

THE READY CLASS PROJECT:
AN EXAMINATION OF A TIER 1 INTERVENTION IN THE EARLY CHILDHOOD
CLASSROOM
A PRETEST AND POSTTEST CONTROL GROUP DESIGN

By

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Abstract

Researchers identify early childhood as a critical period for the development of *academic enablers* (Feil & Frey, 2013). Academic enablers include social behaviors essential to social competence and effective learning such as cooperating, sharing, helping, listening to others, and focusing attention. These academic enablers are highly related to academic achievement (Gresham, Cook, Crews, & Kern, 2004). Early childhood represents a time to develop healthy, prosocial behaviors that prevent development of antisocial behaviors before they become chronic and intractable (Feil & Frey, 2013). If children develop these academic enablers as three, four, and five year olds, they are better able to take advantage of the learning environment now and in their future years as students.

We use self-regulation skills to produce these important academic enablers. Self-regulation is a multifaceted concept described differently throughout the literature. It encompasses management of physiological arousal, emotions, attention, and behavior. Simply put, self-regulation involves the ability to stop doing something and start doing something else (even when you do not want to). My dissertation research involves implementation of a complex Tier 1 intervention, the Ready CLASS Project (RCP), designed to teach self-regulation skills to young children. A series of papers lead to this culminating dissertation study.

The first manuscript entitled “A Literature Review of Parent-Child Interventions with Families with Young Children,” reviewed parent-child intervention literature from early childhood, infant mental health, and early intervention programs. The findings yielded five quality indicators that described effective parent-child relationship interventions. Although many parent-child interventions exist, only three intervention packages address all five quality indicators. Each of the interventions offered unique approaches to developing positive parent-

child relationships, which includes distinctive principles, protocols, theory, and evidence-based outcomes. Consequently, each approach addressed the quality indicators with different methods. Ultimately, I found that these exemplary parent-child intervention approaches offered common themes that we can endorse to foster positive relationship development. I applied this evidence on positive relationship development to my final dissertation study as it relates to relationship building between the occupational therapist, parents and the teachers.

The second manuscript, entitled, “Teaching Children Self-Regulation Skills within the Early Childhood Education Environment: A Feasibility Study” (Blackwell, Yeager, Mische-Lawson, Byrd, & Cook, 2014), explored the feasibility of the RCP. The results of this feasibility study contributed to our understanding of the practicality of implementing a self-regulation program within the early childhood environment. I learned that we can influence children’s vocabulary about self-regulation and feelings recognition capacity when the activities and experiences become embedded into the daily routine. Further, this new vocabulary gave teachers more opportunities to be in tune with children about their feelings or activity levels. Although desired outcomes relating to self-regulation were not fully realized, the intervention showed sufficient promise for refinement and replication. These learned lessons were applied to this dissertation study.

Data collected during the above feasibility study was used to develop the third manuscript entitled, “Active Ingredients for an Embedded Intervention within the Early Childhood Classroom”. The findings from this study revealed three active ingredients for implementing an embedded intervention in an early childhood environment. Findings from this study suggested an interaction of these ingredients that influenced each other and affected the

immediate outcome of an embedded intervention. Based on these findings, recommendations to improve implementation in a replication of RCP were made.

The fourth manuscript entitled, “The Role of Occupational Therapy with Response to Intervention (Tier 1) in Early Childhood Education: An Analysis of Classroom-Based Programs for Young Children” reviewed classroom-based intervention research in inter-professional early childhood literature. Specifically, intervention research that addressed skill acquisition/development, social-emotional development, or sensory-based strategies for young children was explored. Within the discussion, the relationship between present classroom-based literature and occupational therapy theory was underscored. I stress the relevant implementation characteristics of various intervention studies as they relate to outcomes. I highlighted some supporting evidence in the literature in addition to some of the gaps in evidence. The findings from this manuscript directly informed my dissertation study in developing a Tier 1 intervention.

My dissertation study will ultimately be divided into two manuscripts. Part 1 of the dissertation reveals the child outcomes of the RCP. I found improved self-regulation, decreased behavior concerns, and increased self-regulation knowledge compared to the control teachers (Blackwell & Dunn, in progress). I plan to submit ‘Part 1’ to the American Journal of Occupational Therapy. Part 2 of the dissertation explores the teacher outcomes of the Ready CLASS Project. I discovered notable changes in the intervention teachers after implementation of the Ready CLASS Project when compared to the control teachers (Blackwell, Delahunt, Wallisch, & Dunn, in progress). I plan to submit ‘Part 2’ to the Early Childhood Research Quarterly.

During this journey, I have developed an understanding of complex intervention research. Given the importance of self-regulation in early childhood, I intend to continue exploration of this topic as I advance toward a career in research.

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The Ready CLASS Project:

An Examination of a Tier 1 Intervention in the Early Childhood Classroom

A Pretest and Posttest Control Group Design

Abstract

Objective. This study explores the effect of an 8-week Tier 1 intervention on self-regulation skills, behavior concerns, and self-regulation knowledge in an early childhood classroom.

Method. Researchers recruited children from two early childhood classrooms. One classroom participated in the Ready CLASS Project (RCP), an 8-week Tier 1 intervention. The other classroom acted as the control. The pre and posttest outcomes included the Devereux Early Childhood Assessment-Preschool, Second Edition (self-regulation and behavior concerns) and the RCP Knowledge Assessment.

Results. The intervention led to significant changes in self-regulation and behavior concerns in comparing intervention classroom (n=17) to control classroom (n=15). The intervention also resulted in significant changes in self-regulation vocabulary and categorization when comparing intervention to control. No intervention effect was found concerning feeling identification.

Conclusions. The data suggests that the intervention positively influences self-regulation, behavior, and knowledge. Occupational therapists can play a role in teaching self-regulation using a Tier 1 framework.

Introduction and Literature Review

Central to our professional philosophy is helping individuals participate in the everyday activities that they want and need to do. We identify these everyday activities as occupations. In an early childhood setting, children want and need to have fun, maintain healthy relationships, learn new things, and prepare for kindergarten. When a child shows difficulty engaging in his/her occupations, an occupational therapist may become involved to support participation. While one child's difficulty may interfere with his/her participation, it may likewise influence the teacher, other children, or the entire classroom. Situations such as these press the occupational therapist to consider not only the internal child characteristics, but also the classroom context. Internal characteristics include client factors, performance skills, and performance patterns (American Occupational Therapy Association, 2014). The classroom context consists of the teacher(s), the other children, and the physical classroom. For the purpose of intervention, consideration of both internal characteristics and the environment shifts the focus from one isolated child as 'client' to the entire classroom as the 'client'. Although one particular child may present with needs, intervention might begin at the classroom level instead of the individual level. Essentially, we embed interventions into the classroom, which is consistent with evidence-based practices (Swinth, Spencer, & Jackson, 2007). Further, integrated service is consistent with federal mandates for early intervention service (EIS) and Response to Intervention (RtI) (Individuals with Disabilities Education Improvement Act [IDEIA], 2004).

Occupational therapy is currently building evidence for more integrated intervention, with our earliest examples in the areas of fine /gross motor development and handwriting (Bazyk, Michaud, Goodman, Papp, Hawkins, & Welch, 2009; Bellows, Davies, Anderson, & Kennedy, 2013; Case-Smith, Holland, & Bishop, 2011; Lust & Donica, 2011; Ohl, Graze,

Weber, Kenny, Salvatore, & Wagreich, 2013). In these studies, occupational therapists provided services within whole classrooms. All of the positive outcomes reported in these studies provide occupational therapists clear models to transform their practices. We need to continue to build on these exemplar studies to strengthen the evidence and inform practice. Moreover, we are ready for illustrations of interventions for other areas within our scope of practice.

Another area that commonly interferes with a child's participation is self-regulation ability (or lack of). For the purpose of this paper, we define self-regulation as the ability to control one's urges both to stop doing something and to start doing something else (Bodrova & Leong, 2008). Self-regulation relates to attention/arousal, behavior, activity level, or emotions (Williamson & Anzalone, 2001). For example, a child exhibiting difficulty with self-regulation may exhibit an activity level that interferes with his/her learning as well as the learning of others. We all have natural self-regulation (Dunn, 2007). Some of our strategies work for us but others do not. Healthy, appropriate self-regulation can be learned (Bodrova & Leong, 2008; Gordon-Pershey, 2014). While occupational therapist possess expertise about how to support self-regulation needs using sensory-based strategies (Worthen, 2010), we have only a few examples of how to provide service in the context of the whole classroom (such as Lopez & Swinth, 2008; Pfeiffer, Henry, Miller, & Witherell, 2008; Schilling, Washington, Billingsley, & Deitz, 2003). We have even fewer examples of psychoeducational approaches that attempt to teach children how, when, and why they might use sensory-based strategies for self-regulation (Barnes, Vogel, Beck, Schoenfeld, & Owens, 2008). Therefore, an investigation of how we explicitly teach self-regulation to young children in a whole classroom context is the reasonable next step.

The *Ready CLASS Project (RCP)* (Blackwell, Yeager, Mische-Lawson, Byrd, & Cook, 2014) represents one example of an intervention designed to teach young children self-regulation

skills in a whole classroom context (Tier 1). “Ready” refers to children being in the optimal state to learn. “CLASS” stands for Classroom Lessons Applying Sensory Strategies. At the end, children learn to articulate how they feel and have a sense that they can change/control how they feel using appropriate strategies. The framework of RCP comes from the Alert Program[®], which many people know as “How Does Your Engine Run?” (Williams & Shellenberger, 1996). The Alert Program[®] uses an engine analogy to symbolize one’s body. Like a car engine, our body moves at different speeds. Since the Alert Program[®] is designed for children developmentally eight years and older (Williams & Shellenberger, 1996), researchers borrowed the engine vocabulary and developed an intervention package appropriate for young children (ages 3-5 years) (Blackwell, et al., 2014).

In a feasibility study of the RCP, researchers determined that the project was both acceptable and practical (Blackwell & Dunn, submitted; Blackwell et al., 2014). Through the feasibility study, researchers identified a number of strengths such as the teacher’s positive feelings about the project and the children’s use of the vocabulary. Yet, researchers also acknowledged a number of weaknesses in the intervention progression. Researcher concerns included problematic outcome measures, missed opportunities in teacher-researcher planning, and minimal emphasis on how to introduce sensory-based strategies in the classroom. However, we felt with consideration of various adjustments to the protocol RCP showed sufficient promise for replication. In developing new behavioral interventions, we logically move on to testing the intervention with a comparison group (Gitlin, 2013).

Study Purpose

This paper reflects a portion of a larger mixed methods study of the RCP investigating child and teacher outcomes. The objective of this paper is on the child outcomes where we

examine the impact of the RCP on young children in the early childhood classroom. The specific research questions include:

1. Does the RCP improve child outcomes (improved self-regulation and decreased behavior concerns) compared to a control group in the early childhood classroom?
2. Does the RCP improve children's knowledge of self-regulation concepts compared to a control group in an early childhood classroom?

Methods

Research Design

We used pretest-posttest control group design to measure child outcomes (self-regulation, behavior concerns, and knowledge) in two early childhood classrooms. One classroom served as the intervention group while the other classroom continued with their regular programming. The control group received the intervention after the study period was complete. The institutional board reviewed and approved all aspects of the study.

Setting

This study took place in a large early childhood education center that serves children aged six weeks to twelve years old and provides Head Start, Early Head Start along with a range of social services. The early childhood center is located in a major, urban city in the Midwest region of the United States. Overall, there are twenty-two early childhood classrooms. Of these, ten preschool classrooms include children ages three to five years. The primary researcher also provides occupational therapy services at this center.

Measures

Devereaux Early Childhood Assessment Preschool Program: Second Edition (DECA-P2). The DECA-P2 (LeBuffe & Naglieri, 2012a) is a standardized, norm-referenced

behavior rating scale for children three to five years old. The web-based version of the DECA-P2 takes approximately five minutes to complete on each child. The DECA-P2 instructions ask that the teacher consider the child over the past 4 weeks as he or she rates the items. The tool has 38 items total across five scales: initiative, attachment/relationships, self-regulation, total protective factors, and behavior concerns. The DECA-P2 generates a T-score for each of these five scales (M=50, SD=10).

The DECA-P2 has sound psychometric properties. The validity is high as evidenced by three analyses: content-related validity, criterion-related validity, and construct-related validity (LeBuffe & Naglieri, 2012b). For all five scales, internal reliability is high, where α ranges from .85 to .95 (LeBuffe & Naglieri, 2012b; Portney & Watkins, 2009). Test-retest reliability is also high for all five scales, where r ranges from .80 to .95 (LeBuffe & Naglieri, 2012b; Portney & Watkins, 2009). On the other hand, inter-rater reliability is not as strong, r ranges from .36 to .77 (LeBuffe & Naglieri, 2012b; Portney & Watkins, 2009).

The RCP Knowledge Assessment. This tool assessed the specific concepts and vocabulary associated with the intervention, which took approximately five minutes to complete per child. The assessors showed the child four individual pictures (one at a time) and asked three questions about each picture (12 total items):

1. What is this (boy/girl) feeling?
2. How is this (boy/girl)'s engine running?
3. Where does this picture go? (child places it next to proper 'engine' category)

No known assessment for these concepts and vocabulary exist in the literature. Consequently, the primary researcher developed this tool specifically for the present study.

Participant Selection

First, we recruited two preschool classrooms with in the center. We worked with administration to identify classrooms who might be interested and met the following criteria: (1) classroom has two permanent teachers who have worked together for at least two months, and (2) classroom has at least one child with significant self-regulation needs. We excluded classrooms if the classroom teachers had previously participated in the RCP feasibility study. Once the teachers volunteer and gave written consent, we invited all parents within the two classrooms to participate in the study. We obtained written consent from all parents.

Procedures

After obtaining written consent, this study progressed through four stages. First, researchers completed pretest data collection. The DECA-P2 and RCP Knowledge Assessment (both described above) were completed within a three-week period before the classroom intervention. Second, we implemented the 8-week RCP classroom intervention. Third, researchers completed posttest data collection. For posttest, researchers completed the same assessments within a week after the classroom intervention completion. Finally, researchers conducted data analysis.

The Ready CLASS Project Intervention. RCP is a Tier 1 intervention that spans eight weeks. We joined the teachers in the classroom three times a week for intervention related activities. The RCP consisted of six key components:

1. Teacher training
2. Large group
3. Small group
4. Classroom visits
5. Teacher-Researcher Meeting

6. Classroom Tools

Table 1 describes the six intervention components in detail. The research team included an occupational therapist (primary researcher) and a group of graduate occupational therapy students. We combined co-teaching and coaching models (Cook & Friend, 1995; Rush & Shelden, 2011) to embed self-regulation skill development in an early childhood classroom. Although we had an outline of how the lessons might progress across the eight weeks toward independent self-regulation, ideas for lessons and embedded opportunities were generated collaboratively with the teachers during teacher-researcher meetings. Instead of following a pre-determined script of lessons, we endeavored to provide lessons/experiences consistent with the unique needs and of the classroom.

To insure fidelity toward our intended purpose, we maintained precise procedures during the intervention. First, immediately after each interaction with the children and/or teachers, we wrote reflective field notes to contemplate implementation strengths, limitations, and reminders for future sessions. Second, researchers and teachers completed an implementation checklist each week to monitor progress and identify areas of need. Finally, researchers used a Livescribe™ smart pen to record all teacher trainings and meetings. Researchers used this data to reflect on sessions and subsequently mold the intervention as it advanced across the eight weeks. For parsimony, this fidelity data is not included in this paper.

Data Collection

Researchers collected data before the intervention (pretest) and after the intervention (posttest) using the same two assessments. The classroom teachers completed the DECA-P2 on the children in their classrooms. The DECA-P2 is familiar to all the teachers because they use it at the beginning and end of the school year. As for the RCP Knowledge Assessment, two trained

occupational therapy graduate students completed the individual assessments. To limit bias, these two graduate students did not participate in the intervention. Also, they were naive to group assignment, purpose, and goals of the intervention (Persch & Page, 2013). The graduate students worked together to assess each child's knowledge of intervention-related concepts (one assessor and one note taker). The primary researcher trained the two graduate students on the assessment procedures prior to beginning testing procedures.

Data Analysis

We entered all data into the Statistical Package for Social Sciences software, version 20 (SPSS). We used descriptive statistics to analyze the demographic data. For the DECA-P2, we conducted analysis of variance (ANOVA) to compare between pretest and posttest performance within groups and between groups. For the RCP Knowledge Assessment, we needed to prepare the data for analysis. First, we converted all the verbal responses to numerical codes to input into SPSS. Next, we analyzed the frequencies to understand the range of responses. Then, we clustered responses into two categories: acceptable and incorrect. Finally, we conducted ANOVA to understand the influence of RCP on self-regulation vocabulary by comparing the intervention to the control. In both the DECA-P2 and the RCP Knowledge Assessment, we accepted significance when $p < .05$. We calculated effect size using eta squared (η^2), where $\eta^2 = \text{between-group sum of squares} / \text{total sum of squares}$ (Pallant, 2010; Portney & Watkins, 2009).

Results

Participant flow and demographics

Intervention group had seven girls and ten boys, ranging in age from 55 to 65 months (mean age = 60 months). Intervention group also had four children who received internal services (occupational therapy, speech therapy, and/or mental health services). Control group

had eleven girls and six boys, ranging in age from 52 to 65 months (mean age = 57 months). Control group had five children who received internal services. Part way through the study, the early childhood center dis-enrolled two children (one girl and one boy) in the control group due to poor attendance. Consequently, we were not able to keep these two children in the study. We did not gather data on socioeconomic status; however, all children met the income eligibility for Head Start (Improving Head Start for School Readiness Act, 2007).

Equivalence of groups

For DECA-P2, we found no statistical differences between the two groups in pretest for the subscales of interest (i.e., self-regulation or behavior concerns). For the RCP Knowledge Assessment, we found no differences between the two groups in the 12 pretest questions.

DECA-P2

We conducted ANOVA to determine the impact of RCP on self-regulation and behavior concerns by comparing the intervention to the control. There was a statistically significant difference at the $p < .05$ level in self-regulation: $F(1, 30) = 4.748, p = .037$. The effect size using η^2 was .14 (large effect), while the power estimate was .559 (moderate) (Portney & Watkins, 2009). There was a statistically significant difference at the $p < .05$ level in behavior concerns: $F(1, 30) = 13.744, p = .001$. The effect size using η^2 was .31 (large effect), while was .948 (strong) (Portney & Watkins, 2009).

RCP Knowledge Assessment

Of the 12 items of this assessment, there was a statistically significant difference at the $p < .05$ level for some, but not all, items. Table 2 provides the data from ANOVA including statistical significance, effect sizes, and power. For question one (How is this boy/girl feeling?) the groups were not significantly different at posttest. The effect size for question one was small

and power was weak. On the other hand, the data from question two (How is this boy/girl's engine running?) did produce significant differences between the two groups. The effect sizes were large and the power strong on all but picture one (see Table 2). Regarding question three (Where does this picture go?), the data yielded significant difference between groups. The effect sizes were large and the power was strong (see Table 2).

Discussion

This study answered research question one, does the RCP improve child outcomes (improved self-regulation and decreased behavior concerns) compared to a control group in the early childhood classroom? The RCP intervention produced clinically significant positive changes in self-regulation (as measured by the DECA-P2) . Since the power was moderate, future replications will need to include large samples of children. RCP also generated positive changes in behavior concerns (as measured by the DECA-P2) that are clinical significant. The power for this outcome was strong indicating that the sample size was adequate.

Regarding research question two relating to children's knowledge of self-regulation concepts, the RCP produced mixed results. The project did not influence feeling identification (question one). In other words, the children in both groups identified feelings similarly. However, the RCP did affect knowledge in self-regulation vocabulary; that is, the engine jargon specific to the intervention (questions two and three). The large effect sizes indicate that the changes were clinically important. The power was strong for 11 out of 12 of these questions signifying that the sample size was adequate.

These results builds on the feasibility study by Blackwell et.al., 2014. While the feasibility study bore positive outcomes, they were not statistically significant. In the present study, the results reached statistical and clinical significance. There are a few possible

explanations for this change. The first possible explanation is age. Although we found no statistical difference between the groups at pretest on the outcome measure, the children in the intervention group were slightly older (55 to 65 months) as compared to the control group (52 to 65 months). It is possible that this classroom did better because of their age. Future research will need to investigate the relationship between age and outcomes.

Another explanation relates to the teachers, as two components of RCP directly target teacher behaviors. Though we report the teacher outcomes elsewhere (Blackwell, Delahunt, Wallisch, & Dunn, in progress), it is noteworthy that the teachers demonstrated enthusiasm and investment from beginning to end. As we had hoped, the teachers made suggestions for implementation that made sense in their unique classroom. Upon RCP completion, the teachers reported a desire to continue the intervention for the rest of the school year and to introduce with their incoming students in the fall. Without this level of commitment, the outcomes might be very different. Future replications of RCP, we need to continue to investigate teachers' interest, attitudes, and perceptions as they relate to child outcomes.

This commitment to the program may relate to the professional relationship with the primary researcher as she already worked at the study site. Meanwhile, research tells us that relationship building is essential to effective collaboration (Rush & Shelden, 2011). Consequently, the prior relationship might be considered an advantage. The findings may be different if primary researcher had not had a prior professional relationship with the teachers.

Related to the teacher's commitment leads us to another explanation; that is, the parent involvement. We had not anticipated the teacher's emphasis on parent communication about the project. Based on the teacher's recommendations, we developed a parent component to the intervention. More specifically, we sent home miniature versions of the "engine" social story

and a few homework assignments related to the intervention. The teachers reported having informal conversations with parents about the project. Furthermore, parents reported that the children mentioned the “engine” jargon and sang the songs at home. Unfortunately, we did not have any parent outcome measures in place to understand parent involvement. Future research will need to examine the relationship between parent involvement and child outcomes.

Considerations for Future Practice and Research

Through this study, we gained further insight about the different components. For class groups, teachers and researchers worked together to provide various experiences. The children seemed to enjoy all the experiences that we presented with the teachers. However, we came to realize that smaller groups were usually better than larger groups. We also developed an appreciation for how RCP groups or simply the presence of the researchers affected the class. We noticed a spike in negative, disruptive behaviors during the groups at first. We (teachers and researchers) adjusted plans accordingly. This particular issue underscores the need to be responsive, flexible, and open to adjusting original plans when attempting a project like this.

By design, the intervention provides intensive services (3 times a week plus weekly meetings with the teacher) for a designated time (8 weeks) with the expectation that teachers will continue as a part of their regular daily routine. RCP is decidedly time intensive for a therapist. For a therapist to implement RCP, she/he must shift from a *caseload* approach to a *workload* approach to service delivery. With caseload, a therapist allocates her/his time giving each child on his/her caseload a certain number of minutes per week. Whereas a workload approach, permits the therapist to include collaborative and prevention activities. Caseload limits the amount of time a therapist can spend doing related activities that she/he need and want to do, while workload allows more flexibility (AOTA, APTA, ASHA, 2014). Consistent with a

workload approach, RCP front-loads OT services into an 8-week intervention package. By frontloading service, the therapist may only need to check in with teachers and/or children occasionally. Further, this approach to service addresses the needs of children at all three tiers in a tiered model of service. Future research might compare outcomes of RCP (workload approach) to a similar intervention that occurs one time a week for the whole school year (caseload approach). Also an investigation of frequency, duration, and sustainability of RCP is warranted (Gitlin, 2013).

While no outcome measures related to the classroom materials (sensory and educational), we believe these are a valuable component of the intervention. Both teachers regularly spoke of their value (Blackwell, Delahunt, Wallisch, & Dunn, in progress). Moreover, the children showed repeated use of the materials and voluntarily told adults what they liked and how it helped them. However, the materials take time and money. We need additional studies to look at the relationship between the class materials and outcomes.

Limitations

We noted four limitations in our study. First, we developed the RCP Knowledge Assessment just for this study. Interestingly, a few children in the control group provided acceptable answers (such as fast and slow) in the posttest only. Although we do not know how or why this happened, we believe that some of the children in the groups have relationships outside of school (i.e., cousins). The intervention children might have shared what they were learning with the control children. We need to understand the range of answers children might provide. Further refinement of this tool is warranted.

A second limitation is that some children in the study already received occupational therapy from the primary researcher. For ethical reasons, we did not withhold services during

the study. Services included a weekly group and occasional collaboration with the teachers on implementing strategies for individuals and the whole classroom. Furthermore, the control classroom had a play therapist and behavior therapists that worked in the classroom on a regular basis. The intervention classroom did not have these services at the time of study. The findings might be different if the control classroom did not have a child(ren) receiving services during the time of the study.

Implications for Occupational Therapy

Our findings suggest that an 8-week Tier 1 intervention (3 times a week plus weekly meetings with the teacher) was suitable for promoting appropriate self-regulation vocabulary, skills, and behavior. The findings have the following implications:

- Occupational therapy providers can collaborate with teachers to provide effective classroom interventions to teach skills (i.e., using self-regulation vocabulary and using “tools”).
- Occupational therapy providers can collaborate with teachers to change the ecology of the classroom.
- Intensive interventions can yield significant changes in self-regulation knowledge and skills.

References

- American Occupational Therapy Association (2014). Occupational therapy practice framework: Domain and process (3rd ed.). *American Journal of Occupational Therapy*, 68(Suppl.1), S1- S48.<http://dx.doi.org/10.5014/ajot.2014.682006>
- American Occupational Therapy Association, American Physical Therapy Association, American Speech-Language-Hearing Association. (2014). *Workload approach: A paradigm shift for positive impact on student outcomes*. Retrieved from <http://www.aota.org/-/media/Corporate/Files/Practice/Children/APTA-ASHA-AOTA-Joint-Doc-Workload-Approach-Schools-2014.ashx>
- Barnes, K. J., Vogel, K. A., Beck, A. J., Schoenfeld, H. B., & Owen, S. V. (2008). Self-regulation strategies of children with emotional disturbance. *Physical & occupational therapy in pediatrics*, 28(4), 369-387.
- Bazyk, S., Michaud, P., Goodman, G., Papp, P., Hawkins, E., & Welch, M.A. (2009). Integrating occupational therapy services in a kindergarten curriculum: A look at the outcomes. *The American Journal of Occupational Therapy*, 63(2), 160-171.
- Bellows, L.L., Davies, P.L., Anderson, J., & Kennedy, C. (2013). Effectiveness of a physical activity intervention for head start preschoolers: A randomized intervention study. *The American Journal of Occupational Therapy*, 67(1), 28-36. doi: <http://dx.doi.org/10.5014/ajot.2013.005777>
- Blackwell, A.L., & Dunn, W. (2014). *Active ingredients for an embedded intervention within the early childhood classroom*. Manuscript submitted for publication.
- Blackwell, A.L., Yeager, D.C., Mische-Lawson, L., Byrd, R., & Cook, D.M. (2014). Teaching children self-regulation skills within the early childhood education environment: A

- feasibility study *Journal of Occupational Therapy, Schools, & Early Intervention*, 7 (3-4), 204-224, DOI:10.1080/19411243.2014.966013
- Blackwell, A.L., Delahunt, J.Z., Wallisch, A., & Dunn, W. (2015) *Examining early childhood teachers' perceptions: Introducing a tier 1 intervention to address self-regulation*. Manuscript in progress.
- Bodrova, E., & Leong, D. J. (2008). Developing self-regulation in kindergarten. *Young Children*, 63(2), 56-58.
- Case-Smith, J., Holland, T., & Bishop, B. (2011). Effectiveness of an integrated handwriting program for first-grade students: A pilot study. *The American Journal of Occupational Therapy*, 65(6), 670-678.
- Cook, L., & Friend, M. (1995). Co-teaching: Guidelines for creating effective practices. *Focus on Exceptional Children*, 28(3), 1-16.
- Dunn, W. (2007). Supporting children to participate successfully in everyday life by using sensory processing knowledge. *Infants & Young Children*, 20(2), 84-101.
- Improving Head Start for School Readiness Act of 2007, Pub. L. No. 110-134, 42 U.S.C. 9801.
- Individuals with Disabilities Education Improvement Act of 2004 [IDEIA], Pub. L. No. 108-446, 20 U.S.C. 1413.
- Gitlin, L.N. (2013). Introducing a new intervention: An overview of research phases and common challenges. *American Journal of Occupational Therapy*, 67(2), 177-184. doi: 10.5014/ajot.2013.006742
- Gordon-Pershey, M. (2014). Executive Functioning and Language: A Complementary Relationship That Supports Learning. *Perspectives on Language and Literacy*, 40(2), 23.

- LeBuffe, P., & Naglieri, J. (2012a). Devereux early childhood assessment for preschoolers: Lewisville, NC: Kaplan Early Learning Company.
- LeBuffe, P., & Naglieri, J. (2012b). *User's guide and technical manual-preschool*. Lewisville, NC: Kaplan Early Learning Company.
- Lopez, M., & Swinth, Y. (2008). A group proprioceptive program's effect on physical aggression in children. *Journal of Occupational Therapy, Schools, & Early Intervention, 1*(2), 147-166.
- Lust, C.A., & Donica, D.K. (2011). Effectiveness of a handwriting readiness program in head start: A two-group controlled trial. *The American Journal of Occupational Therapy, 65*(5), 560-568.
- Ohl, A.M., Graze, H., Weber, K., Kenny, S., Salvatore, C., & Wagreich, S. (2013). Effectiveness of a 10-week tier-1 response to intervention program in improving fine motor and visual-motor skills in general education kindergarten students. *The American Journal of Occupational Therapy, 67*(5), 507-514.
- Pfeiffer, B., Henry, A., Miller, S., & Witherell, S. (2008). Effectiveness of Disc 'O'Sit cushions on attention to task in second-grade students with attention difficulties. *American Journal of Occupational Therapy, 62*(3), 274-281.
- Pallant, J. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS, 4th edition*. New York, New York: McGraw-Hill International.
- Portney, L. G., & Watkins, M. P. (2009). *Foundations of clinical research: Applications to practice*. Upper Saddle River, New Jersey: Pearson Prentice Hall.
- Rush, D.D., & Shelden, M.L. (2011). *The early childhood coaching handbook*. Baltimore, Maryland: Brookes Publishing.

- Schilling, D. L., Washington, K., Billingsley, F. F., & Deitz, J. (2003). Classroom seating for children with attention deficit hyperactivity disorder: Therapy balls versus chairs. *American Journal of Occupational Therapy*, 57(5), 534-541.
- Swinth, Y., Spencer, K. C., Jackson, L. L. (2007). *Occupational therapy: Effective school-based practices within a policy context. (COPSSE Document Number OP-3). Gainesville, FL: University of Florida, Center on Personnel Studies in Special Education.*
- Williamson, G.G., & Anzalone, M.E. (2001). *Sensory integration and self-regulation in infants and toddlers: Helping very young children interact with their environment.* Washington, D.C.: ZERO TO THREE: National Center for Infants, Toddlers, and Families.
- Worthen, E. (2010). Sensory-based interventions in the general education classroom: A critical appraisal of the topic. *Journal of Occupational Therapy, Schools, & Early Intervention*, 3(1), 76-94.

Table 1. Overview of the Six Components of the Ready CLASS Project (RCP)

Components	Description	Frequency	Duration
1. Teacher training *	Discussed relevant literature and theories. Provided overview of RCP.	Two sessions	60 minutes
2. Large group*	Joined teachers for instruction of RCP concepts to the entire class.	One time a week (8 total)	30 minutes
3. Small group *	Offered hands-on experiences to reinforce RCP concepts with a three-eight children at a time.	One time a week (8 total)	60-90 minutes
4. Classroom visits*^	Observed classroom atmosphere and investigated additional opportunities to incorporate RCP concepts.	One time a week (8 total)	30-90 minutes
5. Teacher-Researcher Meeting*^	Assessed implementation and identified areas that need more support. Discussed plans for upcoming lessons.	One time a week (8 total)	60 minutes
6. Classroom Tools - Educational	Provided materials for RCP instruction. <i>Examples: story books, sensory choice board, and props for 'gas station' in the dramatic play area</i>	N/A	N/A
Classroom Tools - Sensory	Provided materials for self-regulation. <i>Examples: bubbles, dynamic seat cushion, mini-trampoline, and kaleidoscope</i>	N/A	N/A

Components with (*) indicates when the researchers wrote reflective field notes immediately following these sessions.

Components with (^) indicates when the researchers or teachers completed the RCP Implementation Checklist.

Table 2. RCP Knowledge Assessment

	Question 1				Question 2				Question 3			
	How is this (boy/girl) feeling?				How is this (boy/girl)'s engine running?				Where does this picture go?			
	F	<i>p</i>	η^2	Power	F	<i>p</i>	η^2	Power	F	<i>p</i>	η^2	Power
	(1,29)				(1,29)				(1,29)			
Picture 1	.019	.892	.00	.05	6.154	.019*	.18	.67	11.927	.002*	.29	.92
Picture 2	.019	.892	.00	.05	12.088	.002*	.29	.99	15.903	.000*	.35	.97
Picture 3	.592	.448	.02	.12	24.649	.000*	.46	1.0	15.903	.000*	.35	.97
Picture 4	2.399	.132	.08	.32	10.113	.003*	.26	.87	12.088	.002*	.29	.92

**p* < .05

Examining Early Childhood Teachers' Perceptions:
Introducing a Tier 1 Intervention to Address Self-Regulation

Abstract

Objective. This qualitative case study evaluated the effectiveness of the Ready CLASS Project (RCP) on teachers in an early childhood classroom.

Method. Researchers recruited four early childhood classroom teachers. Two classroom teacher participated in a 8-week RCP classroom intervention, while the other two served as the control).

As a part of RCP, researchers met with teachers weekly. These sessions were audio-recorded.

Researchers wrote reflective notes after all classroom activities and teacher meetings.

Researchers interviewed teachers before and after the 8-week RCP intervention, which were transcribed verbatim. Researchers used a combination of interview transcripts, reflective notes, and meeting notes to answer the research question.

Results. Researchers found four major themes in the data. At pretest, the teachers gave similar response that resulted in three themes. At posttest, researchers noted changes in the themes when comparing the intervention teachers to the control teachers. A new theme emerged from the posttest data for the intervention teachers but not the control teachers. This data suggests that RCP positively influenced the teachers application of self-regulation concepts within the early childhood classroom.

Conclusions. Using an 8-week Tier 1 frameowrk, occupational therapists can potentially work with classroom teachers to influence behavior, which leads to positive outcomes for the children and classroom context.

Introduction and Literature Review

When asked about managing self-regulation needs in the classroom, a first year early childhood teacher says,

I think it's been an interesting journey in terms of managing self-regulation because I think that ideally, you want to believe that there's one technique that's going to work for all of your students... and you want to come up with a plan that's going to work for everyone. And I think when I first started teaching, I thought I was going to find this beautiful way of doing it. And while there might be techniques that work for some students or even most students. I really had my eyes opened when I realized that students are just very different...in terms of the ways in which they are soothed and comforted.

This quote illustrates her ambition to use effective strategies for managing self-regulation in her classroom. She aimed to master general teaching practices, but learned to divert her attention to the unique needs of each student. Establishing a universal approach to promote self-regulation posed a greater challenge than she imagined. In other words, she did not feel prepared for the diverse needs in the classroom. This quote highlights the importance of supporting early childhood teachers on their journey, "to find this beautiful way of doing it" to address the educational needs of all children.

Educational needs for young children includes more than academics. In fact, Feil and Frey (2013) identify early childhood as a critical period for the development of *academic enablers*. Academic enablers include social behaviors essential to social competence and effective learning such as cooperating, sharing, helping, listening to others, and focusing attention. These academic enablers are highly related to academic achievement. Early childhood represents a time to develop healthy, prosocial behaviors and prevent development of

antisocial behaviors before they become chronic and intractable (Feil & Frey, 2013). If children develop these academic enablers as three, four, and five year olds, they are better able to take advantage of the learning environment now and in their future years as students. To employ these important academic enablers, one uses self-regulation skills. Far too often development of self-regulation is overshadowed by reading and math curriculum accountability federal mandates (Kagan & Kaurerz, 2007; Scott-Little, Kagan, & Frelow, 2005). With the current focus centered on academic learning, the ability to self-regulate is imperative, yet many times overlooked.

One child's inability to demonstrate self-regulation affects that individual child as well as the whole classroom. For example, when a child has a big emotion or high activity level, they miss instruction. If the teacher needs to stop and focus on the one child, all other children miss instruction too. One child's ability to self-regulate may change the learning environment for peers, as well as a teacher's ability to instruct on academics. This scenario commonly occurs when kindergarten teachers report self-regulation as a missing component when children transition to kindergarten (Degol & Bachman, 2015). Likewise, Rimm-Kaufman, Pianta & Cox (2000) studied the perceptions of 3,595 kindergarten teachers regarding children's transition from preschool. Fifty percent of the respondents found that more than half of their students needed support adjusting (i.e., following directions, working independently, cooperating in small groups, socializing with others). To better prepare children for kindergarten, explicitly teaching self-regulation is critical.

Self-Regulation in Early Childhood Education

Self-regulation is the developmental integration of emotion and cognition. On a behavioral level, the integration involves as a child's temperament or emotional reactivity to events (Blair & Razza, 2007). The ability to inhibit a behavior (e.g., withhold the urge to snatch

for a toy) and engage in a more appropriate behavior (e.g., asking for the toy) is a skill used in both social interactions (emotional component) and in thinking (cognitive component) (Bodrova & Leong, 2008). Children have natural self-regulation patterns. Some of these patterns are appropriate like humming while working. Other patterns may present as disruptive (e.g., fidgety, bothering peers, shouting) or unsafe (e.g., rocking in chair, fighting, jumping) in the classroom. The ability to understand and actively demonstrate self-regulation in an early childhood classroom varies from child to child. Consequently, any given classroom might have a combination of children with diverse self-regulation capacities.

Related Service Providers: Occupational Therapy

Occupational therapy practitioners often receive referrals for children who struggle with self-regulation in the classroom (Cohn, Miller, & Tickle-Degnen, 2000; Cramm, Krupa, Missiuna, Lysaght, & Parker, 2013; Crane, Winsler, & Sands, 2013; Graham, Phelps, Maddison, & Fitzgerald, 2011). Teacher concerns often include unpredictability, difficulty with rules/routines, and other disruptive behaviors. These children have yet to develop effective self-management skills to allow successful participation in the classroom. The decreased participation and disruption to classroom routines drives teachers to seek outside help.

Traditionally, occupational therapy services might include a combination of direct intervention outside of the classroom (i.e., pull-out) and indirect supports (consulting with teachers) to promote child participation (Odom and Wolery, 2003; Spencer, Turkett, Vaughn & Koenig, 2006). However, occupational therapists are becoming increasingly dissatisfied with this pull-out service delivery model because they understand the importance of the classroom as a child's natural context (Benson, 2013). Although dissatisfied, therapists identify several barriers to providing services that are more integrated. In addition, best practice for early

childhood emphasizes the importance of providing services within the natural learning environment of the child (i.e. indirect services within the classroom), and including active dialogue between all care providers (teacher, parent, aides, and other related service providers) (Rush, Shelden & Hanft, 2003). A discrepancy exists between best practice and current service provision in school-based settings.

More recently, occupational therapy practitioners are attempting more integrated and embedded approaches, where therapists spend two or more hours in the classroom working with children one-on-one and in small groups while concurrently supporting teachers (Case-Smith & O'Brien, 2013). In these instances, children made significant improvements in target areas after the intervention (Bazyk, Michaud, Goodman, Papp, Hawkins & Welch, 2009). While there are a few instances of integrating related service providers in the classroom, occupational therapy is just beginning to explore more systematic approaches such as a multi-tiered system being used in education.

Tier 1 intervention and Occupational Therapy

Currently, school systems are launching a multi-tiered model called Response to Intervention (RtI). The approach focuses on providing all children with targeted intervention based on the amount of intensity and support needed. RtI typically incorporates three tiers which follow a continuum of interventions from promoting strategies for all students in the education system, screening children at risk to receive services earlier than later, and providing more intensive services for children in need (Handley-Moore, Hollenbeck, Orentlicher & Wall, 2013).

Limited research exists demonstrating the role of occupational therapy within Tier 1 intervention. One of the few studies examined a 10-week Tier 1 intervention program for fine motor and visual-motor skills in a kindergarten classroom (Ohl, Graze, Weber, Kenny, Salvatore

& Wagreich, 2013). This intervention included 30-minute weekly lessons, a fine motor activity, and time for the teacher and occupational therapist to consult. Results indicated a significant increase in fine motor and visual motor skills, while classrooms without the intervention slightly declined.

Another study examined embedding a handwriting intervention program within a Head Start classroom (Lust & Donica, 2011). The handwriting program focused on various skills three times per week for six months. The results indicated that children in the intervention classroom improved significantly in prewriting, school readiness, and fine motor skills when compared with the control classroom. This study underscores the impact of embedding handwriting programs within early childhood settings, but additional replications are needed to further understand the effectiveness.

Burgeoning literature focuses on the effectiveness of Tier 1 occupational therapy interventions, but is limited to areas of fine motor, visual motor, emergent literacy and to kindergarten curriculum. Occupational therapy interventions to a whole classroom (Tier 1) may minimize the need for referrals later. Instead of “waiting for children to fail,” we create environments that support participation now (Cahill, 2010; Greenwood, Bradfield, Kaminski, Linas, Carta, & Nylander, 2011). While we have growing literature in some areas of practice, we need to build similar literature in developing self-regulation skills.

Teacher-Therapist Collaboration

An important component to implementing Tier 1 approaches is the working relationship between the teacher(s) and the therapist. Bose & Hinojosa (2008) explored the occupational therapist’s perception of the collaborative process with teachers in inclusive early childhood classrooms. Therapists found value in the collaborative process. They defined it as informing

others, sharing goals, problem solving together, and learning from others. However, therapists discussed many challenges including time constraints and differences in teachers' receptiveness to suggestions. Successful collaboration and interactions occurred when therapists saw their suggestions carried over into the classroom. Challenges arose when therapists felt their opinions were not respected and valued. Therapists defined an important component of successful teamwork was clear communication, while a lack of communication resulted in many disagreements about ideas and interventions. These findings suggest that the quality of communication may impede relationship building and intervention implementation.

Alternatively, teachers' perceptions regarding occupational therapy's involvement in the classroom setting is important to understand the collaborative process as well. Vincent, Stewart & Harrison (2008), examined four teachers' thoughts regarding occupational therapy occurring within the classroom setting. Sometimes teachers felt the therapist's recommendations did not adequately target the child's needs. Further, teachers indicated the importance of the therapist's advice, but the teachers wanted more support to implement the suggestions. Teachers expressed wanting to learn from the expertise of therapists to fill in the teacher's knowledge gaps. The two studies mentioned here provide two sides to the same coin (i.e., therapist perspective and teacher perspective). A tiered model of intervention offers a systematic framework for related service providers to work side by side with teachers in the classroom. In a tiered model, related service providers and teachers might build stronger relationships, find more opportunities to collaborate, and exchange expertise for the benefit of the children.

Unfortunately, little research exists examining teacher's perceptions of Tier 1 approaches (Orosco & Klingner, 2010). Moreover, there is no known research available on teacher perceptions of Tier 1 interventions that specifically teach self-regulation to young children.

Ready CLASS Project (RCP)

To address the scarcity of studies examining the impact of Tier 1 approaches on early childhood teachers, this paper presents the RCP. The RCP intervention employs the theoretical assumptions from the *Ecology of Human Performance* (Dunn, Brown, & Youngstrom, 2003). Ecology of Human Performance emphasizes an understanding of the interactions of the person, task, and context; the interaction between these three constructs results in performance. The person construct represents the individual who has unique experiences and skills. The task construct includes a set of behaviors necessary to accomplish a goal. The context construct (or environment) involves the conditions that surround the person. Finally, performance occurs when a person interacts with their context to complete a given task (Dunn et al., 2003). In other words, the key constructs (person, task, or context) can either support or inhibit an individual's performance. Intervention approaches, consequently, may address the person, task, context, or all three constructs.

According to the Ecology of Human Performance, one way to address all three constructs is by using a create approach (Dunn et al., 2003). Create interventions craft circumstances that support performance for all persons and populations, regardless of disability. When implementing a create intervention in the early childhood classroom, the provider (such as occupational therapy) offers unique expertise to augment contextual and/or tasks experiences that will support the children's growth, development, and performance. Create interventions promote more adaptive, complex, and sophisticated performance in the natural context (i.e., the classroom). Like a Tier 1 intervention, the create approach involves embedding learning opportunities within the context of the classroom that enhance child development and preempt potential problems (Dunn, Brown, McGuigan, 1994). RCP exemplifies a create intervention as

outlined in the Ecology of Human Performance, wherein occupational therapy collaborates with early childhood teachers to promote social-emotional and self-regulation skills for a whole classroom (Tier 1).

RCP focuses on collaborating with teachers to create an environment supportive for all children to learn and practice self-regulation strategies. The RCP is an activity-based, Tier 1 intervention designed to teach children self-regulation strategies (Blackwell, Yeager, Mische-Lawson, Byrd & Cook, 2014). The “ready” refers to children at the ideal state to learn. The “CLASS” is an acronym (Classroom Lessons Applying Sensory Strategies). The Alert Program[®] uses an engine analogy to symbolize one’s body. Like a car engine, our body moves at different speeds. One’s speed may be related to mood or arousal/energy levels (i.e., high, low, and just right).

Scholars note that teaching specific vocabulary for self-regulation enhances metacognition (Gordon-Pershey, 2014). Added, this engine vocabulary makes the concept of self-regulation “sticky” for the children and teachers (Gladwell, 2006; Rogers, 2010). Gladwell (2006) explains that the “stickiness” is important so that the concepts are memorable or stay in the minds (of the teacher and children) between sessions and after the intervention is over (i.e. sustainability). Stickiness is how we create change (Gladwell, 2006). Since the Alert Program[®] is designed for children developmentally eight years and older (Williams & Shellenberger, 1996), Blackwell and colleagues borrowed used the engine vocabulary and developed an intervention package appropriate for young children (ages 3-5 years).

Following the Ecology of Human Performance, the RCP represents a create intervention by focusing on both person and context variables in an early childhood classroom. Four of the six intervention components (that is, teacher training, classroom visits, researcher-teacher

meetings, and classroom materials) target the teachers and the overall classroom environment. The teachers and the physical classroom are part of the child's contextual variables. As for the person variables, RCP directly targets the children's development of self-regulation and self-advocacy skills by teaching them self-regulation concepts, vocabulary, and strategies. In essence, this multi-component intervention changes the ecology of the classroom by addressing both the context and the person.

Purpose of the Study

In this study, we report on a portion of the data collected in a larger study of the effectiveness of the RCP. Following the Ecology of Human Performance, we developed a theory of change to describe the process of developing self-regulation skills needed for kindergarten and beyond. Figure 1 provides a simplified theory of change model for a testable proposition about what is occurring during RCP (Hebbeler & Gerlach, 2002). The purpose of this study was to determine if the RCP changed teacher's behavior and application of self-regulation concepts (i.e., strategies and vocabulary) compared to control classroom teachers. At this stage in the research, we define self-regulation as a skill that involves being able to control one's own impulses to either stop doing something or start doing something depending on the situation (Bodrova & Leong, 2008). Those impulses might be emotional, behavioral, or attentional. We report the child outcomes resulting from the larger study elsewhere (Blackwell & Dunn, in progress).

Methods

Study Design

This study used an exploratory qualitative case study bounded by time and place (Baxter, 2006; Creswell, 2007). We sought to understand the perceptions and behaviors of teachers

before and after the RCP (time), as well as compare the control group to the intervention group within the same early childhood education center (place). Reasons for choosing a case study were three-fold. The first reason was to understand more than one teacher's experience with the RCP. The second reason was to identify any change in knowledge or practices when comparing two intervention teachers to two control teachers (Creswell, 2007; Miles, Huberman & Saldana, 2011). The third reason was to incorporate more than one data source (interviews, notes, and other study documents) to provide a greater appreciation related to implementing RCP, which might include the intervention acceptability and utility (Brown, 2009; Gitlin, 2013; Jung, 2013).

Setting and participants

This study included two early childhood classrooms in a large early childhood education center that provided Head Start, Early Head Start, and a range of wrap-around social services. The early childhood center was located in a major, urban city in the Midwest region of the United States. Classrooms in this setting have access to occupational therapy, speech therapy, play therapy, music therapy, and behavior therapy, as needed. Overall, there were twenty-two early childhood classrooms. Of these, ten preschool classrooms included children ages three to five years. The programming at this center included the Creative Curriculum[®] (Dodge, Colker, & Heroman, 2002), Second Steps (Committee for Children, 1991), and Attachment, Regulation, and Competency (ARC) (Arvidson et al., 2011). This study included two early childhood classrooms with children ages three to five years old. Since each classroom had two teachers, this study included four teachers. All four teachers were female and relatively new to the center (ranging from 6 months to a year and 6 months). While one teacher had 35 years of experience, the other three had between 6 months to a year and 6 months working at this particular center. Table 1 provides a full description of the teachers.

Procedures

Following approval from the Institutional Review Board and Human Subjects Committee, we began the recruitment process. The primary researcher approached administration at the early childhood center about the study. We identified three inclusion criteria, which were as follows:

- permanent classroom teachers has been working together as co-teachers for at least two months,
- classroom has at least one student with significant self-regulation needs, and
- classroom has a majority of four and five year old children.

Teachers were excluded if they participated in the feasibility study (Blackwell et al., 2014). Based on these criteria, the administration provided guidance as to where we should recruit volunteer teachers. Following recruitment, participant selection, and informed consent, the study advanced in four major phases. First was the pretest phase. Pretest yielded four interview transcripts. Second was the intervention phase. Intervention was two 1-hour teacher trainings plus eight weeks in the classroom (RCP). The intervention phase generated additional relevant data (such as weekly meeting notes, implementation checklists, and researcher notes). The primary researcher and a group of occupational therapy graduate students conducted RCP. Third was the posttest phase, which involved another interview with each teacher. Posttest phase yielded four interview transcripts. The fourth phase included data analysis.

Data Collection

Methods of data collection included interviews, weekly meeting notes, implementation checklists, and researcher notes (Miles, Huberman, & Saldana, 2014). Data collection spanned

approximately 13 weeks. While we used various data sources for triangulation, the pre and post intervention interviews were the primary data source.

Interviews. The primary researcher conducted all pre and post interviews with the classroom teachers. The interviews occurred at times and places convenient to each teacher during work hours. All interviews followed the same open-ended, semi-structured interview guide (see Table 2). The researcher used follow-up probe questions to respond to teacher's comments (Hsieh & Shannon, 2005). The researcher took brief notes and recorded each interview using a Livescribe™ Smartpen and notebook.

Data Analysis

Two researchers (Delahunt and Wallisch) transcribed each interview verbatim (eight interviews). These two did not know the teachers and were not involved in any of the classroom intervention activities. After the audio was transcribed, we removed all names and replaced them with initials. Next, the inductive data analysis progressed through four stages (Strauss & Corbin, 1998; Brown, Knoche, Edwards, & Sheridan, 2009).

Stage 1: Initial Coding. We worked with the pre-intervention interview data while waiting for the post-intervention data to be completed. First, we read the pre-intervention transcripts several times and coded them independently. Following independent coding, we came together to discuss findings and establish initial codes including definitions. This initial process resulted in 11 codes. To refine the definitions further, we decontextualized approximately 50 separate transcript segments and coded them independently. Based on this process, we discussed and revised the codes until >80% reliability was achieved. Ultimately, this process led to deleting some codes and additional refining others to better depict the data leaving nine codes.

Once the post-intervention interviews were completed and transcribed, we coded the transcripts using the nine codes. Following independent coding, we came together to confer the findings. We identified two new codes not present in the pre-intervention data (11 codes).

Stage 2: Theme Generation. During this stage, we grouped the 11 codes into three meaningful themes based on their similarity or interconnectedness. For example, five codes related to the teacher talking about her teaching style, her perceptions, or her progression. We ultimately grouped these codes together for a larger theme called “*The Way I See It*”.

Stage 3: Theme Comparison, Validation, and Disconfirmation. During this stage, we considered qualitative and quantitative differences between the transcripts (Creswell, 2007). This involved two major comparisons. We compared pre-intervention and post intervention responses among the intervention teachers. We also compared post intervention response of intervention teachers to the control teachers. Within each theme, we looked for changes in frequency or changes in quality of individual codes. In addition, we scanned the other data (meeting notes, implementation checklists, and researcher notes) to triangulate (either validate or disconfirm) the three themes (Curtin & Fossey, 2007).

Stage 4: Theme Relationships and Mapping. The final stage entailed an exploration of relationships between the themes. We returned to the theory of change model based on the Ecology of Human Performance (discussed above). We evaluated how the present themes either supported or threatened the theory of change model (Hebbeler & Gerlach-Downie, 2002).

Trustworthiness

The primary researcher’s role at the early childhood center is worth attention. The primary researcher was responsible for providing occupational therapy services at this center. In fact, the present research questions emerged from her experience working in this setting. The

primary researcher had varying relationships with teachers prior to the study. This prior relationship creates a potential bias (Watts & Teitleman, 2005). Consequently, researchers used several measures to establish and maintain trustworthiness. First, we used reflective field notes throughout the intervention. Our team used these notes to document thoughts, feelings, ideas, and problems (Curtin & Fossey, 2007; Krefting, 1991). Notes included not only logistical matters (like timing) but also therapeutic use of self (American Occupational Therapy Association, 2014) thereby considering our effectiveness. This note taking procedure allowed us to consider how things were going and make adjustments in implementation plans.

The second trustworthiness procedure was triangulation of data sources (i.e., interviews, field notes, meeting notes, and checklist). The triangulation allowed us to corroborate the findings in more than one data source (Miles, Huberman, & Saldana, 2014). Third, our team kept detailed data accounting log to document task completion, data collection, and/or changes in plans. This procedure helps with managing the variety and volume of data that will be useful during triangulation (Miles, Huberman, & Saldana, 2014). Finally, two members of our team (Wallisch and Delahunt) were not involved in the classroom intervention nor did they know the classroom teachers. These two researchers worked independently from the primary researcher on transcription and initial analysis. While the primary researcher remained entrenched in the data collection and intervention implementation, this procedure helped maintain some distance between these researchers and the intervention thereby increasing neutrality (Krefting, 1991). All of these measures strengthen the findings from this study.

Findings

Data analysis generated four main themes: *The Way I See It*, *High Flyers*, *Kindergarten*, *Here We Come*, and *This Is Just The Beginning*. Three of the themes represented teachers'

perceptions shared in interviews across the study from pre-intervention to post-intervention. The fourth theme: *This Is Just The Beginning* emerged from only intervention teachers and was based on their responses to social validity questions in the post-intervention interview. Next, we describe each theme individually and describe how each theme reflected changes across time in teacher perception based on participation with the RCP study. See Table 3 for overview of themes.

Pre-intervention

Before the intervention, all four teachers spoke in a similar manner and frequency to three of the themes.

The way I see it. We define this theme as teachers' perceptions about the effectiveness of their current strategies to address individual child and group needs. Before the intervention, teachers primarily acknowledged ineffective strategies they used in their classroom. They rarely mentioned instances of effective classroom management. Teachers noted gaps in the training they received. One teacher stated that the training felt "hypothetical". Although their training provided them with tools (like a calm down box), teachers were unsure how to operationalize it in their classroom. Another teacher described how outside providers come into the room and "put out fires", meaning help deal with a child demonstrating challenging behaviors. She wished that she could learn more from the outside providers so she could build her own skills.

High flyers. We define this theme as teachers reference to children who frequently display "big" emotions. Moreover, these children needed more support than others with self-regulation. This theme also included teachers' discussion of how these children influenced the learning environment. Before the intervention, all teachers mentioned a few children who fit this description. Although we interviewed teachers separately, the teachers named the same children

as *High Flyers*. All four teachers talked about how disruptive it is when more than one *High Flyer* is acting out at one time.

Kindergarten Here We Come. We define this theme a when a teacher describes what she wants for the children in her class. This theme also includes what she feels the children need now and in the future; that is, kindergarten. Before the intervention, teachers worried the children were not ready for kindergarten. Additionally, they expressed concern that the children would not adapt to kindergarten unless the child's behavior changed.

Post-intervention

Following eight weeks of the RCP, all teachers changed concerning each theme (see Table 3).

The way I see it. After the intervention, all teachers indicated growth by discussing greater effectiveness with the strategies they used, a better understanding of their personal reactions to the classroom environment, and a greater usage of recommendations from outside service providers.

The data suggest that the intervention teachers demonstrated greater change compared to control teachers with embedding self-regulation strategies for all children in their classroom. They spoke of greater versatility in the approaches they used to support self-regulation in comparison to control teachers. Originally, all teachers primarily mentioned classroom management for calming strategies such as deep breathing, rubbing backs, and directing children to sit either on a bench or calm down spot to be away from other children. In their post-intervention interviews, control teachers mentioned many of the same strategies that they used previously, whereas intervention teachers added to their tools and were more intentional with their approaches. For example one intervention teacher stated:

I have discovered what students respond to, and what types of techniques. So there are some students...that I know respond to a specific sensory strategy, so like lotion on the hands is really effective for a lot of students...some of our students respond really well to physical activity, so using something like the trampoline or things like that.

This intervention teacher discussed two new approaches in comparison to pre-intervention, and demonstrated more awareness of child preferences and understanding how to blend newly learned sensory-based strategies with her existing classroom management style.

In addition, the intervention teachers exhibited an understanding of self-regulation concepts and knowledge for managing the needs of each child through new language gained from their participation in the RCP. For example, one intervention teacher stated her approaches as, “Two fold, like personalized as well as some more incorporated universal practice,” and further discussed, “It’s like [the children] are just having a rough time and I can easily isolate three *tools* that are not considered a *toy*...but they’re something that will calm their body.” This intervention teacher’s initial statement indicated a shift in vocabulary by discussing “universal” approaches, synonymous of a Tier 1 approach, and in her second statement she indicated “ease” in supporting the children within her classroom. Her emphasis on tools versus toys is important as well. She felt it was important for the children to learn the sensory-based strategies were not toys but rather something they should use to change how they feel. Unlike the intervention teachers, the control teachers did not use words like tool, universal, sensory, or ease.

On the other hand, the control teachers demonstrated a different progression related to either teaching or managing self-regulation. Control teachers made similar comments in pre- and post-intervention interviews. For example, control teachers used words to indicate gaps in staffing such as “I think just more people...Yeah, more adults, like a third teacher or something”

(pre-intervention). After the intervention, the same teacher made similar remarks, about supporting children with more needs. Rather than developing new strategies, she went on to suggest that some “children lagging behind” might do better in a “therapeutic classroom” (meaning, a classroom with less children and teachers with special training). These quotes indicate that the control teachers felt that more staffing or different ratios might be a better solution to manage self-regulation needs.

Both intervention teachers articulated their thoughts with increased confidence and self-efficacy when answering interview questions addressing self-regulation. One intervention teacher stated, “I definitely feel effective. I would say that there are rarely times anymore where a student is doing something and I just think to myself, “I’m at a loss.” She explained that early in the school year she was, “constantly at a loss.” The RCP generated new knowledge and supported teachers in finding effective strategies within their classroom. Through participation with the RCP, teachers developed feelings of greater competence when addressing self-regulation for the children in their classroom. The control teachers did not make any comments like this.

All teachers acknowledged the value of recommendations from outside providers. Originally, the intervention teachers felt that outside service providers worked in *parallel* to the teachers rather than *with*. The RCP eliminated these gaps and provided teachers with greater positive experiences to collaborate effectively and apply the advice of outside service providers. One intervention teacher discussed, “I was so proud of him today, he kind of pulled it together and never had to go there and I really feel like a lot of it has to do with your personal training and work with us”. Here, the teacher provided an example of how a child had improved, which she attributed to the collaborative support received from the project. Likewise,

a control teacher said, "I think like I've been really uh happy with how occupational therapy is like ...you know come in [and] given us some really good suggestions in the activities, we really like, I think really helpful for kids". The other control teacher commented that she and her co-teacher need help "keeping consistent" with occupational therapy suggestions that work.

Only intervention teachers discussed the useful knowledge shared during the project. Both explained how the intervention helped them in teaching but also personally. For example, one intervention teacher discussed, "It just helped...helped me to be more calm...it helped me to stay regulated." The other teacher also mentioned feeling more in touch with her own "engine" level throughout the day.

High Flyers. The way in which intervention teachers spoke about *High Flyers* changed after the eight weeks. Teachers initially spoke primarily about the negative behaviors of children, and the adverse impact on classroom climate. Reference to *High Flyers* occurred frequently during pre-intervention interviews. Whereas following implementation of the RCP, the intervention shifted to a more positive commentary. Intervention teachers generated discussion of child independence and "empowerment," when selecting self-regulation tools. For example, one intervention teacher said, "...I've seen quite a few students, with just a gentle reminder, they can go, leave, use a tool, come back, and they don't need adult intervention." This example demonstrates that the children could manage their "engines" without one-on-one support from a teacher as some of them needed prior to the intervention.

Intervention teachers saw the children differently and acknowledged new insight for understanding a child's behaviors. For instance, one intervention teacher stated, "I think that there [were] a lot of kids that I had... [who] had issues early on in the year and ...[they] had kind of continuous issues...[and] I didn't know were issues of self-regulation." The teachers

developed an appreciation for better ways to assess and support the self-regulation needs of children in the classroom.

Alternatively, the control teacher noted some growth in the children but continued to deal with many disruptive behaviors. When asked to describe her common strategies for children who struggle with self-regulation, one control teacher shared:

We're still using [the] bench, like as a place, like our calm down place ... I think we've been doing more deep breaths, in the moment... when [we] get really mad, we've been very much explosive, not very good with our words recently. Not necessarily hitting, we've still been hitting some, but um. It's just been where we're yelling at each other, really harsh ... I think we've been trying to do that more, like that, like in the moment... But for most of our kids on self-regulation, that yelling, that explosive, it's kind of shifted from that to more disrespectful stuff like not following directions.

This quote reflects a small shift from aggressive to disrespectful, which the teacher perceives as progress. Additionally, the other control teacher also noted some progress, “You know like kind of more just attitude sort of things, instead of actual hitting so much, which, I mean, it [hitting] still happens, but you know, it's not as much as it was.” Both teachers felt that the children were improving but the children still displayed undesirable behaviors.

Kindergarten Here We Come. Intervention teachers also changed in the manner of their discussion of *Kindergarten Here We Come*. Before the intervention, all teachers expressed fears about not preparing children for kindergarten. Intervention teachers changed to feeling the children had the tools of self-regulation for a successful transition. Specifically, one intervention teacher stated:

You can walk over there, on your own, when you feel like your engine is high or your engine is low, and you can really use those tools independently, and when you're ready,

you can come back. Because they're five years old, I mean the things these kids are able to do independently is so often underestimated by adults.

Intervention teachers observed growth across the eight weeks. In contrast, this theme did not show up in the control teacher interviews.

This Is Just The Beginning. To understand intervention teachers' judgment of using the RCP in their classroom, five interview questions were only asked to intervention teachers. This theme emerged from the five questions (Table 2). We define this theme as the teachers' positive perceptions of participation in the RCP. Literally stating, "This is just the beginning," the intervention teachers clearly intended to continue applying RCP for the rest of the school year. Furthermore, the intervention teachers expressed interest in trying the approach with their new classes in the fall.

This theme yielded several important insights. One intervention teacher admitted initial skepticism with introducing sensory-based tools into the classroom. For example, one intervention teacher stated,

I think that initially I was very much like, "Oh, God." And I would even say, if I look back on the first couple of weeks I was very hesitant to be like, "Yeah, sure go play with this, while we're all reading a book.

The intervention teacher's words revealed her apprehensiveness with the idea of using sensory-based tools to teach children about self-regulation because they seem like toys. While she admitted to her initial hesitation, she goes on to say that she eventually appreciated the benefits of the sensory-based tools. She also noted the importance of "there's no ego in teaching" and future teachers participating must have the ability to "relinquish...that control and that power" and accept change to benefit from the project. Her words post-intervention indicated an

understanding of the importance of being open minded to new learning to support self-regulation in the classroom.

With the exception of initial concerns with the RCP implementation, intervention teachers spoke highly of their experience. Teachers showed investment in the study by wanting to share the information they learned to other teachers, as one intervention teacher stated:

Well, I already have shared with everybody. And I feel like it should be in everybody's classroom. I feel like the when the kids come in and they really sit down and think as we're signing in and where they are...If their engine's running in red, in green, in yellow...It helped them understand why they were feeling what they might have been feeling...I love that the self-check that they have to do for themselves, especially for the pre-Ks as they are getting ready to go to kindergarten. I just think it's going to be a really good tool for them.

As a part of the RCP, we (teachers and researchers) started a check-in system when the children arrived. Her quote depicts how she personally enjoyed the daily check-in. She found it valuable and useful. The other intervention teacher also indicated her excitement, as she stated:

I've been so excited about doing the project just because, as a teacher, I learn more about teaching...you know the populations that we work with, you're not just a teacher, you're a therapist, you're a facilitator, you're a parent figure, you are so many things.

This quote illustrates that the RCP advanced her knowledge to improve her ability to play multiple roles to support the children in her classroom. One intervention teacher respected the support from the RCP and suggested expanding the project to include more disciplines in the future. Since RCP began in early spring, she also wondered about starting the RCP earlier in the school year and with younger children (e.g., three year olds). She felt that earlier exposure to

self-regulation strategies would make a greater difference in the growth and preparation for children's transition to kindergarten.

Teachers perceived the RCP intervention as useful and effective, providing them with the “missing link” in managing their classroom, and supporting children with tools needed for a successful transition to kindergarten. Teachers indicated child progress as a result of the RCP by stating, “I feel like [the children] are more capable of regulating themselves.” Additionally, when asked what the most relevant part of the project was, one intervention teacher answered, “I think the kid's self-check. I think that is the most relevant because it is where they gain that “this is how I'm feeling” and, “this is what I can do to help regulate.” Responses from the intervention teachers to the five social validity questions verify that this particular intervention was successful and effective in the early childhood classroom setting.

Discussion

Our study asked the following research question, “Does the Ready CLASS Project change teacher's behavior and application of self-regulation concepts (i.e., strategies and vocabulary) compared to control classroom teachers?” The findings from our study answer this research question. A comparison of the four themes generated from this study show a change across time (eight weeks). Although all teachers showed some growth across time, the change in the intervention teachers is distinctly different from the control teachers. For further explain the meaning of these findings next, we discuss how the themes relate to the proposed theory of change model.

Theory of change. To illustrate the relationships between the themes, we returned to our theory of change framework. We outlined a simplified version of this framework earlier in this paper (Figure 1). Originally, we hypothesized that a series of outcomes would lead to better

school readiness for the children (related to self-regulation skills). The present study supported our hypothesis. Consequently, we present a more complex version of the theory of change framework, which we developed prior to study implementation (Figure 2). Starting with the column on the left, we have four of the RCP components (teacher training, classroom visits, researcher-teacher meetings, and classroom material). These four components targeted the teachers and the classroom context (represented on the top left box). The last two RCP components (large and small group concentrated on children's development of self-regulation and self-advocacy skills through teaching children self-regulation concepts, vocabulary, and strategies (represented on the bottom left box).

The six components of RCP interact to produce the short-term outcomes (second column from the left) and ultimately the medium-term outcomes for the teachers. For instance, the findings from *The Way I See It* theme directly supports to top three short-term outcomes related to teacher behaviors. The intervention teachers expressed a new appreciation self-regulation needs. Further, they shared how they use the vocabulary and the strategies with ease. Findings comprising *The Way I See It* further reinforce the top medium-term outcome that indeed the classroom is now a more positive learning atmosphere as evidenced by the teachers' comments shifting from negative to positive in their discussion of their children. The quality of intervention teachers' dialogue was noticeably more positive in respect to their perceived classroom environment.

The six components of RCP interact to produce the short-term outcomes (second column from the left) and ultimately the medium-term outcomes for the children as well. For instance, the findings from the *High Flyer* theme strengthen the bottom two short-term outcomes related to the children. Teachers reported multiple examples of children using targeted vocabulary,

knowledge, and skills related to self-regulation. The teachers described how they help some children while others use the strategies more independently. Teachers describe scenarios where children who are considered *High Flyers* are less disruptive and taking less time to calm down when dys-regulated. The teachers used words like “improved” and “pulled it together” to describe the *High Flyers* in their class following the intervention.

Finally, the theme of *Kindergarten Here We Come* falls in place with the long-term outcome (far right column). Interviews from the intervention teachers support the change in their perception from being unsure or “fears” of children’s kindergarten readiness to “knowing what tools to use to calm” in a new kindergarten classroom. The shift of teacher perception from negative to positive regarding their children’s ability to self-regulate within the classroom validates the original theory of change framework.

Limitations

We identified several limitations in this study. Our study may have been stronger if the primary researcher delegated responsibility to the secondary researchers to complete the teacher interviews to reduce researcher bias (Creswell & Miller, 2000). There is a risk that the teachers would be less honest with the primary researcher to avoid hurting her feelings. Independent interviews would add rigor and the element of trustworthiness (Krefting, 1991).

Additionally, the teachers varied in responses. Teacher 3 was especially terse with her responses, while Teacher 2 was verbose. Our study may have benefited from additional interview probes to gain deeper answers during the interviews. Richer responses might have given us more data to compare. Finally, the control classroom received occupational therapy services for a few target children. Services included meeting with the teachers to generate solutions for those specific children that would occur in the daily routine. We felt it was

unethical to withhold services during the study. The findings might have been different if the control classroom received no occupational therapy support.

Future Directions

Findings from this qualitative study reinforce further development of a Tier 1 approach to embed self-regulation learning within an early childhood classroom setting. Replication of this study is warranted. To further address the effectiveness of this approach, future research may support the best way to implement the RCP by exploring dosage. Future directions for research may include extending the intervention time from eight weeks to 12 weeks to see if length of time affects teacher's behavioral change and perception about embedding self-regulation within the classroom curriculum. Extending intervention time may allot more time for teachers to expand their curriculum and further embed self-regulation strategies.

Lastly, a future study might consider the start time, such as the beginning of the school year, for the targeted intervention. For example, if the intervention began earlier in the student's early childhood education, would more exposure to self-regulation framework for the teachers and students make a difference in the long term outcome of teacher behavioral change?

Conclusion

The present qualitative study examined if the Ready CLASS Project (RCP) changed teacher's behavior and application of self-regulation concepts (e.g., strategies and vocabulary) within an early childhood classroom compared to control classroom teachers. The findings from this study indicate the RCP does change teacher behavior, which leads to subsequent positive outcomes for the children and the classroom context. Ultimately, RCP provides the children with useful skills that prepare them for kindergarten.

References

- American Occupational Therapy Association. (2014). Occupational therapy practice framework: Domain and process(3rd ed.). *American Journal of Occupational Therapy*, 68 (Suppl. 1), S1–S48.
- Arvidson, J. , Kinniburgh, K., Howard, K., Spinazzola, J. , Strothers, H., Evans, M., Barry Andres, B., Cohen, C., & Blaustein, M.E. (2011). Treatment of Complex Trauma in Young Children: Developmental and Cultural Considerations in Application of the ARC Intervention Model, *Journal of Child & Adolescent Trauma*, 4:1, 34-51, DOI:10.1080/19361521.2011.545046
- Baxter, P., & Rideout, E. (2006). Second-year baccalaureate nursing students' decision making in the clinical setting. *The Journal of Nursing Education*, 45(4), 121-127.
- Bazyk, S., Michaud, P., Goodman, G., Papp, P., Hawkins, E., & Welch, M. A. (2009). Integrating occupational therapy services in a kindergarten curriculum: A look at the outcomes. *American Journal of Occupational Therapy*, 63(2), 160-171. doi:10.5014/ajot.63.2.160
- Benson, J. (2013). School-based occupational therapy practice: Perceptions and realities of current practice and the role of occupation. *Journal of Occupational Therapy, Schools & Early Intervention*, 6(2), 165-178. doi:10.1080/19411243.2013.811348
- Blackwell, A. L., Yeager, D. C., Mische-Lawson, L., Bird, R. J., & Cook, D. M. (2014). Teaching Children Self-Regulation Skills within the Early Childhood Education Environment: A Feasibility Study. *Journal of Occupational Therapy, Schools, & Early Intervention*, 7(3-4), 204-224. doi 10.1080/19411243.2014.966013

- Blair, C., & Razza, R. P. (2007). Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development*, 78(2), 647-663. doi: 10.1111/j.1467-8624.2007.01019.x
- Bodrova, E., & Leong, D. J. (2008). Developing self-regulation in kindergarten. *Young Children*, 63(2), 56-58.
- Bose, P., & Hinojosa, J. (2008). Reported experiences from occupational therapists interacting with teachers in inclusive early childhood classrooms. *American journal of occupational therapy*, 62(3), 289-297.
- Brown, J. R., Knoche, L. L., Edwards, C. P., & Sheridan, S. M. (2009). Professional development to support parent engagement: A case study of early childhood practitioners. *Early Education and Development*, 20(3), 482-506.
- Cahill, S. M. (2010). Contributions made by occupational therapists in RtI: A pilot study. *Journal of Occupational Therapy, Schools, & Early Intervention*, 3(1), 3-10.
- Case-Smith, J., & O'Brien, J. C. (2013). *Occupational therapy for children*. Elsevier
- Cohn, E., Miller, L. J., & Tickle-Degnen, L. (2000). Parental hopes for therapy outcomes: Children with sensory modulation disorders. *American Journal of Occupational Therapy*, 54(1), 36-43.
- Committee for Children. (1991). *Second Step: A Violence Prevention Curriculum, Preschool-Kindergarten*. Seattle, WA: Committee for Children.
- Cramm, H., Krupa, T., Missiuna, C., Lysaght, R. M., & Parker, K. C. (2013). Broadening the occupational therapy toolkit: An executive functioning lens for occupational therapy with children and youth. *American Journal of Occupational Therapy*, 67(6), e139-e147.

- Crane, J., Winsler, A., & Sands, B. (2013). Patterns of Referral Recommendations for Ethnically Diverse Children in Subsidized Child Care. *Exceptional Children, 80*(1), 45-64.
- Creswell, J. W. (2007). *Qualitative inquiry and research method: Choosing among five approaches, 2nd Ed.* Thousand Oaks, California: Sage Publications.
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into practice, 39*(3), 124-130.
- Curtin, M., & Fossey, E. (2007). Appraising the trustworthiness of qualitative studies: Guidelines for occupational therapists. *Australian Occupational Therapy Journal, 54*(2), 88-94.
- Degol, J. L., & Bachman, H. J. (2015). Preschool teachers' classroom behavioral socialization practices and low-income children's self-regulation skills. *Early Childhood Research Quarterly, (31)*, 89-100.
- Denham, S. A., Bassett, H. H., & Wyatt, T. (2007). The socialization of emotional competence. *Handbook of socialization: Theory and research, 614-637.*
- Dodge, D. T., Colker, L. J., & Heroman, C. (2002). *The Creative Curriculum[®] for Preschool. Teaching Strategies, Washington, DC*
- Dunn, W., Brown, C., & McGuigan, A. (1994). The ecology of human performance: A framework for considering the effect of context. *American Journal of Occupational Therapy, 48*(7), 595-607.
- Dunn, W., Brown, C. & Youngstrom, M. (2003). Ecological Model of Occupation, in Kramer, P., Hinojosa, J. & Royeen, C. (eds.) *Current Perspectives in Human Occupation: participation in life.* Lippincott, Williams & Wilkins, Philadelphia, p. 222-263.

- Feil, E.G., & Frey, A.J. (2013). Responsiveness to intervention in the elementary grades: Implications for early childhood education. *Handbook of response to intervention (RTI) in early childhood education*, 185-203.
- Gitlin, L. N. (2013). Introducing a new intervention: An overview of research phases and common challenges. *American Journal of Occupational Therapy*, 67(2), 177-184.
- Gladwell, M. (2006). *The tipping point: How little things can make a big difference*. Little, Brown.
- Gordon-Pershey, M. (2014). Executive Functioning and Language: A Complementary Relationship That Supports Learning. *Perspectives on Language and Literacy*, 40(2), 23.
- Graham, A., Phelps, R., Maddison, C., & Fitzgerald, R. (2011). Supporting children's mental health in schools: teacher views. *Teachers and Teaching*, 17(4), 479-496.
- Greenwood, C.R., Bradfield, T., Kaminski, R., Linas, M., Carta, J.J., & Nylander, D. (2011). The response to intervention (rti) approach in early childhood. *Focus on Exceptional Children*, 43(9), 1-22.
- Gresham, F.M., Cook, C.R., Crews, S.D., & Kern, L. (2004). Social skills training for children and youth with emotional and behavioral disorders: Validity considerations and future directions. *Behavioral Disorders*, 30(1), 32-46.
- Hebbeler, K. M., & Gerlach-Downie, S. G. (2002). Inside the black box of home visiting: A qualitative analysis of why intended outcomes were not achieved. *Early Childhood Research Quarterly*, 17(1), 28-51.
- Horn, W. F., & Packard, T. (1985). Early identification of learning problems: A meta-analysis. *Journal of Educational Psychology*, 77(5), 597.

- Howse, R. B., Calkins, S. D., Anastopoulos, A. D., Keane, S. P., & Shelton, T. L. (2003). Regulatory contributors to children's kindergarten achievement. *Early Education and Development, 14*(1), 101-120.
- Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277-1288.
- Jung, J. (2013). Teachers' roles in infants' play and its changing nature in a dynamic group care context. *Early Childhood Research Quarterly, 28*(1), 187-198.
- Kagan, S.L., & Kauerz, K.(2007). Reaching for the whole: Integration and alignment in early education policy. In R.C. Pianta, M.J. Cox & K.L. Snow (Eds.). *School readiness and the transition to kindergarten in the era of accountability* (pp. 11-30). Baltimore, MD: Paul H. Brookes.
- Krefting, L. (1991). Rigor in qualitative research: The assessment of trustworthiness. *American Journal of Occupational Therapy, 45*(3), 214-222.
- Ladd, G. W., & Coleman, C. C. (1997). Children's classroom peer relationships and early school attitudes: Concurrent and longitudinal associations. *Early Education and Development, 8*(1), 51-66.
- Lust, C. A., & Donica, D. K. (2011). Effectiveness of a handwriting readiness program in Head Start: A two-group controlled trial. *American Journal of Occupational Therapy, 65*(5), 560-568. doi: 10.5014/ajot.2011.000612
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2013). *Qualitative data analysis: A methods sourcebook*. SAGE Publications, Incorporated.
- Nores, M., & Barnett, W. S. (2010). Benefits of early childhood interventions across the world:(Under) Investing in the very young. *Economics of Education Review, 29*(1), 1-11.

29(2), 271-282.

- Odom, S. L., & Wolery, M. (2003). A unified theory of practice in early intervention/early childhood special education: Evidence-based practices. *The Journal of Special Education, 37*, 164–173.
- Ohl, A.M., Graze, H., Weber, K., Kenny, S., Salvatore, C., & Wagreich, S. (2013). Effectiveness of a 10-week tier-1 response to intervention program in improving fine motor and visual-motor skills in general education kindergarten students. *The American Journal of Occupational Therapy, 67*(5), 507-514.
- Orosco, M. J., & Klingner, J. (2010). One school's implementation of RTI with English language learners: "Referring into RTI". *Journal of Learning Disabilities, 43*(3), 269-288.
- Rimm-Kaufman, S.E., Curby, T.W., Grimm, K.J., Nathanson, L., & Brock, I.L. (2009). The contribution of children's self-regulation and classroom quality to children's adaptive behaviors in the kindergarten classroom. *Developmental Psychology, 45*, 958-972. doi.org/10.1037/a0015861
- Rimm-Kaufman, S.E., Pianta, R.C., & Cox, M.J. (2000). Teacher's judgements of the problems in the transition to kindergarten. *Early Childhood Research Quarterly, 15* (2), 147-166. doi.org/10.1016/S0885-2006(00)00049-1
- Risi, S., Gerhardstein, R., & Kistner, J. (2003). Children's classroom peer relationships and subsequent educational outcomes. *Journal of Clinical Child and Adolescent Psychology, 32*(3), 351-361.
- Rush, D. D., Shelden, M.L., & Hanft, B. E. (2003). Coaching families and colleagues: A process for collaboration in natural settings. *Infants & Young Children, 16*(1), 33-47.

- Scott-Little, C., Kagan, S.L., & Frelow, V.S. (2003). Creating the conditions for success with early learning standards: Results from a national study of state-level standards for children's learning prior to kindergarten. *Early Childhood Research and Practice, 5*, 1-30.
- Spencer, K. C., Turkett, A., Vaughan, R., & Koenig, S. (2006). School-based practice patterns: A survey of occupational therapists in Colorado. *American Journal of Occupational Therapy, 60*(1), 81-91.
- Strauss, A., & Corbin, J. (1998). Basics of qualitative research: Procedures and techniques for developing grounded theory. ed: Thousand Oaks, CA: Sage.
- Rogers, E. M. (2010). *Diffusion of innovations*. Chicago, Illinois: Simon and Schuster.
- Vincent, R., Stewart, H., & Harrison, J. (2008). South Australian school teachers' perceptions of occupational therapy reports. *Australian Occupational Therapy Journal, 55*(3), 163-171.
- Watts, J. H., & Teitelman, J. (2005). Achieving a restorative mental break for family caregivers of persons with Alzheimer's disease. *Australian Occupational Therapy Journal, 52*(4), 282-292.,
- Williams, M. S., & Shellenberger, S. (1996). How does your engine run?: A leader's guide to the Alert Program™ for self-regulation. TherapyWorks, Inc..

Table 1 Teacher Descriptions

	Intervention Teacher 1	Intervention Teacher 2	Control Teacher 3	Control Teacher 4
Education	Associates degree	Bachelor's degree (working on Master's)	Bachelor's degree (working on Master's)	Bachelor's degree
Experience working at present early childhood center	6 months	6 months	1 year, 6 months	1 year
Experience working with young children	35 years	6 months	1 year, 6 months	1 year

Table 2. Interview Protocol

1. Tell me about your most common strategies for managing students who struggle with self-regulation?
2. How effective do you feel with your current strategies?
3. What support or resources would make you feel more effective as a teacher?

Additional Questions Added for Posttest with Intervention Teachers

4. Have your strategies for managing students who struggle with self-regulation changed since our experience together?
 5. Has the way you think about self-regulation and meeting regulation needs changed since our experience together?
 6. What would you like to share with other teachers about this experience?
 7. Was it worth the time it took to participate in this project?
 8. What was the most relevant part of this project to you?
-

Table 3. Comparison of Themes/Definitions Across Teachers

Theme	Definition	Post-Intervention Examples	
		Intervention Teachers	Control Teachers
The Way I See It	Teachers' view about the effectiveness of their current strategies to address individual child and group needs.	"I was so proud of him today, he kind of pulled it together and never had to go there and I really feel like a lot of it has to do with your personal training and work with us".	"I think it's when (another teacher) is not in here and I know I'm not going to have the help like and just like knowing and being able to do it."
High Flyers	Teachers discussed observations of children who needed more support and impacted the learning environment for all children.	"I think that there [were] a lot of kids that I had, [who] had issues early on in the year and [they] had kind of continuous issues...[and] I didn't know were issues of self-regulation."	"The kids are still lagging behind. I feel like they need to be somewhere where they can have more of like a focused like experience on um you know the skills that would get them to a level of as everyone else."
Kindergarten Here We Come	Teacher describes what she wants and feels the children need now and in the future	"You can walk over there on your own when you feel like your engine is high or your engine is low and you can really use those tools independently and when you're ready, you can come back. Because they're five years old, I mean the things these kids are able to do independently is so often underestimated by adults."	"They'll be pretty kindergarten ready if they self-regulate."
This is Just the Beginning	Teachers' provides her positive perceptions of participation in the RCP.	"I've been so excited about doing the study just because as a teacher I learn more about teaching...you know the populations that we work with you're not just a teacher, you're a therapist, you're a facilitator, you're a parent figure, you are so many things."	Not Applicable because control teachers were not asked the five social validity questions.

Figure 1. Simplified version of the theory of change model, which represents a testable proposition of RCP study

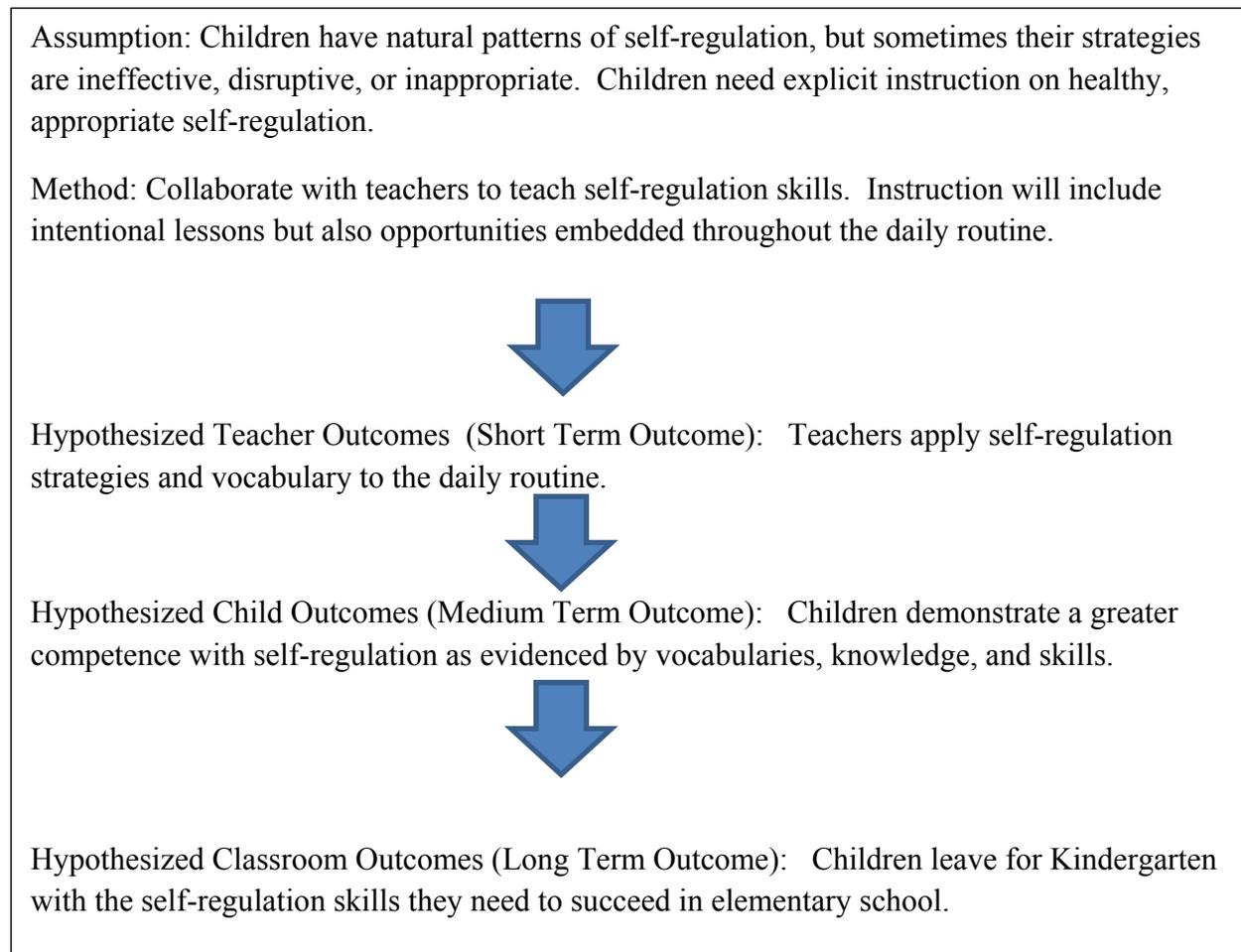
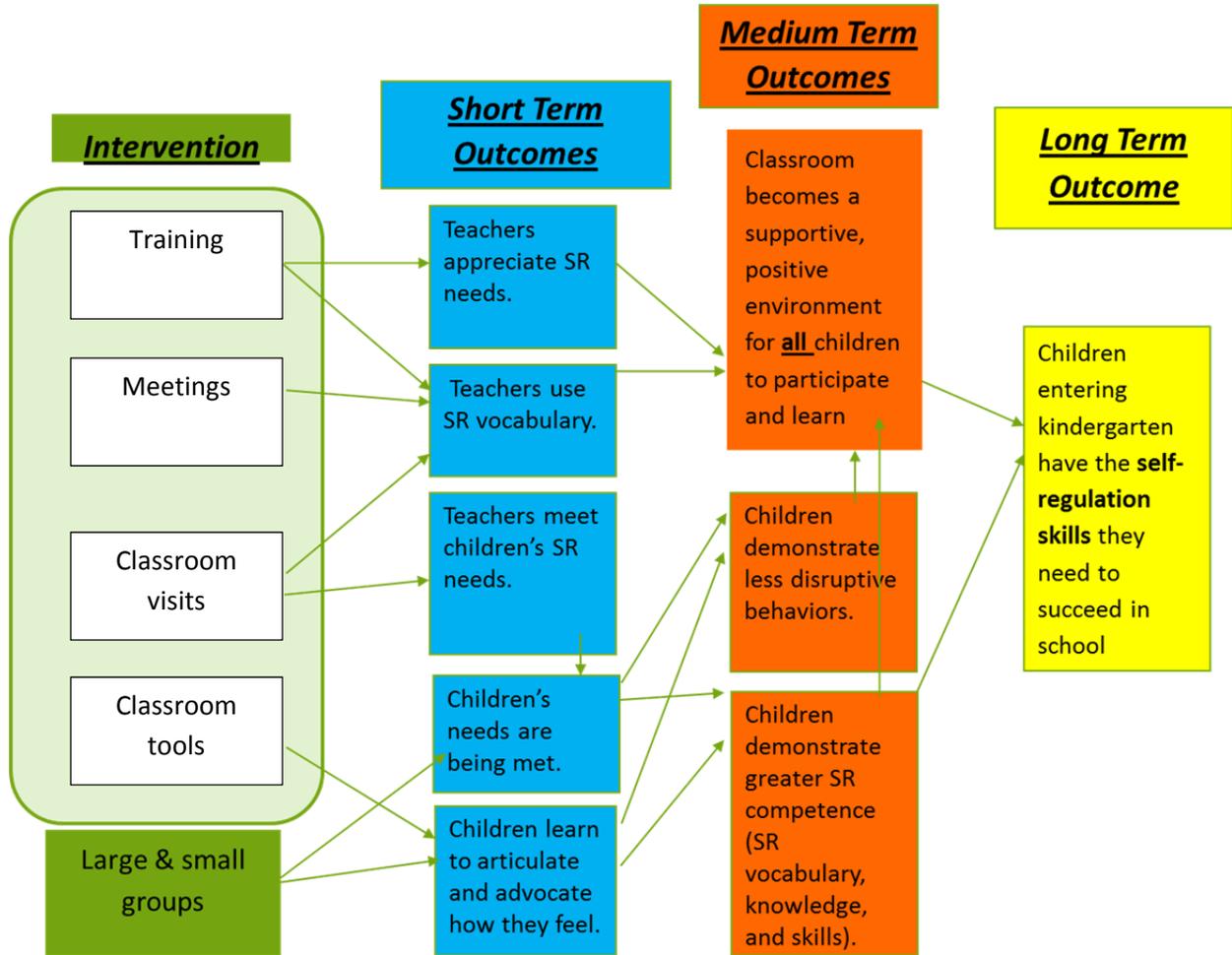


Figure 2. Theory of Change Model



Appendix A

A Literature Review of Parent-Child Interventions with Families with Young Children

Comprehensive Exam I

Introduction

As a part of the Individuals with Disabilities Education Improvement Act of 2004 (IDEIA) Part C, early intervention serves children with disabilities birth to three years of age. An eligible child may receive services such as occupational therapy, speech therapy and physical therapy just to name a few. Historically, early intervention services addressed a parent's¹ desire to remediate their child's underlying skill deficits and foster new skill acquisition (Mahoney, 2009). This approach emphasizes developmentally stimulating experiences. However, experts in early childhood development now consider positive parent-child relationships a priority because evidence shows that positive parent-child relationships foster child development across all domains (National Research Council and Institute of Medicine, 2000; Landry, Smith, & Swank, 2006; Trivette, 2007; Moore, 2009; Zeanah, 2009). In spite of the evidence, early intervention providers are slow to shift their practice emphasis from developmental stimulation to relationship development. A gap remains between what the evidence suggests is best and what early intervention providers actually do in practice.

One reason providers are slow to adopt a greater focus on relationship development is because they have not learned how to deliver relationship-based care. We define relationship-based care as intervention focused on the interaction between the child and their caregiver or caregiving context (Sameroff, 2005). The goal of such intervention is to enhance both the development and social emotional well-being of children (Mahoney, 2009). Relationship-based care is not traditionally a part of pre-service training for early intervention providers (Mahoney & Bella, 1998; Marino, Baxter, & Pickens, 2010; Colyvas, Sawyer, & Campbell, 2010; Mayer, White, Ward, & Barnaby, 2002). Providers need additional direction to acquire a new practice skill set and maintain their competence as they find new ways to do their job (Colyvas et al.,

¹ The term parent(s) is used throughout the paper for simplicity but we consider the topic relevant to any adult primary caregiver.

2010; Humphry, 1989; Campbell, Chiarello, Wilcox, & Milbourne, 2009). While a number of relationship-focused interventions exist in the literature, providers remain unaware of them. In an attempt to close this gap, we sought to answer the following questions in this literature review:

1. What are the quality characteristics of effective parent-child relationship interventions?
2. What are the principles, protocols, theoretical background, and evidenced-based outcomes for parent-child relationship interventions available in the literature?
3. What can early intervention providers learn from the parent-child relationship intervention literature?

Therefore, the purpose of this paper is to illuminate best practices for relationship-based interventions, inspect approaches available in the literature that are consistent with best practices, and finally provide guidance to practitioners as they attempt to adopt best practice.

Methods

Search Process

To complete this review, we searched for intervention research published from 2000 to 2010 using CINAHL, PsycINFO, and ERIC. We included the following key search terms: parent-child relationship interventions, relationship-focused interventions, relationship-based intervention, and parent-child therapy. We also examined references from identified articles for additional literature that would be appropriate for this review. Our intention here was not to create an exhaustive list of all intervention approaches available in the literature. Rather, the purpose of the search was to review a sample of the exemplary approaches available.

Inclusion and Exclusion Criteria

Our initial search revealed a multitude of parent-child relationship interventions. Due to the vast amount of literature available regarding parent-child relationship interventions, we narrowed the scope of interest in two ways; that is, age of children and outcomes. First, age, we

only focus on interventions that address the relationship between parents and *young* children. To be consistent with others in the early childhood field, we define *young* children here as between birth and five years. Interventions that focus on children older than five exclusively were excluded. Second, outcomes, we focus on interventions that offer evidence of changes in parent behaviors and/or the parent-child relationship while excluding interventions which offer only child related outcomes. Occasionally, we found literature that briefly mentioned study outcomes but did not provide the traditional methods and results sections. Therefore, we excluded interventions if we could not find original sources of published outcomes data. The reason for this distinction is because we wanted the opportunity to analyze and interpret the data ourselves.

As the literature review progressed, we discovered evidence supporting certain quality characteristics associated with effective parent-child interventions. More specifically, we identified five quality characteristics (discussed below). Consequently, this paper includes intervention approaches that address all five quality characteristics, while excluding those that meet four or less quality characteristics.

Results

Outcomes of Search Process

During this review, we found more than ten distinct parent-child relationship interventions for children with and without disabilities (see reference list for examples interventions reviewed). However, many of these were eventually excluded because of the criteria as outlined above. Ultimately, this paper only explores three specific intervention approaches because they were the only interventions that address all of the quality characteristics as described in the literature. The next section of this paper summarizes our findings on the quality characteristics.

1. What are the quality characteristics of effective parent-child relationship interventions?

Leaders in early childhood development and infant mental health focus on changing specific parenting behaviors within the parent-child relationship. The scope of the literature includes *what* behaviors parents need to change as well as *how* providers support parents in their growth. More specifically, the literature reveals five quality characteristics, which serve as a compilation of best practices in parent-child interventions. These characteristics offer a way to measure quality of practice, identify areas of improvement, and track changes over time (U.S. Department of Health and Human Services, n.d.; University of the State of New York, 2001). As such, these characteristics represent a set of quality indicators that describe both content and method of effective parent-child relationship interventions. Next, we describe each indicator in detail. However, Figure 1 lists the five quality indicators together.

The first three quality indicators reveal the content necessary for *any* effective parent-child relationship intervention. Content refers the information shared and benchmarks for effective intervention. More specifically, the first three indicators describe *what* behaviors all parents must learn or change to convey more sensitivity and responsiveness. The evidence dating back to Bruner (1978) suggests that caregivers who are sensitive and responsive positively influence their child's cognitive, communication, and social-emotional development. More contemporary researchers continue to support these claims (Trivette, 2007; Kong & Carta, 2012; Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003; Olds, Sadler, & Kitzman, 2007; Sweet & Applbaum, 2004).

Dunst and Kassow (2007) synthesized the evidence from 81 parent-child intervention studies, which revealed three important parental behaviors. Dunst and Kassow effectively operationalize the concept of parental responsiveness or also called responsive interaction style

by breaking down the concept into three distinct behaviors. Thus, the first indicator involves building awareness and attention to their child's behavior (subsequently referred to as QI 1). Interaction is initiated by the child. Moreover, QI 1 consists of helping parents notice their child's signals and cues. Beyond eye contact, crying, and smiling, other signals and cues include grimaces, grunts, squeals, and coos. Crawley and Spiker (1983) investigated the degree to which mothers' responses reflect awareness of child's cues or signals. They found positive cognitive, language, and social-emotional outcomes in toddlers with developmental disabilities. Learning this strategy (QI 1) helps parents increase their awareness and response of the more subtle behaviors.

The second indicator builds on the first in that it addresses correctly interpreting their child's behavior (subsequently referred to as QI 2). QI 2 includes understanding all of the child's signals and cues as attempts to communicate (Dunst and Kassow, 2007). For instance, after a parent notices a grunt, they recognize this as some attempt to interact with the parent. The opposite of this response is a directive response, whereas the parent is more focused on some desired skill or behavior from the child. Kim and Mahoney (2004) investigated the between 30 mothers of toddlers (with and without disabilities) to determine the relationship of parental responsiveness to child engagement. They discovered that when parents respond to any attempt, children are more likely to engage in activities associated with developmental learning such as attention, cooperation, and initiation. Learning this strategy (QI 2) helps parents assign meaning to both subtle and overt behaviors.

The third indicator pertains to responding to their child in a timely and appropriate manner (subsequently referred to as QI 3). QI 3 emphasizes the practice of responding promptly when a child produces a behavior. Case in point, a response may be as simple as making eye

contact or saying “you are grunting” to acknowledge the behavior. Moore, Saylor, & Boyce (1998) considered timing and appropriateness of responses to a child’s cues in 88 medically fragile children and their parents at age 2 and then at age five. They discovered that prompt, appropriate responses related directly to positive cognitive and language outcomes. Interventions that specifically teach parents these three skills (QI 1, QI 2, and QI 3) ensure positive parent-child interactions that are enjoyable, supportive, and warm. Moreover, consistent positive interactions guarantee promotion of better parent-child relationships.

While the three quality indicators above indicate *what* parents need to learn in order to improve their interaction style (i.e. content), the fourth quality indicator relates to *how* parents learn best (i.e method). Method refers to techniques that represent effective practice. More specifically, parents learn best when given examples of other adults being sensitive with children (subsequently referred to as QI 4) (Dunst & Kassow, 2007). For example, providers model interactions in real-time or provide video examples of sensitive parenting. This indicator is further supported by the coaching and adult learning style literature (Trivette, Dunst, Hamby, & O’Herin, 2009). Because parents may be unfamiliar with a responsive interaction style, providing models offers parents an example of *how* a behavior should look. Consequently, parents can mimic these examples during interactions with their own child.

Like the fourth quality indicator, the fifth quality indicator also relates to *how* parents learn and consequently change their behavior. The fifth indicator involves using a video feedback method during home visits (subsequently referred to as QI 5). Video feedback consists of recording footage of the parent and child interacting. This footage allows parents to see themselves interacting with their child. As parents watch the interaction, they observe their own behavior and the child’s response. With guidance from the provider, parents reflect on and

consider how to change their behaviors to improve future interactions. Consequently, the provider offers a safe place for self-reflection. Further, this method provides feedback for parents to compare how their actual behaviors mirror the desired behavior (Rusconi-Serpa, Rossignol, & McDonough, 2009; Dunst & Kassow, 2007). In a meta-analysis of 29 home visiting interventions studies, Fukkink (2008) found that interventions that use video feedback show statistically significant positive effects on parenting behavior, attitudes of parents, and enjoyment in parenting. Video feedback is an effective tool for parents to engage in self-assessment of their responsive interactions. Upon self-assessment, parents learn about themselves and reinforce new, effective strategies.

The five important quality indicators offer a standard to measure parent-child interventions because these are most likely to promote positive relationships between parents and young children (see Figure 1). The indicators address *what* behaviors parents need to change, *how* parents can change them, and *how* providers support parents in this growth process. As such, these indicators symbolize the key ingredients for parent-child relationship intervention. In the next section, we focus on three parent-child intervention approaches that address these five quality indicators.

2. What are the principles, protocols, theoretical background, and evidenced based outcomes for parent-child relationship interventions available in the literature?

Responsive Teaching, Promoting First Relationships, and Child Parent Relationship Training address all five quality indicators. For each of these approaches, the following discussion includes a description of the principles and protocol, an overview of the theoretical background, a review of evidence-based outcomes, and finally a discussion of how each approach addresses the five quality indicators.

Responsive Teaching

Description of the Intervention Approach. The Responsive Teaching (Mahoney & Macdonald, 2007) approach teaches parents exactly how to use a responsive interaction style with their young children. Responsive interaction style describes interactions that are dependent on the child producing a behavior, sensitive to the child's intention, and appropriate to the child's developmental level (Trivette, 2007). To promote a more responsive interaction style, Responsive Teaching providers typically conduct weekly meetings in the family home to teach up to sixty-six *responsive interaction strategies*. The provider introduces the strategies systematically. Mahoney (2009) explains that each of these strategies represents small, incremental steps toward a parent becoming more responsive. With each session maintaining a similar format of modeling, coaching, and video feedback, the provider methodically builds the parent's capacity for more sensitive and responsive interactions with their child.

In addition to the sixty-six responsive interaction strategies, Responsive Teaching emphasizes two concepts to reinforce a responsive interaction style. These two concepts are important because this interaction style tends to be less intuitive to the "average" parent, who lacks any special training. First, the approach encourages parents to engage their children in activities that the child is already capable of doing and want to do rather than helping the child learn a new developmental skill (Kim & Mahoney, 2004; Kim & Mahoney, 2005; Mahoney, 2009). For example, parents often focus on teaching their child a new skill such as clapping hands. In doing so, the parent may miss other significant cues because they are only focused on the skill of interest (i.e. did the child clap or not?). In this case, parent interactions are more directive, performance oriented. Instead, Responsive Teaching encourages parents to follow the child's lead and stay within the child's capacity. For example, this approach teaches parents to

accept incorrect word choices or approximations by responding to the intention (Mahoney, Perales, Wiggers, & Herman, 2006). As such, interactions will be sensitive and consistent with the child's interests as well as appropriate to the child's developmental level. Further, these interactions allow the parent and child to enjoy each other without the pressure of performance.

The other important concept of Responsive Teaching involves encouraging parents to engage in highly responsive interactions throughout the daily routine. Instead of asking for parents to set aside special play times to practice being responsive, the purpose is to maximize the potential of routine parent-child interactions that occur multiple times each day such as riding in the car, dressing, bathing, and feeding. As stated earlier, parents may learn up to sixty-six responsive interaction strategies. Providers describe and demonstrate each strategy, then coach the parent to identify how and when to use the responsive interaction strategies when caring for the child, such as diaper changing (Kim & Mahoney, 2005; Mahoney, 2009). Parents subsequently practice these strategies throughout their daily routines. These responsive strategies then become part of the daily ritual of child care thus affording the parent multiple opportunities to show the child warmth, support and sensitivity.

Theoretical background. While Responsive Teaching originated from the "parenting model" of child development, it also espouses the transactional model for improving parent-child relationships. The parenting model considers parents as the primary influence on a child's development. This influence comes from the way parents interact with their child and the experiences parents provide for their child, also called parenting style (Goodman, 1992). Other factors that impact parenting style include parent temperament and parent history (Pizur-Barnekow, 2011). Complementing the parenting model, the transactional model characterizes child development as a transaction between the child, (who has unique temperament, genetic and

biologic characteristics) and his/her environment (which includes parenting style, experiences and physical surroundings) (Sameroff, 2005). Parents benefit from understanding how each of these characteristics interacts with each to influence child development. In focusing on this transaction, the intervention emphasizes what to expect from children and how certain parenting practices are related to positive developmental outcomes.

To confirm the concepts of the parenting model, researchers investigated how parents positively influence child development and the degree of that influence. Researchers found that the way that parents interact (i.e. responsive interaction style) is vital to developmental outcomes (Mahoney, 2009; Mahoney, Boyce, Fewell, Spiker, & Wheeden, 1998; Mahoney & Perales, 2003; Kim & Mahoney, 2004). More specifically, a responsive interaction style contributes to development of cognitive skills, communication skills, and social-emotional skills (Landry et al., 2006; National Research Council and Institute of Medicine, 2000). This literature shows parental influence is both significant and positive. Mahoney and colleagues (2007) consequently constructed the Responsive Teaching approach to impart a specific set of skills to parents; i.e. sixty-six responsive interaction strategies. This skill set fosters a responsive interaction style, which further promotes child development.

Evidence-based outcomes. Since researchers know that parents can positively influence child development, they investigated the effect of teaching the responsive interaction strategies to mothers. Kim and Mahoney (2005) used a process of modeling, coaching, role-playing, and using video-feedback to teach parents the strategies, which occurred weekly over three months. They found that mothers (n=10) who received the intervention became more responsive, affective, and achievement oriented with their children as measured using Maternal Behavior Rating Scale (a valid observation tool) when compared to the mothers in the control group (n=8).

In addition, intervention mothers reported less stress on the Parent Stress Index (a valid self-report questionnaire) meaning the intervention reduced their stress associated with rearing and interacting with their child. The findings highlight the positive outcomes of the responsive interaction strategies because mothers demonstrated a change in their behavior and reductions in their stress. Less parental stress means more enjoyment with parenting. Furthermore, the intervention mothers, who learned how to be more responsive, offered their children more opportunities to engage in constructive learning behaviors. For example, the children demonstrated increased interest, affect, and cooperation on the Child Behavior Rating Scale (a valid observation scale) than the children in the control group. The change in parental interaction positively influences development. Such findings indicate the potential of the responsive interaction strategies to positively impact parent behavior. Yet, because the sample size is small, we need additional studies such as this to build a stronger body of evidence for this method. Note, this study appears to be a pre-cursor to what is now known as Responsive Teaching because Mahoney and colleagues never refer to it as such.

In more recent work, researchers used the Responsive Teaching approach with 50 mothers in weekly sessions over a year (average of 33 sessions). After the intervention, Mahoney, Perales, Wiggers, and Herman (2006) found that most mothers (two thirds) became more responsive to their children as measured by Maternal Behavior Rating Scale. The researchers did not discuss differences in mothers who improved and mothers who did not improve. For future applications of Responsive Teaching to be effective, both researchers and providers will need to understand what characteristics in families predict success with the Responsive Teaching approach. These results, however, further indicate the promise of the Responsive Teaching approach in fostering change in parenting behavior.

Comparison to the five quality indicators. Responsive Teaching addresses all five quality indicators through its content and methods. The content includes the sixty-six responsive interaction strategies that fall within five dimensions: reciprocity, contingency, shared control, affect, and match (Kim & Mahoney, 2005; Mahoney, 2009; Mahoney & MacDonald, 2007). The specific strategies under these five dimensions address QI 1, QI 2, and QI 3. For instance, under the dimension of contingency, parents learn to simply “observe my child’s behavior,” which fosters parent’s awareness and attention to their child’s behavior (QI 1). As another example, under the dimension of match, parents learn to “interpret my child’s behavior developmentally,” which relates to parental ability to interpret behavior correctly (QI 2). Finally, under the dimension of contingency, parents learn “respond quickly to my child’s signals, cries, or nonverbal requests,” which refers to timely responses (QI 3). Teaching parents the responsive interaction strategies ensures consistency with the first three quality indicators. A next step for researchers and practitioners is to build on existing evidence to demonstrate pre-post differences on the quality indicators after implementation of this approach. Responsive Teaching Planning and Tracking Program is available for this purpose (“Publications,” n.d., para 2).

In addition to the content, the Responsive Teaching methods parallel the quality indicators four and five. For example, the provider typically describes and models each strategy then coaches the parent in using the strategy with his or her own child. This step allows the parent to mimic the provider in using a new skill (QI 4). Furthermore, using Responsive Teaching, providers collect video footage of the parent and child interacting. Utilizing video footage, parents reflect on their own interaction with assistance from the provider (QI 5). Being consistent with the five indicators, Responsive Teaching offers providers a structure to ensure that they remain faithful to best practice in early intervention. (See also Table 1 for additional

examples). Because Responsive Teaching consists of specific procedures, training is essential. Consequently, the Responsive Teaching International Outreach offers written materials (Mahoney & MacDonald, 2007) and training (<http://www.responsiveteaching.org>) to prepare providers for implementation of this approach. Next, we discuss the parent-child relationship intervention entitled, Promoting First Relationships.

Promoting First Relationships (PFR)

Description of intervention approach. Uniquely, the PFR approach focuses on *both* the parent-provider relationship and the parent-child relationship. This distinction is important because it prioritizes nurturing and developing both sets of relationships equally. As an initial goal, the provider learns how to interact effectively with parents (i.e. parent-provider relationship). Specifically, the provider learns new skills to engage parents by using four consultation strategies: joining, giving verbal feedback, using videotape observations, and using reflective questions (Kelly, Zuckerman, Sandoval, & Buehlman, 2008). The tone of each of these strategies emphasizes the provider being sensitive and responsive toward parents. In turn, this posture offers parents an opportunity to receive sensitive, responsive interactions much like parents are encouraged to engage with their children.

Since developing the parent-provider relationship is the first step in the PFR approach, cultivating the parent-child relationship represents the second step. As a secondary goal, the PFR approach promotes quality interaction between a child and the parent. Quality interaction refers to mutual enjoyment and warmth between parent and child. Toward this goal, for example, parents learn to offer comfort and protection in response to child cues of either distress or engagement (Kelly et al., 2008). During distress, the caregiver is consistently available for help and protection, which helps the child feel safe and secure. During engagement, the caregiver

enjoys their child and supports the child's exploration, which fosters development. Above all, quality interaction may occur during either distress or engagement, which results in mutually satisfying relationships. The emphasis on mutually satisfying relationships is not prevalent in other approaches.

Theoretical background. The PFR approach operationalizes attachment theory. Meaning, PFR took the concepts of attachment theory and organized them into a relationship intervention package. Attachment theory essentially promotes warm, sensitive, responsive, and available parenting. Moreover, attachment theorists believe that parents who are warm, available, and responsive to their infant's needs establish a sense of security; further, parents must be consistent in their warmth and availability (Bowlby, 1969; Ainsworth, 1978; Bretherton, 1992). With consistent responses over time, the child develops expectations about their parents. When the child knows what to expect, he learns that the caregiver is dependable. A dependable caregiver creates a secure attachment and consequently creates a secure base for the child to explore the world (Bretherton, 1992). Exploration facilitates learning and positive development. Therefore, attachment theorists believe that the earliest bonds that children have with parents has a tremendous impact that continues throughout life (Bretherton, 1992; Berlin & Cassidy, 2001). While many recognize the importance of attachment, it is more difficult to implement and sustain this consistent warmth and sensitivity with children, especially if it is not one's intuitive or natural way of being with children. One's intuition may be related to parental childhood experiences, culture, temperament and expectations. PFR, then, de-mystifies attachment theory and packages it in a way that is user-friendly for both providers and parents.

Evidence-based outcomes. There are only three published studies about the PFR approach; however, the preliminary evidence using PFR shows promise. For example, one initial

study, which implemented PFR with four service providers working with four homeless families, illustrates a positive change in provider and parent behavior after PFR training (Kelly, Buehlman, & Caldwell, 2000). First, the service providers received direct instruction and observed PFR trainers working with clients using the consultation strategies over a 10 week period. Then, the service providers implemented the newly learned consultation strategies with observation and feedback from the PFR trainers. After the 20 week training, the four providers increased their professional knowledge and researchers observed providers using more positive, responsive, and instructive feedback when interacting with parents (Kelly, Buehlman, & Caldwell, 2000). The providers' interaction style also affected the mothers, who learned to be more positive, responsive and instructive with their children (Kelly et al., 2000). This study provided preliminary evidence about the effectiveness of PFR. One, being faithful to the purpose of this approach to show significant change in provider behaviors, the service providers demonstrated more instructional feedback and positive feedback after the training when compared to pre-training behaviors. Since the provider training extended over a twenty week period, the PFR scholars clearly recognize a significant need for provider skill development. Two, a change in provider's behavior shows the positive impact on the families they serve.

In a second study, PFR researchers added to the evidence that positive change in providers leads to positive change in parents. Whereas the first study included four service providers, the second study followed 14 service providers. Kelly, Zuckerman, & Rosenblatt (2008) found that the providers spent more time focusing on the parent-child dyad after implementation of PFR compared to before implementation. The researchers followed the 14 providers before and after implementation of PFR to determine effectiveness. The researchers coded videotape of the mother-child interaction using the NCAST Teaching scale, which

includes six subtests (Barnard, 1994). Out of six subtests, mothers showed significant improvement on three subtests. More specifically, the mothers displayed more contingent behaviors, more cognitive growth fostering, and more social-emotional growth fostering after the intervention. Cognitive growth fostering involves the parent's ability to communicate a warm and positive feeling during the interaction (Nakamura, Stewart, & Tatarka, 2000). While social-emotional growth fostering means the parent's ability to make opportunities for growth and learning available to the infant (Nakamura, Stewart, & Tatarka, 2000). Further investigation of how to incite change in the parents in the three other subtests (sensitivity to cues, response to child's distress, child clarity of cues, and child responsiveness to caregivers) should be the focus of future studies. Much like Kelly et al. (2000), the results from this study indicate two benefits of the PFR approach; (a) the potential to change provider, and (b) the potential to change parent behavior.

In a third study, PFR researcher used a randomized experimental design to investigate this approach with a large sample of foster parents. Both the sample size and more rigorous design further strengthen the body of evidence. In preparation for this study, Spieker, Oxford, Kelly, Nelson & Fleming (2012) trained the providers for a total of 90 hours over a 6 month period, which included a workshop plus 30 weeks of mentoring with a PFR trainer. Researchers randomly assigned 210 toddlers in foster care to either 10-week PFR condition or a 10-week comparison condition. The comparison condition consisted of three monthly home visits (90 minute duration), where the providers helped connect the family to resources and suggested developmental activities. The study found improved caregiver sensitivity for foster parents using PFR when compared to a comparison condition as measured by the Nursing Child Assessment Teaching Scale, a valid observation tool. In addition, researchers monitored provider's fidelity to

the PFR protocol through use of checklist and video feedback. Both strategies allowed for providers to remediate their therapeutic approach to become more consistent with the PFR approach. Again, the PFR highly regards the need for providers to grow in their practice approach to effectively engage parents. A study of this magnitude adds to the evidence, but is still limited as it sample only includes foster families. Next steps include more studies like this with different populations. More specifically, future PFR studies could investigate it use with different ethnic groups, difference socioeconomic groups, and different types of family composition.

Comparison to the five quality indicators. The components of the PFR approach align with all five quality indicators (See Table 1 for examples). The key components consist of the provider training, instructional DVD, and a written manual for providers to follow. While the training prepares the provider for how to engage parents, the DVD and manual represent materials for providers to use with parents. Further, the manual contains handouts to supplement topics covered in home sessions. For example, the handouts teach parents information on topics such as “meeting the social and emotional needs of infants and toddlers”, “staying connected during difficult times” and “playtime with your child” (Kelly, Zuckerman, Sandoval, & Buehlman, 2008), all of which support parents learning about their child’s behavior (QI 1). PFR providers engage parents by using reflective questions to focus on the underlying feelings and needs of both the caregiver and the child (Kelly, Zuckerman, Sandoval, & Buehlman, 2008). The reflective dialogue as well as handouts such as “toward a better understanding of children’s behavior” fosters parents correctly interpreting their child’s behavior (QI 2). The “circle of security” handout teaches parents about timely and appropriate responses (QI 3). The PFR handouts offer a visual aid to support the content that parents are learning.

While PFR uses videotaped observations for parents to become aware of their own behaviors and their child's interactive strengths (QI 5), the PFR manual does not speak of modeling (QI 4) per se. Rather, PFR teaches providers to use the consultation strategies when relating to parents. These strategies offer the parent a model for how to behave with their child. For example, joining means "establishing an emotional connection with a caregiver that allows the provider to be a safe haven for the caregiver" (Kelly, Zuckerman, Sandoval, & Buehlman, 2008, p. 25). This experience allows the parent to experience and appreciate someone creating a safe haven for them. In turn, the parent can offer this experience to their child. As additional examples, PFR providers use verbal feedback that is responsive (i.e. contingent), teaches the parent new information (i.e. instructive), and emphasizes strengths (i.e. positive). Similarly, this experience gives parents a model to mimic with their own child. In addition to modeling, the provider's responsive style of interaction further supports the parent's learning. Since Promoting First Relationships effectively deals with the five indicators, it offers providers a mechanism to guarantee that they are implementing best practice in early intervention. Next, we discuss the parent-child relationship intervention entitled, Child-Parent Relationship Training.

Child Parent Relationship Training (CPRT)

Description of intervention approach. Unlike the other two approaches, CPRT is a parent education curriculum designed as a group intervention. Within the group context, parents acquire specific skills to enhance their relationship with their child. More specifically, over the course of 10 weeks parents learn how to conduct 30-minute structured, play time sessions at home (Bratton, Landreth, Kellam, & Blackard, 2006). Weekly group meetings of six to seven parents include didactic instruction, handouts, demonstration, role playing, homework activities, and videotaped home sessions. As for the didactic instruction, parents learn child-centered play

therapy skills each week. The skills consist of reflective responding, structuring, empathetic skills, imaginative play skills, limit setting, and choice giving (Wickstrom, 2009; Bratton et al., 2006). The weekly sessions further involve demonstration from the group facilitator and role playing each new skill they learn with the other parents in the group. As homework, each parent sets aside time for “special play time”(structured play sessions),where they videotape themselves interacting with their child at home. Each parent takes turns sharing the videotaped interaction with the other parents in the group. When viewing the video together, the provider highlights strengths in the interaction through reflective discussion with the group (Sheely-Moore & Bratton, 2010). The group context offers multiple opportunities to see how others execute the strategies with their own children. These opportunities potentially reinforce learning for each member of the group.

CPRT defines itself as a strengths-based approach as opposed to a deficit-based approach. This claim is most evident in the focus of intervention and the posture of the provider. First, the focus of the intervention is the relationship. Although families may come to a provider because they are experiencing “problems,” CPRT promotes the belief that all families possess strengths. Rather than focusing on the family problems, parenting problems or a problem child, CPRT focuses on the parent’s strengths and the child’s strengths. For instance, a parent may demonstrate extraordinary coping skills or resourcefulness that can be harnessed toward better parenting. With such potential, CPRT considers parents the primary therapeutic agents of change in the parent-child relationship (Rye, 2006). Consequently, strengthening the relationship between the parent and child deserves more attention than any identified problems. Because with a stronger, more effective parent-child relationship, some of the child’s issues may no longer manifest.

In addition to a relationship focus, the second way CPRT promotes a strengths-based approach relates to the posture of the provider. Posture includes the provider's attitude, demeanor, and overall presence. Specifically, the provider's posture is open, accepting, collaborative, and equal with the family. This posture lies in contrast to a deficit-based approach, where providers might interact with the family as the expert. The expert knows all the answers and makes all decisions. In many instances, this expert position disempowers the parent because the family has a problem and the only the provider can fix the problem (Sheely-Moore & Bratton, 2010). However, using a strengths-based approach, the provider is no longer the expert. Rather, CPRT empowers parents to be the expert in their own family (Topham, Wampler, Titus, & Rolling, 2011). The provider essentially builds on the parent's strengths by highlighting positive interactions, communicating understanding, providing encouragement, acknowledging efforts, and ultimately expressing a genuine belief in parents' capability (Sheely-Moore & Bratton, 2010). Since CPRT offers a group format, the strength experience is potentially magnified. Meaning, parents in the group have the opportunity to experience the provider (i.e group facilitator) focusing on strengths, to mimic the provider's strength-based posture, to reflect on the assets of others in the group and give positive feedback to other parents.

Theoretical background. CPRT advanced from the Filial counseling model. Filial is an adjective that means a child's relationship to a parent ("Filial," 2013, para. 1). Filial counseling involves teaching parents to use child-centered, play therapy skills with their own children. Child-centered play therapy consist of the development of a relationship where the child can fully express himself and explore through play experiences (Watts & Broaddus, 2002). In other words, parents learn a specific way to play with their children. The parent-child relationship is fostered through structured play sessions. Traditionally, the Filial counseling encompasses 6

months (or approximately 30 sessions) of provider working with individual families (Rye, 2006; Watts & Broaddus, 2002; Landreth & Lobaugh, 1998). CPRT both formalizes and abbreviates the Filial model into a group format. The written manual provides detailed group protocols for each of the 10 weeks including discussion points, activities, handouts, and homework.

Evidence-based outcomes. CPRT demonstrates preliminary positive parental outcomes. These benefits are directly related to decreasing stress on parents while improving their interactions with their children. After the CPRT group with 23 low-income families, Sheely-Moore and Bratton (2010) found significant reduction in parent-child relationship stress and a decrease in parenting stress using the Parent Stress Index, a valid self-report measurement tool. Paired with these results, researchers found an improvement in the child's behavior as measured by the Child Behavior Checklist. Although the sample size is small, these findings indicate that CPRT builds family capacity and confidence because parents learned new skills, which positively changed their child's behavior. While these researchers feel that the CPRT group fosters resilience as families realize they have the capacity to take control of their circumstance, a next steps would be for researchers to provide data to support this claim.

Another researcher highlighted the positive effects of CPRT group using phenomenological methods. Using focus groups with eight 2-parent families after the CPRT intervention, Wickstrom (2009) found the following: improved parent-child relationships, improved marital relationships, improved sibling functioning and improved family of origin relationships. Furthermore, the researcher discovered a number of parental themes such as a new way of relating to their child, enhanced understanding of their child, and a new way of viewing themselves as parents. These findings indicate how CPRT potentially strengthens the child-parent relationship, enhances family functioning, increases parent capacity and competence.

While all the studies reviewed explore a variety of interesting variables such as parenting stress (Sheely-Moore & Bratton, 2010; Landreth & Lobaugh, 1998), parent distress (Topham, Wampler, Titus, & rolling, 2011), emotional acceptance (Topham, Wampler, Titus, & rolling, 2011), parental acceptance of the child (Landreth & Lobaugh, 1998), they do not measure parent-child interactions. Future replications need to investigate this variable as well.

Comparison to the Five Quality Indicators. CPRT matches all five quality indicators of effective parent-child interventions (See Table 1 for examples). CPRT accomplishes this by teaching parents how to interact with their child, supporting parents learning through modeling, using video feedback, and lastly, providing a written manual. The manual outlines detailed group protocols for each of the 10 weeks including discussion points, activities, handouts, and homework. Wickstrom (2009) states that parents completing the CPRT process describe a heightened awareness of their child's needs as well as of their own (QI 1). Rye (2006) specifies that CPRT helps parents become more able to trust their children and increase parent's listening skills (QI 2). Further, parents learn child-centered counseling skills such as how to follow the child's lead in play. With support from the provider, parents experience confidence and skill while playing with their child, at the same time responding to the child's needs in a timely and appropriate manner (QI 3). Between sessions, parents videotape themselves playing with their child at home. As a part of the group format, parents rotate bringing their tapes to share with the group (QI 4 and QI 5). Due to this video sharing, parents may observe each other utilizing sensitivity with children (QI 4). Consequently, this benefit is less likely in the individual format. The manual further strengthens this method as it ensures fidelity (QI 6). Like Responsive Teaching and Promoting First Relationships, CPRT offers consistency with the five indicators.

Consequently, this approach also serves as a vehicle to safeguard that providers remain close to best practice in early intervention.

Discussion

While each approach incorporates the five quality indicators, each of them package these concepts in dramatically different ways. For example, PFR involves individual home visits; CPRT consists of a group intervention, while Responsive Teaching can be group or individual sessions. Further, CPRT is a defined 10-week intervention, while Responsive Teaching and PFR are more open-ended in terms of duration and frequency. We offer an analysis of the strengths and weakness in the succeeding paragraphs. First, we discuss Responsive Teaching.

The Responsive Teaching approach presents with strong and weaker aspects. One such strength is that the approach articulates one clear goal; that is, promoting a responsive interaction style. Mahoney and colleagues (2006) suggest teaching parents sixty-six responsive interaction strategies, which represent small, incremental steps toward a responsive interaction style. To this end, Responsive Teaching promotes the use of these strategies within everyday routines and activities. Further, Responsive Teaching de-emphasizes developmental skill acquisition by encouraging parents to engage children in activities that they can already do (Mahoney et al., 2006). These features of Responsive Teaching also point to the strengths of the approach in that the list of sixty-six responsive interaction strategies offers much needed direction for providers who seek more structure and guidance on what skills parents need to learn. Parents, in turn, learn and practice new skills in daily routines, which helps them integrate the strategies so that they become part of the normal routine. The down side; however, is that the large volume of strategies (i.e sixty-six) may overwhelm both providers and parents. Research is needed to discover which of the strategies are most effective.

Promoting First Relationships also possess strengths and weaknesses. One strong point of the PFR approach is that it concentrates equally on enhancing the parent-child relationship as well as parent-provider relationship. Toward this focus, a PFR coach (PFR coach is an individual extensively trained in PFR) spends considerable time on the front end to train providers in how to engage parents (Kelly et al., 2000, Kelly, et al., 2008, Spieker et al., 2012). After the initial training, coaching continues as the providers begin work with families. In an effort to foster the provider's professional growth, this approach emphasizes the importance of reflection. The authors state, "Our work always begins with and continually includes, reflection on the child, the caregiver, and their relationship, plus our self-reflection on our own work" (Kelly, Zuckerman, Sandoval, & Buehlman, 2008, p. 60). Accordingly, this approach offers providers worksheets to help explore these reflective questions. Consequently, the providers are better equipped to help parents engage with their children because they continue to receive support beyond the manual and initial training. Another strong point of PFR is the emphasis on mutually satisfying parent-child relationships. This emphasis stands out because it is less focused on demonstration of particular skills and more focused on enjoying parenting. Additional research is needed on this approach to continue to demonstrate the positive effect of provider training and parent training.

In contrast to the strengths of PFR, a weakness from a provider's perspective is that PFR is more open-ended. The PFR manual does not offer a step by step structure. Step by step structures might tell the novice provider where to start and what to do next. This is most likely dealt with in the extensive provider coaching described in the research studies (see evidence-based outcomes section for PFR). Yet without a PFR coach, the manual may not provide sufficient information about implementation, so fidelity to this method could be compromised. A novice provider would need to seek mentoring from someone with more PFR experience. Studies

investigating the duration, frequency, and intensity of PFR coaching would be useful to this body of evidence.

Child Parent Relationship Therapy bears both strengths and weakness. This approach uniquely emphasizes a strengths-based perspective. The approach offers parents a number of “rules of thumb” consistent with the strength-based perspective. For a poignant example, one rule of thumb is “Focus on the donut, not the hole” (Bratton et al., 2006, p. 4). Since parents come to CPRT due to their child’s behavioral concerns, this rule encourages parents to focus on their relationship, not the problem (i.e. problem child). The message is that parents can focus on enhancing their parent skills to benefit overall family functioning rather than focusing on fixing the child. Consistent with other strengths based literature, researchers state that parents demonstrate more confidence, competence, and resilience after CPRT (Sheely-Moore & Bratton, 2010; “CPR of Strengths”, n.d., para 5). However, more evidence is needed to support these specific claims.

In addition to the strengths-based perspective, another asset of CPRT is the detailed manual. CPRT provides a written manual that outlines ten weeks of group intervention including: discussion points, handouts, worksheets, and homework. This material layouts out each group session so that the provider (group facilitator) does not need to figure out the content or progression, but rather can focus on group needs, group development, and group dynamics. Despite the detailed manual, the material is more effectively executed by someone already trained in play therapy and more specifically, Filial therapy (Watts & Broadus, 2002). Therefore, CPRT has more limited applicability to early intervention providers.

Although the kind of structure provided by a manual is useful, it could also serve as a trap, limiting one’s creativity and flexibility. This is a potential weakness of the CPRT approach.

Providers will need to recognize when the treatment outline is not adequately serving the group or individuals within the group.

The final weakness of CPRT relates to the specialized play time that is a standard for this approach. Throughout the 10-week intervention, parents learn to properly conduct a specialized play time. Parents are asked to set aside a special play time using a specific set of toys to practice new child-centered play therapy skills. The specialized play time is based on two ideas. One, it takes the edge off parents feeling like they need to perform all the time. Two, parents will begin to use the strategies outside of the special play time. This set aside play time de-contextualizes the parent's learning as it is done in isolation from the everyday activities. CPRT, therefore, sits in direct opposition to both Responsive Teaching and PFR, which promote more naturalistic approaches. A study comparing a CPRT group to a Responsive Teaching group would be a useful to determine which program is more efficacious. Despite the strengths and weakness of each approach, all three approaches offer us insight about parent-child relationship intervention. We emphasize these points in the next section.

3. What can early intervention providers learn from the parent-child relationship intervention literature?

Use the quality indicators as a checklist. The list of quality indicators illustrate what relationship-focused intervention should look like in practice. Early intervention may use the indicators as a quality assurance checklist to guide, evaluate, and consequently improve their practice. Using the indicators as a guide, providers may plan sessions or a series of sessions to meet each indicator. Using the indicators for evaluation, providers may review the indicators after each session or series of sessions to assess the quality of practice. This allows providers to quickly analyze their practice, identify areas in need of improvement and opportunities for

growth. A separate opportunity to use the indicators for evaluation includes using the indicators to track changes in parent behavior or the relationship, providers may specifically use indicators one, two and three (QI1, QI2, QI3) to monitor progress in parent outcomes and relationship outcomes.

Identify a written protocol that fits your practice setting. A requirement for evidence-based practice is to have written materials that adequately describe how providers implement the program, such as a manual or podcasts to provide a method of ongoing review/access. Providing written materials for providers ensures that programs are applied as intended. McCall (2009) argues that programs must describe procedures in sufficient detail so that others may replicate it easily and faithfully. Without ample written detail, providers may waste time and fail to show positive outcomes for the parent-child relationship.

After identifying a written protocol that fits one's practice setting, providers must create evidence in their practice. It is important to document both procedures and responses. Further, documentation should clearly connect your chosen procedures with quality indicators. In addition, this documentation should monitor parent behavior. By clearly identifying targeted parenting behavior or relationship outcomes with each step, providers will know if and when the intervention is effective.

Find a coach or mentor. Evidence shows that providers that seek support from a coach as they develop this new skill set associated with relationship focused intervention will have better outcomes. A coach can be a supervisor or a more experienced peer. We learned from PFR that the providers benefitted significantly when given long-term coaching to truly change their practice (Kelly et al., 2000, Kelly, et al., 2008, Spieker et al., 2012; Rush & Shelden, 2005; Rush, Shelden, & Hanft, 2003; Korfmacher et al., 2008). Providers can complete any of the following:

videotape themselves working with a family and then reflect on the session with a coach, review the quality indicator checklist with a coach, and finally, discuss specific questions, concerns or challenges with a coach. Rush, Shelden, and Raab (2008) provide a framework for using a coaching style of interaction.

Incorporate your discipline specific expertise into a relationship-based approach. Early intervention providers may use knowledge unique to their profession within a relationship-focused framework. Providers possess expertise in all areas of development: motor, cognitive, social, communication, and adaptive skills. While working within a specific relationship framework, providers can offer parents developmental information or therapeutic strategies to compliment the relationship work. For example, one of the sixty-six strategies taught in the Responsive Teaching approach involves “being sensitive to my child’s sensations” (“Responsive Teaching Strategies,” 2007, para. 5). Occupational therapists have a unique understanding of sensory processing, which can be applied to the relationship. Scholars describe how parents can benefit from understanding the meaning of their child’s behavior as it relates to the child’s response to their sensory environment (Dunn, 2005; Pizur-Barnekow, 2010). Furthermore, Jaegermann and Klein (2010) hypothesized that informing mothers about their toddlers sensory processing needs while teaching them specific interaction strategies (relationship-based intervention) improves parent-child relationships. When compared to two other conditions, the mothers who learned about their child’s sensory processing showed more change in interaction behaviors than the two other conditions. This study indicates the promise of incorporating unique expertise (in this case, sensory processing) with a relationship-based approach. We need more studies such as this one to confirm these results as well as explore other areas of expertise in early intervention.

Practice a strengths-based approach. Each of the three approaches teaches us something about using a strengths-based perspective. Responsive Teaching says engage children in things they can already do, which emphasizes the child's current skills and interests instead of what the child cannot do (Mahoney, 2009). In essence, the emphasis is on the child's strengths, abilities, and comforts. As for PFR, the aim is mutually satisfying relationships between a child and parent (Kelly, Zuckerman, Sandoval, & Buehlman, 2008). This approach helps us focus on enjoying parenting. CPRT encourages parents to focus on the child rather than the child's problem (Bratton et al., 2006; Johnson, Bruhn, Winek, Krepps, & Wiley, 1999). In doing so, this approach de-emphasizes the problems or deficits in order to build parental capacity (Trivette, Dunst, & Hamby, 2010).

Summary

This paper reviewed literature from early childhood, infant mental health, and early intervention. The findings yielded five quality indicators that describe effective parent-child relationship interventions (Figure 1). Although many parent-child interventions exist, three interventions found address all five quality indicators. The three interventions include Responsive Teaching, Promoting First Relationships, and Child Parent Relationship Training. Each of the interventions offers unique approaches to developing positive parent-child relationships, which includes distinctive principles, protocols, theory, and evidence-based outcomes. Consequently, each approach addresses the quality indicators with different methods (Table 1). Ultimately, we find that these exemplary parent-child intervention approaches offer some common themes that we can endorse to foster positive relationship development.

Conclusion

It is critical that early intervention providers develop skills in relationship-based interventions to yield relationship outcomes, parent outcomes, as well as child outcomes. Since relationship-based intervention is not yet part of pre-service training, providers need to develop a strategy to build this new skill set. This paper presents ideas that providers can use to build their relationship-based practice skills.

References

References marked with an asterisk indicate interventions identified in early phase of the search process.

- Ainsworth, M.D.S. (1978). *Patterns of attachment: A psychological study of the strange situation*. New York: Lawrence Erlbaum Associates.
- Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., & Juffer, F. (2003). Less is more: Meta-analyses of sensitivity and attachment interventions in early childhood. *Psychological Bulletin*, *129*, 195-215.
- Barnard, K.E. (1994). What the NCAST Feeding Scale measures. In G. summer & A. Spietz (Eds.), *NCAST caregiver/child feeding manual*. Seattle, WA: NCAST Publication.
- Berlin, L.J. & Cassidy, J. (2001). Enhancing early child-parent relationships: Implications of adult attachment research. *Infants and Young children*, *14*, 64-76.
- Bowlby, J. (1969). *Attachment and loss*. New York: Basic Books.
- Bratton, S.C., Landreth, G.L., Kellam, T., & Blackard, S.R. (2006). *Child parent relationship therapy (CPRT) treatment manual: A 10-session filial therapy model for training parents*. New York: Routledge.
- Bretherton, I. (1992). The origins of attachment theory: John bowlby and mary ainsworth. *Developmental Psychology*, *28*, 759-775.
- Bruner, J. S. (1978). From communication to language: A psychological perspective. In I. Markova (Ed.), *The social context of language* (pp. 17–48). New York, NY: Wiley.
- Campbell, P.H., Chiarello, L., Wilcox, M.J., & Milbourne, S. (2009). Preparing therapists as effective practitioners in early intervention. *Infants & Young Children*, *22*, 21-31.

- Colyvas, J.L., Sawyer, L.B., & Campbell, P.H. (2010). Identifying strategies early intervention occupational therapists use to teach caregivers. *American Journal of Occupational Therapy*, 64, 776-785. doi:10.5014/ajot.2010.09044
- CPR of Strengths. (n.d.). In the Strengths Institute on the University of Kansas School of Social Welfare website. Retrieved from <http://www.socwel.ku.edu/strengths/about/index.shtml>
- Crawley, S.B. & Spiker, D. (1983). Mother-Child Interactions Involving Two-Year-Olds with Down Syndrome: A Look at Individual Differences. *Child Development*, 54(5), 1312-1323 .
- Dunn, W. (2005). A sensory processing approach to supporting infant-caregiver relationships. In A.J. Sameroff, S.C. McDonough, & K. L. Rosenblum (Eds.), *Treating parent-infant relationship problems: Strategies for intervention* (pp. 152-187). New York: Guilford Press.
- Dunst, C.J. & Kassow, D.Z. (2007). Characteristics of intervention promoting parental sensitivity to child behavior. Winterberry research synthesis, 1, 1-13.
- Drummond, J., Letourneau, N., Neufeld, S.M., Stewart, M., & Weir, A. (2008). Effectiveness of teaching an early parenting approach within a community based support service for adolescent mothers. *Research in nursing & health*, 31, 12-22.
- *Egeland, B. , & Erickson, M.F. (2005). Lessons from STEEP: Linking theory, research, and practice for the well-being of infants and parents. In A.J. Sameroff, S.C. McDonough, & K. L. Rosenblum (Eds.), *Treating parent-infant relationship problems: strategies for intervention*. (pp. 213–242). New York, NY: Guilford Press.
- Filial. (2013). In Merriam-Webster's online dictionary. Retrieved from <http://www.merriam-webster.com/dictionary/filial>).

- *Fivaz-Depeursinge, E., Corboz-Warnery, A., & Keren, M. (2005). The primary triangle: Treating infants in their families. In A.J. Sameroff, S.C. McDonough, & K. L. Rosenblum (Eds.), *Treating parent-infant relationship problems: strategies for intervention*. (pp. 123-151). New York, NY: Guilford Press.
- Fukkink, R.G. (2008). Video feedback in widescreen: A meta-analysis of family programs. *Clinical Psychology Review, 28*, 904-916.
- Goodman, J.F. (1992). *When slow is fast enough: Educating the delayed preschool child*. New York: Guilford Press.
- *Heinicke, C., N., Fineman, N.R., Ruth, G., Recchia, S.L., Guthrie, D., Rodning, C. (1999). Relationship-based intervention with at-risk mothers: Outcome in the first year of life. *Infant Mental Health Journal, 20*, 349-374.
- Humphry, R. (1989). Early intervention and the influence of the occupational therapist on the parent-child relationship. *American Journal of Occupational Therapy, 43*, 738-742.
- Individuals with Disabilities Education Improvement Act of 2004. (2011), Pub. L. No. 108-446, 118 Stat. 2646 (codified as amended in scattered sections of 20 U.S.C. 1400, Part C, § 632, g).
- Jaegermann, N., & Klein, P.S. (2010). Enhancing mothers' interactions with toddlers who have sensory-processing disorders. *Infant Mental Health Journal, 31*, 291-311.
- Johnson, L., Bruhn, R., Winek, J., Krepps, J., & Wiley, K. (1999). The Use of child-centered play therapy and filial therapy with head start families: A brief report. *Journal of Marital and Family Therapy, 25*(2), 169-176.

- Kelly, J. F., Buehlman, K., & Caldwell, K. (2000). Training personnel to promote quality parent-child interaction in families who are homeless. *Topics in Early Childhood Special Education, 20*, 174-185.
- Kelly, J., Zuckerman, T., & Rosenblatt, S. (2008). Promoting first relationships: A relationship-focused early intervention approach. *Infants & Young Children, 21*, 285.
- Kelly, J.F., Zuckerman, T.G., Sandoval, D., & Buehlman, K. (2008). *Promoting First Relationships: A curriculum for service providers to help parents and other caregivers meet the social and emotional needs of young children (2nd Ed.)*. Seattle, WA: NCAST Publication.
- Kim, J., & Mahoney, G. (2004). The effects of mother's style of interaction on children's engagement: Implications for using responsive interventions with parents. *Topics for Early Childhood Special Education, 24*, 31-38.
- Kim, J., & Mahoney, G. (2005). The effects of relationship focused intervention on Korean parents and their young children with disabilities. *Research in Developmental Disabilities, 26*, 117-130.
- *Klein, P. (2003). Early intervention: Mediation Intervention for Sensitizing Caregivers. In S.L. Odom, M.J. Hanson, J.A. Blackman, & K. Sudha (Eds.), *Early intervention practices around the world* (pp. 68-84). Retrieved from <http://www.cesmoo.be>
- *Klein, P. (2006). The literacy of interaction: Are infants and young children receiving a "mental diet" conducive for future learning? *Journal of Developmental Processes, 1*, 123-137.
- *Klein, P. S., & Rye, H. (2004). Interaction-oriented early intervention in ethiopia: The MISC approach. *Infants and Young Children, 17*, 340-354.

- Kong, N., & Carta, J. (2012). Research synthesis of studies on responsive interaction intervention for children with or at risk for developmental delays. *Topics in Early Childhood Special Education, 1-14*. doi: 10.1177/0271121411426486
- Korfmacher, J., Green, B., Staerkel, F., Peterson, C., Cook, G., Roggman, L., ... Schiffman, R. (2008). Parent involvement in early childhood home visiting. *Child and Youth Care Forum, 37*(4), 171-196).
- Landreth, G. L., & Lobaugh, A. F. (1998). Filial therapy with incarcerated fathers: Effects on parental acceptance of child, parental stress, and child adjustment. *Journal of Counseling & Development, 76*(2), 157-165.
- Landry, S.H., Smith, K.E., & Swank, P.R. (2006). Responsive parenting: Establishing early foundations for social, communication, and independent problem-solving skills. *Developmental Psychology, 42* (4), 627-642.
- *Letourneau, N., Drummond, J., Fleming, D., Kysela, G., McDonald, L., & Stewart, M. (2001). Supporting parents: Can intervention improve parent-child relationships? *Journal of Family Nursing, 7*, 159-186.
- *Lieberman, A.F. (2005). Child-parent psychotherapy: A relationship-based approach to the treatment of mental health disorders in infancy and early childhood. In A.J. Sameroff, S.C. McDonough, & K. L. Rosenblum (Eds.), *Treating parent-infant relationship problems: strategies for intervention*. (pp. 97-122). New York, NY: Guilford Press.
- *Lieberman, A.F., Silverman, R., & Pawl, J.H. (2000). Infant-parent psychotherapy: Core concepts and current approaches. In C.H. Zeanah (Ed) *Handbook of infant mental health*, 2nd edition (pp. 472-484). New York, NY: Guilford Press.

- Mahoney, G. (2009). Relationship focused intervention (RFI): Enhancing the role of parents in children's developmental intervention. *International Journal of Early Childhood Special Education, 1*, 79-94.
- Mahoney, G. & MacDonald, J. (2007). *Autism and developmental delays in young children: The responsive teaching curriculum for parents and professionals*. Austin, TX:PRO-ED.
- Mahoney, G. & Bella, J.M. (1998). An examination of the effects of family centered early intervention on child and family outcomes. *Topics for Early Childhood Special Education, 18*, 83-94.
- Mahoney, G., Boyce, G., Fewell, R. R., Spiker, D., & Wheeden, C. A. (1998). The relationship of parent-child interaction to the effectiveness of early intervention services for at-risk children and children with disabilities. *Topics in Early Childhood Special Education, 18*(1), 5-17.
- Mahoney, G., Perales, F., Wiggers, B., & Herman, B.B. (2006). Responsive teaching: Early intervention for children with down syndrome and other disabilities. *Down Syndrome Research and Practice, 11*, 18-28.
- Marino, J.M., Baxter, M.F., & Pickens, N. D. (2010). Who is in charge? Strategies to foster parent-child interaction in early childhood practice. *Journal of Occupational Therapy, Schools & Early Intervention, 3*, 304-318.
- Mayer, M.L., White, B.P., Ward, J.D., & Barnaby, E.M. (2002). Therapists' perceptions about making a difference in parent-child relationships in early intervention occupational therapy services. *American Journal of Occupational Therapy, 56*, 411-421.
- McCall (2009). Evidence-based programming in the context of practice and policy. *Social Policy Report, 23* (3), 1-19.

- *McCollum, J.A., Gooler, F., Appl, D.J., Yates, T.J. (2001). PIWI: Enhancing parent-child interaction as a foundation for early intervention. *Infants and Young Children, 14*, 34-45.
- *Mc Donough, S.C. (2005). Interaction guidance: Promoting and nurturing the caregiver relationship. In A.J. Sameroff, S.C. McDonough, & K. L. Rosenblum (Eds.), *Treating parent-infant relationship problems: strategies for intervention*. (pp. 79-96). New York, NY: Guilford Press.
- *McDonough, S.C. (2000). Interaction guidance: An approach for difficult-to-engage families. In C.H. Zeanah (Ed) *Handbook of infant mental health*, 2nd edition (pp. 485–493). New York, NY: Guilford Press.
- Moore, T. (March, 2009). *The nature and significance of relationships in the lives of children with and without developmental disabilities*. Keynote presentation at national conference of Early Intervention Association of Aoteroa New Zealand, Auckland.
- Nakamura, W. M., Stewart, K. B., & Tatarka, M. E. (2000). Assessing father–infant interactions using the NCAST Teaching Scale: A pilot study. *American Journal of Occupational Therapy, 54*, 44–51.
- National Research Council and Institute of Medicine (2000). *From neurons to neighborhoods: The science of early early childhood development*. Washington, D.C.: National Academy Press.
- Olds, D. L., Sadler, L., Kitzman, H. (2007). Programs for parents of infants and toddlers: Recent evidence from randomized trials. *Journal of Child and Adolescent Psychology and Psychiatry, 48*, 355-391.

- Pizur-Barnekow, K. (2011). Early intervention: A practice setting for infant and toddler mental health. In C. Brown, V.C. Stoffel, & J.P. Munoz (Eds.), *Occupational therapy in mental health: A vision for participation* (pp.491-502). Philadelphia, PA: F.A.Davis.
- Publications. (2007). In Responsive Teaching International Outreach website. Retrieved from <http://www.responsiveteaching.org/materials.php>
- Responsive Teaching Strategies. (2007). In Responsive Teaching International Outreach website. Retrieved from <http://www.responsiveteaching.org/strategies.php>
- Rusconi-Serpa, S., Rossignol, A.S., & McDonough, S.C. (2009). Videofeedback in parent-infant treatments. *Child and Adolescent Psychiatric Clinics of North America, 18*, 735-751.
- Rush, D.D., & Shelden, M.L. (2005) Evidence-based definition of coaching practices. *CASEinPoint, 1(6)*, 1-6.
- Rush, D.D., Shelden, M.L., & Hanft, B.E. (2003). Coaching families and colleagues: A process for collaboration in natural settings. *Infants & Young Children, 16* (1), 33-47.
- Rush, D.D., Shelden, M.L., & Raab, M. (2008). A framework for reflective questioning when using a coaching interaction style. *CASEtools, 4* (1), 1-5.
- Rye, N. (2006). Empowering the parent. *Therapy Today, 17(7)*, 25-28.
- Sameroff, A. J. (2005). Ports of entry and the dynamics of mother-infant intervention. In A.J. Sameroff, S.C. McDonough, & K.L. Rosenblum (Eds.), *Treating parent-infant relationship problems: Strategies for intervention* (pp. 3-28). New York: The Guilford Press.
- Sheely-Moore, A. L. & Bratton, S.C. (2010). A strengths-based parenting intervention with low-income african american families. *Professional School Counseling, 13*, 175-183.

- Spieker, S. J., Oxford, M. L., Kelly, J. F., Nelson, E. M., & Fleming, C. B. (2012). Promoting first relationships: Randomized trial of a relationship-based intervention for toddlers in child welfare. *Child Maltreatment, 17*(4), 271-286. doi: 10.1177/1077559512458176
- Sweet, M. & Appelbaum, M. (2004). Is home visiting an effective strategy? A meta-analytic review of home visiting programs for families with young children. *Child Development, 75*, 1435-1456.
- Topham, G.L., Wampler, K.S., Titus, G., & Rolling, E. (2011). Predicting parent and child outcomes of filial therapy program. *International Journal of Play Therapy, 20*, 79-93.
- Trivette, C.M. (2007). Influence of caregiver responsiveness on the development of young children with or at risk for developmental disabilities. *Winterberry Research Synthesis, 1* (12); 1-13.
- Trivette, C. M., Dunst, C. J., & Hamby, D. W. (2010). Influences of family-systems intervention practices on parent-child interactions and child development. *Topics in Early Childhood Special Education, 30*(1), 3-19.
- Trivette, C. M., Dunst, C. J., Hamby, D. W., & O'Herin, C.E. (2009). Characteristics and consequences of adult learning methods and strategies, *Practice Evaluation Reports, 2*(1), 1-32.
- University of the State of New York, New York State Education Department, Office of Vocational and Educational Services for Individuals with Disabilities. (2001). A self-review and quality improvement guide for schools and programs serving students with autism spectrum disorders. Retrieved from <http://www.p12.nysed.gov/specialed/autism/apqi.htm>

U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality.

(n.d.). Agency for Healthcare Research and Quality (AHRQ) Quality Indicators:

Introduction. Retrieved from <http://www.qualityindicators.ahrq.gov>

Watts, R.E. & Broaddus, J.L. (2002). Improving parent-child relationships through filial therapy:

An interview with Garry Landreth. *Journal of Counseling and Development*, 80(3), 372-379.

Wickstrom, A. (2009). The process of systemic change in filial therapy: A phenomenological study of parent experience. *Contemporary Family Therapy*, 31, 193-208.

Zeanah, C. H. (Ed.). (2009). *Handbook of infant mental health (3rd ed.)*. New York: The Guilford Press.

Quality Indicators

1. Parent–child relationship interventions should build parental awareness and attention to their child’s behavior. (QI 1)
2. Parent-child relationship interventions should enhance parental ability to interpret their child’s behavior correctly, which includes understand the child’s intent. (QI 2)
3. Parent-child relationship interventions should encourage parents to provide timely and appropriate responses. (QI 3)
4. Parent-child relationship interventions should provide parents with examples of other adults modeling sensitivity with children. Examples may be real time modeling or video modeling. (QI 4)
5. Parent-child relationship interventions should incorporate video feedback methods so that parents observe themselves interacting with their own child. (QI 5)

Figure 1. Quality characteristics of effective parent-child relationship interventions (Dunst & Kassow, 2007; Fukkink, 2008; Rusconi-Serpa, Rossignol, & McDonough, 2009)

Table 1

Comparison to the Five Quality Indicators

	Responsive Teaching	Promoting First Relationships (PFR)	Child-Parent Relationship Training (CPRT)
Quality Indicator 1	<p>Providers teach parents strategies such as ...</p> <p>Reciprocity-“Be physically available and interactive”</p> <p>Contingency-“Be sensitive to my child’s state”</p> <p>Affect-“Wait with anticipation”</p> <p>http://www.responsiveteaching.org/strategies.php</p>	<p>Provides handouts such as: “Meeting the social and emotional needs of infants and toddlers”, “Staying connected during difficult times”</p> <p>“Playtime with your child”</p> <p>(Kelly, Zuckerman, Sandoval, & Buehlman, 2008)</p>	<p>Affords parents a heighten awareness of their child’s needs as well as their own needs. Examples of this include: “Feeling Response” homework (Bratton, Landreth, Kellam, &Blackard, 2006, p. 5-6)</p> <p>“Parent Play Session” homework (Bratton, Landreth, Kellam, &Blackard, 2006, p. 63)</p>
Quality Indicator 2	<p>Providers teach parents strategies such as ...</p> <p>Match-“Interpret my child’s behavior developmentally”</p> <p>Contingency-“Respond to unintentional vocalizations, facial displays, and gestures as if they were meaningful conversations”</p> <p>Affect-“Treat my child’s fears as meaningful and legitimate”</p> <p>http://www.responsiveteaching.org/strategies.php</p>	<p>Provides handouts such as: “Toward a better understanding of behavior”</p> <p>Offers materials for providers to discuss engagement versus disengagement cues.</p> <p>(Kelly, Zuckerman, Sandoval, & Buehlman, 2008)</p>	<p>Offers the various rules of thumb for parents such as “Be a thermostat, not a thermometer.”</p> <p>This means, “reflecting/responding to your child’s, thoughts, feelings, and needs creates an atmosphere of understanding and acceptance for your child” (Bratton, Landreth, Kellam, &Blackard, 2006, p. 16).</p>

Notes. These are merely example and not a comprehensive sorting into the quality indicator categories. Further, the examples given do not always discretely fall into the category of one quality indicator or another. Rather, the examples are relevant to more than one quality indicator. Under Responsive Teaching, the bolded words are the five dimensions of responsiveness as conceptualized by the Responsive Teaching approach.

Table 1(continue)

Comparison to the Five Quality Indicators

	Responsive Teaching	Promoting First Relationships (PFR)	Child-Parent Relationship Training (CPRT)
Quality Indicator 3	<p>Providers teach parents strategies such as ...</p> <p>Contingency- “Respond quickly to my child’s signals, cries, or nonverbal requests”</p> <p>Shared Control-“Wait silently for more mature response”</p> <p>Match-“Follow my child’s lead”</p> <p>http://www.responsiveteaching.org/strategies.php</p>	<p>Provides handouts such as: “Circle of security” “Intimate connections”</p> <p>(Kelly, Zuckerman, Sandoval, & Buehlman, 2008)</p>	<p>Teaches <i>Reflective Responding</i> as a way of following, rather than leading.</p> <p>Parents learn to convey a “be with” attitude, which means giving the child your full attention. This attitude tells the child, “I am here, I understand, I care”</p> <p><i>Reflective Responding</i> also includes matching child’s voice tone, affect, and intensity (Bratton, Landreth, Kellam, &Blackard, 2006).</p>
Quality Indicator 4	<p>Providers use modeling to teach each of the sixty-six responsive interaction skills. (Mahoney, Perales, Wiggers, & Herman, 2006)</p>	<p>The provider manual does not speak of modeling per se but rather the provider uses consultation strategies: joining, reflective observation, verbal feedback strategies, and supporting reflective capacity. These consultation strategies offer parents a model for how to behave with their own child. (Kelly, Zuckerman, Sandoval, & Buehlman, 2008)</p>	<p>Uses role play and live demonstrations frequently in the group sessions.</p> <p>(Sheeley-Moore & Bratton, 2010; Bratton, Landreth, Kellam, &Blackard, 2006)</p>
Quality Indicator 5	<p>Providers take video footage of parent-child playing together. As parents use Responsive Teaching strategies, many discover the impact responsiveness has on their child’s engagement and participation. These experiences help the parent appreciate the implications of this style of interaction...” (Mahoney, Perales, Wiggers, & Herman, 2006, p. 22)</p>	<p>Providers take video footage of parent-child during home visits. Parent and provider view the video together. Providers use the four consultation strategies as they watch the video with the parent. (Kelly, Zuckerman, Sandoval, & Buehlman, 2008)</p>	<p>Asks parents in the group to take turns showing footage of parent-child pair together at home during the special play time. This occurs in sessions 3-10. CPRT offers a worksheet for parent to use as they watch each others video footage (Bratton, Landreth, Kellam, &Blackard, 2006).</p>

Notes. These are merely example and not a comprehensive sorting into the quality indicator categories. Further, the examples given do not always discretely fall into the category of one quality indicator or another. Rather, the examples are relevant to more than one quality indicator. Under Responsive Teaching, the bolded words are the five dimensions of responsiveness as conceptualized by the Responsive Teaching approach.

Appendix B

Teaching Children Self-Regulation Skills with the Early childhood Education Environment: A Feasibility Study

This work has been edited and published as Blackwell, A.L., Yeager, D.C., Mische-Lawson, L., Byrd, R., & Cook, D.M. (2014). Teaching children self-regulation skills within the early childhood education environment: A feasibility study *Journal of Occupational Therapy, Schools, & Early Intervention*, 7 (3-4), 204-224, DOI:10.1080/19411243.2014.966013

Abstract

This study explores the feasibility of teaching self-regulation skills in an early childhood setting. Based on the concepts of the Alert Program[®], one early childhood classroom of 19 students (aged three-five years) and two classroom teachers took part in the *Ready CLASS Project*. The eight week intervention focused on increasing self-regulation skills in young children through intentional group instruction and embedded experiences. This study utilized a time-series, quasi-experimental design. The results indicate that children's vocabulary about self-regulation and feelings recognition capacity can be influenced when the activities and experiences become embedded into the daily routine of the classroom.

Teaching Children Self-Regulation Skills within the Early Childhood Education Environment:

A Feasibility Study

People use self-regulation many times during the course of the day and throughout the lifespan. Self-regulation is a multifaceted concept described differently throughout the literature. It encompasses management of physiological arousal, emotions, attention, and behavior.

Physiological arousal refers to the ability to make transitions between different states of sleep and alertness. For example, as we wake up in the morning, we begin making a transition from a sleep state to a more alert state, which we maintain for most of the day (Williamson & Anzalone, 2001). Emotional regulation relates to actions or behaviors we use to identify, manage, and express feelings while engaging in activities or interacting with others (AOTA, 2008).

Managing and expressing feelings might involve either suppressing emotions or deploying emotions effectively within relationships (Shonkoff & Phillips, 2000). Attention is the ability to focus on a desired stimulus or task and effectively ignore distractions (Williamson & Anzalone, 2001). Finally, behavior involves an ability to engage in adaptive, goal directed behavior such as delaying gratification, waiting in line, or remaining quiet and still during a religious ceremony (Post, Boyer, & Brett, 2006; Rothbart, Sheese, Rueda, & Posner, 2011; Williamson & Anzalone, 2001). Others still refer to self-regulation as a management of needs and preferences (Dunn, 2006). All four facets of self-regulation (physiological arousal, emotions, attention, and behavior) reflect various forms of self-monitoring and response inhibition that begins development in infancy and continues to mature throughout childhood and beyond.

Scholars reason that the development of self-regulation skills for young children should be the foundation of early childhood education because it intersects with all domains of behavior. Within the early childhood classroom, self-regulation skills allow children to take full advantage

of learning opportunities. For example, children who develop self-regulation are more likely to follow directions, wait their turn, and pay attention; they are *less likely* to display aggressive and impulsive behavior (McClelland et al., 2007). Therefore, a child's self-regulation abilities affect learning, school performance, social participation, and play. Raver (2004) suggests that self-regulation skills are as important to early development as learning to read. In fact, children who have developed self-regulation skills not only have better relationships with teachers and peers, but they also perform better with daily school work including literacy and math (McClelland et al., 2007). Furthermore, Post, Boyer, and Brett (2006) describe self-regulation as a learning tool, which is highly predictive of academic success. This evidence suggests self-regulation is imperative for a child's social-emotional development and academic success.

Because occupational therapists have expertise in sensory processing, they often receive referrals for children who need extra support with self-regulation (AOTA, 2009). For instance, a child's activity level, attention span, or anxiety may be interfering with their ability to participate in their learning environment and maintain peer relationships. When Cohn, Miller, and Tickle-Degnen (2002) investigated parents' hopes and expectations for therapy, the researchers identified three major themes i.e. social participation, self-regulation, and perceived competence. These themes included concepts such as acquiring skills to "fit in" socially, learning self-control or asking for help when needed, and finally, feeling confident in their ability to control their own behavior and feeling satisfaction with their accomplishments. Social participation and perceived competence, as described here, highly correlate with the broader concept of self-regulation. These three themes represent the parents' greatest priority for their children. These are behaviors or skills that parents hoped their children would gain from occupational therapy.

When faced with a child who needs support with self-regulation, occupational therapists may consider many approaches. One such approach is the use of sensory strategies to support the child's participation within his or her natural context. For example, emerging evidence supports providing fidgets and fiddle toys to increase focus on tasks (Rapport, 2009); making gum or non-food chewing items available to help with calming (Scheer, 1992) or performance (Leveille, McMahon, Alcantaro, & Zibell, 2008); offering weighted vest for attention to task and calming (Fertel-Daly, Bedell, & Hinojosa, 2001; VandenBerg, 2001); or providing dynamic seating for attention to task and in-seat behavior (Pfeiffer, Henry, Miller, & Witherell, 2008; Schilling, Washington, Billingsley, & Deitz, 2003). This preliminary evidence suggests the benefits of sensory strategies for both children with and without disabilities. Since these studies are small and limited in number, therapists are obligated to create their own evidence within their practice settings.

While occupational therapists demonstrate a willingness to experiment with these emerging sensory techniques, therapists appreciate that sensory strategies implemented for only individual children can also be problematic at times. For example, let's consider 4 year old Max who might benefit from a dynamic seating option during circle time. Other children may feel jealous because Max gets to have something special and they do not. Or the other children may think Max is weird because they do not understand his needs. Either way Max is further isolated from his peers. In addition, the teacher feels overwhelmed at the idea of how she can make this "special" item part of her daily routine when she is responsible for all the children (Mulligan, 2001). Little to no literature is available on how therapists are preparing children like Max, his peers, or his teachers to implement individual strategies.

As an alternative to introducing individual strategies, occupational therapists may attempt to teach children how to use sensory strategies for effective self-regulation. In this case, the therapist seeks to establish a skill that has not yet developed (Bazyk, 2011; AOTA, 2008). One common approach is the Alert Program[®] (Williams & Shellenberger, 1996). Through the Alert Program[®], children learn about self-regulation using developmentally appropriate vocabulary and sensory strategies through engaging classroom activities. To teach children the concepts of self-regulation, the program uses the following analogy, “If your body is like a car engine, sometimes it runs on high, sometimes it runs on low, and sometimes it runs just right” (Williams & Shellenberger, 1996, p. 2-1). To this end, the program material suggests that providers implement the program in three stages: 1). Identifying engine speeds, 2). Experimenting with methods to change engine speeds, and 3). Regulating engine speeds. Each of the three stages includes a series of steps and related activities to help children reach their potential for self-regulation (Williams & Shellenberger, 1996). The creators of the Alert Program[®] do not specify an appropriate length for the program. Rather, they suggest that implementers pace according to the children’s needs. Ultimately, children learn to monitor, maintain, or change their state of arousal for increased participation and performance in the classroom (Williams & Shellenberger, 1996). Through the Alert Program[®], children may develop self-regulation skills necessary for peer interactions, learning, and overall success at school.

In review of the literature on the Alert Program[®], recent studies suggest positive outcomes for school-aged and middle school children. Grove (2002) described the Alert Program[®] as an easily implemented approach to addressing school-aged children’s psychosocial needs (Grove, 2002). Salls and Bucey (2003) suggested that the Alert Program[®] improved middle school children’s self-awareness, problem solving, and self-regulation ability (Salls &

Bucey, 2003). Schoonover (2002) discussed using the Alert Program[®] to teach social skills to eleven elementary aged children. This resulted in teacher reported improvements in many of the children's observed social skill problem areas (Schoonover, 2002). Barnes, Vogel, Beck, Schoenfeld, and Owen (2008) demonstrated that the Alert Program[®] improved classroom behavioral skills, including interpersonal skills, appropriate behavior and feelings, depression, and physical symptoms/fears as measured by the Devereux Behavior Rating Scale-School Form (DBRS). This study also suggested, through teacher observations, the Alert Program[®] was effective in improving school-aged children's abilities to self-regulate, change tasks, organize themselves, cope with sensory challenges, and focus on classroom tasks and activities (Barnes et al., 2008). Another study was conducted using the Alert Program[®] within group treatment design for children diagnosed with Fetal Alcohol Syndrome. This study found that the Alert Program[®] was helpful in increasing the children's self-regulation and emotional problem-solving as their treatment groups demonstrated significant improvements in executive functioning (Wells, Chasnoff, Schmidt, Telford & Schwartz, 2012). This literature shows the promise of the Alert Program[®], however, more evidence is needed to support its effectiveness.

The Alert Program[®] is a widely used program to teach children self-regulation strategies. Many occupational therapists report use of the Alert Program[®] with a large variety of age groups, and in numerous settings. In a survey of 476 school-based occupational therapists, 224 therapists reported that they specifically served children with emotional disturbances (77.2% in grades K-5). Of these 224 therapists, the researchers found 105 (46.8%) therapists reported use of the Alert Program[®] in practice (Barnes, Beck, Vogel, Grice, & Murphy, 2003). In another study, almost one-third (29%) of 555 occupational therapists, serving children with and without emotional disturbances, used the Alert Program[®] in their practice (Case-Smith & Archer, 2008).

Clearly, occupational therapists find the Alert Program[®] framework highly relevant to their practice. Although the Alert Program[®] has become increasingly popular and widely used by occupational therapists across the United States, the lack of evidential support indicates the need for further research on its effectiveness.

According to Williams and Shellenberger (1996), the Alert Program[®] has been adapted for a variety of individuals including preschool through high school students and adults. While limited evidence is available for school-aged children, no evidence exists for early childhood education. Because much of the Alert Program[®] activities require both reading and writing, significant modifications are warranted to make it fit the early childhood environment. Moreover, many of the suggested activities would not be considered developmentally appropriate practice and consequently unacceptable in the early childhood environment. With occupational therapy's role in early childhood education, it is imperative to determine acceptable and practical approaches for teaching children in early childhood settings, aged three to five, self-regulation skill development. Based on the principals of the Alert Program[®], the overall purpose of this study is to explore the feasibility of modifying the Alert Program[®] or the early childhood setting. We asked the questions "Can it work? Will it work? Does it Work?" Throughout this paper, we will refer to our modification as the *Ready CLASS Project*. The term "Ready" in the title refers to the children achieving a feeling where they feel ready to learn and play. The term "CLASS" represents an acronym that means Classroom Lessons Applying Sensory Strategies.

Methods

Research Design

The research team developed an embedded intervention for promoting self-regulation skills in the early childhood classroom. We then designed a study to determine the feasibility of the *Ready CLASS Project*. In research, feasibility studies are used to determine whether an intervention is acceptable in a desired context, practical for a desired population, and appropriate for further testing (Bowen et al., 2010, Tickle-Degnen, 2013). Often, these studies focus on whether changes of a program's contents or procedures are necessary to fit a desired population or context (Bowen et al., 2010). Once the protocol is established through a feasibility study, more rigorous and quality research can be completed.

While the feasibility study of the *Ready CLASS Project* utilized both qualitative and quantitative data, this paper discusses only the quantitative data. (For information about the qualitative results; please see Blackwell & Dunn, in preparation). For the quantitative portion, the research team examined two data sources. First, we utilized a time-series, quasi-experimental design, which involved data on the children's responses during small and large group sessions. Second, we analyzed the impact on children's behaviors using a pre and post design. We hoped that this information would confirm the practicality of the *Ready CLASS Project* in an early childhood classroom, and determine whether this intervention was appropriate for further testing. A university Institutional Review Board approved this study.

Setting

This feasibility study took place in an urban family service center, located in a Midwestern city. The family service center offers full-day, early education programming five days a week for children from birth to five years. This center follows the federal regulations for Early Head Start and Head Start. In addition to early education programming, the center offers before/after-school care for school-age children, emergency aid, housing services, food pantry,

case management, health clinics, mental health services, and allied health services. The center maintains twelve infant-toddler classrooms and ten multi-age classrooms for children three -five years old.

Participants

One early childhood (3-5 year olds) classroom participated in the feasibility study. Three female teachers worked together as co-teachers within this classroom. Two teachers held Associate's Degrees in Child Development; both had more than twenty years of experience working with young children. The third teacher held a Bachelor's Degree in Family & Childhood Development, with three years of experience working with young children. Approximately halfway through the study, the third teacher discontinued employment at the center and no longer participated in the study. The classroom included nineteen children, with an average age of 59 months (age range: 48-66 months). Of the nineteen children, fourteen (74%) were male and five (26%) were female. The ethnic origin of the class included fifteen African-American students, two Caucasian students, and two Biracial Unspecified students. Eighty-nine percent (N= 16) of the children came from household incomes of less than \$31,000 and three of the children were considered homeless. All of the children and teachers spoke English. One child received occupational therapy, three received mental health services, four received speech therapy, and one received both speech and mental health services. The research team obtained informed consent from the classroom teachers and parents/guardians of the children.

Research Team

The research team included one registered occupational therapist, one early childhood educator, and four graduate occupational therapy students. The occupational therapist (first author) had fifteen years of experience working with children and families in early intervention,

schools, pediatric hospitals and other community settings. Further, she had prior training and experience implementing the Alert Program[®] in school and outpatient hospital settings. The early childhood educator had a master's degree in curriculum and instruction and 25 years of experience working with children, teachers and families in a variety of roles (i.e. early childhood instructional coach, resource specialists, instruction specialist). She served as supervisor to approximately twelve teachers at the study site; however, she was not the direct supervisor of the three teachers in this study. Rather, she contributed on-going expertise in implementation of best practices in early childhood education, offered insight on how to best relate to the teachers, and ensured consistency with the philosophy of the center. The graduate students completed this study as a part of their requirement of the graduate program. The graduate students participated in writing the research protocol, developing the *Ready CLASS Project* materials/activities, implementing the program, and analyzing the data.

Procedures

Before initiating the classroom intervention, we presented the proposed intervention package to a panel of experts. The expert panel included three occupational therapists, one social worker, three early childhood teachers, one mental health therapist, and two administrators. Two of the occupational therapists worked at a nearby University. With the exception of these two occupational therapists, all participants in the expert panel worked at the center where the study took place. All the participants reported between two and twenty-two years of experience working in early childhood environments. The purpose of the expert panel was to elicit feedback about materials and plans for the intervention. For example, we asked the expert panel if the materials were developmentally appropriate and a good match for the setting. Consequently, the

research team made minor revisions to all components of the intervention package as a result of the expert panel feedback.

The intervention classroom participated in the *Ready CLASS Project* as part of their general curriculum. Teachers of that classroom participated in the teacher training before initiating the classroom intervention and also completed the pretest measure on each of the children. The intervention (described in the intervention section) continued for 8 weeks. Each week included a large group session, a small group session, and teacher meetings. We recorded all three weekly sessions using a Livescribe echo smartpen (Livescribe, Inc., 2012), which allowed the researchers to play back everything written and heard during the study sessions. In addition to the notes/audio from the Livescribe, the researchers collected data on the children's responses during the large group and small group sessions. The research team met briefly after each session to discuss and reflect on the experience. Based on this discussion, the research team made adjustments to the plans for upcoming sessions. In other words, the researchers were responsive to the teachers' and children's needs rather than sticking to protocol as it was written before the study began. This responsiveness allowed the researchers to refine the intervention to increase usability in the classroom context (cite feasibility literature). Four weeks after the intervention concluded, the teachers completed the post-test measure on each of the children.

Intervention

The *Ready CLASS Project*. The research team designed a Tier 1 intervention based on the principles of the Alert Program[®] to promote development of self-regulation and social-emotional competency. As a Tier 1 intervention, the researchers did not assume any disability of dysfunction, but rather offered children and teachers a framework to practice self-regulation within a safe, supportive environment. The intervention consisted of six components: teacher

training, large group, small group, teacher meetings, handouts, and classroom tools. The teacher training occurred before the classroom intervention began, which took place over 8 weeks. The first 4 weeks of the program focused on teaching the children vocabulary to communicate their feelings and engine levels. Using the Alert Program[®] car engine analogy, the research team incorporated and expanded the vocabulary to make it appropriate for young children. For example, if your engine is running high, you may feel mad, excited, or out of control. If your engine is running low, you may feel tired, sad, or stuck in the mud. If your engine is running just right, you feel happy and ready to learn and play. The six key components for the classroom intervention included: teacher trainings (two 1-hour sessions), large group sessions (8), small group sessions (8), parent handouts (8), teacher meetings (8) and classroom materials. Next, we outline these components in more detail.

Teacher training. Before initiating the classroom intervention, teachers attended two 1-hour sessions. These sessions discussed (a) current Alert Program[®] evidence, (b) the pilot protocol, (c) desired outcomes, and (d) teacher involvement. In addition, researchers gave the teachers opportunities to converse their own personal self-regulation needs/strategies. Researchers also encouraged teachers to share self-regulation strategies they already employ in their daily routine. Finally, the research team solicited the teacher's feedback, concerns, and questions.

Large group. Once a week, the research team provided explicit instruction elements of the *Ready Class Project* to the entire class for approximately 30 minutes. The weekly sessions focused on engine vocabulary, feeling identification, and eventually strategies to change how one feels. Large group typically included reading the "How Does Your Engine Run?"[®] story aloud, interacting with pictures of children presenting with different activity levels and feelings, and

experimenting with novel sensory-motor equipment (such as tunnels, trampolines, therapy balls). These activities moved quickly so as to maintain the children's interest and attention. The research team and teachers shared responsibility in implementing the large group activities.

Small group. Once a week, the research team provided small group instruction within the classroom for 45 to 60 minutes. Small group provided hands-on experiences that reinforced the large group instruction for that week. For example, week two activities centered around "high engines". Consequently, we offered the children a sensorimotor experience like straddling a peanut shaped therapy ball to act as a boat. The children could rock or bounce the boat. We gave the children fishing poles (i.e. sticks with string and a magnet) and encouraged them to "go fishing". In the water, we offered a few pictures of children expressing high engines with paperclips attached to them. As the children captured the picture, we asked them to identify the feeling, engine level, and then place it on the correct spot on the engine level matching chart. The small group included two or three children at a time so that the activity could be engaging and provide the children many chances to interact with the materials and group leaders. During small group sessions, the classroom teachers engaged other children in meaningful classroom experiences, monitored those children playing independently, and facilitated a rotation through the research team's small group.

Teacher Meeting. Once a week, we met with the teachers for two reasons. First, to elicit feedback about small and large group sessions by discussing what went well and what could be improved. Second, we discussed the plan for the next session, which prepared the teachers for what was coming next. In addition, the goal of this collaborative meeting was to identify potential opportunity to embed experiences throughout the daily classroom routine.

Classroom Tools. The research team assembled a variety of materials for the *Ready CLASS Project* to reinforce group instruction and/or to embed opportunities throughout the daily classroom routine. Classroom tools included two categories: educational materials and sensory materials. For example, educational materials included miniature toy cars, an engine matching chart (Figure 1.1), “How Does Your Engine Run?[®]” storybook (, Figure1.2), and engine speedometer (Figure1.3). As another example, we offered posters full of photographs of children expressing high, low, and just right engine levels for display in the classroom (Figure 1.4). Finally, the researchers employed the check-in poster, which allowed for an intentional opportunity for the children to express how they were feeling at the moment, then be acknowledged and validated for those feelings. While we used the check-in poster during large group instruction, we also encouraged the teachers to use the check-in poster at least once a day. Most of the materials depicted a yellow car stuck in the mud for low engine, a green car for just right, and a red car crashing into a tree for high engine. These images were drawn by hand by the second author. We developed many of the materials prior to intervention implementation, yet others evolved from the teacher’s contributions and our own learning.

The other category of classroom tools consisted of sensory materials. Sensory materials included a weighted vest, weighted blanket, dynamic seat cushion, fidget toys, sunglasses, bubbles, and a variety of fidget toys. Other classroom tools were not necessarily tangible objects but rather techniques such as yoga poses, breathing techniques, and wall pushes.

Handouts. The researchers sent home handouts to the child’s family each week to offer background information and updates. Furthermore, the handout provided suggestions of how family members can use the program at home in an effort to support the child’s learning and facilitate opportunities to practice vocabulary and strategies in the family routine. To ensure

understanding, we designed the handouts using a simple yet colorful format and maintained a consistent organization across all eight weeks.

Data Collection/Measures

The Ready CLASS Project Activity Assessment. To document children's accuracy and performance during large and small group activities, the researchers created the *Ready CLASS Project Activity Assessment*. Using pictures of children's faces, this assessment looked at performance in these three areas: (1) Are the participating children able to correctly recognize and identify feelings of children in pictures? (Feeling Identification), (2) Are the children able to correctly state feelings with associated engine terminology? (Engine Level Identification), (3) Are the children able to correctly place identified engine levels with their corresponding pictures? (Matching Picture with Corresponding Engine Vocabulary). This data was collected during large and small group sessions.

Devereux Early Childhood Assessment (DECA). The DECA (LeBuffe & Naglieri, 1999a) is a standardized, norm-referenced behavior rating scale for children two to five years old. Developers of the DECA designed this strengths-based tool to promote resiliency within the early childhood classroom environment. Resilient children possess certain characteristics or protective factors that moderate or buffer the effects of stress and adversity. These protective factors include initiative, attachment, and self-control. The DECA represents a valid and reliable measure of initiative, self-control, and attachment. Initiative involves an ability to use independent thought and action to meet his or her needs (LeBuffe & Naglieri, 1999b). Self-control means the child's ability to experience a range of feelings and express them using the words and actions that society considers appropriate (LeBuffe & Naglieri, 1999b). Attachment symbolizes a mutual, strong, and long-lasting relationship between a child and significant

adult(s) (LeBuffe & Naglieri, 1999b). In addition to these three scales (initiative, self-control, and attachment), the DECA calculates Total Protective Factors, which denotes an overall indication of the strength of child's protective factors (LeBuffe & Naglieri, 1999b). Finally, the DECA includes a 10-item Behavioral Concern Scale that measures challenging and problem behaviors (LeBuffe & Naglieri, 1999b). This tool categorizes the child's skills as either strength, typical, or need. At this study site, the early childhood teachers already use the DECA throughout the school year. For the purpose of this study, teachers completed this measure immediately before the intervention and then four weeks after the intervention.

Data Analysis

The research team used IBM SPSS Version 20.0 (IBM SPSS, Inc., New York) to analyze the time series data and the DECA data. When interpreting time series data, many researchers use graphic visual analysis (Portney & Watkins, 2009). Traditionally, graphic visual analysis includes an examination of level, immediacy, variability, and trend (Riley-Tillman & Burns, 2009). Since this feasibility study did not collect baseline data on the measure of interest, analysis of the level and immediacy are not relevant. Instead, the goal in this feasibility investigation is to determine the trend of the children's responses of the measures of interest. A positive trend indicates that the classroom is increasing their understanding of the concept. When interpreting the DECA data, the children's standard scores were analyzed to determine if there were significant differences between the pretest and the posttest scores, using the significance level of $p=.10$ (90%). nature, the importance of capturing meaningful difference outweighs the risk of Type I error, thus a significance of $p=.10$ is more appropriate than the conventional significance of $p=.05$ (Portney and Watkins, 2009).

Results

Implementation of the Intervention Package

Researchers implemented all six components of the intervention package. While most activities and experiences occurred as planned, others did not. Both teacher training sessions occurred as planned. However, all three teachers could not attend both trainings. Due to needing coverage in the preschool classroom, one teacher attended the first session and then all three attended the second training. All eight large group sessions and eight small group sessions occurred as planned. Six out of eight weekly teacher meetings occurred. Two sessions cancelled due to lack of teacher coverage. Researchers offered both educational materials and sensory materials. We found that the body of classroom materials grew as the intervention progressed because of researcher insight and teacher input. Further, the teachers consistently utilized vocabulary and materials between group sessions during regular classroom activities, while the children spontaneously used the vocabulary and the materials in between group sessions. Researchers gave teachers one handout for each child to take home each week (a total of eight different handouts). We discovered that handouts did not always make it home in a timely manner. Finally, the research team met briefly after every intervention session. We consequently adjusted the intervention plans based on post-intervention reflection.

Child Outcomes

The *Ready CLASS Project Activity Assessment*. Although our intention was to collect this data at every session (large and small group), which is two times a week for 8 weeks, we discontinued this procedure after week 6. We did this for two reasons. First, we realized that we were structuring our activities around the need to collect data rather than arranging activities for optimal engagement. Second, we recognized that children seemed to be giving incorrect answers on purpose. We hypothesized that this was a sign of disengagement because maybe the children

were tired of the activities involving the poster and pictures. Consequently for weeks 2-6, the research team interpreted the trends of the children's responses to feeling identification, engine level recognition, and matching the engine with the corresponding vocabulary word.

Feeling identification. Results indicate that children participating in the *large* group session demonstrated increased correct responses from week 2 to week 3 and maintained from week 3 to week 4. During week 5, correct responses decreased slightly and then returned to the level of week 3 and week 4. Results indicate that children participating in the *small* group continued to increase in the correct responses from week 2 to week 5. During week 6, the children demonstrated a decline in correct responses (*Figure 2*).

Engine level identification. Results from identifying the correct engine level in the *large* group session demonstrated a decrease in correct responses from week 2 to week 3. Then from week 3 to week 6, the correct responses increased each week. Results indicate that children participating in the *small* group demonstrated an increase from week 2 to week 4. The responses stabilize from week 4 to week 5, then responses decline between week 5 and week 6 (*Figure 3*).

Matching picture with corresponding engine vocabulary word. Results from correctly matching pictures to corresponding engine vocabulary word in the *large* group setting indicate a decline from week 2 to week 3, then an increase from week 3 to week 4. The children's responses stabilized between week 4 and week 6. In the *small* group, the responses increased from week 2 to week 3, then declined from week 3 to week 4. From week 4 to week 5, the children demonstrated an increase, then a decrease in week 6 (*Figure 4*).

Devereaux Early Childhood Assessment (DECA). Research team analyzed pre and post intervention DECA scores. The DECA looks specifically at changes in attachment, self-control, initiative, and behavior scores; as reported by their classroom teachers. The goal is for

initiative, self-control, attachment, and total protective factors to increase, while behavior control scores decrease. There was no significant difference between pre and post intervention testing initiative, self-control, attachment, and total protective factors (*Table 1*).

Discussion

This feasibility study led to abundant insights regarding next steps in this line of inquiry. Next, we discuss strengths, limitations, and finally implications for future research.

Strengths

The *Ready CLASS Project* intervention package. We identify a number of strengths within the six components of the intervention package. First, the teacher training sessions are vital to (a) gaining initial “buy-in”, investment, and ownership and (b) preparing teachers for the roles and responsibilities. Second, the frequency and consistency of class-wide groups helped the concepts stay fresh in both the teacher’s and children’s minds. Third, children used the vocabulary words in the group context but teachers/parents also reported spontaneous use of the words in classroom and home. This emphasis on particular vocabulary promotes development of social-emotional skills, communication skills, and literacy skills. Fourth, teacher meetings were critical as they offer teachers (a) a space to contribute to the direction of the intervention and take ownership of the intervention and (b) an opportunity to feel prepared for the upcoming group lessons. Fifth, the researcher weekly reflection/planning sessions allowed the researchers to be responsive to the unique needs of the teachers and students. Further, these sessions allowed the researchers to immediately address weakness in the intervention. Sixth, class materials offer a bridge between sessions that promotes sustainability beyond intervention phase. The teachers further commented that they liked how the materials and repetition promoted literacy as the children began to memorize the “How Does Your Engine Run? [®]” social story to the point where

they were “reading” the story independently. Seventh, the project also introduced sensory equipment that the teachers and children might not otherwise have knowledge about or have access to. Finally, the parent handout provided an opportunity for parents to be informed about new vocabulary and skills their children might utilize at home.

The Ready CLASS Project Activity Assessment. This assessment tracked the use of the vocabulary words in the structured group context. Consequently, this assessment allowed the researchers to determine the children’s comprehension of the concepts.

DECA. The DECA is an assessment tool already utilized in the setting. The teachers were familiar with the assessment and did not require additional training for research purposes. The DECA requires that administrators be familiar with the children for at least 4 weeks, which the teachers in this study knew these children for the entire school year. The DECA is designed to strengthen the abilities of the children and design a classroom that builds upon their strengths for healthy social-emotional development. The intervention components and assessment measures are worth considering in any future replication of this study.

Limitations

The Ready CLASS project Intervention Package. We noted a number of limitations in this study. Although the teacher training was useful, we did not have full attendance at both sessions. As a result, we needed to use the second session to play catch up with two out of three teachers. We had hoped after the first session the teachers could reflect and bring back additional questions. This discussion would be facilitated by a homework assignment between training session one and two. Another limitation was that occasionally, the teachers made slight adjustments to the daily routine (such as going outside earlier) and consequently forgot we were coming for the class-wide groups. Because the teachers forgot we were coming our group posed

as a disruption; for example, the children were pulled from the outdoor playground when we arrived.

An additional limitation was related to teacher meetings. Since all teacher meetings did not happen as planned, we believe that opportunities for collaboration and growth were lost. Further, we did not consistently have both teachers at these sessions, further compromising the potential of these meetings. We speculate that the teacher coaching sessions lacked enough structure to maximize the potential for collaboration and changes in behavior. Regarding the parent handout, written notes may not be the best way to keep parents informed.

Finally, we acknowledge that the class materials warrant additional refinement. More specifically, the classroom poster (figure 1.1) illustrates the concepts high, low, and just right on a horizontal format. We wonder if a vertical format would be easier for understanding the concepts of high and low. Or if we preserve the horizontal format, we wonder if the terms fast and slow are more relevant to this age group than high and low. Either of these words could appropriately refer to arousal, attention, or behavior. Yet, fast and slow may not accurately encompass emotional regulation. Furthermore, we recognize that the phrase just right is an appropriate term for arousal, attention, or behavior, but may be too evaluative for emotional regulation. In other words, there is a risk that the children (or teachers) will assign value to certain engine levels (i.e. “I am good” or “I am bad”). This may be reconciled by replacing the phrase just right with a new phrase or through intentional learning experiences. Another consideration is the image of a car crashing into a tree to represent high engines. It is possible that this image gives high engine a more negative connotation than desired. Lastly, we may consider real photographs of cars rather than hand drawn figures to be more consistent with the educational philosophy of the early learning center.

Regarding the sensory materials, we do not know the extent that the teachers spontaneously used the sensory strategies in context. Unfortunately, we did not have adequate mechanisms in place to document these actions. We believe it might have been more useful to the teachers if we had modeled and supported the use of sensory strategies “in the moment”. We could also have emphasized use of the sensory strategies during teacher meetings. While we addressed some of these limitations of the intervention package as went along, a future replication of this study should keep these issues in mind.

The Ready CLASS Project Activity Assessment. While the children did show an increase in using the vocabulary words, we noted four issues with the data collection related to vocabulary. First, around week 5 or 6, children began being ‘silly’ with the responses e.g. intentionally giving incorrect responses. This suggests they knew the right responses but were either disengaged or wanted attention from the adults. Second, we noted inconsistency between researchers about how much to help children during the activity. For example, some researchers made exaggerated facial expressions and/or emphasized the words to ensure the children selected the correct answers while others did not. The confusion originated in that we considered this activity a learning experience but also a data collection opportunity. Third, during the second half of the intervention (weeks 4-5), the data collection approach began to limit creativity and relevance. More specifically, the researchers began focusing on activities that made data collection possible rather than prioritizing the children’s engagement. This could explain the disengagement and subsequent decline in correct responses noted. We discontinued data collection and activity plans once we discovered this barrier. Finally, attendance affected correct responses as children were often absent. More specifically, an average of 2.8 children missed the large group experiences and an average of 4.6 children missed the small group experiences.

Frequent absences directly impact the children's exposure to the concepts and subsequent learning.

DECA. DECA scores did not demonstrate significant change from pre to post intervention, demonstrating some limitations in the intervention. The DECA is recommended to be administered two to three times a year, since the testing periods conducted in this study were within this timeframe significant changes could have occurred. This demonstrates that the intervention package may not be long enough and/or strong enough to elicit changes in the DECA assessment. Since both the DECA and the *Ready CLASS Project* are designed to be completed by the classroom teachers, this may create a bias. Furthermore, one of the classroom teachers left the school during the intervention period. The loss of a significant attachment figure in the classroom could have had a negative effect on the children's attachment scores on this assessment.

Implications for future research

Based on this feasibility study, the *Ready CLASS Project* warrants further investigation with a number of adjustments related to the intervention package and the data collection methods. First, we discuss the intervention package.

The *Ready CLASS Project* Intervention Package. We recognize that we could strengthen all six components of the intervention package. Giving additional attention to these components could yield more significant outcomes. Below is a list of the insights we gained toward future replications.

Teacher training. We need to ensure that the teachers and their immediate supervisor appreciate the importance of these sessions. We should offer supports and assist with arrangements to guarantee that teachers are available for sessions. We may consider re-

structuring the training sessions to include planning *with* the teachers, rather than planning many of the lessons *for* the teachers.

Class-wide groups. The adjustments to class-wide groups fall into two categories: group content and strategy. As far as group content, we acknowledge some flaws, which we discussed above in the limitations. Because the data collection methods inadvertently began to compromise the small group activity engagement, we need to consider alternatives. In other words, we need to ensure data collection does not dictate lesson plans. One option is to re-examine data collection methods and consider alternatives. Another option is to discontinue collecting response data once most children demonstrate consistent correct use of the vocabulary. Yet another option is to explore more open-ended activities consistent with developmentally appropriate practice (DAP) (NAEYC, 2009). Our preliminary ideas not only address social-emotional domain but also literacy, math, science, and motor areas. The teachers would likely find this useful in helping achieve the standards and expectations of quality early childhood environments. We would further benefit from problem-solving such solutions with teachers while encouraging them to facilitate more of these experiences.

Another adjustment category relates to strategy. Since child were absent frequently, we may want to prioritize the children who were absent for small groups. The same is true for children who need extra support in learning the concepts. We might consider the RtI model (Riley-Tillman & Burns, 2009); whereas, the eight week intervention might be tier one. For children who do not respond to this first tier, we move them to small group work for a designated period of time (tier two). An additional strategic change is to focus more on teaching the teachers how and when to use the sensory strategies during weeks five through eight, instead of

the children. This can be achieved by scheduling opportunities to support teachers and children “in the moment” to try out sensory strategies.

Class materials. We want to continue to explore *additional* expansion activities to promote concepts in between group sessions. One idea is to encourage use of commercially available books to reinforce the concepts of the intervention. Another idea is create more sensory social stories to help illustrate the concepts (Thompson & Johnston, 2013; Marr & Nackley, 2010). Finally, we continue to appreciate the need for visual supports to help the children know when the group is happening and what is happening during the group.

Teacher meetings. Like teacher training, we need to ensure that the teachers and their immediate supervisor appreciate the importance of these sessions. We should offer supports and assist with arrangements to guarantee that teachers are available for sessions. In addition to making sure that all teachers can participate in all sessions, we appreciate the need to strengthen these sessions. These meetings ended up being more directive than we initially intended (Blackwell & Dunn, in preparation). Offering the teachers more opportunities to make choices could help this, but perhaps using the coaching framework outlined by (Rush & Shelden, 2011), would help the researchers structure the meetings to be even more productive and collaborative. For instance, researchers may want to focus on more problem-solving opportunities with the teachers. Researchers could prompt the teachers with questions like, “Tell me about a time where you used or thought about using sensory strategies.” Such a prompt would give the teachers an opportunity to be validated, encouraged, or supported to generate a new solution. Another useful method to support the teachers could include videotaping classroom interactions and discussing these episodes using reflective questions during teacher meetings. Further, it may

be useful to add a component where the researchers come to the classroom during the regular routine to model and support teachers “in the moment”.

Parent handout. Simple, user-friendly handouts were the simplest way to keep parents informed. Next, we might explore alternate forms of communication such as emails, phone calls, or texts to parents. We could also consider a parent informational session or parent participation.

Data Collection

Activity assessment. There are two possible solutions to address the limitations of data collection procedures. One option involves discontinuing collecting activity assessment data, after most children demonstrate consistent correct use of the vocabulary during group sessions. Another option might be to use activity assessment data to identify which children need more support or instruction on the concepts. Strategies for these children could be the subject of the teacher coaching sessions. The final option involves separating the data collection from the group activity.

DECA. There are multiple avenues to address the limitations of the DECA in relation to this study. The intervention may need to change to elicit changes in the DECA; a longer intervention period, stronger training of teachers, and intensified classroom support. Alternately, it may be necessary to explore other assessment tools to find a better fit for the *Ready CLASS Project*. Assessment tools that are completed by an unbiased source may prove useful. In addition to measuring comprehension of concepts and growth in self-regulation, we may also want to know more about how often the teachers are using sensory strategies and the subsequent outcome.

Conclusion

The results of this feasibility study contribute to our understanding of the practicality of implementing a self-regulation program within the early childhood environment. The program explicitly teaches children about self-regulation. This study suggests that we can influence children's vocabulary about self-regulation and feelings recognition capacity when the activities and experiences become embedded into the daily routine. Further, this new vocabulary gives teachers more opportunities to attune with children about their feelings or activity levels. While the program attempts to support teachers and children in using sensory strategies within the daily routine, the desired outcome was not fully realized. Additional refinement of this intervention is warranted.

References

- American Occupational Therapy Association. (2008). Occupational therapy practice framework: Domain and process (2nd ed.). *American Journal of Occupational Therapy*, 62(6), 625–683.
- American Occupational Therapy Association. (2009). *Occupational therapy and school mental health* (Fact Sheet). Retrieved from <http://www.aota.org/About-Occupational-Therapy/Professionals/CY/School.aspx>
- Barnes, K. J., Beck, A. J., Vogel, K. A., Grice, K. O., & Murphy, D. (2003). Perceptions regarding school-based occupational therapy for children with emotional disturbances. *The American journal of occupational therapy*, 57(3), 337-341.
- Barnes, K. J., Vogel, K. A., Beck, A. J., Schoenfeld, H. B., & Owen, S. V. (2008). Self-regulation strategies of children with emotional disturbance. *Physical & Occupational Therapy in Pediatrics*, 28(4), 369-387.
- Bazyk, S. (Ed.). (2011). *Mental health promotion, prevention, and intervention with children and youth: A guiding framework for occupational therapy*. Bethesda, Maryland: AOTA Press.
- Blackwell, A., & Dunn, W. (2013). *Active ingredients for an embedded intervention within the early childhood classroom*. Manuscript in preparation.
- Bowen, D. J., Kreuter, M., Spring, B., Cofta-Woerpel, L., Linnan, L., Weiner, D., ... & Fernandez, M. (2009). How we design feasibility studies. *American journal of preventive medicine*, 36(5), 452-457.
- Case-Smith, J., & Archer, L. (2008). School-based services for students with emotional disturbance: Findings and recommendations. *OT PRACTICE*, 13(1), 17.

- Cohn, E., Miller, L. J., & Tickle-Degnen, L. (2000). Parental hopes for therapy outcomes: Children with sensory modulation disorders. *The American Journal of Occupational Therapy, 54*(1), 36-43.
- Dunn, W. (2006). *The Sensory Profile School Companion manual*. San Antonio, Texas: Psychological Corporation.
- Fertel-Daly, D., Bedell, G., & Hinojosa, J. (2001). Effects of a weighted vest on attention to task and self-stimulatory behaviors in preschoolers with pervasive developmental disorders. *The American Journal of Occupational Therapy, 55*(6), 629-640.
- Grove, R. (2002). OT in the schools: Embracing our psychosocial roots. *OT Practice, (7)*6, 21–25.
- LeBuffe, P. A., & Naglieri, J. A. (1999a). *Devereux Early Childhood Assessment: Technical manual*. Kaplan Press.
- LeBuffe, P. A., & Naglieri, J. A. (1999b). *Devereux Early Childhood Assessment: User's Guide*. Kaplan Press.
- Leveille, G., McMahon, K., Alcantara, E., & Zibell, S. (2008). Benefits of chewing gum: Oral health and beyond. *Nutrition Today, 43*(2), 75-81.
- Livescribe, Inc. (2012). Echo Smartpen [hardware and software]. Oakland, CA: Author.
- Marr, D., & Nackley, V. (2010). Social stories and sensory stories in autism intervention. *OT Practice, 15*(10), 17-20.
- McClelland, M. M., Cameron, C. E., Connor, C. M., Farris, C. L., Jewkes, A. M., & Morrison, F. J. (2007). Links between behavioral regulation and preschoolers' literacy, vocabulary, and math skills. *Developmental psychology, 43*(4), 947. doi: 10.1037/0012-1649.43.4.947

- Mulligan, S. (2001). Classroom strategies used by teachers of students with attention deficit hyperactivity disorder. *Physical & occupational therapy in pediatrics*, 20(4), 25-44.
- National Association for the Education of Young Children. (2009). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8: A position statement of the National Association for the Education of Young Children*. Retrieved from <http://www.naeyc.org/files/naeyc/file/positions/position%20statement%20Web.pdf>
- Pfeiffer, B., Henry, A., Miller, S., & Witherell, S. (2008). Effectiveness of disc 'o'sit cushions on attention to task in second-grade students with attention difficulties. *The American Journal of Occupational Therapy*, 62(3), 274-281.
- Portney, L. G., & Watkins, M. P. (2009). *Foundations of clinical research, 3rd Ed.* Upper Saddle River, NJ: Pearson Education, Inc..
- Post, Y., Boyer, W., & Brett, L. (2006). A historical examination of self-regulation: Helping children now and in the future. *Early Childhood Education Journal*, 34 (1), 5-14. doi: 10.1007/s10643-006-0107-x
- Rappport, M. D., Bolden, J., Kofler, M. J., Sarver, D. E., Raiker, J. S., & Alderson, R. M. (2009). Hyperactivity in boys with attention-deficit/hyperactivity disorder (ADHD): A ubiquitous core symptom or manifestation of working memory deficits? *Journal of Abnormal Child Psychology*, 37(4), 521-534.
- Raver, C. C. (2004). Placing emotional self-regulation in sociocultural and socioeconomic contexts. *Child Development*, 75(2), 346-353. Retrieved from <http://www.jstor.org/stable/3696641>

- Riley-Tillman, T. C., & Burns, M. K. (2009). *Evaluating educational interventions: Single-case design for measuring response to intervention*. New York, NY: Guilford Press.
- Rothbart, M. K., Sheese, B. E., Rueda, M. R., & Posner, M. I. (2011). Developing mechanisms of self-regulation in early life. *Emotion review*, 3(2), 207-213. doi: 10.1177/1754073910387943
- Rush, D. D., & Shelden, M. L. L. (2011). *The Early Childhood Coaching Handbook*. Baltimore, MD: Brookes Publishing Company.
- Salls, J., & Bucey, J. C. (2003). Self-regulation strategies for middle school students. *OT PRACTICE*, 8(5), 11-16.
- Scheerer, C. R. (1992). Perspectives on an Oral Motor Activity: The Use of Rubber Tubing as a “Chewy”. *The American Journal of Occupational Therapy*, 46(4), 344-352.
- Schilling, D. L., Washington, K., Billingsley, F. F., & Deitz, J. (2003). Classroom seating for children with attention deficit hyperactivity disorder: Therapy balls versus chairs. *The American Journal of Occupational Therapy*, 57(5), 534-541.
- Schoonover, J. (2002). Teaching social skills. In Y. Swinth & B. Hanft (eds), *School-based practice: Moving beyond 1:1 service delivery*. *OT Practice*, 18-19. Retrieved from <http://www.aota.org/Pubs/OTP.aspx>
- Shonkoff, J. P., & Phillips, D. A. (Eds.). (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, D.C.: National Academies Press.
- Tickle-Degnen, L. (2013). Nuts and Bolts of Conducting Feasibility Studies. *The American Journal of Occupational Therapy*, 67(2), 171-176. doi: 10.5014/ajot.2013.006270

- Thompson, R. M., & Johnston, S. (2013). Use of Social Stories to Improve Self-Regulation in Children with Autism Spectrum Disorders. *Physical & occupational therapy in pediatrics*. doi: 10.3109/01942638.2013.768322
- VandenBerg, N. L. (2001). The use of a weighted vest to increase on-task behavior in children with attention difficulties. *The American Journal of Occupational Therapy*, 55(6), 621-628.
- Wells, A. M., Chasnoff, I. J., Schmidt, C. A., Telford, E., & Schwartz, L. D. (2012). Neurocognitive habilitation therapy for children with fetal alcohol spectrum disorders: An adaptation of the Alert Program®. *The American Journal of Occupational Therapy*, 66(1), 24-34.
- Williams, M. S., & Shellenberger, S. (1996). *How does your engine run?: A leader's guide to The Alert Program for self-regulation*. Albuquerque, New Mexico: TherapyWorks, Inc.
- Williamson, G.G., & Anzalone, M.E. (2001). *Sensory integration and self-regulation in infants and toddlers: Helping very young children interact with their environment*. Washington, D.C.: ZERO TO THREE: National Center for Infants, Toddlers, and Families.

Materials for the *Ready CLASS Project*



Figure 1.1 Engine Level Matching Chart, similar board also used for check-in.

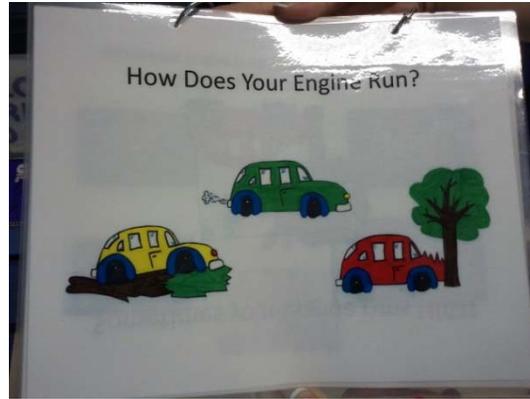


Figure 1.2 Small book used for small group. Also had large version of book.



Figure 1.3 Engine Speedometer, used for children waiting during small group activity.



Figure 1.4 Just Right poster, similar posters were also created for high and low and were left in the classroom after being taught to the class.

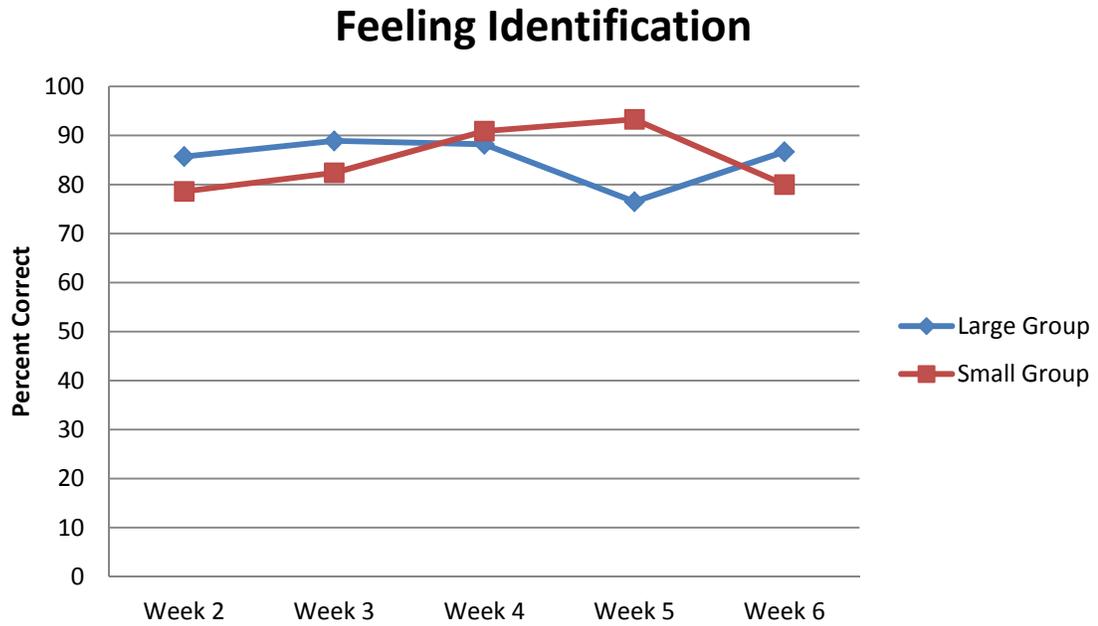


Figure 2. Percentage of correct responses for identifying feelings of children in pictures during large group and small group sessions.

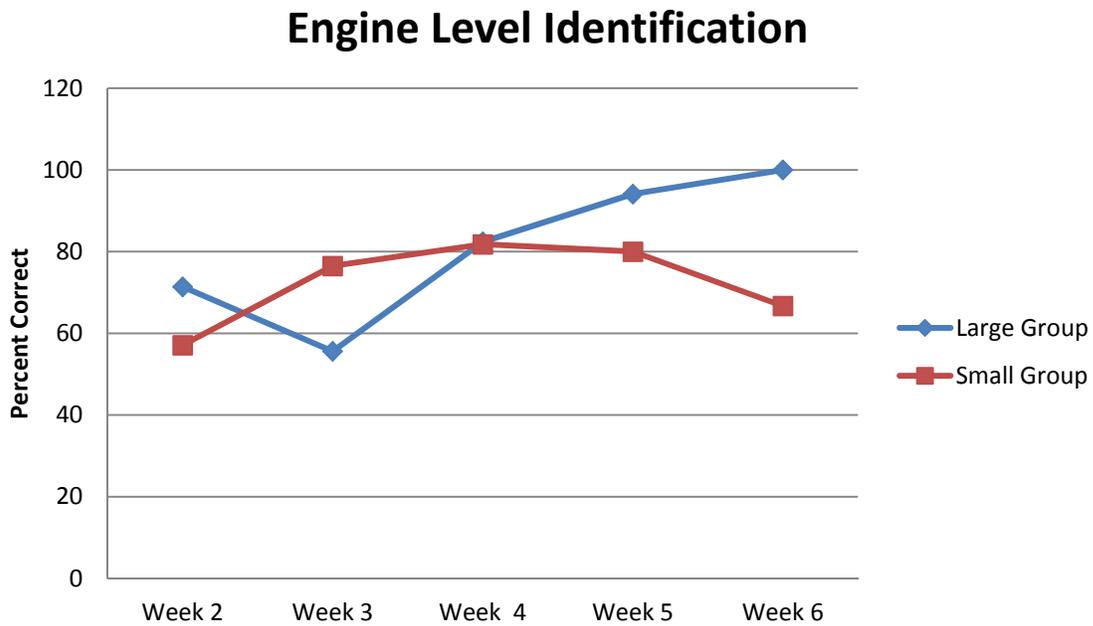


Figure 3. Percentage of correct responses stating the feelings with associated engine terminology of children in pictures during large group and small group sessions.

Matching Picture with Corresponding Engine Vocabulary

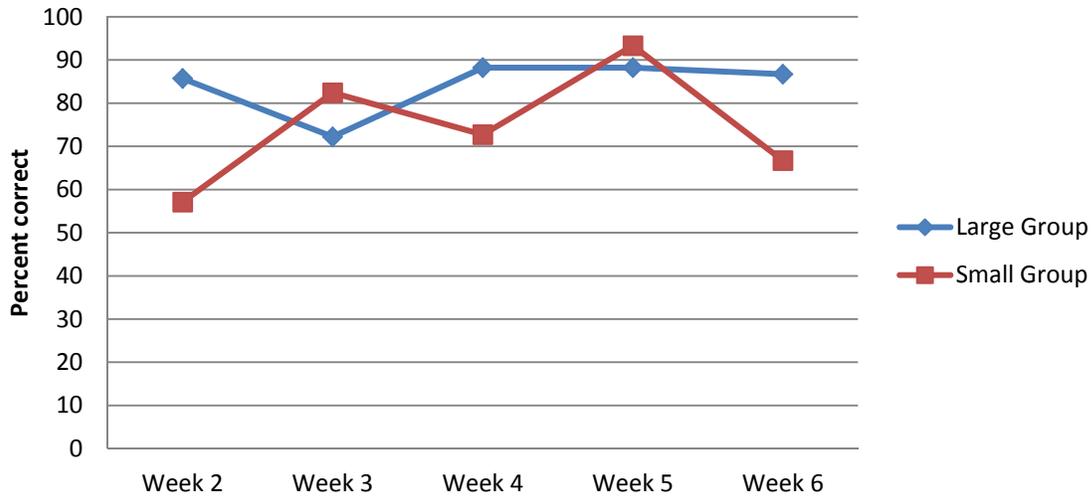


Figure 4. Percentage of correct responses for matching pictures of children with corresponding engine vocabulary during large group and small group sessions.

Table 1. Devereaux Early Childhood Assessment (DECA): Change from Pre- to Post-Test

Measure	Pre-Test		Post-Test		t	df	p
	X	SD	X	SD			
Initiative	32.33	8.05	31.94	6.94	.326	17	.749
Self-Control	19.72	6.66	20.28	6.52	-.704	17	.491
Attachment	23.50	4.81	22.94	5.29	.632	17	.536
Total Protective Factors	75.56	18.12	75.17	17.41	.163	17	.873
Behavior Control	13.11	5.83	12.28	6.59	.774	17	.449

Note. No significant difference on a two-tailed test

Appendix C

Active Ingredients for an Embedded Intervention within the Early Childhood Classroom

Comprehensive Exam II

Public education in the United States is moving toward a tiered model of intervention (Response to Intervention) (Handley-More, Hollenbeck, Orentlicher, & Wall, 2013). Response to Intervention (RtI) outlines a multi-tiered intervention approach within the general education classroom for both academic and behavioral needs (Bayat, Mindes, & Covitt, 2010; Coleman, Roth, & West, 2009). RtI begins with intervention with a whole school or whole classroom because they are evidenced based practices deemed to benefit all children (Tier 1). The operative word in RtI is response or responsiveness. At Tier 1, the school team monitors progress of all children. If certain children not progress within Tier 1, then the school team responds to this evidence by advancing them to Tier 2. In Tier 2, intervention will be more focused and intensive with a smaller group of identified children. Approximately 15% of the children will fall into this category (Buysse & Peisner-Feinberg, 2013). If a child does not progress within Tier 2, then the team uses this evidence to advance them to Tier 3. In Tier 3, the team identifies individual interventions and specific progress monitoring (Ball & Trammell, 2011). Approximately 5% of the children will fall into this category (Buysse & Peisner-Feinberg, 2013). Scholars propose that RtI provides a unified system for supporting more children within the general education environment and decreases potential special education referrals (AOTA Response to Intervention Workgroup, 2012). Occupational therapy has a unique opportunity to support an increased number of children in the general education environment. By starting with Tier 1, occupational therapists can pursue opportunities to embed their services within the general education environment. Therefore, the purpose of this paper is to describe the key characteristics necessary to create an embedded intervention within an early education setting.

As for the early childhood setting, the RtI approach creates an opportunity for occupational therapists to support all children in their classroom. Beginning at Tier 1,

occupational therapists may assist educators in class-wide screening related to either education or behavior needs. Based on needs of the class, an occupational therapist might recommend relevant activities, strategies, or materials that could benefit typically developing children as well as those with greater needs. The goal of this Tier 1 approach would be to embed the intervention into the daily lessons and routines rather than create an isolated strategy or event with the occupational therapist. Embedded interventions allow children more frequent exposure and practice over a longer period of time (Dunn, 2011). Given the opportunity to function and learn in the natural environment of the classroom, more intensive services (i.e. Tier 2 and Tier 3) may not be warranted.

Evidence is emerging on high frequency, class wide interventions in early childhood education from occupational therapy. High frequency refers to the opportunity or exposure to particular content within daily routine. Lust and Donica (2011) indicated significant, positive outcomes after providing handwriting readiness program in a classroom with 4 and 5 year olds. The therapist and teacher lead a group three times a week over the course of six months. Further, the therapist suggested follow-up activities for the teacher to do on other days. The experimental group made significant gains in pre-writing, school readiness, and fine motor skills. As another example, Bellows, Davies, Anderson, and Kennedy (2013) showed significant positive changes in gross motor skills in a classroom with 3 to 5 year olds. Teachers provided a gross motor lesson four times a week for 18 weeks. Both of these studies suggest that high frequency instruction (i.e. three or more times a week) yields favorable results. These studies illustrate the immediate impact of a high frequency, class wide intervention; yet, the active ingredients that contributed to such outcomes remain unknown. Furthermore, these interventions spanned 4 to 6 months, so more research is needed to examine a shorter intervention period to be more consistent with the

RtI approach. For instance, researchers might increase intensity for a small percentage of identified children who do not show progress after designated period such as two months.

The work of Ohl and colleagues (2013) represents an early example of a Tier 1 intervention in occupational therapy. These researchers implemented a 10-week intervention program addressing fine motor and visual-motor skills in a Kindergarten classroom using a pretest-posttest control-group design including 113 children. The 10-week intervention included three main parts: 30-minute weekly lesson (led by an occupational therapist), a fine motor center activity (related to weekly lesson), and teacher-occupational therapist consultation time. The fine motor center activity extends the weekly lesson and creates an embedded opportunity that children can access daily. In other words, the exposure moves beyond an isolated weekly lesson. As a result, the intervention group showed a significant increase in fine motor and visual motor skills, while the control group declined slightly (Ohl, Graze, Weber, Kenny, Salvatore, & Wagreich, 2013). More studies combining targeted lessons, embedded opportunities, and teacher consultation are needed. More specifically, more investigations like this with different age groups (early childhood and school age) and with different areas of practice (such as social-emotional skills) would be useful. Moreover, we would benefit from a greater understanding of the teacher-therapist interaction that make interventions like this successful.

Aside from the RtI approach, many scholars attempt to address early childhood priorities through integrated or embedded models of practice. Scholars in speech-language pathology, for example, describe an embedded-explicit model of intervention for emergent literacy (Justice & Kaderavek, 2004; Kaderavek & Justice, 2004). The embedded explicit model promotes naturalistic, meaningful, intentional, and contextualized exposure to the target concepts (i.e., emergent literacy). As for the explicit part, the model also involves the therapist planning and

implementing small group and/or whole class activities related to the target concepts, which occur two to three times per week (Justice & Kaderavek, 2004). Regarding the embedded part, the model promotes daily opportunities such as literacy- enriched play settings and storybook reading. The embedded-explicit model is beneficial in that it helps to clarify a therapist's role as collaborators and direct service providers within children's natural environment (Justice & Kaderavek, 2004). An immediate benefit of embedded-explicit model is that it represents an efficient and effective way for addressing widespread needs (similar to a Tier 1 approach). This model provides a framework for other related service providers; yet, we need scientific evidence that shows positive outcomes using this framework.

Similar to the embedded-explicit model, Bazyk and colleagues (2009) describe an integrated model of occupational therapy intervention, which offer a useful framework for implementing services within a general education environment. The integrated model involves both direct (planned group activities) and indirect services (observations, teacher training, classroom materials, consultation). Bazyk and colleagues included both emergent literacy and fine motor skills in their intervention. Among the 37 kindergarten children who participated in the seven month integrated occupational therapy intervention, children made in significant improvements in areas of fine motor and literacy. Those without disabilities showed improvement in more areas of fine motor and literacy than children with disabilities. Since this study did not include a control group, additional rigorous studies using integrated service design are needed. Nonetheless, this integrated model represents a feasible option for therapists to support participation within the general education environment.

The concept of either teacher consultation or collaboration is evident in each of the examples mentioned above. Other researchers add that therapist-teacher collaboration central to inclusion

and positive student outcomes (Collins, 2013; Handley-More, Wall, Orentlicher, & Hollenbeck, 2013; Morris, 2013). Despite embracing the importance of collaboration, some studies suggest that practicing therapists remain mystified by exactly how to collaborate effectively (Benson, 2013; Bose & Hinojosa, 2008). Therapists want a venue to offer expertise and provide teachers with support. Therapists need more guidance on how to navigate this complex skill.

The literature on co-teaching and coaching offer therapists structure for collaborating/consulting with teachers to improve outcomes. Co-teaching involves two or more professionals delivering instruction to a group of students with a single classroom (Cook & Friend, 1995; Silverman, 2011). Using a co-teaching model between a classroom teacher and occupational therapist, researchers implemented a 12-week handwriting program with first-grade students. The co-teaching intervention yielded positive outcomes in legibility, speed, and fluency (Case-Smith, Holland, & Bishop, 2011; Case-Smith, Holland, Lane, & White, 2012). The other approach, coaching comes from adult learning theory (Rush & Shelden, 2011). The goal of coaching is to build the capacity of a caregiver or colleague to improve existing abilities, develop new skills, and gain a deeper understanding of his/her practices for use in current and future situations (Rush & Shelden, 2005). Early work using coaching in occupational therapy yielded positive results with parents of children with disabilities (Dunn, Cox, Foster, Mische-Lawson, & Tanquary, 2012; Graham, Rodger, & Ziviani, 2009).

Combining literature from RtI, integrated models, embedded models, co-teaching, and coaching, we developed an intervention package to foster the development of self-regulation skills in the early childhood environment called the *Ready CLASS Project*. The *Ready CLASS Project* evolved from concepts in the Alert Program[®] (Williams & Shellenberger, 1996). In a feasibility study, we outlined activities and materials for implementation of the *Ready CLASS*

Project. As the intervention progressed, we collaborated with the teachers about both explicit group instruction and opportunities to learn self-regulation embedded within the classroom routines (Blackwell, Yeager, Mische-Lawson, Cook, & Bird, submitted). Since the teacher and therapist offered the intervention to the entire class and the concepts (lessons, routines, and materials) become embedded in the classroom, we consider this a Tier 1 intervention.

This paper outlines the Active Ingredients necessary to create an embedded intervention within an early education setting. To this end, we report about a process of examining meeting transcripts from the feasibility study described in Blackwell, Yeager, Mische-Lawson, Cook, & Bird (submitted). The term “Active Ingredients” refers to the key characteristics that contribute to the success of the therapeutic intervention. The Active Ingredients explain how the intervention works and how the Active Ingredients are exerting their effect (Craig et al., 2008). We wanted to understand how these Active Ingredients work together to form a conceptual framework. The following questions guided our study:

- How does one implement a desired intervention approach within an early childhood education setting?
- What parts of this framework work and why?
- What parts do not work and why?
- What parts should we replicate?

By answering these questions, we may further refine a framework for implementing a Tier 1 intervention for occupational therapists in early childhood education.

Methods

In this study, we examine qualitative data from meetings among early childhood classroom teachers, occupational therapy providers and other support personnel (see Research Team

below). Meetings between the teachers and research team occurred during a feasibility study of the *Ready CLASS Project*.

Participants

Teachers. Three early childhood teachers participated in the feasibility study with experience ranging from 3 to 25 years in early childhood education. Two teachers held associate degrees in child development, while the other teacher held a bachelor's degree in family and childhood development. These three teachers functioned as co-teachers in one 3-5 year old classroom of nineteen children. Approximately halfway through the study, one teacher discontinued employment at the center and no longer participated in the study. Researchers obtained informed consent from all three teachers.

Research Team. A primary research team of six implemented the feasibility study procedures. This team included one registered occupational therapist, one early childhood educator, and four occupational therapy graduate students. The occupational therapist (first author) had fifteen years of experience working with children and families in early intervention, schools, pediatric hospitals, and other community settings. Further, she had prior experience implementing the Alert Program[®].

The early childhood educator had a master's degree in curriculum and instruction and 25 years of experience working with children, teachers, and families in a variety of roles (i.e. early childhood instructional coach, resource specialists, instruction specialist). She served as supervisor to approximately twelve teachers at the study site; however, she was not the direct supervisor of the three teachers in this study. Rather, she contributed by providing on-going expertise in implementation of best practices in early childhood education, offering insight on the

best ways to relate to the teachers, and ensuring consistency with the education philosophy of the center.

The occupational therapy graduate students completed the feasibility study as a part of their requirement of the graduate program. The graduate students participated in writing the research protocol, developing the *Ready CLASS Project*, and implementing the classroom intervention (including teacher meetings).

Data Analysis Team. Nine colleagues assisted the primary author in three distinct phases of defining and validating the operational definitions used in data analysis (see ‘indexing’ process below). This group consisted of five occupational therapists with six months to 35 years of experience, two speech-language pathologists with 10 and 11 years of experience, one school psychologist with seven years of experience, and one sociologist with 10 years of experience in the field of special education.

Data Collection

The data for the present study came from weekly meeting transcripts between the teachers and the research team over the 8-week period of intervention implementation. Each meeting included one or both classroom teachers. At least two out of the six research team members participated in each of these meetings. One member facilitated the meeting while another took notes. The purpose of these meetings was three-fold. First, we wanted to elicit feedback about small and large group sessions by discussing what went well during the intervention and what needed improvement. Second, we wanted to share the proposed plan for the upcoming week. Third, we wanted to receive feedback about the proposed plan. We recorded these meetings using a Livescribe™ smartpen (Livescribe™, Inc., 2012). The Livescribe™

smartpen allows users to record and play back everything written and heard, which then can be transcribed for coding.

Data Analysis

We employed a deductive qualitative analysis technique, sometimes referred to as a “framework approach” (Pope, Ziebland, & Mays, 2000). In this approach, analysis starts from pre-set aims and objectives, strongly informed by *a priori* reasoning. This reasoning comes from clinical experience and literature. When using a deductive approach, researchers hypothesize that certain themes will be present before beginning the analysis. Hence, the analytic process tends to be more predictive and explicit than inductive qualitative work. With inductive work, researchers look for themes to emerge from the data (Miles, Huberman, & Saldana, 2014). In other words, inductive analysis moves from specific ideas in the data to develop general themes. In contrast, the deductive approach starts with general themes and seeks to identify specific within the data (Elo & Kyngas, 2007). Pope and colleagues (2000) argued that this design protects against potentially subjective judgments of an individual researcher. Further, such an approach allows researchers to build on previous insights in the field (Bradley, Curry, & Devers, 2007). Because this analysis occurred after the completion of the intervention study, we suspected the presence of the Active Ingredients that made the intervention successful. We wanted to test the presence of the Active Ingredients in the teacher-researcher meeting transcripts. Consequently, we began with a general theme (Active Ingredients) and then analyzed the data to identify specific instances of each ingredient.

The deductive or framework approach involves five stages: familiarizing, identifying a thematic framework, indexing, charting, and interpretation/mapping (Pope et al., 2000). For the familiarizing stage, we listened to selected audio files, reviewed field notes, and generated a list

of key concepts. In the next stage, we narrowed the list of key concepts into four hypothesized Active Ingredients and conceptualized a framework to illustrate the relationship between the Active Ingredients (see Figure 1). This stage also included developing operational definitions for each Active Ingredient. Literature and clinical experience informed this stage.

In the third stage (indexing), the primary author and a member from the data analysis team independently coded one meeting transcript using the operational definitions. The primary author compared the two data analyses to identify agreement and disagreement in application of the operational definitions. After further discussion about disagreements in the coding, the primary author re-organized the Active Ingredients and revised operational definitions to achieve 84% agreement.

As indexing continued, the primary author introduced the operational definitions to a group of seven colleagues (members of Data Analysis Team). This group applied the definitions to a meeting transcript and discussed their agreements and disagreements with coding, which led to further revision of the definitions. After this discussion, the primary researcher reduced the four Active Ingredients to three. An evolution of the conceptual framework is expected during this process (Miles, Huberman, & Saldana, 2014). The process of analyzing meeting transcripts continued until the team achieved intra-rater reliability of 93% (primary author with self) and inter-rater reliability of 90% (primary author with a different member of the Data Analysis Team).

In the fourth stage (charting) we examined statements related to each Active Ingredient together to glean additional insight. In the fifth and final stage (interpretation/mapping), we further revised the conceptual framework (see Figure 2). At this stage, we employed inductive

analysis as we identified an unanticipated though important theme that could not be ignored (Elo & Kyngas, 2007).

Results and Discussion

Five transcripts were available for analysis. Audio recordings ranged from approximately 10 to 39 minutes. As anticipated, data analysis confirmed the Active Ingredients that work together to create an embedded intervention. These Active Ingredients come together to form the Active Ingredient Framework. Although we initially hypothesized four Active Ingredients, we re-organized the conceptual framework to include only three (see Figure 1 and 2). The three Active Ingredients are as follows:

1. Therapist relates to teacher (RELATES)
2. Therapist translates the therapeutic intervention (TRANSLATES)
3. Teacher exhibits investment and demonstrates insight relevant to the therapeutic intervention (INVESTMENT/INSIGHT).

We use the term therapist to represent the collective group of therapists (Research Team) that worked together to implement the intervention. The Active Ingredients symbolize the productive work within the intervention. The Active Ingredient Framework (Figure 2) displays how the Active Ingredients work together. Together they answer our research questions, “How does one implement a desired intervention approach within an early childhood education setting?” and “What parts of this framework work and why?”

While we confirmed the presence of the Active Ingredients, we found an additional theme that we had not anticipated. This theme also relates to the efficiency of meeting interactions and consequently the intervention. We call this secondary theme ‘missed opportunities’. In contrast to the Active Ingredients, the missed opportunities theme involves behaviors that limit

productivity. These behaviors interfere with the potential of creating an embedded activities and experiences. Essentially, these behaviors work against the goal of embedding intervention.

Moreover, these findings answer our research question, “What parts do not work and why?” This next section describes both the Active Ingredients and the missed opportunities.

Active Ingredients

Active Ingredient 1: Therapist relates to teacher (RELATES). This Active Ingredient involves relationship building. The therapist invests in a relationship with the teachers rather than indicating a need to have control over implementation. This investment consists of demonstration of respect for the teacher’s expertise and genuine interest in collaboration. One example is providing positive feedback. For instance, when the teacher shares a story about a recent interaction with a student, the therapist says, “Well, I’m glad that you’re starting to think of some things for them to do...” Here the therapist is complimenting the teacher’s understanding and intuition. As another example, this Active Ingredient includes inviting conversation and feedback. For example, when the therapist prepares to introduce some new strategies to the children, she says “...let’s just go through these strategies and ... I’ll cross off ones that you *don’t* want and add ones that we *don’t* have on here that you *do* want....” This quote illustrates that the therapist is giving priority to the teacher’s preference.

This Active Ingredient also describes the therapist’s way of being *with* the teacher. Therefore, the therapist solicits the teacher’s opinion and expertise frequently and uses a variety of relationship building behaviors such as validation and positive feedback. This *with* aspect is important because it conveys mutual respect and shared control. This Active Ingredient also represents an intervention approach where the teacher and subsequently the whole classroom is

the consumer of services rather than a particular child (Bazyk, 2011; Law, Baum, & Baptiste, 2002; Rush & Shelden, 2011).

Active Ingredient 2: Therapist translates the therapeutic intervention (TRANSLATES).

This Active Ingredient consists of the therapist modifying /adapting materials from a therapeutic intervention to meet the needs of the teachers and students. The therapists and teacher have come together because the therapist has some information or strategies to share. For example, the therapist makes plans for implementation by creating new materials, suggesting strategies, or sharing information. Further, this Active Ingredient includes the therapist analyzing and adapting activities to fit the children's skill level or to fit the classroom environment. In week six of the intervention, for instance, the therapist presented a variety of sensory-based strategies to meet self-regulation needs. The therapist showed all the materials and provided an explanation for when to use the strategies. The therapist further explained that each sensory-based strategy would have an accompanying labeled picture to promote choice making and literacy for the children. In this particular discussion, the therapist called attention to relevant areas already existing in the classroom such as an aquarium, a quiet area, and a listening center. This Active Ingredient captures the concept that the therapist is offering the teacher relevant activities, strategies, and materials. Moreover, this Active Ingredient allows the therapist to validate and encourage the teacher's existing routines and strategies.

Active Ingredient 3: Teacher exhibits investment and demonstrates insight relevant to the therapeutic intervention (INVESTMENT/INSIGHT). This Active Ingredient has two parts.

First, it pertains to evidence that the teacher acknowledges and accepts ownership of the therapeutic intervention (INVESTMENT). For instance, the teachers give examples of how they have used (or will use) the content or material related to the therapeutic intervention. In this

study, the teachers spontaneously decided to extend the experiences by incorporating the concepts throughout their weekly lesson plan. Furthermore, the teachers spoke about the intervention with pride and ownership. This is evident in comments such as, "... we're just getting a lot of praises and compliments from the parents ... and volunteers. ... We were doing, you know, engine ..., you know, just talking and then one [volunteer] said, 'Where did they learn that from?' Well, I had to break it down.... We're doing, like, social-emotional skills..." Not only does this quote demonstrate the teacher's satisfaction, but also the use of the word "we" further illustrates that the teacher feels equally responsible for implementation and outcomes.

Second, this Active Ingredient involves evidence that the teacher utilizes the therapeutic intervention to analyze behavior, monitor progress, or solve problems (INSIGHT). For instance, the teachers give examples about student behavior using the language of the therapeutic intervention when the teacher explains how she checked-in with a child, "I noticed your engine was high this morning, so how does your engine feel now." As another example, the teacher describes an interaction with a child as follows:

...let's talk about it. What's your...what was your engine doing?... "My engine was running high!" I was just.... I'm, like, okay, but what do we need? We need to bring that engine back down,...so it can run *just right*. What can we do to help your engine? You know, just kind of giving him the words to...to say and to put him to think about different choices that he can use.

Both of these examples illustrate the teachers using the therapeutic concepts spontaneously and outside of the scheduled group intervention sessions.

Through the analysis of the data, we confirmed relationships between the Active Ingredients (see Figure 2). Active Ingredient 1 (RELATES) and 2 (TRANSLATES) both

influence Active Ingredient 3 (INVESTMENT/INSIGHT). In other words, the therapist's interaction and expertise influences the teacher's behavior. As teacher investment and insight increases, the intervention becomes more embedded into the classroom. On the other hand, Active Ingredient 3 (INVESTMENT/INSIGHT) influences Active Ingredient 2 (TRANSLATES) as indicated by the bidirectional arrow. In such cases, the therapist operationalizes the teacher's suggestions with additional activities, materials, and routines. As the teacher embeds these activities and materials into the daily routines, it creates frequent natural learning opportunities, which is the desired outcome. Furthermore, the therapist benefits from the teacher's expertise and experience. Finally, Active Ingredient 2 (TRANSLATES) is vital because teachers need consistent support to be successful in operationalizing new ideas in their classrooms. For example, support may include providing assistance to create relevant materials and problem solve implementation strategies.

While the three Active Ingredients advance the implementation on an embedded intervention, we also discovered a number of missed opportunities through the transcripts. These missed opportunities decrease the influence that the Active Ingredients have on each other as well as the impact on the ultimate outcomes. We discuss these in the next section.

Missed Opportunities

Missed opportunities involve behaviors that do not move implementation forward as much as the productive work. Although an unanticipated finding, the missed opportunities answer our guiding question: What parts of the framework do not work and why? The Active Ingredient Framework does not illustrate the missed opportunities because they do not facilitate progress. Rather, they weaken the impact of the ingredients especially Active Ingredient 1 (RELATES) and 2 (TRANSLATES).

There are three types of missed opportunities: low quality feedback, neglected bids for collaboration, and directive interaction style.

Low quality feedback. Low quality feedback involves the therapist making simplistic remarks that lack meaning or content. The therapist commonly used comments such as “great”, “awesome”, and “exactly.” While these kind of complimentary statements serve to encourage the teacher and show that the therapist is listening actively, they lack focus or reflection. Moving beyond positive praise, feedback that is not only positive but also specific, contingent, and instructive is more effective and more likely to produce results (Kelly, Zuckerman, Sandoval, & Buehlman, 2008). Feedback with more depth might have yielded a more profound discussion between the therapist and teacher(s). Low quality feedback lessens the impact of Active Ingredient 1 (RELATES) and 2 (TRANSLATES).

Neglected bids for collaboration. A neglected bid for collaboration refers to occasions when the therapist overlooked or lost a chance to enact Active Ingredient 1 (RELATES) or 2 (TRANSLATES). For example, sometimes the therapist failed to follow-up on teacher’s ideas. This is evident in the following passage when the therapist is describing the plans for the upcoming week the teacher says,

“And if you want to...this is an idea...it’s just an idea. You can use the red, green, and yellow light stop sign say “when your engine’s running just right you can go, ya know, this way” and...” The therapist responded with “Yeah!” and “That’s a good idea!” The next thing the therapist said was “And I would love your ...um...both of you guys’ help in picking out which kids turn it is because I know that you guys...”

Although the teacher’s idea was not clear from this passage, it would be important to follow-up and discuss further. Instead, the therapist returns to the pre-set agenda. At this time, the therapist

could have asked the teacher to expand on her comment and then move toward enacting the teacher's idea. Such a response would convey both openness and flexibility, which increases potential for positive outcomes (Rush & Shelden, 2011).

Other times, the therapist neglected opportunities to collaborate by rushing the conversation. This occurred when the therapist interjected comments without allowing the teacher to finish her thought or an idea. Another neglected opportunity occurred when the therapist would ask a question or two then not allow time for a response. These behaviors are common with therapists who have less experience with this type of collaboration. When the therapist overlooked an opportunity to collaborate, that action interfered with the influence of Active Ingredient 1 (RELATES) and 2 (TRANSLATES) on Active Ingredient 3 (INVESTMENT/INSIGHT) and ultimately the desired outcome i.e. embedded intervention.

Directive Interaction Style. A directive interaction style describes a posture where the therapist is acting as an expert who is telling the teacher what to do. Interestingly, the statements coded as Active Ingredient 2 (TRANSLATES) were far more directive than we expected. For instance, on one occasion the therapist said,

... (researcher) had some good ideas going for next week on how, you know, somethin' that we thought could be improved was maintain all of the kids' attention and involvement during the large group activity... 'cause you know some kids started doing other things, you know, it's hard to keep their attention when you're starting to, like, call single kids up.... coming up with some movements and things like that, so we tried to think about how we could do it differently. We wanted to run it by you today to see if you think it would work.

While this passage illustrates how the therapist was being reflective and responsive to the children's needs in a previous group session, the therapist missed an opportunity to reflect *with* the teacher and generate a solution *with* the teacher. Contrary to our intent, statements such as these illustrate the therapist making decisions and merely reviewing such decisions to the teacher for her eventual approval or endorsement rather than genuine collaboration. This directive interaction style contradicts Active Ingredient 1 (RELATES) and limits Active Ingredient 3 (INVESTMENT/INSIGHT), which ultimately compromises the intended outcome.

As another example of directive interaction style, the therapist said, "Since (teacher) is not here, make sure you let her know what we talked about today." Although subtle, phrases like "make sure you let her know" sound authoritarian rather than conveying respect and collaboration. Instances like these limit the opportunity for the therapist and teacher to discuss an issue and agree upon a solution.

Unfortunately, these missed opportunities worked against our intention to create embedded activities, experiences, and routines related to the intervention because they convey that the therapist is not interested in true collaboration. Consequently, these behaviors interfered with the relationship building, the productivity of the meeting, and ultimately the outcomes.

Overall, the analysis answers our guiding questions. The Active Ingredient conceptual framework addresses the first question, "How does one implement a desired intervention approach within an early childhood education setting?" Confirmation of three Active Ingredients addresses second question, "What parts of this framework work and why?" The identification of the missed opportunities relates to the third question, "What parts do not work and why?" We deal with the final question, "What parts should we replicate?" in the next section.

Recommendations for Increasing Intervention Effectiveness

Both the Active Ingredients and missed opportunities provide us with valuable insight about creating an embedded intervention in early childhood classrooms. We suggest applying the Active Ingredient conceptual framework along with the following considerations:

Record meetings and review promptly. We suggest that data analysis run concurrently with data collection, which would yield two separate benefits. First, prompt examination could prevent some of the behaviors associated with the missed opportunities (discussed above). For instance, the researchers could notice and correct non-productive behaviors (missed opportunities) earlier. Furthermore, after reading transcripts researchers could follow-up on missed opportunities and address these prospects in the next session. Thus, allowing for even greater responsiveness within the intervention. Second, prompt review could further refine data collection by identifying themes and questions early. Such a procedure allows the researchers to develop a preliminary conceptual map of what is happening and why it is happening during the study rather than afterwards (Bose & Hinojosa, 2008; Miles, Huberman, & Saldana, 2014).

Maintain Fidelity with a Coaching Model. Although we intended to employ the tenants of coaching (Rush & Sheldon, 2011) during teacher and research team meetings, the data revealed that these meetings focused more on planning and reflection. Given the missed opportunities (described above), the coaching model as defined by Rush and Shelden (2011) may be more effective. The coaching model includes a coaching interaction style as well as specific practice characteristics, which consists of joint planning, observation, action, reflection, and feedback. The structure provide by Rush and Shelden potentially strengthens Active Ingredients 1 (RELATES) and 2 (TRANSLATES). With appropriate application, the coaching model would protect against the potential missed opportunities such as being directive (Rush & Shelden,

2011). In a future replication, we would want to adequately train the research team on the coaching model and subsequently implement structure to ensure fidelity.

Create more opportunities for teacher choice making and decision-making. Although this recommendation could be subsumed in the recommendation above regarding the coaching model, it is worth talking about separately because it reflects a specific goal. The goal being to build the teacher's capacity through more opportunities for choice making and decision making. While the therapist can bear responsibility for translating or interpreting the therapeutic intervention into materials and activities that the teacher finds relevant, the therapist may consider offering two or more choices related to implementation. For example, as the therapist navigates each step in implementation, she/he may propose a few appropriate options for the teacher to consider. Furthermore, the therapist willingly embraces the teacher's alternate ideas.

One step beyond creating more opportunities for choice making and decision making would be to be even more open-ended. For instance, the therapist could say, "the next concept we need to address is x, how do we want to handle this?" This posture fosters the teacher and therapist generating a new idea together. Either of these approaches leads to increased adherence and satisfaction with services (Law, Baum, & Baptiste, 2002). If the therapist focuses on creating more opportunities for the teacher, she/he will be less likely to miss opportunities to collaborate and further strengthen the intervention. In a future replication, we would want to train the research team on ways to create more opportunities for the teachers to make decisions.

Employ a reflective feedback structure. During our analysis, we found the feedback was predominantly positive praise. Scholars argue that either positive feedback or positive instructive feedback is more powerful (Kelly, Zuckerman, Sandoval, & Buehlman, 2008). Positive feedback involves statements that are specific, positive, and contingent on a behavior

that one observes. Likewise, positive instructive feedback consists of specific, positive, and contingent statements, yet it adds information about the benefits or importance of the observed behavior. These two types of feedback empower the receiver of the feedback and further build trust and openness. Consequently, this feedback structure is more effective and more likely to produce results (Kelly, Zuckerman, Sandoval, & Buehlman, 2008). In a future replication, we would want to emphasize use of a reflective feedback structure.

Directions for Future Research

If the above four recommendations were implemented during research team-teacher meetings, we hypothesize that an intervention study might yield a variety of positive outcomes. A future study might consider outcomes related to the child, teacher, classroom environment, and the therapist. Child outcomes might include increased participation and performance as it relates to the therapeutic intervention. Teacher outcomes could consist of increased satisfaction, competency, and efficacy related to the therapeutic intervention. Environment outcomes might involve increased availability of supports and materials related to the therapeutic intervention embedded in the natural environment. Any of these outcomes would build on the body of evidence toward effectively embedding an intervention within an early childhood classroom. Finally, all four of the recommendations above relate to teacher-therapist meetings. Having adequate time to plan embedded services with classroom teachers is essential. This will be a barrier to overcome (Bose & Hinojosa, 2008; Bazyk et al., 2009). Future research will need to legitimize the amount of time needed to embed occupational therapy services successfully. This data will help persuade relevant stakeholders (i.e. teachers, supervisors, and principals) to support more embedded services.

Conclusion

The findings from this study reveal evidence of three Active Ingredients for implementing an embedded intervention in an early childhood environment. Findings from this study suggest that these Active Ingredients influence each other and affect the immediate outcome of an embedded intervention. Practitioners and researchers interested in implementing a Tier 1 intervention in an early childhood environment could apply this Active Ingredient framework to their practice setting. The authors recommend a number of adjustments to procedures to improve fidelity within implementation that would likely affect the immediate outcome of an embedded intervention as well as outcomes for the children, teachers, and classroom environment.

References

- AOTA Response to Intervention Workgroup. (2012). AOTA practice advisory on occupational therapy in response to intervention. Bethesda, MD: American Occupational Therapy Association.
- Ball, C. R. & Trammell, B. A. (2011). Response-to-intervention in high-risk preschools: Critical issues for implementation. *Psychology in the Schools, 48*(5), 502-512. doi: 10.1002/pits.20572
- Bayat, M., Mindes, G., & Covitt, S. (2010). What does RTI (response to intervention) look like in preschool? *Early Childhood Education Journal, 37*(6), 493-500. doi: 10.1007/s10643-010-0372-6
- Bazyk, S. (2011). *Mental health promotion, prevention, and intervention with children and youth: A guiding framework for occupational therapy*. Bethesda, Maryland: AOTA Press.
- Bazyk, S., Michaud, P., Goodman, G., Papp, P., Hawkins, E., & Welch, M. A. (2009). Integrating occupational therapy services in a kindergarten curriculum: A look at the outcomes. *The American Journal of Occupational Therapy, 63*(2), 160-171.
- Bellows, L. L., Davies, P. L., Anderson, J., & Kennedy, C. (2013). Effectiveness of a physical activity intervention for head start preschoolers: A randomized intervention study. *The American Journal of Occupational Therapy, 67*(1), 28-36.
<http://dx.doi.org/10.5014/ajot.2013.005777>
- Benson, J. (2013). School-based occupational therapy practice: Perceptions and realities of current practice and the role of occupation. *Journal of Occupational Therapy, Schools, & Early Intervention, 6*(2), 165-178.

- Blackwell, A.L., Yeager, D.C., Mische-Lawson, L., Cook, D.M., & Bird, R.J. *Teaching children self-regulation skills within the early childhood education environment: A feasibility study*. Manuscript submitted for publication.
- Bose, P., & Hinojosa, J. (2008). Reported experiences from occupational therapists interacting with teachers in inclusive early childhood classrooms. *The American Journal of Occupational Therapy, 62*(3), 289-297.
- Bradley, E. H., Curry, L. A., & Devers, K. J. (2007). Qualitative data analysis for health services research: Developing taxonomy, themes, and theory. *Health services research, 42*(4), 1758-1772. doi: 10.1111/j.1475-6773.2006.00684.x
- Peisner-Feinberg, E. (2013). *Handbook of Response to Intervention in Early Childhood*. V. Buysse (Ed.). Paul H. Brookes Publishing Company.
- Case-Smith, J., Holland, T., & Bishop, B. (2011). Effectiveness of an integrated handwriting program for first-grade students: A pilot study. *The American Journal of Occupational Therapy, 65*(6), 670-8. Retrieved from <http://search.proquest.com/docview/906328681?accountid=28920>
- Case-Smith, J., Holland, T., Lane, A., & White, S. (2012). Effect of a Coteaching Handwriting Program for First Graders: One-Group Pretest–Posttest Design. *The American Journal of Occupational Therapy, 66*(4), 396-405.
- Coleman, M. R., Roth, F.P., & West, T. (2009). Roadmap to Pre-K RTI: Applying response to intervention in preschool settings. *National Center for Learning Disabilities, Inc.* Retrieved from <http://www.rtinetwork.org/images/roadmaptoprekrtri.pdf>
- Collins, A.E. (2013, March 25). Classroom integrated Therapy: Strengthening teacher-practitioner collaboration and improving student outcomes. *OT Practice, 18*(5), 17-19.

- Cook, L., & Friend, M. (1995). Co-teaching: Guidelines for creating effective practices. *Focus on Exceptional Children*, 28(3), 1-16.
- Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2008). Developing and evaluating complex interventions: The new medical research council guidance. *BMJ: British Medical Journal*, 1-39.
- Dunn, W. (2011). *Best practice occupational therapy for children and families in community settings, 2nd ed.* Thorofare, New Jersey : SLACK Incorporated.
- Dunn, W., Cox, J., Foster, L., Mische-Lawson, L., & Tanquary, J. (2012). Impact of a Contextual Intervention on Child Participation and Parent Competence Among Children With Autism Spectrum Disorders: A Pretest–Posttest Repeated-Measures Design. *The American Journal of Occupational Therapy*, 66(5), 520-528.
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of advanced nursing*, 62(1), 107-115.
- Graham, F., Rodger, S., & Ziviani, J. (2010). Enabling occupational performance of children through coaching parents: Three case reports. *Physical & Occupational Therapy in Pediatrics*, 30(1), 4-15.
- Handley-More, D., Hollenbeck, J., Orentlicher, M. L., & Wall, E. (2013, September). Education reform initiatives and school-based practice. *Early Intervention & School Special Interest Section Quarterly*, 20(3), 1–4.
- Handley-More, D., Wall, E., Orentlicher, M. L., & Hollenbeck, J. (2013, June). Working in early intervention and school settings: Current views of best practice. *Early Intervention & School Special Interest Section Quarterly*, 20(2), 1–4.

- Justice, L. M., & Kaderavek, J. N. (2004). Embedded-explicit emergent literacy intervention I: Background and description of approach. *Language, Speech, and Hearing Services in Schools, 35*(3), 201. doi: 10.1044/0161-1461(2004/020)
- Kaderavek, J. N., & Justice, L. M. (2004). Embedded-explicit emergent literacy intervention II: Goal selection and implementation in the early childhood classroom. *Language, Speech, and Hearing Services in Schools, 35*(3), 212. doi:10.1044/0161-1461 (2004/021)
- Kelly, J.F., Zuckerman, T.G., Sandoval, D., & Buehlman, K. (2008). *Promoting first relationships: A program for service providers to help parents and other caregivers nurture young children's social emotional development, 2nd ed.* Seattle, Washington: NCAST-AVENUE Publications.
- Law, M., Baum, C.M., & Baptiste, S. (2002). *Occupation-based practice: Fostering performance and participation.* Thorofare, New Jersey: SLACK Incorporated.
- Livescribe, Inc. (2012). *Echo Smartpen* [hardware and software]. Oakland, CA: Author.
- Lust, C. A., & Donica, D. K. (2011). Effectiveness of a handwriting readiness program in head start: A two-group controlled trial. *The American Journal of Occupational Therapy, 65*(5), 560-568. doi: 10.5014/ajot.2011.000612
- Miles, M.B., Huberman, A.M., & Saldana, J. (2014). *Qualitative data analysis: A methods sourcebook, 3rd ed.* Thousand Oaks, California: SAGE Publications, Inc.
- Morris, M. L. (2013, March). Collaboration in schools: Perspectives of occupational therapist and teacher dyads. *Early Intervention & School Special Interest Section Quarterly, 20*(1), 1–4.
- Ohl, A. M., Graze, H., Weber, K., Kenny, S., Salvatore, C., & Wagreich, S. (2013). Effectiveness of a 10-Week Tier-1 Response to Intervention Program in Improving Fine

- Motor and Visual–Motor Skills in General Education Kindergarten Students. *The American Journal of Occupational Therapy*, 67(5), 507-514.
- Pope, C., Ziebland, S., & Mays, N. (2000). Qualitative research in health care: Analysing qualitative data. *BMJ: British Medical Journal*, 320, 114-116.
- Rush, D. D., & Shelden, M. L. (2005). Evidence-based definition of coaching practices. *CASEinPoint*, 1(6), 1-6.
- Rush, D. D., & Shelden, M. L. (2011). *The Early Childhood Coaching Handbook*. Baltimore, Maryland: Brookes Publishing Company.
- Silverman, F. (2011). Promoting inclusion with occupational therapy: A coteaching model. *Journal of occupational therapy, schools, & early intervention*, 4, 100-107. Doi: 10.1080/19411243.2011.595308
- Williams, M. S., & Shellenberger, S. (1996). *How does your engine run? Leaders's guide to the alert program for self regulation*. Albuquerque, NM: Therapy Works, Inc.

Figure 1. Initial conceptual framework devised before data analysis.

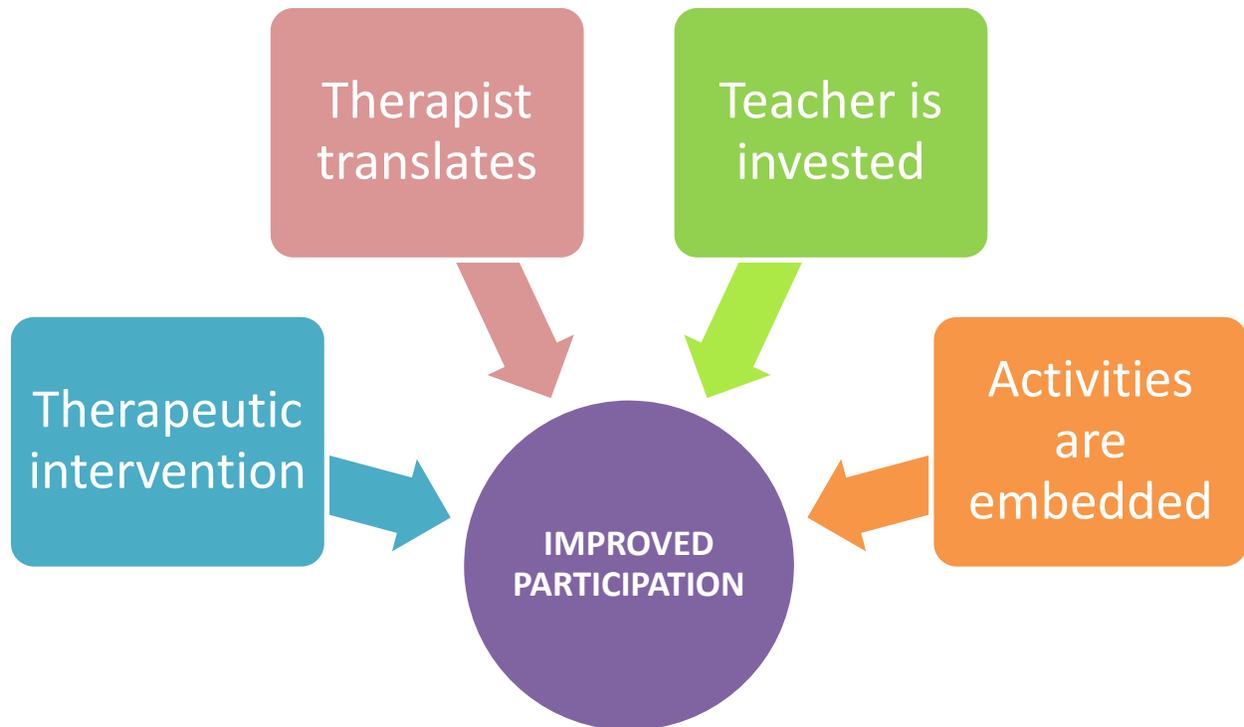


Figure 1. Initial conceptual framework devised before data analysis. Each rectangle represents a code (Active Ingredient) that we expected to find in the data. We hypothesized that these four ingredients contributed to improved participation. This depiction represents stage two (identifying a thematic framework) of the Framework approach (Pope, Ziebland, & Mays, 2000).

Figure 2. Final Active Ingredient conceptual framework devised after data analysis.

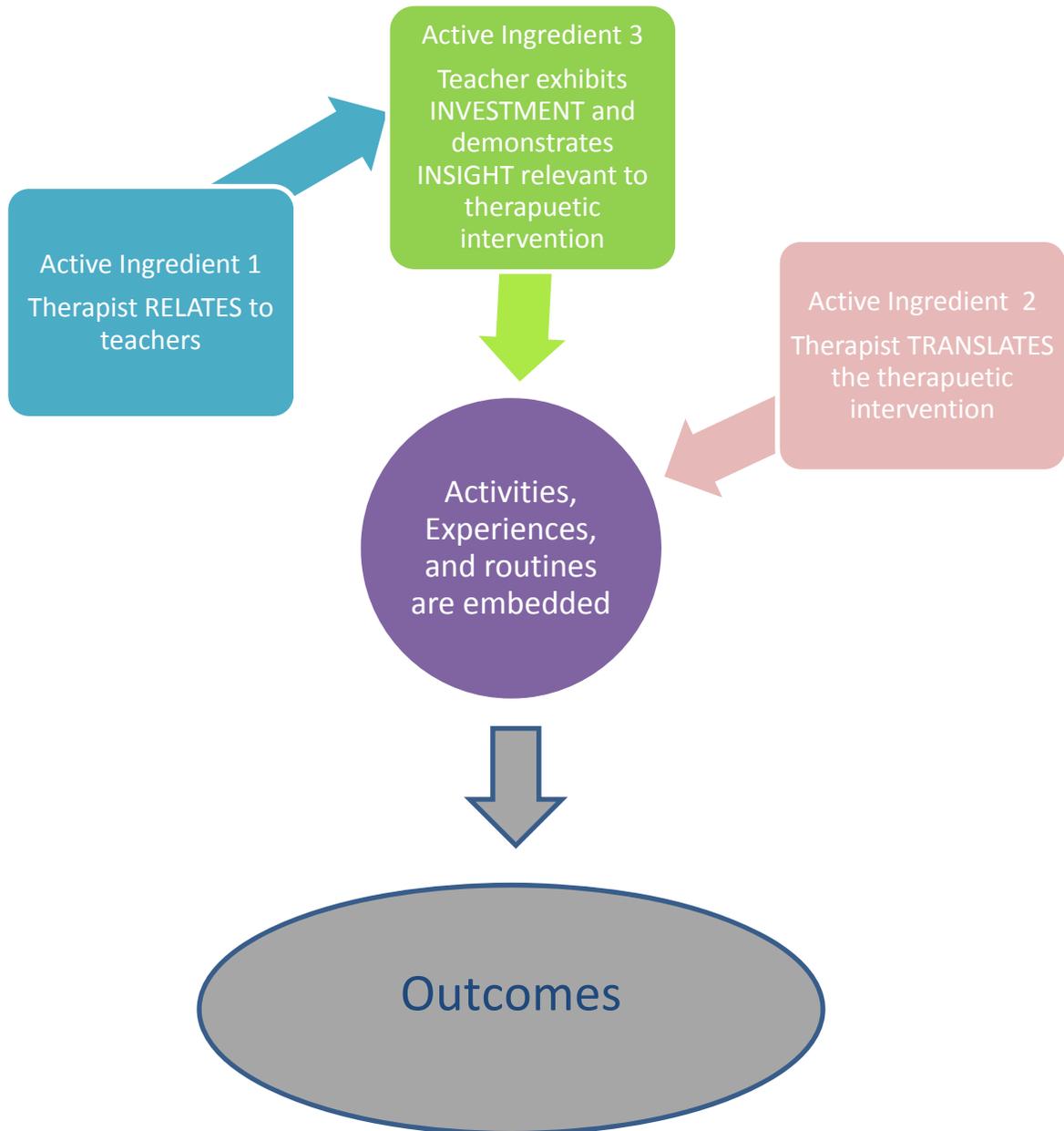


Figure 2. Final Active Ingredient conceptual framework devised after data analysis. Each rectangle represents a code (Active Ingredient) that we found in the data. We found evidence of these three ingredients with the data. The arrows reflect the influence each ingredient has on others. Working together, activities, experiences, and routines become embedded in the classroom setting. An embedded intervention yields positive outcomes. This depiction represents stage five (interpretation/mapping) of the Framework approach (Pope, Ziebland, & Mays, 2000).

Appendix D

The Role of Occupational Therapy with Response to Intervention (Tier 1) in Early Childhood

Education:

An Analysis of Classroom-Based Programs for Young Children

Comprehensive Exam III

Introduction

The Individuals with Disabilities Education Act (IDEA) of 2004 (Pub. L. 108-446) asserts that provision of educational services must occur in the Least Restrictive Environment (LRE). Meaning, strategies to increase student participation must be implemented within the student's classroom schedule or daily routine before isolated interventions are attempted (Burton, Holahan, Laverdure, & Muhlenhaupt, 2013). Despite this mandate, occupational therapists continue to remove children from their classrooms to work on goals (Case-Smith & Cable, 1996; Spencer, Turkett, Vaughan, & Koenig, 2006), which we commonly refer to as "pullout" services. Benson (2013) discovered that many therapists feel dissatisfied with pullout and prefer "push-in" services but feel stuck due to a variety of challenges (e.g., logistics, time, educational team expectations/dynamics). Consequently, there is a gap in what we (occupational therapists) want and need to do and what we actually do in practice.

IDEA 2004 outlines a preventative practice model called *Response to Intervention (RtI)*. RtI model is one option for how educators and related service providers operationalize the LRE mandate in the law. RtI is a data-driven, multi-tiered system that increases opportunities for differentiated learning in the general education environment. The first tier includes the provision of evidence-based practices understood to benefit all children (Tier 1). Educators collect data at established intervals on children's performance (i.e. the children's response to the intervention) (Buisse & Peisner-Feinberg, 2013). Children who do not show significant progress at Tier 1 advance to intervention that is more intensive, possibly small groups of children with similar needs (Tier 2). At Tier 2, educators monitor progress more frequently than Tier 1 (Buisse & Peisner-Feinberg, 2013). Based on the data, the education team may advance a child to the next tier, which involves individualized intervention and more frequent data collection (Tier 3). If a

child shows little to no progress, the educator initiates a discussion with parents and the rest of the educational team to pursue a full evaluation for special education services (Buysse & Peisner-Feinberg, 2013).

The data-driven practices of RtI create a more responsive and accountable education system that allows children to get the support they need without immediately escalating children into special education. In doing so, RtI integrates general education with special education (Jackson,2008; S. Jackson, Pretti-Frontczak, Harjusola-Webb, Grisham-Brown, & Romani, 2009) consistent with the LRE mandate. The model calls for general educators, special educators, and related service providers (e.g., occupational therapists, speech therapists, and physical therapists) to actively problem-solve together to decrease fragmented or duplicated services (Jackson,2008). This preventive model ultimately allows educational to focus on those with the greatest need, because most children successfully learn in general education contexts with appropriate supports.

Though RtI is not mandated, school districts across the country have embraced the practice model to address priority outcomes (Sailor & Burrello, 2013). For instance, districts may implement the RtI model to specifically foster reading outcomes (Vernon-Feagans, Amendum, Kainz, & Ginsburg, 2009; Vukelich, Justice, & Han, 2013). Adoption of the RtI model has also spread to early childhood environments to include infants, toddlers, and preschoolers (Buysse & Peisner-Feinberg, 2013; Coleman, Roth, & West, 2009). Related service providers like occupational therapists, however, are just beginning to articulate how their services fit in the RtI model.

Leaders in the field identify a number of reasons why occupational therapists ought to shift their practice to conform to the RtI model (AOTA RtI Workgroup, 2012; Persch,

Braveman, & Metzler, 2013). RtI allows therapists to provide service within the child's natural context (i.e. the classroom, playground, and cafeteria). The general education context allows occupational therapists to focus on participation-based goals and occupation-based interventions consistent with the profession's core philosophy (American Occupational Therapy Association, 2011).

RtI signifies an important opportunity for occupational therapy practitioners. Despite the desire to work in the general education environment, therapists express a range of challenges with providing special education related services in the classroom (Benson, 2013; Bose & Hinojosa, 2008). Not only does the RtI model give occupational therapy practitioners a framework to engage more naturally in general education context for identified children (i.e., LRE), but also make themselves available to children who are at-risk. For instance, within RtI, occupational therapy practitioners could apply concepts of universal design to whole classrooms for dynamic seating and/or various writing tool options (Missiuna et al., 2012; Pfeiffer, Henry, Miller, & Witherell, 2008; Schilling, Washington, Billingsley, & Deitz, 2003). Such strategies would support all children and prevent the need for future referrals (Jackson et. al.,2009). Ultimately, RtI allows OT to build capacity of teachers for both present and future needs in their classrooms. With expert knowledge supporting participation, occupational therapists are uniquely qualified to participate in inter-professional implementation of RtI in their local school districts.

Beyond service provision under IDEA 2004 in schools, occupational therapists may provide services under Head Start requirements (Improving Head Start for School Readiness Act of 2007, P.L. 110-134). Since children who attend Head Start are at-risk by definition(Robbins, Stagman, & Smith, 2012; The Office of Head Start, n.d.), using a preventative model such as RtI

allows occupational therapists and Head Start educators to work collaboratively in promotion of school readiness (e.g., literacy, language, motor, social-emotional skills) close any possible developmental gaps prior to entry to Kindergarten. that the ultimate goal is that fewer children will present a need for special education services in elementary school and beyond.

Although leaders in occupational therapy call for the use of RtI (AOTA RtI Workgroup, 2012; Clark & Polichino, 2010) implementation strategies are just being developed. As such, the research applying RtI in occupational therapy is limited. Ohl et al. (2013) implementation of STEPS-K likely represents the first (if not the only) empirical study in occupational therapy literature that investigates a 10-week Tier 1 program. These researchers sought to improve fine motor and visual motor skills in a general education Kindergarten classroom. Occupational therapist practitioners are still learning how to implement RtI. With large student caseloads, occupational therapists remain stuck in the “pullout” delivery system of the past (Benson, 2013). Doing so violates the LRE mandates of the law.

A national survey of school-based occupational therapists (n=276) found that more than 60% perceive the lack of resources to be a barrier to participating in RtI in their school districts (Cahill & McGuire, 2014), with approximately 44% wanting continuing education on the topic of providing services within the RtI model. Many also indicated that they wanted direction for how to advocate for change in their school districts (43.8%). These statistics signify the need for more support to help occupational therapy practitioners understand how they may transform practice in their own settings. The first step involves examining the current evidence to identify current trends and establish future research directions.

Purpose

A common objective of early childhood education is social participation and successful pre-academic achievement within the classroom. Occupational therapists contribute to these important outcomes using activity-based and occupation-based interventions. More specifically, occupational therapists commonly support participation in classrooms using interventions in the areas of skill acquisition/development, social-emotional development, and sensory-based strategies (Kreider, Bendixen, Huang, & Lim, 2014). Understanding how these interventions fit into the RtI model will be useful to both therapists and researchers. Since intervention begins at the classroom level in the RtI model, this review focuses on classroom-based intervention research in inter-professional early childhood literature. More specifically, this literature review sought to answer the following questions:

1. How does the current literature concerning classroom-based intervention align with occupational therapy theory and philosophy?
2. What have inter-professional, early childhood researchers already found related to classroom-based interventions?
3. What are the implications of these findings on future practice and research in occupational therapy?

Answers to these questions may foster better alignment between current early childhood education and occupational therapy practices. Further, these answers help occupational therapy practitioners identify next steps to navigate this contemporary model of service provision.

Methods

Consistent with Tier 1 of the RtI model, we reviewed literature that involved whole classroom interventions without regard for identified disability or need. We examined literature from occupational therapy, speech therapy, physical therapy, school mental health, social work,

psychology, and early childhood education disciplines. Databases searched include PsychINFO, CINAHL, ERIC, PubMed, and Google Scholar. Of the literature found, we conducted a manual search of reference lists to yield additional intervention literature.

To be included in the review, the research must have a focus on an intervention to address skill acquisition/development, social-emotional development, or sensory-based strategies in a general education classroom with young children (generally ages three to eight years old). We excluded articles that addressed children under three years or over eight years of age exclusively or implemented “pullout” therapy for identified individuals or small groups. Next, we analyzed each intervention study to understand the therapeutic approach used based on an ecological theory (Dunn, Brown, & McGuigan, 1994; Dunn et al., 2003) Then, we categorized each intervention study according to implementation characteristics (delivery method, professional development, and dosage). Finally, we investigated how the therapeutic approach and implementation characteristics related to the outcomes. To this end, we ranked the each study according to a five level grading system (Arbesman, Lieberman, & Berlanstein, 2013; Law & MacDermid, 2008). See Table 1 for definitions of evidence grading system.

Results

The initial search yielded 30 studies, with 20 meeting inclusion criteria. Eight studies described interventions addressing skill acquisition/ development as the intervention focused on mastery of developmentally appropriate behaviors, skills, or tasks (Kreider et al., 2014). Seven studies described interventions addressing social-emotional development as they centered on development of pro-social skills, emotional competence, positive relationships, and social problem solving. One study addressed skill acquisition/development and social-emotional development. Four studies described interventions using sensory-based strategies as they applied

sensory processing concepts in the general education classroom as a part of school routine (Dunn, 2008; Worthen, 2010). Of the 20 studies, nine studies came from occupational therapy literature, while the remaining eleven came from other fields. Table 1 summarizes the studies included in this review.

Discussion

The collection of research articles identified in this review provides a wealth of evidence supporting Tier 1 interventions in early childhood. The evidence helps us answer the three guiding questions. Next, we will address each question individually.

How does the current literature concerning classroom-based intervention align with occupational therapy theory and philosophy?

To understand how the present literature informs next steps in occupational therapy practice, it is useful to look through the lens of occupational therapy theory. For this discussion, we use the *Ecology of Human Performance (EHP)* to examine the literature. We selected this theory because it considers the dynamic interaction between the person, task, and context (Dunn et al., 2003). Person refers to a unique being with skills and experiences. The person uses skills and experiences to perform tasks. Task means an objective set of behaviors necessary for goal attainment.

Context consists of the interconnected circumstances that surround a person. Interconnection is key because a person cannot be detached from their context. Context refers to the physical environment (classroom furniture, toys, or décor) and social environment (social climate, behavioral expectations, and relationships). Context may also be less obvious temporal aspects (chronological age, developmental stage, life cycle, and health status) and cultural aspects (ethnicity, religion, nationality). Context is external to the person yet influences behavior

(Dunn et al., 2003) . For example, Malachi consistently presents as hyperactive in his classroom to the extent that it interferes with his participation. However, when ten students are absent due to bad weather conditions, Malachi demonstrates self-control and on-task behaviors for the whole morning routine. We could hypothesize that changes in context (i.e., less children) facilitated his improved participation. Consequently, the therapist might problem solve with the teacher to generate strategies to help the child manage when the context becomes overwhelming. Use of the context variable allows the therapist to consider the dynamic interaction between person and context.

While EHP emphasizes the importance of context in occupational therapy practice, its creators also envisioned the theory to facilitate inter-professional collaboration (Dunn et al., 2003; Rempfer et al., 2003). EHP provides vocabulary occupational therapy practitioners can use with inter-professional team members to articulate unique contributions. Moreover, the vocabulary helps practitioners synergize with the contributions to achieve early childhood outcomes. For classroom-based interventions to be successful, teachers and therapists will need to work together in synchrony. Consequently, EHP proves relevant to implementing classroom-based interventions across disciplines.

Approaches to intervention. EHP outlines five therapeutic approaches to intervention (Dunn et al., 2003). These approaches include the following: *create*, *establish/restore*, *prevent*, *modify*, and *alter*. Each approach to intervention indicates where the therapist must focus attention to facilitate change. Furthermore, the choice of therapeutic approach signifies the underlying belief of the intervention. We found the studies in this review used a combination of two to four intervention approaches. Next, we discuss examples of EHP therapeutic approaches found within this review.

Create. The create approach involves constructing circumstances that support optimal participation for all persons within an environment (Dunn, 2008). The intervention can focus on person, context, and/or task variables. Unlike other approaches, the create approach does not assume that a problem or disability exists. Since classroom-based intervention was one of the inclusion criteria for this review, we expected most of the studies to fall in the create category. Indeed, sixteen of the studies used the create approach in combination with other approaches.

Bazyk and colleagues (2009) provide an example of the create approach addressing person, context, and task variables with a variety of occupational therapy services fully embedded in a kindergarten classroom. Classroom routines with teacher's priorities and concerns provided the basis for making environmental recommendations and teacher training. These intervention activities targeted Kindergarten classroom context and task variables. Individual and group intervention followed and involved the occupational therapist co-teaching with teachers. Interestingly, collaboration extended beyond the classroom teacher to include art, music, and physical education teachers. These individual and group interventions focused on successful participation and the development of various performance skills, thus addressing the person variables as well. Ultimately, the children made gains in fine motor and literacy outcomes. This study illustrates a related service provider supporting the teacher to construct an optimal environment for learning for all children using a variety of strategies.

Two other studies offer examples of the create approach addressing the context. Two different researchers offered teachers "sensory kits" of sensory-based equipment and techniques. In addition, both studies provided training sessions to explain rationale and usage of the items in the kit. The researchers then gave the teachers an opportunity to use the equipment/strategies within their classrooms; these studies qualify as create interventions because the training and

materials applied to the teacher's overall curriculum and schedule. In one study, the teachers reported an increase in knowledge and application of sensory processing ideas from the training process (Morgan, 2011). In the other study, teachers perceived a number of positive child outcomes from using items in the sensory kit; for example, increased attention, decreased hyperactivity, and increased engagement (Griesse & Ikard, unpublished). Both of these examples demonstrate how the occupational therapist as related service providers can enrich the learning environment by offering training and resources. The belief here is that if teachers have information and the appropriate sensory tools then the children will be more successful. Future studies will also need to investigate child outcomes with these types of interventions, to determine if the interventions support child participation and academic success.

Establish/restore. The establish/restore approach focuses on improving a person's skills (Dunn et al., 2003). For example, therapists often focus on developing or refining specific performance skills. Performance skills refer to concrete, observable, and goal directed behaviors (American Occupational Therapy Association, 2014). Many intervention studies in this review focused on teaching new skills (establish/restore) to the teachers, children, or both hypothesizing that with a larger skill set, the children would have greater skill performance or increased participation. Thirteen interventions addressed skill building with both the teachers and the children (Han, Catron, Weiss, & Marciel, 2005; Lust & Donica, 2011). Five studies were professional development interventions, meaning they only utilized teacher training (i.e., skill building), without targeting child skill development directly (Fox, Hemmeter, Snyder, Binder, & Clarke, 2011; Griesse & Ikard, unpublished). We provide more detail about professional development later in this paper.

Prevent. The prevent approach preempts the development of participation limitations by intervening with person, context, or task variables to thwart negative outcomes (Dunn et al., 2003). Golos and colleagues (2011) provided a multidisciplinary, multimodal intervention for classroom of preschool age children, where many were identified as at-risk (i.e., 30%). The at-risk status was due to emphasis on religious education with minimal play and physical activities that are considered important in development. The multidisciplinary team included occupational therapy, speech therapy, and educational counselor. These researchers attempted to close the developmental gap (for the at-risk children) and improve both cognitive and motor skills with an eight-month intervention. Likewise, Koenig and colleagues (2012) incorporated movement into the daily classroom routine using a 16-week, manualized yoga intervention. While the intervention was implemented for a whole classroom, the researchers sought to decrease problem behaviors in children with autism spectrum disorders. Finally, Case-Smith, Holland, Lane, and White (2012) described a co-teaching intervention developed and implemented by an occupational therapist and two educators. The intent of the intervention was to prevent handwriting problems and promote fluent writing. All three studies yielded positive results. Consequently, these studies supported the underlying belief of prevention interventions as with intentional experiences and routines implemented in a whole class undesirable behaviors decreased while desirable behaviors increased.

Modify. The modify approach involves adapting the context or tasks to improve participation. Pham (unpublished), for instance, provided chewing gum to all of the children in a 2nd grade classroom (during 45-minute writing task for six consecutive days). Data was collected only for two identified children with a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD), but not the rest of the 2nd grade students. Though other studies yielded

positive results from chewing gum in the classroom (Witter, 1998), this researcher found the children showed decreased on-task behaviors and decreased quality of work. However, one of the two children demonstrated completion of more work during the intervention phase. It would be interesting to know how the gum affected the rest of the children in the classroom because gum might have positively affected the other children. Even though the findings were inconclusive, this literature offers an example of how researchers attempt to employ the modify approach in a classroom-based intervention. In this instance, the researcher believes that making a specific sensory strategy available for a certain classroom task will support a child's success.

Although this review only yielded one study using a modify approach that met all the inclusion criteria, a small body of literature exists either with older children or as Tier 3 interventions. In these examples, researchers explored the application of specific sensory-based approaches such as dynamic seating, exercise programs, fidgets, and music (Abikoff, Courtney, Szeibel, & Koplewicz, 1996; Kercood, Grskovic, Lee, & Emmert, 2007; Schilling et al., 2003). The wide use of these interventions highlights the need for further investigation using methods that are more rigorous with young children in whole classrooms.

Integration of more than one approach. The Teaching Pyramid (Buysse & Peisner-Feinberg, 2013; Fox et al., 2011), a three-tiered system for social-emotional competence, exemplifies implementation of four intervention approaches across the three tiers. Unlike other social-emotional interventions in this review, the Teaching Pyramid is a framework of practice rather than a curriculum. The first tier (universal level) focuses on a set of evidenced-based teaching practices known to promote social-emotional development such as nurturing, responsive relationships and high-quality, supportive environments (Fox et al., 2011). At this level, the teacher works at consistently implementing best practices such as visual schedules and

transition songs. With the first tier in place, researchers hypothesize the teacher is indirectly promoting social-emotional development by providing predictability and consistency (Fox et al., 2011) As most children thrive with these best practices in place (Fox et al., 2011). Simultaneously, the Teaching Pyramid builds the teacher's capacity (i.e. establish/restore) while constructing an optimal environment to positive social-emotional development for the children (i.e. create).

One may interpret the various studies in this review as representative of different approaches depending on goals and beliefs about change. Moving forward, practitioners need to articulate the how and why. The Ecology of Human Performance fosters the decision process as it relates to classroom-based work.

What have inter-professional, early childhood researchers already found related to classroom-based interventions?

Within this review, each intervention study employed specific combinations of professional development, delivery method, and dosage; that is, implementation characteristics. The implementation characteristics represent important decisions that influence outcomes. Similar to the therapeutic approaches (described above), the implementation characteristics underscore the researcher(s) beliefs about change.

Professional development. Professional development consists of learning activities associated with improving skills one needs to perform the job successfully (Kratochwill, Volpiansky, Clements, & Ball, 2007; Snyder et al., 2012). Each study included in this review employed a variety of professional development packages (e.g., teacher training, manuals, materials, performance feedback, skilled observations, and coaching) to support proper implementation. Professional development is key to sustainable RtI implementation; however,

no one protocol exist to represent the standard (Kratochwill et al., 2007). Each intervention study employed a different combination of professional development strategies. To illustrate, we will highlight a few examples.

The amount of training varied greatly across the studies reviewed. For example, Izard and colleagues (2008) offered an initial two-hour training for their Emotion-Based Prevention Program, whereas Webster-Stratton, Reid, and Hammond (2001) provided one 6-hour training per month for six months (36 hours total) for the Incredible Years Program. In the first example, the researchers concentrated the training prior to the 5-month intervention. In the other example, the researchers designed the intervention so that training extended across the course of the intervention (7 months). Most studies provided little to no information about training decisions (such as content, frequency, intensity, duration, or methods). Only one study in this review provided a clear rationale for their teacher training plans (Girolametto, Weitzman, Lefebvre, & Greenberg, 2007). More transparency (or explanation) regarding training decisions will also be useful to future research. Further, this variability in training plans suggests that the optimal amount of training is unclear. In future replications of these studies, use of variable training plans within the same intervention to evaluate outcomes will advance our knowledge in this area. We may find that intensive training across time is excessive or perhaps some combination of training components is best.

Other professional development options included manuals, scripted lessons, and prepared materials that support program implementation. These implementation aids also differed across the programs reviewed. For instance, Second Steps (McMahon, Washburn, Felix, Yakin, & Childrey, 2000; Wenz-Gross & Upshur, 2012), REDI (Bierman et al., 2008), and Incredible Years (Buysse & Peisner-Feinberg, 2013; Webster-Stratton et al., 2001) provide a curriculum

with scripted lessons for easy implementation throughout the school year. Lesson scripts include systematic instructions, specific discussion prompts/questions, and suggested activities for the children. Scripted lessons appear more user-friendly because the materials clearly outline the work for the teachers. On the other hand, the Teaching Pyramid provides professional development on best practice teaching to promote desired, targeted skill development rather than concentrating on scripted lesson plans. Scripted lessons underscore the belief that teachers need (or want) more structure to execute lessons, while other intervention protocols require more teacher problem solving, creativity, and individualization based on teacher's styles/preferences. The underlying belief that less structured programs is leads teachers to realize they have the capacity to change their own practices is consistent with current literature on adult learning styles (Rush & Shelden, 2011). Further, evidence shows that differentiated instruction essential to RtI is not easily accomplished within scripted curricula (Rock, Gregg, Ellis, & Gable, 2008). Since both scripted curricula and flexible open-ended programs yielded positive results, a comparison of scripted versus open-ended utilizing the same intervention would be useful.

In addition to training, manuals, and materials, most of the interventions (n=10) reviewed add some dimension of ongoing support for the teacher while implementing the program in classrooms. Supports included teacher observation and feedback (Han et al., 2005; Izard et al., 2008) and/or consultation/coaching (Bazyk et al., 2009; Bierman et al., 2008; Conroy, Sutherland, Vo, Carr, & Ogston, 2014; Fox et al., 2011). Adult learning practices emphasize the use of observation, feedback, and coaching/consultation to enhance a training session (Rush, M'Lisa, & Hanft, 2003). Although teachers may be motivated and engaged in the learning about a new intervention coming to their classroom, the task of operationalizing the intervention

techniques and principles from the training session back to their classrooms may be challenging. Consequently, teachers need support *in situ* to transform their practice (Knight, 2009a).

Of note, there were two studies, which utilized ongoing performance feedback (i.e., coaching) to focus on the teacher's behaviors as the outcomes. These are the only studies in this review that provide a rationale for their specific use of coaching. In the first example, Conroy et al. (2014) combined training with 14 coaching sessions in 14 weeks to establish specific effective teaching practices. These researchers found that teachers increased and maintained their use of specific practices, which led to increased child engagement and decreased problem behaviors. In the second example, Fox et al. (2011) also combined training with coaching. However, instead of a pre-determined number of sessions, these researchers continued coaching until the teachers met a specified criterion (i.e. three sessions with demonstration of 80% or greater desired practices) on a standardized observation tool. Although the sample size was small (n=3 teachers), the outcomes suggest a positive relationship between the chosen professional development strategy (i.e., coaching) and consistent implementation of desired teaching practices.

Clearly, intervention researchers in this review recognize the need to properly prepare and support teachers across time for successful implementation. In addition to providing ongoing support, there are numerous factors supporting child outcomes, though the literature has not yet clarified which parts to increase, decrease, or replicate. The next steps within each approach will be identifying the optimal professional development package (i.e., teacher training, coaching, manuals, materials) for program implementation to achieve the best outcomes. Beyond professional development, we also need to consider how we operationalize the intervention in the classroom, which we refer to as delivery method.

Delivery method. Three different delivery methods surfaced in this review: teacher-mediated, co-teaching, and complex methods. In the *teacher-mediated* delivery method, the teacher is responsible for intervention implementation, while the therapist provides the teacher with training and materials to lead classroom lessons independently. For example, Bellows and colleagues (2013) developed an intervention protocol to enhance motor skills and provide more physical activity within a Head Start setting. The researchers trained the teachers on gross motor development and provided them with 72 lessons, which the teachers independently carried out four times a week. This study supports use of a teacher-mediated delivery method to teach children new gross motor skills, but carry over to more distal measures was not successful (e.g., physical activity, weight).

In the *co-teaching* delivery method, the classroom teacher and the therapist share responsibility for implementing the intervention. Both parties deliver substantive instruction to a group of students in the same physical space, usually at the same time (Cook & Friend, 1995). In contrast to pullout therapy, some call this *push-in* service. Different types of co-teaching exist, which require variable levels of collaboration time allocation, trust, and knowledge (Nevin, Thousand, & Villa, 2009; Thousand, Villa, & Nevin, 2006). Using a co-teaching method in first grade classrooms, researchers found significant improvements in handwriting legibility, speed, and fluency (Case-Smith, Holland, & Bishop, 2011; Case-Smith et al., 2012). In another handwriting study using co-teaching in a Head Start program, researchers found significant improvement in pre-writing skills, Kindergarten readiness skills, and fine motor skills (Lust & Donica, 2011). These studies illustrate the promise of the co-teaching method for teaching skills to young children. Furthermore, these interventions promote related service professionals working with all children within the general education environment rather than the more

traditional focus on serving only children with identified needs. Future research concerning co-teaching interventions will be useful to continue to move practice forward.

Building on the teacher-mediated and co-teaching delivery methods, other researchers offer a *complex method*. This complex method integrates the teacher-mediated and co-teaching method and adds more embedded opportunities. Giangreco (1986) offered the following definition of complex, integrated services: “the incorporation, of educational and therapeutic techniques employed cooperatively to assess, plan, implement, evaluate, and report progress on common goals and needs” (p.9). Such a method allows the team to provide opportunities for the children to practice throughout the week within the classroom curriculum and schedule (Buysse & Peisner-Feinberg, 2013). We could categorize this complex method as another form of push-in service. Some intervention studies that utilize the complex method combine skill-focused lessons for the children like the previous studies mentioned but also intentionally build in more naturally occurring learning opportunities. Examples of natural learning opportunities include learning centers and daily routines that provide the child with authentic opportunities to use target skills *in situ*. Based on the present work, however, we do not have data on how much children engage in or take advantage of the natural learning opportunities. In future studies, we will want to quantify the exposure children are getting to the target concepts and show related positive outcomes.

Bazyk et al. (2009), as previously mentioned, integrated occupational therapy within an existing emergent literacy curriculum in two Kindergarten classrooms across a seven-month period. The children with disabilities (n=12) made significant gains in some but not all fine motor skills and literacy assessments, while the children without identified disabilities made significant improvements in all outcome measures. Although the study did not include a no-

intervention control group, the data showed that improvement in fine motor and literacy development exceeded normal maturation in children with and without disabilities (cite Bazyk). Replication of this important study with a control group will be useful.

Ohl et al. (2013) also utilized a complex intervention method for a 10-week program (*STEPS-K*) to improve fine motor and visual-motor skills in a Kindergarten classroom. This intervention had three parts: 30-minute weekly group co-led by the therapist and teacher, a new fine motor center every week, and teacher consultation time ranging from six to 33 minutes a week, in addition to the established Kindergarten curriculum. The experimental group improved significantly on fine motor and visual motor development while the control group who received the established Kindergarten curriculum declined. At three months post-intervention, teachers reported continued use of the fine motor center and consultation with the occupational therapist. Replication will be important, as will an understanding of the factors that contribute to sustainability of interventions.

Dosage. Another important contribution of classroom intervention research is our understanding of how dosage relates to outcomes. Dosage refers to a person(s) direct, intentional exposure to the target concepts or therapeutic technique. As with medication, an optimal outcome of a therapeutic technique depends on precise specification and administration of the intervention (McGinty, Breit-Smith, Fan, Justice, & Kaderavek, 2011). Dosage involves three factors: duration (intervention period e.g., number of weeks), frequency (sessions per week), and intensity (approximate length of sessions in minutes) of the intervention (definitions adapted from #Warren, Fey, & Yoder, 2007). In this review, intervention duration ranged from ten weeks (Ohl et al., 2013) to approximately nine months (Han et al., 2005). Regarding frequency, many intervention studies included intentional experiences at least one time a week (Ohl et al., 2013)

or as much as four times a week (Bellows et al., 2013; McMahon et al., 2000). Although some researchers do not describe the intensity of the intervention, when reported, sessions varied between fifteen minutes (Bellows et al., 2013) and forty-five minutes (Case-Smith et al., 2011; Case-Smith et al., 2012). When an intervention is consistent with Tier 1 of the Rtl model and intentionally embedded in the school day (Domitrovich, Cortes, & Greenberg, 2007; Webster-Stratton et al., 2001), it is often hard to discern frequency, intensity, and duration. Therefore, comparisons across studies are more challenging because the intervention studies that utilize complex, embedded methods are not as intentional with a precise dosage. Nevertheless, we must not overlook dosage, as duration, intensity, and frequency are relevant to learning something new. The work of McGinty and colleagues (2011) points to the need for future research to continue to unpack these dosage variables as the optimal amount of intervention likely will be different depending on the desired outcome(s).

While not all these interventions share target skills or outcome measures, this literature showed that significant positive outcomes can be achieved with both high dosage interventions (i.e. two days a week for seven months) (Bazyk et al., 2009) and low dosage interventions (i.e. 30-minutes, once a week for 10 weeks)(Ohl et al., 2013). We need additional research to replicate these results in various target skill areas with increased focus on lower dosages. However, the discrepancy in duration; that is, ten weeks versus seven months suggests that the time the therapist invested in the classroom over a 7-month period is either unnecessary or may yield more long-term effects than a brief 10-week intervention can measure. Furthermore, researchers explain that intensity matters for some outcomes but not others (McGinty et al., 2011). We will need to continue to clarify these questions about dosage as we forward using systematic scientific methods.

What are the implications of these findings on future practice and research in occupational therapy?

Employ an ecological theory. Scholars advise that interventions must be grounded in theory (Missiuna et al., 2012). At the same time, the RtI model presses therapists to think beyond individual children to begin at populations of children. In doing so, we consider teachers, whole classrooms, community early childhood centers, or school districts as the client. The Ecology of Human Performance (EHP) provides the framework to organize the contributions of occupational therapy at the population level.

At Tier 1, the therapist may focus on changing the ecology of the classroom context. Early childhood scholars describe the importance environment as a child's "third" teacher. As the third teacher, the environment should foster movement, thinking, exploration, autonomy, and creativity (Strong-Wilson & Ellis, 2007). Occupational therapy practitioners possess a skill set to assist teachers with creating these types of environments (American Occupational Therapy Association, 2011; Sekerak, Kirkpatrick, Nelson, & Propes, 2003). Intervention may emphasize the teacher's need to adjust class routines or classroom climate to support peer relationships and schoolwork productivity. For example, to improve the social-emotional climate in the classroom, a therapist could coach the teacher to identify social-emotional interaction opportunities throughout the day. The therapist could also suggest materials, visuals, activities, routines, and/or interaction approaches to enhance the curriculum. Suggestions might include lessons about individual needs within the classroom. In this example, the therapist implements the create approach to foster a change in the classroom atmosphere to recognize and diverse needs among the children. Consequently, the teacher becomes more responsive and supportive of social-emotional needs, resulting in an emotionally positive context.

Many studies within this review provided examples of integrated, context-based programming that could be categorized as the create approach. Studies implemented various learning centers and play settings in the classroom to support key intervention concepts (Ohl et al., 2013), while other studies utilized extension activities to increase exposure to key concepts of the intervention (Webster-Stratton et al., 2001). Others embedded key intervention concepts into the daily lesson plan such as the circle time routine (Bierman et al., 2008). All of these examples illustrate how to make the intervention seamless within the educational context and create circumstances that support performance for all. Additional research using the various EHP therapeutic approaches with children ages three to five years old is needed.

Consider the bigger picture. As investment in the RtI implementation grows, we must be cognizant of our role within the target organization (i.e., the particular educational system where one provides service). Bazyk and colleagues (2009) highlight the importance of understanding the early childhood educator's philosophical views and understanding how those views differ from occupational therapy. Reconciling these philosophical differences allows for efficient integration of related services into the existing curriculum (Bazyk et al., 2009). First, we will need to understand the *scope* of the core curriculum, which includes both developmental (e.g., motor, communication, social) and content areas (e.g., reading and math) as educational systems may have identified priorities within this scope (Buisse & Peisner-Feinberg, 2013). Second, therapists must appreciate the *sequence* of the core curriculum, which involves optimal progression for learning (Buisse & Peisner-Feinberg, 2013). The sequence is where differentiated learning is needed to accommodate different learning needs within a given classroom. Third, therapists must reflect on how their expertise compliments the scope and sequence of the core curriculum. Occupational therapist's expertise in activity analysis (i.e.,

adaptations and grading) could be used to identify opportunities to embed learning into the daily routine or construct specific activity-based experiences.

The research of Bierman et al. (2008), for example, accentuated the need to integrate research-based practice into an existing curriculum. These researchers emphasized the identified scope and sequence of priority in Head Start; that is, social-emotional competency and cognitive development (i.e. language and literacy). To this end, these researchers provided teachers with “crosswalk tables” to underscore how the intervention target skills and methods mapped onto the core curriculum. Strategies like the crosswalk tables help teachers appreciate how an intervention compliments the curriculum rather than adding to the teaching load. This dialogue may also allow a therapist to assist teachers with lesson plan development across the scope of the curriculum. By appreciating the present educational philosophy (i.e., core curriculum), related services are more likely to become embedded in the educational programming. Research studies that illustrate how inter-professional teams (including occupational therapists) build effective tiered interventions are a logical next step.

Design complex interventions. The literature in this review also highlights the importance of implementing complex interventions over more simple interventions. Complex interventions contain three or more interacting components (Craig et al., 2008), while a more simple intervention may employ only one or two components. Each component represents critical decisions made by the researchers related to the change process. We found in this review that interventions with added complexity were more successful.

As an example, we refer back to Pham (unpublished) implementation of a simplistic intervention, previously discussed. Here, the researcher hypothesized that if teachers provided chewing gum to the children during work time then the children would be more on-task and

produce work of better quality. Though the intervention targeted more than one outcome, the study only offered one strategy (i.e. gum). Furthermore, there is no mention of additional training for the teachers or education for children about the intervention beyond the informed consent process. Researchers might add complexity in two ways. First, the researchers might introduce other strategies for self-regulation in addition to gum. Second, researchers could add an establish/restore approach by teaching the teacher's about the theory behind gum-chewing or other appropriate sensory strategies in the classroom.

The work of Girolametto et al. (2007) gives us another example of a professional development intervention that could be more effective with added complexity. After two 6-hour in-services on emergent literacy, the researchers hypothesized that the teachers would significantly increase their rate of abstract utterances (two types targeted) and print references compared to a control group. In reality, the teachers increased print referencing and one of two types of abstract references. While these results are encouraging, the researchers point out how teachers may benefit from regular follow-up in the classroom to help teachers fine tune their skills and match utterance to the present composition of the classroom. They also suggest the addition of embedded naturalistic opportunities in the classroom, which may be generated when a therapist becomes familiar with a particular classroom composition. The researcher's suggestions resemble the coaching component utilized in other powerful intervention studies within this review.

On the other hand, Justice and Kaderavek (2004) provide an exemplary complex intervention model called the *Embedded-Explicit Model*. The Embedded-Explicit Model is an emergent literacy intervention for at-risk preschoolers, which incorporates established evidence-based literacy practices. Part one of the Embedded-Explicit Model includes direct instruction of

target concepts to the children provided by the teacher and therapist two or three times a week. The other part involves taking advantage of embedded learning opportunities such as arranging familiar signage around the classroom (e.g., McDonald's golden arches and traffic signs) to promote literacy through familiar community landmarks. Embedded opportunities such as these complement existing curriculum and consequently increase the children's exposure to the target concepts, in this case, literacy. Though there is not yet evidence to support the Embedded-Explicit Model, other studies covered in this review apply complex intervention methods similar to the Embedded-Explicit Model with promising outcomes (Bazyk et al., 2009; Ohl et al., 2013). Future studies in occupational therapy using similar methods will promote classroom participation.

Ultimately, the literature review reveals five key components common to successful complex intervention implemented in early childhood classrooms: professional development, materials, shared goals, embedded opportunities, and dosage. First, professional development includes training whereas knowledge transfers from one party to another. Further, all parties come to some mutual understanding. Research shows that teachers do not change their practices based on a one-time workshop (Knight, 2009a). Rather, teachers need on-going support and performance-based feedback in the form of coaching as the intervention progresses (Knight, 2009a; Rush & Shelden, 2011). Coaching warrants distinction because it involves relationship building between the teacher(s) and the related service provider that leads to more sophisticated collaboration (Nolan, Mannato, & Wilding, 2004; Rush et al., 2003; Sekerak et al., 2003). In this review, we learned that some researchers were more explicit about professional development than others were, which made appraisals challenging. Due to this discrepancy, Snyder et al.

(2012) urged future researchers to be transparent about the details for the professional development plan (i.e., form, dose, context, components) to foster comparisons and replication.

The second component involves materials. Materials are teaching tools such as visuals, books, equipment specific to the intervention. The work of Knight (2009b) explains if we want teachers to implement new practices, then interventions need to be both powerful and easy to implement. We address the powerful aspect later in this section. As far as easy, he adds that teachers are more likely to adopt new programs when the teaching materials are created for them. However, providing materials must be balanced so as to become too scripted, which limits teacher autonomy, creativity, flexibility, and differentiated learning that is essential to employing new classroom practices and RtI implementation (Ball & Trammell, 2011; Copple & Bredekamp, 2009; Knight, 2009a, 2009b) .

The third component consists of educators and related service providers having shared goals, for a desired outcome. For instance, both parties decide they want to increase student achievement, improve classroom quality, or increase support for diverse learning needs. With shared goals, the teacher and related service provider share the investment in the generate solutions to problems/concerns. When all parties believe the intervention is meaningful and important, the intervention will be more powerful (Knight, 2009b).

The fourth component involves embedded opportunities or instruction (e.g., materials, activities, experiences, transitions, and routines) that extend the target concepts of a given intervention. Embedded instruction represents additional chances to practice or interface with the target concepts. This chance to practice is intention but also occurs naturally within the environment (Buysse & Peisner-Feinberg, 2013)

The fifth component is the concept of dosage. Dosage refers to the duration, frequency, and intensity. This is an important aspect that should not be discounted in intervention planning, but will be unique to each intervention (McGinty et al., 2011). Each of the five components interacts differently with the other components. Future research will need to unpack each component within a given intervention package.

Though we do not yet know the optimal combination of these five components, the Craig and colleagues (2008) outlines a useful framework for developing and implementing complex interventions. The MRC document suggests that researchers systematically test the various components through an iterative process that goes from development to pilot testing to full-scale implementation/ evaluation. Using this methodology, many of the intervention studies in this review might replicate with systematic manipulation of each independent component in isolation. This systematic process could be long and arduous, which may hamper with innovations being adopted in everyday practice settings. Consequently, Gitlin (2013) underscores a few emerging scientific models to accelerate the discovery process. We will also want to consider some of these emerging models in future replications and in developing new interventions.

Conclusion

The IDEA mandates that service provision occur in the Least Restrictive Environment. RtI provides a method for members of the special education team (including occupational therapy practitioners) to comply with this law. The first tier of RtI addresses the whole population (e.g., district, school, or classroom) by implementing best practices for all children. In contrast to traditional special education wherein professionals work only with identified children, RtI addresses the needs of the whole classrooms without regard for disability or identified need. Consequently, this review paper focuses on classroom-based intervention

research in inter-professional early childhood literature. We specifically investigate intervention research that addresses skill acquisition/development, social-emotional development, or sensory-based strategies for young children. Within the discussion, we underscore the relationship between present classroom-based literature and occupational therapy theory. We highlight the relevant implementation characteristics of various intervention studies as they relate to outcomes. We highlight some supporting evidence in the literature in addition to some of the gaps in evidence. Finally, the results of this review lead us to three major conclusions. These conclusions reflect the understanding gained from the various studies, which provide insight for future practice and research.

References

- Abikoff, H., Courtney, M.E., Szeibel, P.J., & Koplewicz, H.S. (1996). The effects of auditory stimulation on the arithmetic performance of children with adhd and nondisabled children. *Journal of Learning Disabilities, 29*(3), 238-246.
- American Occupational Therapy Association. (2011). Occupational therapy services in early childhood and school-based settings. *American Journal of Occupational Therapy, 65*(Supplement), S46-54. doi: 10.5014/ajot.2011.65S46
- American Occupational Therapy Association. (2014). Occupational therapy practice framework: Domain and process (3rd edition). *American Journal of Occupational Therapy, 68*(Supplement_1), S1-S48. doi: 10.5014/ajot.2014.682006
- AOTA RtI Workgroup. (2012). Aota practice advisory on occupational therapy in response to intervention. Bethesda, MD.
- Arbesman, M., Lieberman, D., & Berlanstein, D.R. (2013). Method for the systematic reviews on occupational therapy and early intervention and early childhood services. *Am J Occup Ther, 67*(4), 389-394. doi: 10.5014/ajot.2013.007039
- Ball, C.R., & Trammell, B.A. (2011). Response-to-intervention in high-risk preschools: Critical issues for implementation. *Psychology in the Schools, 48*(5), 502-512. doi: 10.1002/pits.20572
- Bazyk, S., Michaud, P., Goodman, G., Papp, P., Hawkins, E., & Welch, M.A. (2009). Integrating occupational therapy services in a kindergarten curriculum: A look at the outcomes. *The American Journal of Occupational Therapy, 63*(2), 160-171.

- Bellows, L.L., Davies, P.L., Anderson, J., & Kennedy, C. (2013). Effectiveness of a physical activity intervention for head start preschoolers: A randomized intervention study. *The American Journal of Occupational Therapy*, 67(1), 28-36. doi: <http://dx.doi.org/10.5014/ajot.2013.005777>
- Benson, J. (2013). School-based occupational therapy practice: Perceptions and realities of current practice and the role of occupation. *Journal of Occupational Therapy, Schools, & Early Intervention*, 6(2), 165-178.
- Bierman, K.L., Domitrovich, C.E., Nix, R.L., Gest, S.D., Welsh, J.A., Greenberg, M.T., . . . Gill, S. (2008). Promoting academic and social-emotional school readiness: The head start redi program. *Child development*, 79(6), 1802-1817.
- Bose, P., & Hinojosa, J. (2008). Reported experiences from occupational therapists interacting with teachers in inclusive early childhood classrooms. *The American Journal of Occupational Therapy*, 62(3), 289-297.
- Burton, S., Holahan, L., Laverdure, P., & Muhlenhaupt, M. (2013). Guidance for performance evaluation of school occupational therapists. Bethesda, MD: American Occupational Therapy Association.
- Buysse, V., & Peisner-Feinberg, E. (2013). *Handbook of response to intervention in early childhood*: Paul H. Brookes Publishing Company.
- Buysse, V., & Peisner-Feinberg, E.S. (Eds.). (2013). *Handbook of response to intervention in early childhood*. Baltimore, MD: Brooks Publishing.
- Cahill, S.M., & McGuire, B. (2014). *A national survey of occupational therapy practioners' involvement in response to intervention* Paper presented at the Poster session presented at

- American Occupational Therapy Association Annual Conference and Expo, Baltimore, MD.
- Case-Smith, J., & Cable, J. (1996). Perceptions of occupational therapists regarding service delivery models in school-based practice. *The Occupational Therapy Journal of Research, 16*(1), 23-44.
- Case-Smith, J., Holland, T., & Bishop, B. (2011). Effectiveness of an integrated handwriting program for first-grade students: A pilot study. *The American Journal of Occupational Therapy, 65*(6), 670-678.
- Case-Smith, J., Holland, T., Lane, A., & White, S. (2012). Effect of a coteaching handwriting program for first graders: One-group pretest–posttest design. *The American Journal of Occupational Therapy, 66*(4), 396-405.
- Clark, G., & Polichino, J. (2010). Response to intervention & early intervening services: Occupational therapy roles in general education. *OT Practice, 15*(1).
- Coleman, M., Roth, F., & West, T. (2009). Roadmap to pre-k rti: Applying response to intervention in preschool settings. from <http://www.rtinetwork.org/images/roadmaptoprekrtri.pdf>
- Conroy, M.A., Sutherland, K.S., Vo, A.K., Carr, S., & Ogston, P.L. (2014). Early childhood teachers' use of effective instructional practices and the collateral effects on young children's behavior. *Journal of Positive Behavior Interventions, 16*(2), 81-92.
- Cook, L., & Friend, M. (1995). Co-teaching: Guidelines for creating effective practices. *Focus on Exceptional Children, 28*(3), 1-16.
- Copple, C., & Bredekamp, S. (2009). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8*: ERIC.

- Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2008). Developing and evaluating complex interventions: New guidance.
- Domitrovich, C.E., Cortes, R.C., & Greenberg, M.T. (2007). Improving young children's social and emotional competence: A randomized trial of the preschool "paths" curriculum. *The Journal of Primary Prevention, 28*(2), 67-91.
- Dunn, W. (2008). Sensory processing as an evidence-based practice at school. *Physical & occupational therapy in pediatrics, 28*(2), 137-140.
- Dunn, W., Brown, C., & McGuigan, A. (1994). The ecology of human performance: A framework for considering the effect of context. *American Journal of Occupational Therapy, 48*(7), 595-607.
- Dunn, W., Brown, C., Youngstrom, M.J., Kramer, P., Hinojosa, J., & Royeen, C. (2003). Ecological model of occupation. *Perspectives in human occupation, 222-263*.
- Fox, L., Hemmeter, M.L., Snyder, P., Binder, D.P., & Clarke, S. (2011). Coaching early childhood special educators to implement a comprehensive model for promoting young children's social competence. *Topics in Early Childhood Special Education, 31*(3), 178-192. doi: 10.1177/0271121411404440
- Giangreco, M.F. (1986). Delivery of therapeutic services in special education programs for learners with severe handicaps. *Physical & Occupational Therapy in Pediatrics, 6*(2), 5-25.
- Girolametto, L., Weitzman, E., Lefebvre, P., & Greenberg, J. (2007). The effects of in-service education to promote emergent literacy in child care centers: A feasibility study. *Language, speech, and hearing services in schools, 38*(1), 72-83.

- Gitlin, L.N. (2013). Introducing a new intervention: An overview of research phases and common challenges. *American Journal of Occupational Therapy*, 67(2), 177-184. doi: 10.5014/ajot.2013.006742
- Golos, A., Sarid, M., Weill, M., & Weintraub, N. (2011). Efficacy of an early intervention program for at-risk preschool boys: A two-group control study. *American Journal of Occupational Therapy*, 65(4), 400-408.
- Griesse, J., & Ikard, J. (2013). *Teachers' perceptions of the wiggle whomper kit: Improving sensory regulation in the general education classroom®: A pilot study (unpublished master's thesis)*. University of Puget Sound. Tacoma, Washington.
- Han, S.S., Catron, T., Weiss, B., & Marciel, K.K. (2005). A teacher-consultation approach to social skills training for pre-kindergarten children: Treatment model and short-term outcome effects. *Journal of Abnormal Child Psychology*, 33(6), 681-693.
- Improving Head Start for School Readiness Act of 2007, Pub. L. 110-134, 121 Stat. 1363, 42 U.S.C. 9801 *et seq.*
- Individuals with Disabilities Education Improvement Act of 2004, Pub.L. 108-446, 20 U.S.C. § 1400 *et seq.*
- Izard, C.E., King, K.A., Trentacosta, C.J., Morgan, J.K., Laurenceau, J.P., Krauthamer-Ewing, E.S., & Finlon, K.J. (2008). Accelerating the development of emotion competence in head start children: Effects on adaptive and maladaptive behavior. *Dev Psychopathol*, 20(1), 369-397. doi: 10.1017/S0954579408000175
- Jackson, L.L. (2008). What occupational therapy should know about the new idea. *Journal of Occupational Therapy, Schools, & Early Intervention*, 1(1), 4-11. doi: 10.1080/19411240802060280

- Jackson, S., Pretti-Frontczak, K., Harjusola-Webb, S., Grisham-Brown, J., & Romani, J.M. (2009). Response to intervention: Implications for early childhood professionals. *Language, Speech, and Hearing Services in Schools, 40*(4), 424-434.
- Justice, L.M., & Kaderavek, J.N. (2004). Embedded-explicit emergent literacy intervention i: Background and description of approach. *Language, Speech, and Hearing Services in Schools, 35*(3), 201.
- Kercood, S., Grskovic, J.A., Lee, D.L., & Emmert, S. (2007). The effects of fine motor movement and tactile stimulation on the math problem solving of students with attention problems. *Journal of Behavioral Education, 16*(4), 303-310.
- Knight, J. (2009a). Coaching. *Journal of Staff Development, 30*(1), 18-22.
- Knight, J. (2009b). What can we do about teacher resistance. *Phi Delta Kappan, 90*(7), 508-513.
- Koenig, K.P., Buckley-Reen, A., & Garg, S. (2012). Efficacy of the get ready to learn yoga program among children with autism spectrum disorders: A pretest–posttest control group design. *The American Journal of Occupational Therapy, 66*(5), 538-546.
- Kratochwill, T.R., Volpiansky, P., Clements, M., & Ball, C. (2007). Professional development in implementing and sustaining multitier prevention models: Implications for response to intervention. *School Psychology Review, 36*(4), 618-631.
- Kreider, C.M., Bendixen, R.M., Huang, Y.Y., & Lim, Y. (2014). Review of occupational therapy intervention research in the practice area of children and youth 2009–2013. *American Journal of Occupational Therapy, 68*(2), e61-e73.
- Law, M.C., & MacDermid, J. (2008). *Evidence-based rehabilitation: A guide to practice*: Slack Incorporated.

- Lust, C.A., & Donica, D.K. (2011). Effectiveness of a handwriting readiness program in head start: A two-group controlled trial. *The American Journal of Occupational Therapy*, 65(5), 560-568.
- McGinty, A.S., Breit-Smith, A., Fan, X., Justice, L.M., & Kaderavek, J.N. (2011). Does intensity matter? Preschoolers' print knowledge development within a classroom-based intervention. *Early Childhood Research Quarterly*, 26(3), 255-267.
- McMahon, S.D., Washburn, J., Felix, E.D., Yakin, J., & Childrey, G. (2000). Violence prevention: Program effects on urban preschool and kindergarten children. *Applied and Preventive Psychology*, 9(4), 271-281.
- Missiuna, C., Pollock, N., Campbell, W.N., Bennett, S., Hecimovich, C., Gaines, R., . . . Molinaro, E. (2012). Use of the medical research council framework to develop a complex intervention in pediatric occupational therapy: Assessing feasibility. *Research in developmental disabilities*, 33(5), 1443-1452.
- Missiuna, C.A., Pollock, N.A., Levac, D.E., Campbell, W.N., Whalen, S.D.S., Bennett, S.M., . . . Russell, D.J. (2012). Partnering for change: An innovative school-based occupational therapy service delivery model for children with developmental coordination disorder. *Canadian Journal of Occupational Therapy*, 79(1), 41-50.
- Morgan, D. (2011). *Sensory coaching: Increasing awareness of sensory processing in early childhood educators* Paper presented at the Occupational Therapy Australia, 24th National Conference and Exhibition, Queensland, Australia.
- Nevin, A.I., Thousand, J.S., & Villa, R.A. (2009). Collaborative teaching for teacher educators—what does the research say? *Teaching and Teacher Education*, 25(4), 569-574.

- Nolan, K.W., Mannato, L., & Wilding, G.E. (2004). Integrated models of pediatric physical and occupational therapy: Regional practice and related outcomes. *Pediatric Physical Therapy, 16*(2), 121-128.
- Ohl, A.M., Graze, H., Weber, K., Kenny, S., Salvatore, C., & Wagreich, S. (2013). Effectiveness of a 10-week tier-1 response to intervention program in improving fine motor and visual-motor skills in general education kindergarten students. *The American Journal of Occupational Therapy, 67*(5), 507-514.
- Persch, A.C., Braveman, B.H., & Metzler, C.A. (2013). P4 medicine and pediatric occupational therapy. *American Journal of Occupational Therapy, 67*(4), 383-388.
- Pfeiffer, B., Henry, A., Miller, S., & Witherell, S. (2008). Effectiveness of disc 'o'sit cushions on attention to task in second-grade students with attention difficulties. *American Journal of Occupational Therapy, 62*(3), 274-281.
- Pham, T. (2011). *The effects of gum chewing on classroom performance in children with adhd: A pilot study (unpublished master's thesis)*. University of Puget Sound. Tacoma, Washington.
- Rempfer, M., Hildenbrand, W., Parker, K., Brown, C., Letts, L., Rigby, P., & Stewart, D. (2003). An interdisciplinary approach to environmental intervention: Ecology of human performance. *Using environment to enable occupational performance*. Thorofare, NJ: SLACK Incorporated.
- Robbins, T., Stagman, S., & Smith, S. (2012). Young children at risk: National and state prevalence of risk factors. *New York, NY: National Center for Children in Poverty, Mailman School of Public Health, Columbia University*.

- Rock, M.L., Gregg, M., Ellis, E., & Gable, R.A. (2008). Reach: A framework for differentiating classroom instruction. *Preventing School Failure: Alternative Education for Children and Youth, 52*(2), 31-47.
- Rush, D.D., M'Lisa, L.S., & Hanft, B.E. (2003). Coaching families and colleagues: A process for collaboration in natural settings. *Infants & Young Children, 16*(1), 33-47.
- Rush, D.D., & Shelden, M.L.L. (2011). *The early childhood coaching handbook*: ERIC.
- Sailor, W., & Burrello, L.C. (2013). Shifting perspective to frame disability policy. *Unifying Educational Systems: Leadership and Policy Perspectives, 21*.
- Schilling, D.L., Washington, K., Billingsley, F.F., & Deitz, J. (2003). Classroom seating for children with attention deficit hyperactivity disorder: Therapy balls versus chairs. *American Journal of Occupational Therapy, 57*(5), 534-541.
- Sekerak, D.M., Kirkpatrick, D.B., Nelson, K.C., & Propes, J.H. (2003). Physical therapy in preschool classrooms: Successful integration of therapy into classroom routines. *Pediatric Physical Therapy, 15*(2), 93-104.
- Snyder, P., Hemmeter, M.L., Meeker, K.A., Kinder, K., Pasia, C., & McLaughlin, T. (2012). Characterizing key features of the early childhood professional development literature. *Infants & Young Children, 25*(3), 188-212.
- Spencer, K.C., Turkett, A., Vaughan, R., & Koenig, S. (2006). School-based practice patterns: A survey of occupational therapists in colorado. *The American journal of occupational therapy, 60*(1), 81-91.
- Strong-Wilson, T., & Ellis, J. (2007). Children and place: Reggio emilia's environment as third teacher. *Theory into practice, 46*(1), 40-47.

- The Office of Head Start. (n.d.). Head start services. Retrieved July 14, 2014, from <http://www.acf.hhs.gov/programs/ohs/about>
- Thousand, J.S., Villa, R.A., & Nevin, A.I. (2006). The many faces of collaborative planning and teaching. *Theory into practice, 45*(3), 239-248.
- Vernon-Feagans, L., Amendum, S., Kainz, K., & Ginsburg, M. (2009). The targeted reading intervention (tri): A classroom teacher tier 2 intervention to help struggling readers in early elementary school. Evanston, IL: Society for Research on Educational Effectiveness. .
- Vukelich, C., Justice, L.M., & Han, M. (2013). *Impact of supplemental tutoring configurations for preschoolers at risk for reading difficulties*. Paper presented at the Child & Youth Care Forum.
- Warren, S.F., Fey, M.E., & Yoder, P.J. (2007). Differential treatment intensity research: A missing link to creating optimally effective communication interventions. *Mental Retardation and Developmental Disabilities Resesarch Reviews, 13*(1), 70-77. doi: 10.1002/mrdd.20139
- Webster-Stratton, C., Reid, M.J., & Hammond, M. (2001). Preventing conduct problems, promoting social competence: A parent and teacher training partnership in head start. *Journal of clinical child psychology, 30*(3), 283-302.
- Wenz-Gross, M., & Upshur, C. (2012). Implementing a primary prevention social skills intervention in urban preschools: Factors associated with quality and fidelity. *Early Education & Development, 23*(4), 427-450. doi: 10.1080/10409289.2011.589043

Witter, L.L. (1998). *The effects of oral sensorimotor input on non-attending behaviors at school in children with attention-deficit/hyperactivity disorder*. University of Puget Sound.

Tacoma, Washington.

Worthen, E. (2010). Sensory-based interventions in the general education classroom: A critical appraisal of the topic. *Journal of Occupational Therapy, Schools, & Early Intervention*, 3(1), 76-94.