to identify, understand, accurately express, and regulate their emotions. Such interactions can be effective in reducing arousal escalation, relieving distress reactions, and promoting the experience of positive interactions (Sroufe, 2000). This technique works toward the development not only of emotional competence, but also of self-regulation and related problem-solving and prosocial skills (Housman, 2017).

Notably, *begin to…*ECSEL was developed at a time when research had only focused on CT outside the immediate emotional experience and was centered on parent-child interactions and their positive correlation between mother's and children's emotion knowledge (Brown & Dunn, 1996; Gavazzi & Ornaghi, 2011; Yelinek & Grady, 2017). While both CT and CTEE are implemented in *begin to…*ECSEL within the model of caregiver support, coaching and modeling, researchers have posited that a key to promoting children's emotional competence is not just CT but using CT in current emotional situations (CTEE) as an opportunity to teach and learn more appropriate emotion regulation strategies (Housman, 2017; Salmon et al, 2013). These affective interactions between the young child and caregiver (CTEE) are leveraged in teaching emotion regulation, particularly when emotions are heightened. The integration of emotional regulation, cognitive, and social skills during this state of emotional arousal can contribute to the development of emotional competence and self-regulation (Housman, 2017).

*Begin to…*ECSEL aims to teach children how to recognize, understand, experience, constructively express, and effectively manage the intensity of their own emotions, both positive and negative, and those of others through the process of co-regulation. *Begin to…*ECSEL recognizes that regulation is deeply embedded in the child's relationship with the significant caregiver, the teacher as socializer of children's emotional and behavioral expressions. Through observation, imitation, modeling, guidance, and contingent reactions, the

child's learning process is initially informed by directed control by the teacher, moves to guided control involving both teacher and child, and ends with the child establishing self-control through internalization.

*Begin to…*ECSEL incorporates a variety of specific tools that utilize CT and CTEE to promote emotional competence. These tools aim to strengthen emotion knowledge and emotion regulation skills while integrating emotion knowledge and regulation with critical thinking skills (Housman, 2017). The teacher's role is to integrate emotion regulation with critical thinking skills to help the children understand, manage and deal with their feelings. For teachers to successfully fulfill their role as socializer and effectively implement this approach, *begin to…*ECSEL recognizes that teachers need to be aware of and understand their own emotionality, as teacher's own emotional competence relates to their ability to promote children's emotional competence (Ersay, 2015). B*egin to…*ECSEL provides ongoing clinical training and reflective supervision to equip teachers with these necessary skills and competencies.

*Present Study*

A paucity of published research exists around how early childhood educators worldwide promote emotional competence using evidence-based programs under the age of 6, with new research referring to older children's classrooms and very little published on how early childhood educators promote such emotional competence (Denham et al., 2012b; Murray et al., 2015). This study aimed to show how *begin to…*ECSEL can promote emotional competence (involving emotion knowledge and emotion regulation) and self-regulation, as well as the associated skills of attachment, initiative, positive reactions to frustration, empathy and prosocial skills, and the ability to manage negative emotions and aggressive behaviors in children aged 2 to 6 years.

Based on previous research regarding emotional competence and self-regulation, the first goal of our study was to examine how students at Beginnings School who received *begin to…*ECSEL performed over one academic year on measures of attachment/relationship, initiative, self-regulation, emotion knowledge, and emotion regulation, and theoretically related constructs involving empathy, prosocial skills, positive reactions to frustration, and managing negative emotions and aggressive behaviors. To achieve this goal, we analyzed the growth of these students from the start of the school year to the end to determine change in the above constructs after receiving the *begin to…*ECSEL intervention.

Our second goal was to examine that the differences between these students and national normative samples on measures of attachment/relationship, initiative, and self-regulation. To achieve this goal, we compared the end-of-year performance of Beginnings School students after receiving the *begin to…*ECSEL against normative samples on the relevant measures.

Finally, the present study's third goal was to explore the differences in change scores between Beginning students and normative samples on emotion knowledge and emotion regulation, and theoretically related constructs involving empathy, prosocial skills, positive reactions to frustration, and managing negative emotions and aggressive behaviors. As normative samples are considered a control group who did not receive *begin to…*ECSEL, their changes could be attributed to the effect of time or other factors unrelated to the intervention. In comparison, as Beginnings children received the training, their changes could be

attributed to the effect of the approach/intervention, time or other factors unrelated to the intervention. As such, if the change scores of Beginnings children surpassed the change score of normative samples, we could speculate that our intervention is effective in improving children's abilities and skills assessed by the corresponding measures.

Our hypothesis was that *begin to*…ECSEL would notably improve these students' performances on the aforementioned constructs.

## Method

### *Overview*

The current study is part of a larger project focused on the effectiveness of *begin to*…ECSEL. For this study, children were recruited from the private child development center, Beginnings School, in Eastern Massachusetts that uses *begin to*…ECSEL.

### *Participants*

The present study consisted of a total of 100 children ages 2 through 6 years. Each child was assessed only once in each measure upon age eligibility for pre- and post-program outcomes over one year, yielding 100 unique children as participants, 49 males (49%) and 51 females (51%) with a mean age of 38.67 months (*SD* = 11.46). Seventy-four percent of participants were under 4 years old. Data were collected through observation, filming, and psychometric assessments administered by trained assessors and observational rating scales completed by classroom teachers. In accordance with Sterling Institutional Review Board standards, children's parents received informed consent forms and the opportunity to opt-out with no impact on enrollment, instruction, or education quality. Data pertaining to race and ethnicity were not collected for research purposes due to many parents opting to maintain their right not to identify their child's race or ethnicity. According to census data (TownCharts, 2018), 82.7% of residents in the school location are White or Caucasian, 2.1% are Black or African American, 10.7% are Asian, and 4.2% as Hispanic or Latino. Children came from a range of socioeconomic backgrounds; confidentiality agreements precluded asking families about their income directly.

### *General Procedures*

A cohort sequential longitudinal design was used whereby data was collected over three consecutive academic years. There were two rounds of psychometric testing during the school year: Round one (T1) within a four-month range in the fall (September through December) and Round two (T2) in the spring (March through June). The program was consistently implemented over each of the academic years. Each student was assessed at the start (T1) and end (T2) of a six-month period in different measures over only one academic year.

To quantitatively assess the frequency of implementation of CTEE technique, teachers were instructed over four to six months to self-report and document how many times per day they employed the technique and then averaged their response. Teachers self-reported using CTEE on average up to 40

timesdaily for 1- to 2-year-old classrooms; 30 times daily for 2- to 3-year-old classrooms; 20 times daily for 3- 4.5-year-old classrooms; and 10 times daily for 4.5 to 6 year-old-classrooms.

*Measures*

We used three measures: the Minnesota Preschool Affect Checklist – Revised/Shortened (MPAC-R/S); the Devereux Early Childhood Assessment (DECA); and the Affect Knowledge Test (AKT). Some children were not included in all measures due to enrollment dates not coinciding with testing periods or opting out of participation in specific measures.

*Minnesota Preschool Affect Checklist-Revised and Shortened (MPAC-R/S).* To assess children's emotional expression, emotion regulation, and social behavior, video recordings were coded using the adapted MPAC-R/S (Denham et al., 2012a). Each participant was video recorded by trained assessors four separate times for five minutes each during natural free play over a two-week period to allow for variability.

*Training MPAC-R/S assessors*. The research coordinator trained two assessors individually using the training package (Denham et al., 2012a). First, assessors read how to score each item using the MPAC-R/S manual. Next, assessors watched and scored training videos from the training package. Each assessor's video scoring was compared for reliability purposes. Once parity and at least 90% inter-rater agreement between assistants were achieved, assessors began scoring collected videos.. Random reliability checks were conducted twice during the year to ensure high inter-rater reliability.

*Scoring MPAC-R/S*. The MPAC-R/S includes 18 items that are scored based on frequency of observed behaviors over four times on a scale of 0 (not observed during any five-minute video) to 4 (observed in each five-minute video). For example, a child received a 1 when demonstrating the item once in the four five-minute periods. The 18items are clustered into three groups: Emotionally Regulated/Prosocial (e.g., "The child smoothly approaches an already ongoing activity and gets actively involved"), Emotionally Positive/Productive (e.g., "The child displays positive emotion in any manner"), and Emotionally Negative/Aggressive (e.g., "The child directs negative emotion specifically at a particular person who already in contact with them") (Denham et al., 2012a). One hundred students (49% male 51% female), were observed using MPAC-R/S at both time points. For the MPAC-R/S of Beginnings sample, the Cronbach's alphas for six-item regulated/prosocial subscale, seven-item positive/productive subscale, and five-item negative/aggressive subscale are 0.64, 0.48, 0.76 respectively. For the normative sample, the Cronbach's alphas for six-item regulated/prosocial subscale, seven-item positive/productive subscale, and five-item negative/aggressive subscale are 0.51, 0.58, 0.69 respectively. The Cronbach's alphas for MAPC-R/S in the current study are comparable to the developer's previous publications (Denham al., 2012).

*Devereux Early Childhood Assessments.* The Devereux Early Childhood Assessment for Infants (DECA-I), Devereux Early Childhood Assessment for Toddlers (DECA- T) and the Devereux Early Childhood Assessment for Preschoolers, Second Edition (DECA-P2) were administered to teachers to compare children's attachment/relationships, initiative, and self-regulation to national norms (LeBuffe & Naglieri, 2012; Powell, Mackrain, LeBuffe, & Lewisville, 2007).

The 33-item DECA-I assesses Attachment/Relationship and Initiative for infants, 0 to 18 months; the 36-item DECA-T reflecting positive behaviors (strengths) typically seen in resilient toddlers, aged 18 to 36 months. The 38-item DECA-P2 assesses within-child protective factors central to social and emotional health and resilience for children 3 to 6 years. The assessments were created to control for developmental change, therefore scores should not move unless an intervention is applied. Thus, pre-test scores are not relevant for normative samples and not available or included in our comparative analysis. Specifically, standardized scores remain constant unless there is an intervention (Lebuffe & Naglieri, 2012; Lebuffe, Ross, Fleming, & Naglieri, 2013). DECA-T and DECA-P provide three protective factor scales: Attachment/Relationships, Initiative and Self-Regulation, whereas DECA-I only provides Attachment/Relationships and Initiative scales. Attachment/Relationships items assess the mutual, strong, long lasting relationship between the child and significant adults including family members and teachers(e.g., Sample item: "make needs known to a familiar adult") Initiative item assess the child's ability to use independent thought and actions to meet needs(e.g., Sample items: "try to clean up after herself/himself"). Self-Regulation item assess the child's ability to gain control of and manage emotions, and sustain focus and attention (e.g., Sample items: "handle frustration well") Previous research has shown robust internal reliability, test-retest reliability, and convergent validity for the DECA-I, DECA-T and DECA-P2 (LeBuffe & Naglieri, 2012; Powell et al., 2007).

Teachers learned about the purpose and procedure of the assessment from the online DECA workshop. Each teacher practiced filling out the DECA form with a scripted child example. Teachers then completed the age-appropriate, pre- and post-intervention DECA assessment for each classroom child, taking five to 10 minutes. Teachers completed the online assessments created for Beginnings School staff by DECA. for comparison to national norms (LeBuffe & Naglieri, 2012; Powell et al., 2007).

*Scoring DECA.* Scoring was based on a five-point Likert scale from 0 (never) to 4 (very frequently) with 36 DECA-T items for the DECA-T (18 Attachment/Relationships items, 11 Initiative items, and seven Self-Regulation items) and 38 DECA-P2 items (nine items for each of the three aforementioned constructs), allowing for a sum composite score for each construct. The DECA online platform automatically generates a normed *t*-score based on the sum composite, allowing for group comparisons.

Ninety-three children, aged 2 to 6 years (49.5% male and 50.5% female), participated in T-1 and T-2 assessments and national normative comparisons for the DECA-T/ P2 measures. Although an additional 33 children aged 3-18 months were initially included in data collection for DECA-I pre-and post-comparison, infants were excluded in the DECA national normative comparison because of lack of normative data. Due to incomplete data sets (lack of pre or post test scores) and exclusion based on score being greater than three standard deviations from the mean the combined DECA-T/P2 participation at 93 is lower than MPAC participation.

For DECA-T, the Cronbach's alphas for 18-item attachment/relationship subscale, 11-item initiative subscale, and 7-item self-regulation subscale are 0.94, 0.91, 0.90 respectively. For DECA-P2, the Cronbach's alphas for 9-item attachment/relationship subscale, 9-item initiative subscale, and 9-item self-regulation subscale are 0.78, 0.91, 0.93 respectively.

*Affect Knowledge Test* (AKT). The AKT assessed children's level of emotion knowledge (AKT; Denham, 1986). Children participated in games using puppets with felt detachable faces depicting the four emotions: happy, sad, angry, and afraid (Denham et al., 2002). AKT measure had two portions: labeling (eight items) and situation knowledge (15 vignettes).

Accompanying each portion was vocal and visual affective cues given by the research assistant. During labeling, children were asked to identify the four emotions by verbal naming. We also asked children to point to the four emotions, testing receptive capabilities. For three vignettes from the situational knowledge portion, the puppet performs the same emotion most people would feel. In the remaining 12 vignettes, the puppet depicted different emotions from what each child's caregiver had reported that the child would probably feel. Of the 12 non-stereotypical situations, six vignettes were positive versus negative emotion, and the remaining 6 vignettes were negative versus negative emotion (Denham, 1986). Children affixed to the puppet the felt emotion face of their choice.

*Training AKT assessors.* The research coordinator trained assessors using the AKT Manual.For certification to administer the AKT, assessors had to receive a minimum score of seven out of 10 points on the AKT certification form (AKT; Denham, 1986)

*Scoring AKT*. Children received two points for correct emotion identification, one point for identifying correct valence, but not the correct emotion (e.g., sad for afraid), and zero points if the emotion was not identified. Children could earn maximums of 16 points during the labeling portion and 30 points during the situation knowledge portion. 96 students participated (47.9% male and 52.1% female), slightly lower than the MPAC number due to children's unwillingness to participate in the assessment. Internal reliability of AKT for Beginnings sample measured by Cronbach's alpha is 0.92; and 0.89 for the normative sample.

*Description of Normative Samples*

Normative samples consisted of data collected by the creators of the MPAC-R/S, DECA- T/P2, and the AKT. To ensure comparability between the Beginnings sample and normative samples, the following subgroups were excluded from the normative dataset before analysis: children with special needs, in Head Start programs, receiving government assistance, and with at least one parent without a college education. MPAC-R/S and AKT normative samples were drawn from a large pool of participants who had not received interventions at all similiar to *begin to…*ECSEL. Any interventions previously applied were neither rigorously implemented nor evaluated, and as such were considered part of business-as-usual classroom procedure in comparison with *begin to…*ECSEL. Concerning the DECA-T/P2, authors note that the measure can be used to examine the effectiveness of SEL programs or interventions by examining the changes in children's scores before and after intervention (Fleming & Le Buffe, 2014). AKT normative sample included 257 children after exclusion (mean age 49.04 months,*SD* = 7.03,52.14% female). MPAC-R/S normative sample included 469 children after exclusion (mean age 48.26 months,*SD* = 7.26, 48.4% female). DECA-T/P2 national normative included 577 children after exculsions based on the parameters described above (mean age 41.88 months, 51.02% female (LeBuffe & Naglieri, 2012; Powell et al, 2007).

*Statistical Analysis*

We used normative comparisons specific to each measure. Only one set of national normative data was provided for the DECA-T/P2, as the measure controls for developmental change and is designed not to show change unless there has been an effective intervention (LeBuffe et al., 2013; LeBuffe & Naglieri, 2012; Mackrain, LeBuffe, & Powell, 2007). For all assessments, we tested pre-post changes in measures within the Beginnings cohort and evaluated potential differences by sex adjusting for age. To conduct our change score analyses, we employed the following strategy: to examine the distributional characteristics of all measures, we first generated descriptive statistics on all measures of interest and examined graphical representations using box-and-whisker plots. We then initially assessed pre-post-intervention change on outcomes within the Beginnings sample using paired t-tests. In subsequent statistical models, we employed ANCOVA models on pre-post change scores to compare the two cohorts (Beginnings and AKT and MPAC normative data), adjusting for sex and age. We tested interactions between sex and cohort to verify validity of our main effects only models. We employed SAS version 9.3 for all data management and statistical analyses. We applied an alpha level of 0.05 throughout to denote statistical significance. In addition to relevant sample estimates of the measures of interest, we reported *p*-values along with associated test statistics and degrees of freedom.

**Results**

The first study goal was to evaluate pre-post intervention changes within Beginnings samples. To evaluate these changes, we used the MPAC-R/S, DECA-T/P2, and AKT assessments, with change scores representing the difference in the means of pre- and post-intervention scores. Our use of change scores was consistent with our focus on improvement within our own population. Although each participant was new to our program, T-1 was implemented in the fall, two to four months after the program had commenced, further supporting our use of change scores as the most appropriate indicator to account for any slight improvement that may have occurred prior to T-1 testing.

Analysis of MPAC-R/S results (Table I) demonstrated significant improvement on the Emotionally Regulated/Prosocial scale, reflecting a medium effect size, as well as a significant improvement in the Emotionally Positive/Productive score, a small effect size. We found no statistically significant differences on the changes in the MPAC measures by sex adjusting for age.

In evaluating the degree of pre-to-post intervention change on DECA-T/P2 measures within the Beginnings sample (Table II), we found statistically significant improvement in all DECA-T/P2 scores relating to attachment/relationships, initiative, and self-regulation between pre- and post-intervention. All results are considered medium effect sizes. We found no statistically significant difference on DECA-T/P2 measures in the pre-post change between boys and girls adjusting for age.

Finally, we examined the degree of pre-post intervention changes on measures from the AKT within the Beginnings sample. The mean pre-post intervention changes in the expressive, receptive, stereotypical, and non-stereotypical emotion knowledge scores (Table III) were all significantly increased post intervention. All results are considered medium effect sizes. We found no statistically significant differences on the changes in the AKT measures by sex adjusting for age.

**Table I. Pre-and Post-test Statistics on MPAC-R/S measures**

| | | | | | Pre-Post Test Difference (within group) | | | Beginnings vs. National Normative Sample Mean Change Difference (between group) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Pre-mean (SD) | Post-mean (SD) | Change-mean (SD) | *t* (df) | *p*-value | Cohen's *d* | *F* (df) | *p*-value | Cohen's *d* |
| Emotionally Regulated/ Prosocial | Beginnings (N=100) | 4.61 (2.40) | 5.91 (3.12) | 1.30 (3.03) | 4.30 (99) | <0.0001 | 0.47 | 23.61 (1, 558) | <0.0001 | 0.50 |
| | Norm (N=469) | 2.90 (2.32) | 2.73 (2.10) | -0.15 (2.88) | N/A | N/A | N/A | | | |
| Emotionally Positive/ Productive | Beginnings (N=100) | 19.16 (2.64) | 19.80 (2.68) | 0.64 (3.29) | 1.93 (99) | 0.05 | 0.24 | 0.14 (1, 563) | 0.71 | 0.002 |
| | Norm (N=469) | 19.56 (3.71) | 20.19 (3.54) | 0.63 (4.56) | N/A | N/A | N/A | | | |
| Emotionally Negative/ Aggressive | Beginnings (N=100) | 1.40 (1.40) | 1.10 (1.88) | -0.30 (2.14) | -1.39 (98) | 0.16 | 0.18 | 0.46 (1,561) | 0.49 | -0.10 |
| | Norm (N=469) | 2.17 (2.17) | 2.15 (2.22) | -0.03 (2.71) | N/A | N/A | N/A | | | |

**Table II. Pre- and Post-test Statistics on DECA-T/P2 measures**

| | | | | | Pre-Post Test Difference (within group) | | | Beginnings post-intervention vs. National Normative Sample Difference (between group) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Pre-mean (SD) | Post-mean (SD) | Change-mean (SD) | *t* (df) | *p*-value | Cohen's *d* | *F* (df) | *p*-value | Cohen's *d* |
| Attachment | Beginnings (N=93) | 52.7 (8.4) | 56.8 (8.8) | 4.1 (9.8) | 4.05 (92) | 0.0001 | 0.42 | 145.76 (1, 663) | < 0.0001 | 0.87 |
| | Norm (N=577) | N/A | 46.6 (12.4) | N/A | N/A | N/A | N/A | | | |
| Initiative | Beginnings (N=93) | 53.0 (9.1) | 58.1 (10.0) | 5.1 (11.1) | 4.39 (92) | <0.0001 | 0.46 | 83.97 (1, 658) | < 0.0001 | 0.98 |
| | Norm (N=572) | N/A | 48.8 (9.4) | N/A | N/A | N/A | N/A | | | |
| Self-Regulation | Beginnings (N=93) | 52.7 (11.0) | 56.3 (10.6) | 3.6 (9.6) | 3.61 (92) | 0.0005 | 0.38 | 9.752 (1, 645) | 0.002 | 0.40 |
| | Norm (N=559) | N/A | 52.2 (9.2) | N/A | N/A | N/A | N/A | | | |

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**Table III. Pre-post intervention change on AKT measures**

| | | | | | Pre-Post Test Difference (within group) | | | Beginnings post-intervention vs. National Normative Sample Difference (between group) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Pre-mean (SD) | Post-mean (SD) | Change-mean (SD) | *t* (df) | *p*-value | Cohen's *d* | *F* (df) | *p*-value | Cohen's *d* |
| Expressive | Beginnings (N=96) | 6.13 (2.12) | 6.95 (1.45) | 0.82 (1.88) | 4.29 (95) | <0.0001 | 0.45 | 0.11 (1, 347) | 0.73 | 0.10 |
| | Norm (N=257) | 6.26 (1.51) | 6.92 (1.32) | 0.66 (1.52) | N/A | N/A | N/A | | | |
| Receptive | Beginnings (N=96) | 6.56 (2.26) | 7.49 (1.49) | 0.93 (2.13) | 4.26 (95) | <0.0001 | 0.49 | 0.24 (1, 347) | 0.62 | 0.38 |
| | Norm (N=257) | 7.20 (1.40) | 7.52 (1.15) | 0.32 (1.36) | N/A | N/A | N/A | | | |
| Stereotypical | Beginnings (N=96) | 4.47 (1.84) | 5.28 (1.21) | 0.81 (1.73) | 4.60 (95) | <0.0001 | 0.52 | 0.36 (1, 347) | 0.55 | 0.32 |
| | Norm (N=257) | 5.00 (1.14) | 5.42 (1.05) | 0.42 (0.95) | N/A | N/A | N/A | | | |
| Non-stereotypical | Beginnings (N=96) | 18.20 (6.03) | 21.09 (4.46) | 2.89 (4.48) | 6.33 (95) | <0.0001 | 0.54 | 0.83 (1, 347) | 0.36 | 0.35 |
| | Norm (N=257) | 19.21 (4.09) | 20.72 (4.28) | 1.51 (3.68) | N/A | N/A | N/A | | | |

**Table AI. Pre-post intervention change on DECA measures within the Beginnings sample for children aged 3 months – 18 months (n=33)**

| | Pre-mean (SD) | Post-mean (SD) | Change-mean (SD) | *t* (df) | *p*-value | Cohen's *d* |
|---|---|---|---|---|---|---|
| Attachment | 53.4 (10.2) | 57.7 (10.1) | 4.3 (9.3) | 2.66 (32) | 0.01 | 0.46 |
| Initiative | 57.9 (9.7) | 58.8 (9.1) | 0.9 (8.9) | 0.61 (32) | 0.55 | 0.10 |

The second study goal was to examine differences between these students and national normative samples on measures of attachment/relationship, initiative, and self-regulation. To achieve this objective, we used DECA-T and DECA-P2. In comparing post values from the Beginnings sample to the national norm sample in linear models adjusting for sex and age, we found statistically significant differences in mean post-intervention scores, favoring the Beginnings cohort for attachment, initiative, and self-regulation (Table II).

Based on the criteria for Cohen's *d*, the effect size for self-regulation is considered a medium effect size, whereas the effect sizes for both attachment and initiative are considered large effect sizes. We found no significant interaction between cohort and sex in these models for the DECA-T/P2 measures.

Our last goal was to explore differences between students receiving *begin to…*ECSEL and normative samples on emotion knowledge and emotion regulation, as well as empathy, prosocial skills, positive reactions to frustration, and managing negative emotions and aggressive behaviors. In comparing the Beginnings cohort with the normative cohorts on pre-post intervention change in the MPAC-R/S measures using linear models adjusting for sex and age (Table I), we found the improvement in Emotionally Regulated/Prosocial scale was greater in the Beginnings cohort than in the normed cohort, a difference that was statistically significant and a medium effect size. We did not, however, find statistically significant differences in the pre-post changes on the Emotionally Negative/Aggressive and Emotionally Positive/Productive and the Emotionally Negative/Aggressive scales between the cohorts. We found no significant interaction of sex and cohort on changes on the MPAC-R/S.

We next compared in linear models the pre-post intervention changes on measures from the AKT between Beginnings and normed cohorts adjusting for sex and age. In these models, we found that the change in the Expressive, Receptive, Stereotypical and Non-Stereotypical scores were not significantly better in the Beginnings cohort than in the national norm sample, adjusting for age and gender (Table III). We also found no statistically significant interaction between cohort and sex in these models.

Supplemental analyses using non-parametric procedures yielded similar results for all measures.

**Discussion**

Our study evidences that *begin to…*ECSEL promotes the foundational constructs of emotional competence and self-regulation, enhancing and optimizing the growth of children's emotion knowledge, emotion regulation, empathy, prosocial skills, and social-emotional competencies. Through the introduction of a prevention-intervention model in which a primary caregiver teaches young children from birth through lived emotional experience most notably during heightened states of arousal, children improve in these critical constructs.

Pursuant to our first goal, we evidenced the efficacy of *begin to*…ECSEL by demonstrating that children who received the approach showed significant improvement over the course of one academic year in attachment/relationships, initiative, self-regulation, emotion knowledge, and emotion regulation, and theoretically related constructs involving empathy, prosocial skills, positive reactions to frustration, and managing negative emotions and aggressive behaviors. Children significantly improved in their emotionally regulated/prosocial skills and increased markedly post-intervention in all aspects of emotion knowledge. Their abilities to express and identify emotions, as well as interpret and understand emotional content within an interaction, also significantly improved. Their elevated initiative scores suggest children receiving *begin to…*ECSEL were more confident in their ability to use independent thought and action to meet their needs, demonstrating perseverance, a willingness to take risks, persist in the face of frustration and an interest in learning new things. The large effect size when assessing children's non-stereotypical behavior speaks to

children's heightened ability to empathize and take the perspective of others. Their ability to discern, understand and allow for differences between their own likes and dislikes from those of others is further acknowledgement and support for the importance of helping to develop these skills from birth.

Further, children who received *begin to…*ECSEL improved significantly in attachment/relationships, initiative, and self-regulation (Table II). We believe that these constructs, as well as children's social-emotional competencies, are promoted through the teacher's awareness and understanding of their own emotionality and their use of *begin to*…ECSEL tools and techniques, most notably the consistent and frequent use of CTEE deployed during heightened emotional interactions. These CTEE experiences contribute to the working model of affect-related expectations that we believe will transfer from the immediate caregiving environment to the larger social world of peers and others.

Our results support our premise that *begin to…*ECSEL can be implemented from birth. The significant growth in attachment-relationships for 3 to 18-months-old children with a caregiver—an increase that has not yet been observed to be empirically evidenced—points to the seemingly unparalleled effect of *begin to*…ECSEL in helping enhance young children's secure attachment beginning from birth (Table AI). Recognizing the importance of attachment in the development of emotional competence, the approach prioritizes the awareness and development of teachers' own emotionality while cultivating and enhancing their attunement, sensitivity and responsiveness to the young child's unique needs (Housman, 2017; Nissen & Hawkins, 2010; Siegel, 2001). The contingent interaction between caregiver and child can create a warm and positive relationship in which new abilities are fostered in the child, leading to more excitement and positivity toward learning, school and themselves (Cohen, 2017). The dramatic improvement in quality of attachment can therefore be attributed to the attuned and responsive teacher-child relationship promoted through *begin to…*ECSEL with the teacher-as-socializer as a foundational component. Furthermore, Beginnings infants significant improvement on scores of attachment and relationships, reinforced by the medium effect size, further validates the capacity of infants to develop social and emotional competencies within the context of a relationship through co-regulation. Our approach lends support to research showing that adult-child interactions can help scaffold the development of these capacities (Housman, 2017; Murray et al., 2015; Osher et al., 2017) and that attachment is integral to co-regulation, from which self-regulation develops (Murray et al., 2015). Early attachment is also foundational for self-agency (initiative), emotion regulation, self-esteem, social competence, and the capacity to develop trusting relationships in adolescence and adulthood (Sroufe & Siegel, 2011), suggesting that our approach could have longer-term impact on other important social and emotional competencies.

We also evidenced the efficacy of *begin to*…ECSEL through our examination of the differences between students receiving *begin to…*ECSEL and national normative samples on measures of attachment/relationships, initiative, and self-regulation. Our large effect sizes for attachment and initiative, as compared to the national normative sample, indicates that children taught through *begin to…*ECSEL significantly outperform children nationally in these critical constructs, adding further credence to the strength and potential magnitude of *begin to…*ECSEL.

Finally, through exploring differences between students receiving *begin to…*ECSEL and normative

samples on emotion knowledge, emotion regulation, empathy, prosocial skills, positive reactions to frustration and managing negative emotions and aggressive behaviors, we illustrated that children who received the approach outperformed their peers in these critical constructs. Moreover, these children significantly outperformed the normative sample at a younger age, as the mean age of the sample of children taught *begin to*…ECSEL (38.67 months) was approximately ten months younger than that of the AKT (49.04 months) and MPAC-R/S (48.26 months) normative samples, thus adding credence to the importance of providing social-emotional learning from birth. Although we did not find a statistically significant difference in the AKT change score between the Beginnings children and normative samples, Beginnings children still outperformed normative samples in mean change in all four aspects of affect knowledge. We attribute the somewhat mitigated outcome of the AKT test to the fact that Beginnings children's pretest scores were already higher than the normative samples and to the AKT only measuring four basic emotions, leaving less opportunity to demonstrate improved understanding of more complex emotions. For example, one AKT measure requires children only to name and point to one of four emotions based on a provided visual representation of the four facial emotional expressions, increasing the probability of a ceiling effect which may have resulted in lower change score results. Another measure presents stereotypical and non-stereotypical narratives to identify emotions but since this measure is conducted twice, scores may benefit from a practice effect whereby children are preemptively aware of questions on the test, becoming more adept. Results however reflected Beginnings students' ability to think more independently, better coordinate action to meet their needs, promote and maintain positive relationships, and exhibit greater empathy through turn-taking sharing, and cooperating. They also could better express their emotions and manage their behaviors within a self-regulatory context as evidenced by their prompt ability to verbally express feelings arising from a conflict or problem situation and to move forward to achieve goals through problem-solving and conflict resolution.

Our findings build upon extant literature on how early childhood educators can promote emotional competence among children (Denham et al., 2012b). To our knowledge, this study is the first to examine children within the first years of life on the growth of attachment, initiative, self-regulation, emotion knowledge, emotion regulation, empathy, and positive reactions to frustration through an early childhood intervention-prevention program using both between-groups and within-groups.

Our results suggest that targeting children between birth and 6 years old provides the opportunity to scaffold emotional, cognitive and social skills. By focusing on the promotion of emotional competence through co-regulation in lived emotional experience in early childhood, children showed significant improvements in critical foundational social-emotional regulatory skills.

*Limitations*

This study is among the few to rigorously examine young children's behavior within the context and confines of the school environment. Due to the small school size and the need to maximize sample size, study participants could not be randomized based on who received the approach, as the approach is integral to the

mission of Beginnings School. Moreover, due to a lack of national normative data for infants, a randomized control group was unavailable for this population, thus limiting the ability to compare.

Another limitation is the delay between initial MPAC-R/S recording and intervention implementation. Several students had pre-MPAC-R/S recordings taken in the fall, within a four-month period of beginning to receive *begin to…*ECSEL. Due to the need to assess a relatively small body of students through three measures in a developmentally appropriate phased approach, some delay of initial measurement occurred, resulting in measurement after intervention had commenced. Thus, pre-scores may be slightly elevated and change scores depressed, potentially not fully reflecting the baseline level of dysregulation present pre-intervention.

A possible limitation of the DECA could be a perceived, subjective rating based on teacher observation. Yet, research has shown robust internal reliability, test-retest reliability, and convergent validity for all DECA measures (LeBuffe & Naglieri, 2012; Powell et al., 2007), further adding credence to the validity of teacher ratings.

**Conclusion**

Our findings evidence that *begin to …*ECSEL results in multifaceted change, demonstrating significant improvement in emotional competence, self-regulation, empathy and associated skills. These findings come at a time when skills associated with emotional competence are now deemed critical for many fundamental abilities, including memory, attention, and stress management (Osher et al., 2017) and when children with poor emotion management skills are considered prone to act aggressively and impulsively rather than use problem-solving skills to analyze situations, anticipate consequences, and plan a response (Donohew et al., 2000). Recognizing that thinking can be impaired and the brain cannot learn when feelings are not regulated (Cohen, 2017), an intervention-prevention approach that promotes the regulation of emotion comes at a critical juncture. An approach that utilizes a teacher-as-socializer model in the context of co-regulation to promote self-regulation, emotional competence, and prosocial skills such as empathy could be instrumental in early childhood education. Once more, the absence of early childhood educations programs focusing on teachers' effective management of their own internal feelings and external displays of emotion (Garner, 2010; Schonert-Reichl, Kitil, & Hanson-Peterson, 2017) speaks to the compelling need for an approach that specifically aims to promote young children's emotional competence by fostering and scaffolding the growth of teacher's own emotionality. Reinforcing the relevancy of this approach is the OECD's release of an early learning assessment tool ("Baby PISA", 2017) that evaluates self-regulation and empathy, directly speaking to the increased global recognition of the imperative role of these core competencies..

Further study, however, is warranted on the implications of the *begin to…*ECSEL program on emotional, cognitive and social early learning within Beginnings and beyond. Research suggests the competencies that b*egin to…*ECSEL promotes result in improved mental health, learning, and lifelong success. Notably and anecdotally, parents, caregivers, and educators have reported over decades that Beginnings alumni consistently demonstrate heightened confidence; success in their interactions with others; academic achievement; leadership skills; and resiliency. Conversely, extant research shows that children with

poor self-regulation not only have more difficulty transitioning to school, but are also at increased risk long-term for low academic achievement, emotional and behavioral problems, peer rejection, and school dropout (Denham, 2006; Duncan et al., 2007; Jones et al., 2015; McClelland, Acock, & Morrison, 2006; Shaw, Gilliom, Ingoldsby, & Nagin, 2003; Vitaro, Brendgen, Larose, & Tremblay, 2005). More than fact-based learning, the ability to manage ones' own emotions and be sensitive to the emotions of others are not only essential to academic accomplishment but also to personal, social, and professional growth (Elias, 2006). Further study can explore whether young children who receive *begin to…*ECSEL continue to outperform their cohorts in self-regulation, emotional competence and empathy as they mature.

This current study is relevant to the advancement of the field of child development and importantly to early childhood education globally. The earlier we can help children connect their emotions to their behaviors and thoughts, the more we can help them develop their own emotional, cognitive and social capabilities; be empathic with others; and develop a strong, positive and secure sense of self. Teaching the connection between feelings, thoughts and behavior provides the bridge for understanding appropriate ways of getting one's needs met and constructively resolving conflicts and solving problems. These skills can and should be taught early, as evidenced by *begin to…*ECSEL. Given that today we live, communicate and interact globally, the ability to be empathetic, take another's perspective, and self-regulate is imperative for not only future generations but for our collective society as a whole.

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