Preschool Intervention for Embodied Storytelling (PIES):

Using Drama to Enhance Language Skills at Storytime

by

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved May 2022 by the
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ARIZONA STATE UNIVERSITY

August 2022

ABSTRACT

The purpose of the Preschool Intervention for Embodied Storytelling (PIES) study was to evaluate the efficacy of a drama-based story time intervention on at-risk preschool students' emotion knowledge, story retell and story comprehension skills. Six classrooms with 44 students were randomly assigned into drama-based intervention and dialogic reading control groups. After four weeks of intervention sessions twice per week, students' emotion knowledge and story retell skills were assessed with distal measures. During the program, students' comprehension of the stories was evaluated weekly. Participants did not show significant main effects on any measures, however investigation of simple effects revealed differences in gains over time for intervention students in their story retell skills. Despite lack of significance, effect sizes for story retell were promising. Mean differences in story comprehension skills were consistently in favor of the intervention group for the duration of the program. Teacher participants showed an increase in their positive perceptions of drama-based instruction, but their own use of these strategies at story time was variable before and after observing the PIES program. Drama based instruction through PIES may be a favorable intervention strategy for preschool students as they develop narrative skills that are a prerequisite for future reading comprehension success.

DEDICATION

To my husband, Jon. Without your endless love, encouragement, and humor, achieving this milestone would have been impossible. To my family, even though you are far away I felt your support through all the ups and downs. A special thanks to my mother, who was my first professor. I also want to thank my friends and classmates who have sprinkled these four years of work with inspiration, enthusiasm, and joy – you are all brilliant.

ACKNOWLEDGMENTS

I want to extend my gratitude to my committee members, Dr. Restrepo, Dr. Glenberg and Dr. Marley. Your guidance over the last several years has been immeasurable in my development as a researcher. You have all inspired me to continue seeking knowledge anywhere and everywhere. I especially want to thank Dr. Restrepo, whose advice and support continues to be invaluable as I prepare for the next stage of my career. Thank you for believing I could do it, even when I had my doubts.

A special thanks to my fellow RIDLLs scholars, I couldn't have done it without you. Finally, thank you to the wonderful team of Head Start staff, teaching artists and research assistants who made this project possible. I look forward to following your accomplishments in the future.

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CHAPTER 1

INTRODUCTION

Head Start programs across the United States educate at-risk preschoolers in essential academic and social skills. Some of the academic skills are highly predictive of later academic success, such as oral language and narrative skills. Appropriate interventions for these students are critical so that they are prepared to enter kindergarten and continue to have academic success. Despite the importance of evidence-based interventions, there is a dearth of such evidence when it comes to effective language interventions for at-risk and dual-language learners (DLLs) at the preschool level. This shortage of evidence persists, despite the substantial population of at-risk and DLL preschoolers in the United States (National Center for Education Statistics, 2016). Interventions that have an evidence base for monolingual, middle SES students may be generalized to these populations by practitioners who lack appropriate materials and training, despite the limited research base. DLLs in this document refers to students who are acquiring English as a second language while they are still developing their first language (Office of Head Start, 2009). "At-risk" refers to students at risk of academic difficulties for a variety of reasons, such as dual-language learner status, low parental education, low socioeconomic status, or diagnosis of a language disorder or learning disability (Moore, 2006). In Head Start, at-risk students are represented at a rate higher than that of the general population primarily due to income requirements for enrollment. Depending on geographic location, DLLs may also be heavily represented in Head Start programs. The development of appropriate and evidence-based educational interventions can help close the persistent achievement gaps between at-risk students and their peers.

Preschoolers are apt to benefit significantly from well-timed and effective interventions that support key pre-literacy skills that are predictive of later academic success (August et al., 2009; Dickinson & Porche, 2011; J. F. Miller et al., 2006; Roth et al., 2002). Young children's competence in oral narratives, for example, is highly correlated to their ability to comprehend and recall written narratives in the later elementary grades (Rahman & Bisanz, 1986; Thorndyke & Hayes-Roth, 1979), and on measures of reading comprehension on statewide exams, for monolingual children and DLLs (Castro et al., 2011; National Center for Education Statistics, 2016). Narrative ability in the language of instruction may then bolster skills necessary for academic success. This holds particularly true for DLLs in the United States, whose academic skills are usually measured in English regardless of their home language. The framework and research discussed in the following sections document the need for continued study in this area and potential paths for maximizing treatment efficacy.

Theoretical Framework

The concept of embodied language development derives from embodied cognition theory, which posits that humans develop cognitive skills based on their embodied interactions with the world at large. The embodiment literature includes accounts for how children and adults understand language. Most of these theories rely on simulation as an explanation for the activation of motor systems in the brain during language processing. One route to simulation is via activation of the mirror neuron system. The mirror neuron system, as Rizzolatti & Craighero (2004) explain, is a system of neurons that is activated when an action is observed in addition to when it is performed. It can be argued that such activation strengthens neural connections even

when a person does not perform an action, feel a sensation, see an object, or hear a sound directly. Simulation has surfaced in many studies of embodied language via neuroimaging and neurophysiological research and is suspected to underlie effects in behavioral research as well (Dargue & Sweller, 2018b; Glenberg et al., 2004; Havas et al., 2010; Immordino-Yang & Damasio, 2007). These theories stand in contrast to abstract, arbitrary, and amodal theories of language which assert that thinking is like computation where abstract symbols are interpreted and manipulated to form conscious thought, despite their disconnect from real meaning (for analysis of these theories see Glenberg & Gallese, 2012).

The aspects of embodied cognition theory most relevant to how children come to learn the narrative elements of a story are the dual coding theory (Sadoski & Paivio, 2001) and the indexical hypothesis (Glenberg & Robertson, 2000; Kaschak & Glenberg, 2000). Dual coding theory describes language comprehension as rooted in the "activation of mental representations", which, importantly includes representations grounded in perception, a concept analogous to simulation. As with simulation, the theory suggests that cognition is explained by blending linguistic processing and sensorimotor grounding procedures and relies on a bottom-up approach to cognitive development.

When language contains new or recently acquired vocabulary, sensory perception, emotions, and physical actions ground the words in meaning. This matching of perception, feeling and action with meaning supports children's development of language and allows them to use activation of the mirror neuron system to support their comprehension each time they hear the same words in the future. The learning of any vocabulary word or concept can be boosted in this manner; however, acting out emotion

words may support comprehension to an extended degree in the context of storytelling (Noice & Noice, 2006). We posit that extra repetitions of emotion words coupled with actions (e.g., facial expressions and movements associated with those emotions) will assist children in their comprehension and recall of stories. As they ground the emotion words in meaning through these actions, they can simultaneously pretend to be the main character of the story and take on that character's actions, emotions, and motivations. By taking on the emotions of the main character, the children may activate emotion processing centers in the brain (Immordino-Yang & Damasio, 2007). Although studies of embodied understanding of emotions with children are limited, those with adults have shown a relationship between facial expression and comprehension of emotion vocabulary (Havas et al., 2010; Niedenthal et al., 2009). Dreyer et al. (2015) also showed that lesions to motion processing areas of the brain (e.g., the left sensorimotor cortex) seem to inhibit processing of verbally presented emotion words.

Behavioral research with children shows correlations between drama-based instruction (DBI) and social/emotional outcomes, such as recognition of emotion in others (Smith, 2010) and conflict resolution (Walsh-Bowers & Basso, 1999). For the present study, DBI refers to instruction that incorporates the use of gestures, acting out, movement, facial expressions, and taking on character roles during story time. Taken together, the behavioral research with children following DBI and physiological research with adults point to the presence of simulation with emotions, and positive behavioral outcomes that reflect comprehension of these emotions. Focusing on characters' internal response (the story element associated with emotion), then, is a key component of an effective drama-based, embodied story time intervention with preschoolers, because it

guides them to take on the main character's role and motivations. As they do so, we capitalize on children's natural empathy for others. This empathy allows them to understand why the main character makes certain choices or feels a certain way, thus improving their comprehension of the sequence of story elements and how they interact, such as through cause and effect. Certain functional explanations of the purpose of emotions focus on consequences at an interactive social level (Keltner & Gross, 1999). When we experience certain emotions, our resulting decisions yield consequences that impact what happens around us. This sequence also occurs for characters in story books. To elaborate on this principle in the context of the present study, *In a Jar* by Deborah Marcero provides an example. When the main character, a rabbit, feels sad and lonely because he misses his friend, he consequently sends her a package in the mail to show he is thinking of her. His friend is happy to receive it and sends one back. In this case and others, the initial emotion (the character's internal response) results in a logical action to address that emotion which has consequences that are described in the story. If the children can act out the emotions of sadness and loneliness, this supports their understanding of why the rabbit sends the package and is more memorable to them than two unrelated but sequential story elements, reflecting the idea that emotions result in consequential actions and serve a social function.

Narrative-Based Language Interventions

The use of storytelling for explicit instruction in language comprehension and production in the early school years is a frequently used evidence-based technique in preschool classrooms (Baker et al., 2013; Duff et al., 2014). This method typically relies on the instruction of the story grammar elements, which are the components of a story

that form the overall schema. These include the character, setting, initiating event, problem, internal response, attempt, resolution, and conclusion (Stein, 1982). In addition to the instruction of story grammar elements, the use of stories is versatile and allows the incorporation of other language areas in the instruction, such as grammar and vocabulary (Spencer et al., 2020). Teaching production and comprehension of stories is often done through multisensory programs involving symbolic representations of the story elements. In programs such as Braidy - The Story Grammar Marker (Moreau & Fidrych, 2002) or Story Champs (Spencer & Petersen, 2012), children are explicitly taught story sequencing and are prompted to identify and/or recall story grammar elements with pictures or tokens.

Dialogic Book Reading

Dialogic book reading (DBR) strategies also address story comprehension and are commonly employed during preschool students' daily story time (Lonigan & Whitehurst, 1998). Using DBR, teachers ask students different types of questions relating to the story (e.g., sentence completion, recall, open-ended, *wh*-, and distancing). For example, in one model of DBR, adults model and scaffold students' responses (Whitehurst et al., 1988). Scaffolding follows a sequential format: First, the adult prompts the child to comment on the book, then the adult evaluates the response, next, the adult expands on the child's response, and last, the adult repeats the prompt. Questions and scaffolding in the DBR format improve children's story comprehension (Flynn, 2011; Towson et al., 2017; Whitehurst et al., 1999).

DBR and structured storytelling interventions are types of multisensory instruction, which is based on multiple intelligences theory (Gardner, 1991, 2011). In

fact, most formal narrative language instruction programs and strategies include multisensory components, such as tokens or sets of pictures and/or symbols and are designed around the use of the story-grammar elements, also known as macrostructure. Learning to use these elements in stories is critical for successful storytelling and comprehension (Bar-On et al., 2018). For preschool DLLs and at-risk children, the use of multisensory storytelling instruction is effective for improving their story retell skills when delivered in children's home language (e.g., Restrepo et al., 2013), English only (e.g., Miller et al., 2018; Petersen et al., 2016) or both (Petersen et al., 2016; Spencer et al., 2020).

Storytelling instruction during DBR for at-risk students is an evidence-based practice in preschool and elementary grades (Baker et al., 2013; Duff et al., 2014). For example, Peterson et al. (2016) provided an English individualized narrative treatment to 73 Spanish-English bilingual children, with typical development (TD) or with developmental language disorders (DLD). They found that the children in the TD group improved in both micro (sentence and word level) and macrostructure (story elements and sequence levels). Specifically, DLL students with TD had statistically significant improvements in their use of causal subordination and use of story grammar elements in both languages. As in previous studies, TD children fared better than children with DLD on all skills measured. Further, the intervention group with TD improved significantly compared to the control group with TD and skills transferred from English to Spanish in this TD, but not in the DLD group.

Spencer et al. (2015) also applied an English narrative intervention with at-risk preschoolers that included whole-class and small group implementation of the *Story*

Champs program (Spencer & Peterson, 2012) with 71 preschool-aged culturally and linguistically diverse students. Results from pre and posttest assessments on English retells, comprehension questions, and personal story generation for monolingual and DLL students indicated improvements in participants' story retell and comprehension. Though both improved significantly, the authors reported no significant differences between the level of improvement shown between monolingual and DLL students on English outcomes, indicating that both groups improved to a similar degree in their English narrative skills.

Brown et al. (2014)) examined a storytelling intervention for monolingual at-risk children. The authors provided a narrative language intervention in small groups to three low-income, African American kindergarten students in a single case, multiple baseline design. The children were explicitly taught the story grammar elements, practiced retelling stories, and listened to their own retells for practice identifying the inclusion of each element. All three students demonstrated significant improvements in their story retelling skills, which they maintained two weeks after the last treatment session.

Embodied Drama-Based Interventions

Though both story grammar element multisensory intervention and DBR strategies are evidence-based methods of narrative language instruction, research on embodied language development suggests that movement-based interventions may deliver stronger effects than dialogic reading with picture books alone (Glenberg et al., 2004; Wall et al., 2022). As explored in our theoretical framework, embodied instructional techniques use DBI with movements to help children comprehend concepts, such as story macrostructure, through characters' emotions. One method of instructing

young students in story comprehension and production using embodied principles is through drama-based activities, which inherently involve movement.

Drama-based instruction (DBI) helps young students to develop skills in a variety of areas, including socioemotional, mathematics, and English language arts (Brown, 2017). DBI activities include use of facial expressions, gestures, and role-playing during storytelling. Though DBI research on distal oral language outcomes shows varying levels of effectiveness, meta-analyses show that DBI is effective in most studies with early elementary school children (Mages, 2008; Podlozny, 2000). A metanalysis by Lee et al. (2015), described the effects of DBI delivered at school for typically developing students. Results were categorized by the subject area (e.g., English language arts, social studies, etc.) during which the DBI was applied, and moderating factors were explored. Drama based pedagogy delivered in the language arts was more effective than when delivered during other subjects, such as social studies and math, with a medium effect size (d = .48). Moreover, early childhood students benefit more from DBI in their achievement outcomes than higher grades, also with medium effects (d = .75).

Quantitative studies examining DBI with oral language outcomes, particularly with preschool-aged students and their story comprehension and storytelling skills, are limited. Nonetheless, several researchers have examined embodied interventions that used DBI strategies with young children in the context of second-and native-language learning with story-based outcome measurements. Ionescu & Ilie (2018) used puppets, images, and toys to incorporate dramatic play with 25 Romanian kindergarten students (M_{age} = 4;9) while listening to a story. A control group heard the story in the typical format of children sitting in a semicircle and hearing the story while looking at the

pictures. The children in the embodied, DBI group scored significantly better on a measure of recognition of the narrative elements compared to the control group. Older studies have also found positive outcomes on language skills following dramatic play activities (Christie et al., 1992; Lovinger, 1974); however, the dramatic play activities centered on open-ended play rather than story centered DBI. Qualitative studies also show improvements in children's language (e.g., Creech & Bhavnagri, 2002; Stinson, 2015) and overall engagement and participation while listening to stories at story time (e.g., Choi & Hyun, 2011) using DBI.

Teachers' use of gestures during storytelling seems to improve overall comprehension. For example, Macoun & Sweller (2016) investigated the role of teachers' use of gestures in children's comprehension of orally presented stories in monolingual, Australian preschoolers. The authors specifically focused on which types of gestures were most effective, comparing iconic, deictic and beat gestures. Iconic gestures represent the meaning of what was said, while deictic gestures are pointing, and beat are those that do not fall into the iconic or deictic categories. Children viewed a short story on video and were later asked to recall the story and answer comprehension questions. The authors found that listening to stories with gesture support had a strong, significant effect on their story recall, with iconic and deictic gestures providing the most benefit. Dargue & Sweller (2020) also measured preschoolers' story retell and comprehension skills after the children observed stories on video that included gestures, focusing on differences between typical, or, relevant to events in the story, and atypical, not relevant to events in the story, gestures. They found that the children who saw typical gestures

recalled and answered questions significantly better than the atypical and no-gesture groups.

Whereas the above-mentioned authors focused on the children's observation of gestures, other authors have studied what happens when the children themselves use gestures or movement. For example, Murachver & Pipe (1996) evaluated monolingual kindergarten students' retell and comprehension of a pirate-themed story across three experiences: observing another child, interacting, and gesturing with props and the storyteller, or simply listening to a storybook with no props, gestures, or interactions. The authors also assessed differences between single vs. multiple exposures to the pirate story. Overall, the children who directly experienced the story through props and actions were able to retell stories that were significantly more detailed and accurate than those in the other conditions. Moreover, children who heard the story three times rather than once were able to retell significantly more details.

Wall et al. (2022) also utilized an embodied condition in their DBR study with 29 preschoolers. Children received DBR alone, DBR then embodiment, or embodiment then DBR. These conditions were compared with a control group that simply heard the story eight times. Children who received embodied activities in addition to DBR demonstrated stronger effects than those who received DBR alone, and the strongest effects were observed in the group that received embodiment then DBR. This held true for both story recall and vocabulary measures.

Research has also compared acting out events with props to acting with only the body. For example, Berenhaus et al. (2015) compared story recall and comprehension for 72 children ($M_{age} = 111.74$ months, $sd = 11.5$) in an "active experience" condition,

"indexing" condition, and reading normally in a control condition. Children read the story themselves. For those in the "active experiencing" condition, a research assistant modeled acting out the story with gestures, vocal inflection, and physical movements, and encouraged the child to do the same. In the "indexing" condition, the child moved a set of toys around as they read, with the toys corresponding to characters at objects in the story. Both the active experiencing and indexing conditions demonstrated better retell and comprehension than the control group, measured by inclusion of specific types of information such as description, action and dialogue. "Active experiencing" children also included more descriptive story details over the other conditions, but it was not significant for students except those labeled as poor comprehenders.

Studies above examined the effects of embodied learning on story retell and comprehension. Though Berenhaus et al. (2015) did not observe significant effects for children who read and acted out a story themselves, the other studies showed that acting out story elements did result in improved story comprehension and retell. Moreover, hearing a story multiple times was more effective than a single presentation (Murachver et al., 1996), and observing gestures performed by the instructor was also helpful for children's recall and comprehension (Dargue & Sweller, 2020; Macoun & Sweller,2016). Most of these strategies are incorporated in the lesson plans of the current study.

Using DBI instruction helps children ground and simulate language better than traditional DBR, which in turn helps students with low vocabulary and low language proficiency in English to better ground the stories and concepts that they hear. The Preschool Intervention for Embodied Storytelling (PIES) study aims to determine whether these techniques are more effective than traditional DBR. By combining

children's actions with the emotions, or internal responses (and associated vocabulary), of the stories' main characters, we will capitalize on young children's natural inclination toward empathy in a way that lets them relate to the main character and understand that character's actions. Specifically, we aim to use drama-based, embodied strategies to enhance story time instruction and consequently children's learning of the story elements (e.g., main character, setting, problem, etc.), thereby improving their comprehension and recall of stories. Long-term, we believe these improvements in comprehension and recall may result in better reading comprehension skills in later elementary grades.

The PIES program emphasizes the main character's internal response through acting out the story during DBR. Students observe the interventionist carrying out these actions while simultaneously doing them themselves. Highlighting the internal response during this method of instruction may yield positive outcomes for Head Start students' story retell and comprehension. By measuring the students' emotion knowledge in addition to their story recall and comprehension, we can identify whether improvements in this mechanism of interest are related to improvements in the others. We believe that PIES DBI will allow the students to embody emotions and actions in such a way that this natural empathy for the main character is tapped and supports the children's comprehension.

Apart from students' outcomes, teachers' behavior changes during story time are also of interest. Teachers remain in the classroom during PIES and observe all lessons. If they increase their own use of drama-based strategies over the course of the program, this may further support increases in the students' language outcomes. Though research shows classroom teachers may not feel confident in using DBI, observing teaching artists

in action may provide an example and motivation in the context of the present study (Garvis & Pendergast, 2012).

CHAPTER 2

THE CURRENT STUDY

Research Questions and Hypotheses

The use of embodied techniques to facilitate language development holds promise to improve at-risk preschoolers' language and literacy skills. In the context of the current research, embodied techniques refer to those that use body movements and facial expressions as part of the instruction. Embodied learning through DBI with a focus on characters' internal response is the foundation of the present study and the mechanism through which we hypothesized that the children would improve their story retell and story comprehension skills (see PIES Learning Model in Appendix A). Based on the information outlined above, we implemented an embodied, DBI of narratives program to address the questions outlined below. See the *Measures* section for a full description of each outcome measurement tool.

1. Does participation in an embodied, DBI story time program result in significantly higher skills than participation in a traditional dialogic book reading story time program in the following areas:
    - Story comprehension
    - Story retell and
    - Emotion knowledge
2. Does observing teaching artists' delivery of an embodied, DBI story time program increase classroom teachers' use of DBI strategies during story time and positive attitudes about drama-based instruction?

It was hypothesized that after receiving the PIES intervention, children would show greater improvements in their story comprehension and retell than children receiving traditional DBR in the control group. It was hypothesized that children in the intervention group would show improvement in their ability to recognize and label emotions indicating that improved emotion knowledge boosts recall and comprehension ability. Finally, it was hypothesized that classroom teachers in the intervention group would increase their perceived and observed use of drama-based strategies during story time.

CHAPTER 3

METHODS

This study was initially approved by the Institutional Review Board of Arizona State University on February 19, 2021 and was renewed through a continuation request on February 25, 2022.

Participant Selection and Inclusion

Participants

The study was implemented with a Head Start preschool program in a rural Head Start program outside of the Phoenix, Arizona metro area. Classroom teachers were recruited for participation with help from program representatives, such as the program director and education specialist. Teachers received an informational brochure about the intervention, related testing, and incentives. Six teachers consented to participate in the study. After teacher consents were received, all of the students in those classrooms were recruited with an informational handout sent to parents on paper and through the school's parent communication system.

Teachers

Teachers were recruited from three school buildings in the selected Head Start program. The initial goal for recruitment was ten teachers, however due to Covid-19 restrictions on visitors in classrooms and the possibility of classrooms closing with cases, many teachers were hesitant to participate in a study with outside researchers visiting their class regularly for nearly two months. Of the six teachers that consented to participate in the study, five classrooms were located in one building while the sixth was

located in another. All of the participating teachers were female. After the program was complete, participating teachers were provided the full set of control and intervention books and lesson plans and a $25 Amazon gift card as remuneration.

Students

Initial plans were to recruit up to 80 students, however, due to Covid-19 restrictions, classroom sizes were smaller than typical, resulting in an overall smaller sample size for the study. Students' inclusionary criteria for participation in the study included demonstration of sufficient English proficiency to particpate in pre and posttesting measures. This was evaluated during presentation of the narrative retell task at pretest, and corroborated with parent and teacher report. Additionally, students were required to have typical language development as noted by parent and teacher report. Fifty students were enrolled in the study with parent consent at the pretest time point. One child dropped out of the study after moving to a different school soon after pretesting concluded. Two students responded to pretest measures in Spanish. Their scores were calculated for descriptive information only and were not included in the full analyses. Two students had identified disabilities and were not able to complete testing. However, they participated in all of the story lessons with their peers. Forty-four consented students met criteria and were enrolled throughout the length of the program (M_{age}= 4;3, *sd* = .59). Children provided verbal assent on each testing occasion. Based on parent and teacher report, eight students (18.2% of sample) were from households that used primarily Spanish, or both English and Spanish. These students are referred to as DLLs. All student participants were from homes classified as having low socioeconomic

status based on Head Start guidelines that are updated annually (*Arizona Head Start and Early Head Start*, n.d.) and results of the caregiver questionnaire.

Caregivers

Of the 50 caregivers that signed consent for their children, 29 completed a questionnaire about themselves and their child. Information about the caregivers, such as parent educational background, income, and household language use, was collected.

Personnel

Research Assistants

Research assistants RAs were undergraduate students recruited from the Speech and Hearing Science and Family Studies bachelor's degree programs at Arizona State University. Seven RAs were hired as student workers and supported with grant funds. They were trained to administer and score all student measures as and complete data processing tasks. Two of the RAs were Spanish-English bilingual.

Interventionists

The intervention group lessons were implemented by teaching artists (TAs). TAs are defined as professionals who can engage a variety of people using the arts while employing the skill set of an eudcator simultaneously (Association of Teaching Artists, n.d.). Qualified Teaching Artists are imperative for effective delivery and measurement of the effects of this intervention (Dunn & Stinson, 2011; Mages, 2008). The two PIES TAs were recruited from the Master of Fine Arts program in the Theater department at Arizona State University and were trained to deliver the drama-based PIES lessons to the intervention classrooms with fidelity. Control group lessons were implemented by a

research assistant and the principal investigator due to Covid-19 related scheduling difficulties (described in *Procedures* below).

Measures

Student Measures

Narrative Assessment Protocol - 2nd Edition (NAP-2)

The NAP-2 (Bowles et al., 2020) provides an authentic assessment of subcomponents of language production via story retell. The measure can be used with children ages 3-6. Students listened to a story with picture supports and were then asked to retell the story. Pictorial support in story retelling tasks is associated with better story structure and less cognitive demands in young children (Duinmeijer et al., 2012). The measure is scored on the inclusion of story macrostructure and microstructure features, such as vocabulary and morphosyntax and results in a continuous score.

The NAP-2 testing and scoring framework is standardized, has good interrater reliability (.84), and demonstrates good content and construct validity (Bowles et al., 2020). The order of administration of the stories was randomly assigned before pretesting, such that each student heard the stories in a different sequence and heard each story only once. Two of the four NAP-2 stories were administered to each student at each time point, and the higher of the two scores was used for the outcome variable. Multiple administrations at each time point have been used in past studies to give children ample opportunity to provide a quality retell (e.g., Spencer et al., 2015). This method of administration also allowed the children a second opportunity to retell a story once they were more comfortable with the RA assigned to their classroom.

The NAP-2 was administered within the students' classrooms to abide by Head Start regulations of not allowing visitors to interact with students outside the classroom. RAs chose as quiet a corner as possible in the classroom; however, at times the classrooms were distracting. Twenty percent of the NAP-2s ($N = 19$) from the present study were double scored to ensure consistent results. A mixed model was used to calculate ICC, with raters as random effects. ICC values below 0.50 are considered poor, between 0.50 - 0.75 are considered moderate, between 0.75 - 0.90 are considered good and above 0.90 are considered excellent (Koo & Li, 2016). ICCs were considered moderate for the NAP-2 (.74). Discrepancies were resolved with a consensus meeting between the two scorers.

Story Retell Assessment (SRA)

The Story Retell Assessment (SRA) is a researcher-designed proximal measure used to assess participants' comprehension of the books presented during each week of PIES lessons. PIES lessons used one book per week over two days, and the SRA was administered on the second day. Therefore, students completed four SRAs corresponding with the four books in the program. The SRA produces a continuous score based on participants' ability to accurately answer comprehension questions about the story they heard.

The SRA was administered by a combination of trained school staff and research assistnats. The SRA addresses each of the story elements through eight questions, such as "Who was the story about? How did (character) feel? and "What happened at the end of the story?" (see example SRA in Appendix B). Twenty percent of the SRAs ($n = 32$) from the present study were double scored to evaluate reliability. A mixed model was

used to calculate ICC, with raters as random effects. ICCs were considered good for *Don't Worry, Little Crab* (.88) and *Mother Bruce* (.89) and excellent for *A Visitor for Bear* (.95) and *In a Jar* (.97) (Koo & Li, 2016).

Emotion Matching Task (EMT)

Students completed The Emotion Matching Task (EMT; Izard et al., 2003) at pre and posttest. The test is comprised of pictures from The Child Affective Facial Expression (CAFÉ) set (LoBue & Thrasher, 2015), adapted into an emotion matching task by Izard et al. (EMT;2003). The extensive CAFÉ photo set used with the EMT is validated (LoBue, 2014) and depicts ethnically diverse children. The overall alpha for the EMT is .88 (Izard et al., 2003).The EMT addresses receptive and expressive emotion knowledge, and situational emotion knowledge using photos of preschool-aged children from a field of four choices. The task consists of four parts: (1) matching facial expressions in the same category, (2) matching facial expressions with situations, (3) labeling a pictured emotion and (4), identifying a pictured emotion after hearing the label. Each part produces a continous score, and the total score derived from all four parts together is also continuous. The EMT demonstrates good criterion and construct validity (Morgan et al., 2010). Morgan et al. (2010) validated the EMT with American children and reported an alpha score of .88 for the total score, and .65, .54, .76 and .80 for parts 1-4, respectively. Twenty percent of EMTs (n = 15) from the present study were double scored to ensure consistent results. Scoring consistency was examined using intraclass correlations (ICCs). A two-way mixed model was used to calculate ICC, with raters as random effects. ICCs were good for the expressive (.80) subtest, and excellent for the situation subtest (.99) and the total overall score (.99) (Koo & Li, 2016). The receptive

subtest was not analyzed for ICC because the EMT was not video recorded, therefore the double scorer had to copy the receptive responses from the original score sheet and there was no way to assess reliability for this subtest.

Teacher Measures

Teachers' Use of Storytime Strategies for Drama (TUSSD)

The TUSSD (Schmidt, 2020) is an observational tool designed to assess teachers' use of drama-related strategies during storytime (See Appendix C for description of strategies). The measure includes specific drama strategies such as pantomime and vocal exaggeration in addition to more traditional shared book reading strategies such as print and picture referencing.

For the present study, the TUSSD strategies were divided into two categories: "drama-based" and "shared reading". This is an adaptation from the original TUSSD which includes a third category, overlapping strategies. The overlapping category includes "vocal variety" and "facial expressions". "Facial expressions" was removed from the present analysis because all teachers wore masks at both time points due to Covid-19 regulations, and the strategy could not be accurately documented. "Vocal variety" was included in the "drama-based" strategies category so that it would not stand-alone.

We video recorded teachers completing their usual storytime before and after the PIES program, and compared the TUSSD results from each time point. For most teachers, we compared strategy use in the middle five minutes of the videos that they provided. Due to a technical problem, one control group teacher's pretest video was only 1:22 in length. Another teacher from the intervention group provided a short but complete

pretest video lasting 3:36. For these teachers, the coding for their posttest videos was matched in length.

The TUSSD authors report good interrater reliability (ICC = 0.50-0.90) across techniques (Schmidt et al., 2021). The TUSSD measured the frequency and duration of strategies. Teachers' videos were coded using web-based video coding software (www.vosaic.com). For the present study, twenty percent of the twelve total TUSSDs (three videos) were double coded to ensure consistency. A two-way mixed model was used to calculate ICC, with raters as random effects. ICCs for pantomime, vocal variety, feedback about task, print referencing and questioning techniques were all considered good (in order: .85, .85, 1.0, .82, .90), while directed pantomime and picture rferencing were considered moderate (.57 and .58). Feedback about self had zero variance (Koo & Li, 2016).

Teacher Questionnaire

The researcher designed a 27 item survey that includes demographic information and questions related to teachers' experiences with and perceptions of drama-based instruction. The drama-related portion of the survey addresses the teachers' perceptions of using drama strategies during storytime and how it affects children's participation and language skills. The demographic questionnaire was administered at pretest, and the survey was administered at pre and post-test. Questions were original or selected from existing questionnaires (e.g., EYEPlay, n.d.).The survey is divided into two sections. The first revolves around the importance of drama in the classroom generally (six questions) and must be completed with a 0 (not important) to 5 (extremely important) likert scale. For example, "It is ___ for chidlren to participate in dramatic play". The second section is

about the importance of drama-based instructional strategies (ten questions), and is also completed with a likert scale, this time from 1 (disagree strongly) to 5 (agree strongly). For example, “Drama supports children’s understanding of feelings”. The survey can be found in Appendix D.

Parent Measures

Parent Questionnaire

Parents completed a 22 item questionnaire before the start of PIES to collect demographic and language history information about themselves and their child. Results were used in combination with teacher report to determine classification as DLL or monolingual for analysis groupings and English proficiency for inclusion criteria. Relevant questions were selected from several questionnaires used in previous studies (Farver et al., 2006; Spencer et al., 2020) with similar populations.

Home Literacy Environment Questionnaire (HLEQ)

The parent questionnaire also includes the version of the Home Literacy Environment Questionnaire (HLEQ) used by Farver et al. (2006) with adults with limited education, which was modeled after (Payne et al., 1994)’s survey. The HLEQ is a thirteen-item likert scale addressing characteristics of the home that are related to literacy, such as number of available books (Appendix E).

Procedures

Book Selection

Four books were selected for the PIES program, one for each week of instruction. The books were selected following consultation between the principal investigator and a

children's literature specialist at a local book store under the guidelines that each had an anthropomorphized animal as a main character, included each of the story grammar elements outlined by Stein (1982) in a similar length and quanitity of the story elements. Books with anthropomorphic protagonists were selected for two reasons: a) the behaviors and physical characteristics of animals were highly engaging for the children in both control and intervention groups, and b) animal protagonists allowed all children to relate to the main character as equally as possible despite the heterogeneity of race and gender represented in each class.

Data Collection

During pretesting, RAs administered standardized tests to students including the Emotion Matching Task (EMT; Izard et al., 2003), and Narrative Assessment Protocol – 2nd Edition (NAP-2; Bowles et al., 2020), which were audio recorded. RAs also collected video recordings of teachers during a typical storytime before the PIES program began.

During the four weeks of PIES lessons, the SRA measure was administered weekly following the second, or last, story lesson, for a total of four SRAs per child. Each of these SRAs were video recorded. SRAs were administered by research assistants and several trained staff volunteers who had permission to enter the rooms.

At posttest, RAs administered the NAP-2 and Emotion Matching Task once again. Teachers completed the drama-based instruction survey portion of the original teacher questionnaire a second time, and recorded a second typical storytime both after the PIES program was complete.

Story Time Lessons

Trained TAs delivered the PIES lessons with the intervention groups. The attentional control group PIES lessons were deliverd by the principal investigator, a trained RA, and a trained school staff member. This was necessary to accommodate Covid-19 classroom visitor restrictions that were established after the study was initially planned and proposed. Sharing the instructional load helped the research team adhere to this rule. All classrooms heard the PIES storytime lessons on two days out of the week for four weeks. A different book was read each week, making two lessons per book. The lessons divided the books into two parts. During the first lesson, the first half of the book was read and during the second lesson, the second half of the book was read. Participants in the control group heard the same storybooks as the intervention group with the same frequency; however, the intervention group lessons were differentiated by the inclusion of drama based elements through having the students take on the identity of the main character. See Appendix F for a comparison of the lesson activities between control and intervention. Intervention group children were encouraged repeatedly to embody or act out the main characters' emotions.

Each PIES lesson format reflects the story grammar elements. Both control DBR and intervention DBI lessons began with an embodied activity for building rapport with the interventionist. In the control group, this activity involved acting out as an animal that is tangentially related to the book, but does not represent any character in the book. In the intervention group, this involved taking on the identity of the main character through an activity known as the "Magic Bag" by pretending to put on physical and vocal characteristics of that character. The "Magic Bag" is a component of lessons created by a

chidlren's theater company, Childsplay, in Arizona. For example, in the example lessons provided (Appendices G and H) the main character is a bear. During "The Magic Bag" the intervention students were guided to put on pretend claws, roar, and walk like a bear on all fours on the floor. The control group students were guided to put on deer characteristics, such as long, skinny legs and soft fur. They were then guided to eat the flowers on the floor and trot around. At the end of the "Magic Bag", control group students took off their pretend deer characteristics and returned "The Magic Bag" to the ceiling before beginning the book, while the intervention DBI group stayed in character as bears throughout the reading. The comparable movement based activity completed by the control DBR group was part of the lesson to create comparable starting conditions, such as similar opportunity to build rapport with the TA and each other, and experience physical movement to support initial engagement and attention (Cawthon et al., 2011; Tunçgenç & Cohen, 2018).

Following the embodied activity, the remainder of the lessons are organized by the additonal story elements beyond character, inspired by Stein & Glenn (1979). These are: exploring the setting, introduce problem, internal response, attempts, resolution, and conclusion. The control DBR group was asked a variety of question types throughout the story (1-3 questions per story element) aligned with effective dialogic book reading techniques described by (Lonigan & Whitehurst, 1998). The intervention DBI group was asked the same questions in the same order; however, each question was accompanied by a physical movement that reflected the meaning. For example, if the bear in the story felt angry, the children acted out that emotion with facial expressions and roaring. If the bear was drinking tea, the children pretended to drink tea, and so on.

Each element also required asking the children "how do you feel" (intervention) or "how does crab feel" (control), thus distinguishing between taking on the role of main character versus an observer role in interpreting the events of the story. This question was included in order to activate children's emotion recognition. (Guilbert, Sweller, & Van Bergen, 2021) found that when young children ages 4-6 observed gestures and emotions from the narrator while listening to a story, their ability to recall the emotion related events of the story was enhanced. In the intervention group, we sought to further emphasize emotions by asking the children to act them out in addition to observing the TA. As intervention students acted out the internal response of the main character, we hoped to capitalize on their natural understanding of emotions and thereby help them understand the choices and motivations of the main character. We hypothesized that it is this key distinction that allows young children to comprehend the main characters' actions more effectively, and therefore recall the events of a story more accurately.

After the book was complete, the control DBR group gathered as a group for final questions. The intervention DBI group did the same after using "The Magic Bag" once again to remove their main character characteristics and return the bag to the ceiling. At the end of each lesson in both groups, the Teaching Artist asked a distancing question, described by the dialogic book reading framework as a question that requires the children to apply events in the story to their own lives and experiences (Lonigan & Whitehurst, 1998), and closed the session with a group song.

We video recorded 20% of the total PIES lessons (20% control and 20% intervention) and assessed them for procedural fidelity (See Procedural Fidelity checklists for control and intervention lessons in Appendices I and J, respectively). Interventionists

adhered to the procedure on average 92.5% of the time across both groups (95.5% for intervention groups and 91.2% for control groups).

CHAPTER 4

ANALYTIC APPROACH

All study variables were examined using descriptive statistics and bivariate correlations. For student emotion knowledge, narrative retell, and narrative comprehension outcomes, analyses tested the hypothesis that participation in the PIES program would be associated with greater gains in emotion knowledge, story comprehension, and story retell outcomes than a traditional dialogic book reading intervention.

Because the students were nested within classrooms, the degree of correlation across the classrooms was evaluated to determine whether accounting for the nesting in analysis was necessary. Intraclass correlations (ICCs) was calculated and compared across classrooms for the student outcomes using MPlus version 8.7 (Muthén & Muthén, 2017), which revealed low between-classroom variation. ICC for age was .001, for the EMT was .034, and for the NAP-2 was .002. Values below .04 are considered low, indicating that age, and EMT and NAP-2 outcomes were not significantly different by classroom (Musca et al., 2011). To further explore the degree of variation between classrooms, Dummy variables were created representing each teacher (0=student not in classroom; 1=student in classroom) and the pretest student outcomes were regressed on those dummy variables. The results of this regression analysis did not reveal that any specific classrooms were significant predictors of the EMT (F [1, 35] = 1.43, p = .24) or the NAP-2 (F [1, 35] = .49, p = .78) outcomes, indicating negligible variation. Based on these ICCs and regressions, multilevel analysis was not used in an effort to maintain statistical power with the small sample size (McNeish & Stapleton, 2016).

Student demographics were also examined and showed that age was correlated with EMT and NAP-2 scores at pretest, while dual language status and gender were not (Table 1). Finally, age predicted SRA scores for three out of the four books: *Mother Bruce* ($\beta = 5.22$, t (33) = 4.27, p =<.001) *A Visitor for Bear* ($\beta = 4.38$, t (31) = .2.99, p =.01) and *In a Jar* ($\beta = 4.69$, t (32) = .3.39, p =.002). Gender and dual language status were not predictive of scores on any of the SRAs (Table 2). Age was therefore used as a covariate in these analyses. Because within-classroom clustering effects were not significant, mixed analysis of covariance (ANCOVA) was used.

Table 1

Correlations between pretest EMT and NAP-2 Scores and Independent Variables

	Gender	Dual Language Status	Age	EMT at Pretest	NAP2 at Pretest
Gender	1				
Dual Language Status	.08	1			
Age	.12	.16	1		
EMT at Pretest	.15	.04	.54**	1	
NAP2 at Pretest	.15	.19	.43**	.60**	1

Note: * = $p < .05$; ** = $p < .01$

Table 2

Correlations between SRA Scores and Independent Variables

	Gender	Dual Language Status	Age	SRA Week 1	SRA Week 2	SRA Week 3	SRA Week 4
Gender	1						
Dual Language Status	-.08	1					
Age	.12	.16	1				
SRA Week 1	-.32	-.19	.29	1			
SRA Week 2	-.16	.30	.48**	.46*	1		
SRA Week 3	-.21	.10	.52**	.67**	.50*	1	
SRA Week 4	.04	.02	.60**	.37	.23	.53**	1

Note: * = $p < .05$; ** = $p < .01$

SPSS Version 28 was used for all analyses except the ICCs described above. ANCOVA in SPSS uses listwise deletion to handle missing data and, as a result, includes only cases with complete data at all time points. This is a consideration in this study because student absenteeism, naptime, and other uncontrollable factors impacted the quantity of missing data for certain outcome measures and time points. A mixed ANCOVA with age as the covariate was performed to test the main effects of group (intervention vs. control) and time (pretest vs. posttest, or lesson week for SRA) and the time by group interaction effect for each student outcome (i.e., EMT, NAP-2, and SRA). The threshold for statistical significance was set at $\alpha = .05$. Descriptive data for student pre and posttest outcome measures is presented in Table 3.

Table 3

Outcome Measures Descriptives

	Intervention				Control			
Variable	*M(SD)*	Range	Skew (*SE*)	Kurtosis (*SE*)	*M(SD)*	Range	Skew (*SE*)	Kurtosis (*SE*)
EMT Pretest	38.83 (10.57)	16.00-54.00	-.49 (.54)	-.14 (1.04)	33.83 (12.42)	10.00-52.00	-.41 (.54)	-.51 (1.04)
EMT Posttest	43.30 (13.29)	14-64	-.32 (.51)	-.37 (.99)	37.67 (14.34)	8.00-58.00	-.37 (.50)	-.49 (.97)
NAP2 Pretest	9.06 (4.45)	2.00 – 17.00	.26 (.55)	-.84 (1.06)	7.26 (4.90)	1.00-17.00	.83 (.52)	-.26 (1.01)
NAP2 Posttest	12.38 (6.08)	2.00-30.00	.89 (.50)	2.41 (.97)	9.32 (5.74)	1.00 – 29.00	1.96 (.49)	5.9 (.95)

CHAPTER 5

RESULTS

Demographic Data

Results of the caregiver and teacher questionnaires are reported in Tables 4-6. which was collected from 31 caregivers out of 44 students (70.5%) enrolled in the study. The mean total score for the HLEQ was 43.5 (*SD* = 17.2, range: 7-78).

Table 4

Caregiver Survey Results – Caregiver Background (N = 29)

Caregiver Background	*n*	%
Mother's Highest Level of Education		
Some high school	7	14
Finished high school or GED	14	28
Some university	2	4
Associates degree or technical certificate	4	8
Bachelor's degree (BA, BS)	1	2
Master's degree (MA, MS)	1	2
Father's Highest Level of Education		
8th Grade or less	1	2
Some high school	10	20
Finished high school or GED	16	32
Some university	1	2
Associates degree or technical certificate	1	2
Household Income		
$5,000 or lower	5	10
$5,0001-$10,000	2	4
$10,001 - $15,000	5	10
$15,001 - $20,000	3	6
$20,001 - $30,000	6	12
$30,001 - $40,000	4	8
$40,001 - $50,000	2	4

Table 5

Caregiver Survey Results – Language Background (N = 29)

Language Background	*n*	*%*
Child first learned English at school	5	10
Caregiver Rating of Child's ability to *Understand* English		
Understands a little.	1	2
Understands most of what is said.	5	10
Understands as well as a native speaker of English.	2	4
Is a native speaker of English.	23	46
Caregiver Rating of Child's Ability to *Speak* English		
Cannot speak any English.	1	2
Speaks fluent English with errors.	5	10
Speaks like a native speaker of English.	2	4
Is a native speaker of English.	23	46
Child has a diagnosed deficit in vision, hearing or cognitive functioning	2	4
Caregiver is concerned about child's language skills	6	12
Child is from a bilingual household	5	10
Caregivers' Preferred Language		
English	23	46
Spanish	3	6
Spanish and English	5	10
Child's Preferred Language		
English	26	52
Spanish	5	10

Table 6

Teacher Demographics (N = 6)

	M	*SD*	Range
Age	37.06	15.4	30.4-55.2
Years of All Teaching Experience	9	9.402	1-27
Years of Preschool Teaching Experience	9.17	9.326	1-27
Number of Students in Class	8.33	2.16	5-11
	n	*%*	
Highest Level of Education			
Associate's	5	83.3	
Bachelor's	1	16.7	

A detailed report of HLEQ results is presented in Table 7. Student demographics are presented in Table 8.

Table 7

Home Literacy Environment Questionnaire Results (N = 31)

Category	*M*	*SD*	Range	Skew (SE)	Kurtosis (SE)
Parent Literacy Involvement	3.45	1.48	.60-6.00	.07(.42)	-.32(.82)
Parent Literacy Habits	2.87	1.58	.00-6.00	.24(.42)	-.15(.82)
Child Literacy Interest	3.55	1.41	.75-6.00	-.17(.42)	-.65(.82)
Total Score	3.35	1.32	.58-6.00	-.08(.42)	.23(.82)

Note: Likert scale range (0 = never, 6 = daily)

Table 8

Student Demographics (N = 44)

	Intervention		Control	
	n	%	*n*	%
Intervention Status	22	50	22	50
Dual Language Status				
DLL	5	22.7	3	13.6
Monolingual	17	77.3	19	86.4
Gender				
Female	8	36.4	12	54.5
Male	14	63.6	10	45.5

Student Outcomes

Emotion Matching Task (EMT)

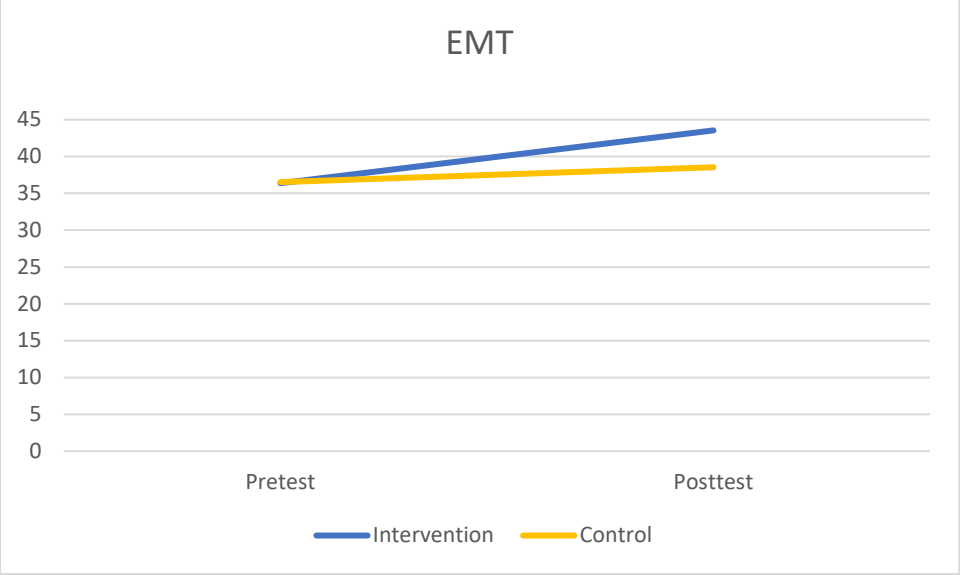
EMT scores were normally distributed among intervention and control groups, as assessed by Shapiro-Wilk's test ($p > .05$), and there were no outliers in the data, as assessed by examination of studentized residuals for values greater than ±3. Shapiro-Wilk's test was used to assess normality rather than assessment of Q-Q plots due to the small overall sample size. The assumption of homogeneity of variances was confirmed using Levene's test ($p = .51$), in which a p value greater than .05 indicates that the assumption is met. The assumption of homogeneity of covariances was also examined

and confirmed using Box's test of equality of covariance matrices (p = .97), in which a p value greater than .05 indicates that the assumption is met.

EMT scores for 34 students were analyzed using a mixed ANCOVA with age as the covariate to test the main and interaction effects of time and group. The main effect of time was significant (F [1, 30] = 5.26, p = .03, η_p^2 = .15), but group (F [1, 30] = .33, p = .57, , η_p^2 = .01) and time by group interaction (F [1, 30] = 1.40, p = .25, , η_p^2 = .05) were not. The effect size for time is considered large (> .14; Cohen, 1988), while group and time by group interaction are considered small. Due to the small sample size, the analysis is likely underpowered for detection of main effects, so the interaction was probed for simple slopes. Additionally, visual inspection of the line graph comparing the two groups showed a slight difference in slopes (Figure 1).

Figure 1

EMT Results: Mean Difference between Control and Intervention Conditions over Time



Note: EMT = Emotion Matching Task.

Changes between pre and posttest were examined for each group. Change from pre to posttest for the intervention group was significant (F [1, 30] = 5.65, p = .02, d = .87) with a large effect size, while change for the control group was not significant and had a small effect size (F [1, 30] = .48, p = .49, d= .29).

Narrative Assessment Protocol – 2nd Edition (NAP-2)

The NAP-2 was used to measure students' narrative retell skills. Students completed two NAP-2s at each time point, and the higher of the two scores was used for analysis. Visual inspection of box plots revealed two outliers at post-test (one from the control and one from the intervention group). The assumption of normality based on Shapiro-Wilk's test was violated for the control group at posttest (p = .01) with these outliers included. However, examination of studentized residuals did not show values greater than ±3, indicating that the residuals were normally distributed. The analysis was performed with and without these outliers and the significance of results was not impacted; therefore, they were included in the final analysis. The assumption of homogeneity of variance was assessed using Levene's test (p = .72), and the assumption of homogeneity of covariances was as assessed with Box's test of equality of covariance matrices (p = .34). In both tests, values higher than .05 indicate that the assumption is met.

The HLEQ results (Farver et al., 2006) was initially planned as a covariate due to the association between home literacy environment and children's oral language skills (Payne et al., 1994). However, a regression analysis revealed that HLEQ outcomes were not predictive of students' NAP-2 scores at pretest (F [1, 22] = .01, R^2= .00, p = .94), nor

were they correlated with the SRA outcomes in the current sample and therefore were not included (Table 9).

Table 9

Correlations between HLEQ and Student Language Outcomes

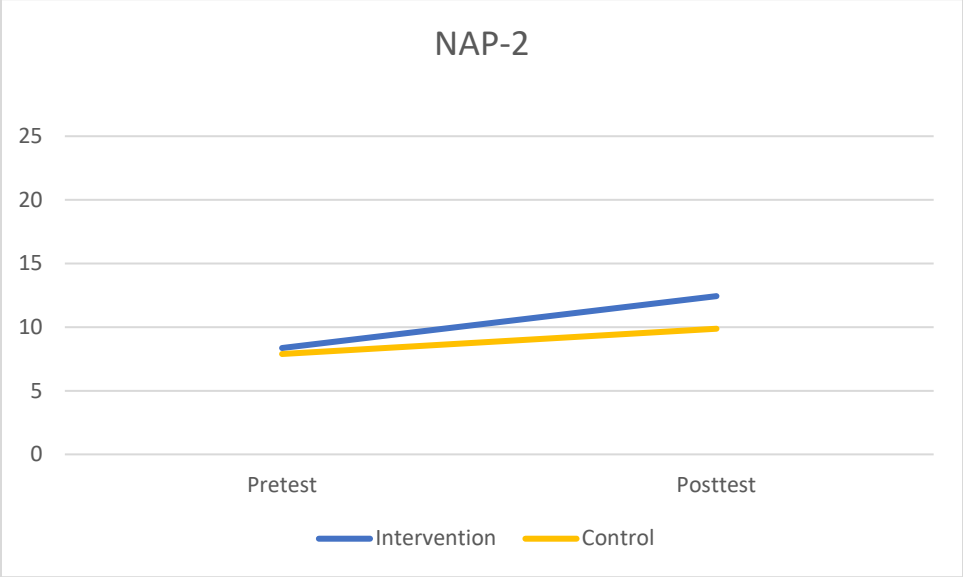
	HLEQ	NAP-2 Pretest	SRA Week 1	SRA Week 2	SRA Week 3	SRA Week 4
HLEQ	1					
NAP-2 Pretest	.02	1				
SRA Week 1	.05	.40*	1			
SRA Week 2	.22	.17	.46*	1		
SRA Week 3	-.02	.43*	.67***	.50*	1	
SRA Week 4	.11	.47**	.37	.23	.53**	1

Note: * = $p < .05$; ** = $p < .01$; *** = $p < .001$.

NAP-2 scores for 36 students were analyzed using a mixed ANCOVA with age as the covariate to assess the main and interaction effects of time and group. Unlike the EMT, time did not have significant main effect (F [1, 33] = .48, p = .49, η_p^2 = .01) and the effect size was small. Group (F [1, 33] = 1.04, p = .31, η_p^2 = .03) and time by group interaction (F [1, 33] = .85, p = .36, η_p^2 = .03) were also not significant and had small effect sizes. Like the EMT, this analysis is underpowered for detection of main effects and was also probed for simple effects. Visual inspection of mean differences by group also revealed a noticeable slope difference between groups (Figure 2).

Figure 2

NAP-2 Results: Mean Difference between Control and Intervention Conditions over Time



Note: NAP-2 = Narrative Assessment Protocol, 2nd Edition.

Results revealed a significant increase in NAP-2 scores for the intervention group (F (1, 33) = 6.44, p = .02, d = .87) but not the control group (F (1, 33) = 1.71, p =.19, d = .46). The effect sizes for intervention and control group simple effects were considered large and small, respectively.

Story Recall Assessment (SRA)

The SRA was administered weekly as a measure of the students' story comprehension to further test the hypothesis that students who participate in drama-based story time improve their narrative comprehension skills to a greater degree than students who participate in traditional dialogic book reading. Students completed the SRA after the second story lesson each week of the study, for a total of four SRA scores, one for each book that was read. Because the story lessons were delivered twice per week,

student attendance was considered in the evaluation of SRA results. Attendance was not correlated with SRA scores.

An independent samples *t*-test was used to compare the SRA scores between students who attended both lessons vs. students who attended only the second lesson, and none were significant (Table 10). Most students with complete data attended both lessons each week.

Table 10

T-tests Comparing Student Attendance with SRA Results

	Attended Both Lessons	Attended only Second Lesson		
	M(SD)	*M(SD)*	*t*	*p*
DWLC	9.27(6.35) (n = 22)	3.50(4.95) (n = 2)	1.24	.23
AVFB	7.00(4.97) (n = 20)	6.00 (n = 5)	.19	.85
IAJ	7.23(4.97) (n = 24)	(n = 0)	-	-
MB	7.24(4.65) (n = 21)	(n = 0)	-	-

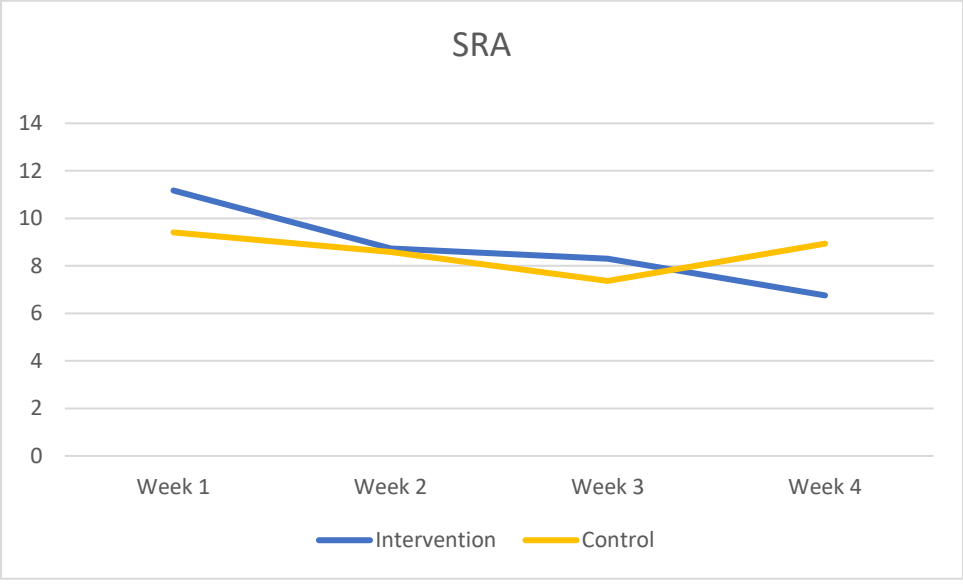
Note: DWLC = Don't Worry Little Crab; AFVB = A Visitor for Bear; IAJ = In a Jar; MB = Mother Bruce. All students attended both lessons of MB. One student attended only the second lesson each week for AVFB and IAJ.

Visual inspection of box plots revealed one outlier in the control group at week four (*Mother Bruce* by Ryan T. Higgins). The SRAs were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$). Examination of studentized residuals did not show values greater than ±3. The analysis was performed with and without the outlier

and significance of was not impacted, therefore the outlier was left in the data set. Homogeneity of variances was assessed by Levene's test of homogeneity of variance for each week, in which *p* values ranged from .46-.84, indicating the assumption was met. There was homogeneity of covariances, as assessed by Box's test of equality of covariance matrices ($p = .05$). Finally, the assumption of sphericity was assessed for the SRA because the time variable includes more than two within-subjects categories (i.e., weeks 1-4). Mauchly's Test of Sphericity, where *p*-values greater than .05 indicate that the assumption is met, showed $p = .78$ for the SRA indicating that the assumption was met. Visual inspection of the mean scores (adjusted for the age covariate) by group over time did not show differences between groups, and neither group showed a marked increase nor decrease (Figure 3).

Figure 3

SRA Results: Mean Difference between Control and Intervention Conditions over Time



Note: SRA = Story Recall Assessment

A mixed ANCOVA was used to evaluate main effects of time, group, and time by group interaction for the SRA with 18 students and age as the covariate. The main effect for time was not significant (F [1, 15] = .42, p = .74, η_p^2 =.03). Group (F [1, 15] = .01, p = .92, η_p^2 =.001), and the time by group interaction effect (F (1, 15) = .53, p = .66, η_p^2 =.04) were also not significant. Effect sizes are considered small for all main effects. Probing for simple effects did not show significant differences between groups each week of the program, nor did it show significant changes in SRA scores over time when comparing groups. Of all the outcome measures assessed, the SRA was impacted most by listwise deletion since few students had data for all four SRAs. Because of this, *t*-tests were used to further explore differences between groups each week while retaining more data. These *t*-tests did not reveal a significant difference between groups for any of the SRAs (Table 11).

Table 11

Differences Between SRA Results by Group and Time

Story/Week	*n*	*M*	*SD*	*t*	*df*	*p*
Week 1 – DWLC				1.77	27	.09
Intervention	14	10.71	5.81			
Control	15	6.73	6.27			
Week 2 - AVFB				-.59	30	.56
Intervention	17	8.35	4.76			
Control	15	7.20	6.32			
Week 3 – IAJ				1.39	31	.18
Intervention	16	7.88	5.15			
Control	17	5.53	4.57			
Week 4 - MB				1.78	32	.08
Intervention	15	8.80	4.33			
Control	19	6.00	4.70			

Teacher Outcomes

Survey

All six participating teachers completed a survey about their perceptions of drama-based instruction at pretest and posttest. No outliers were observed in a visual inspection of box plots. Overall, teachers in both groups reported higher positive beliefs about drama at posttest (M = 74.6, SD = 5.4) as opposed to pretest (M = 66.3, SD = 13.1). Results are presented visually in Figure 4 and detailed by individual teachers in Table 12.

Figure 4

Teacher Survey Results: Mean Difference between Control and Intervention Conditions over Time

All teachers in both groups increased their positive perceptions of drama over the course of the program. Control group teachers had more positive perceptions at pretest, but both groups changed to a similar degree over time.

Table 12

Teacher Survey Subtest and Total Scores by Teacher and Group

Condition	Teacher ID	Importance of Drama		Belief in Drama-Based Instruction	
		Pretest	Posttest	Pretest	Posttest
Intervention	2	4.7	4.8	5	5
	5	3	4.7	3.1	4.0
	6	3.5	3.3	4.5	4.8
Control	3	4.8	5	5	5
	4	4.8	5	4.7	4.8
	7	3.7	4.5	3	4.8

Note: Importance of Drama Scale Range (0 = not important), 5 = extremely important); Belief in Drama-Based Instruction Scale Range (1 = disagree strongly, 5 = agree strongly).

TUSSD

In addition to completing the survey, teachers submitted videos of themselves delivering a "business as usual" story time before the start of the PIES program and after the end. Each video was analyzed to evaluate the hypothesis that observing PIES lessons would yield an increase in use of drama-based strategies for intervention group teachers. Refer to Appendix C for a description of each strategy within the two categories (drama-based and shared reading). Twenty percent of the videos (n = 3) were double coded by two experienced coders and consensus was reached through discussion. Statistical analyses were not performed on TUSSD data due to the small sample size ($N_{Control}$ = 3;

$N_{Intervention}$= 3) and subsequent limited interpretability. Results are presented visually and numerically instead. Tables 13 and 14 show the frequency and duration of the individual strategies used at pre and posttest.

Table 13

TUSSD Results – Frequency Individual Strategy Use by Teacher, Group and Time

Strategy Category	Strategy	Control						Intervention					
		TID 3		TID 4		TID 7		TID 2		TID 5		TID 6	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Drama-Based	DP	0	1	2	0	0	0	6	2	0	1	1	0
	P	0	2	10	0	0	0	13	9	0	1	3	1
	VV	6	5	24	9	22	2	26	11	11	4	10	15
	CD	0	0	1	0	0	0	0	2	0	0	0	0
Shared Reading	PR	5	0	1	1	0	1	0	0	2	0	4	1
	PicR	1	2	22	9	12	18	2	7	1	4	14	4
	QT	2	3	20	7	0	15	10	12	10	17	20	5
	FBT	0	3	8	0	0	0	0	0	0	0	0	1
	FBS	0	0	1	0	0	0	1	0	0	0	0	0

Note: DP = Directed Pantomime; P = Pantomime; VV = Vocal Variety; CD = Character Development; PR = Print Referencing; PicR = Picture Referencing; QT = Questioning Techniques; FBT = Feedback about Task; FBS = Feedback About Self; TID = Teacher ID Number.

Table 14

TUSSD Results – Duration in Seconds of Individual Strategy Use by Teacher, Group and Time

Strategy Category	Strategy	Control						Intervention					
		TID 3		TID 4		TID 7		TID 2		TID 5		TID 6	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Drama-Based	DP	0	2	3	0	0	0	8	4	0	2	3	0
	P	0	3	28	0	0	0	30	22	0	6	11	4
	VV	20	10	53	39	75	3	73	58	61	12	72	105
	CD	0	0	1	0	0	0	0	11	0	0	0	0
Shared Reading	PR	10	0	12	4	0	2	0	0	5	0	24	6
	PicR	2	4	48	25	47	71	7	16	2	18	75	13
	QT	2	5	37	9	0	27	25	12	15	26	25	8
	FBT	0	4	8	0	0	0	0	0	0	0	0	2
	FBS	0	0	1	0	0	0	1	0	0	0	0	0

Note: DP = Directed Pantomime; P = Pantomime; VV = Vocal Variety; CD = Character Development; PR = Print Referencing; PicR = Picture Referencing; QT = Questioning Techniques; FBT = Feedback about Task; FBS = Feedback About Self; TID = Teacher ID Number.

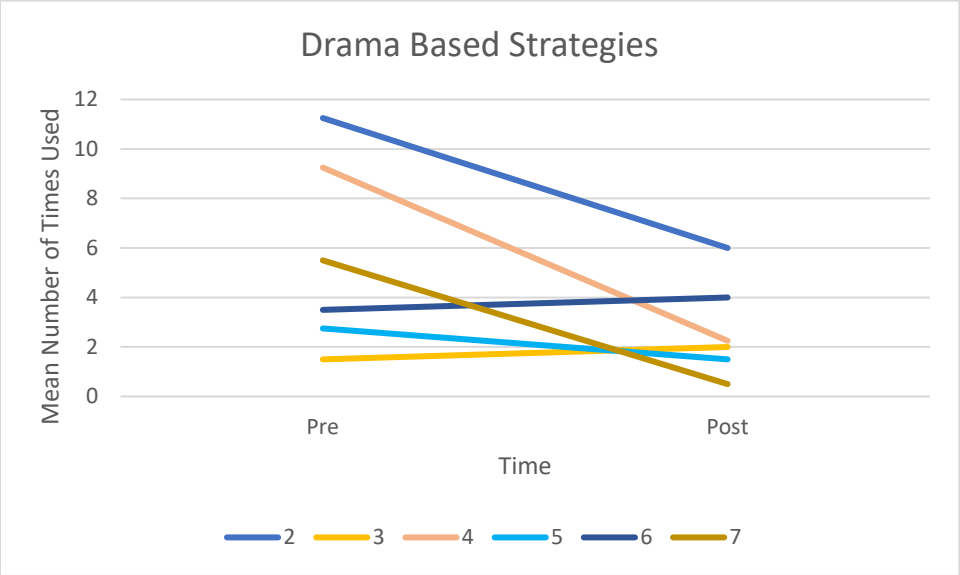
Overall, teachers' changes in strategy use from pretest to posttest were variable. Certain drama-based strategies, such as pantomime and directed pantomime, increased in frequency and duration for two teachers (one control and one intervention). A different intervention teacher increased her frequency and duration of vocal variety, while most decreased in their use of vocal variety. One intervention teacher increased her use and duration of character development while the rest did not use this strategy at all.

In terms of shared reading strategies, four out of the six teachers (two intervention and two control) increased their frequency and duration of picture referencing. All but one of the same teachers increased frequency and duration of questioning techniques also, with the fourth increasing frequency but decreasing duration. Most teachers decreased their use of feedback about task, and in general teachers rarely used feedback about self.

When visually observing individual teachers' mean usage of drama based vs. shared reading strategies, patterns were also variable (Figures 5-8).

Figure 5

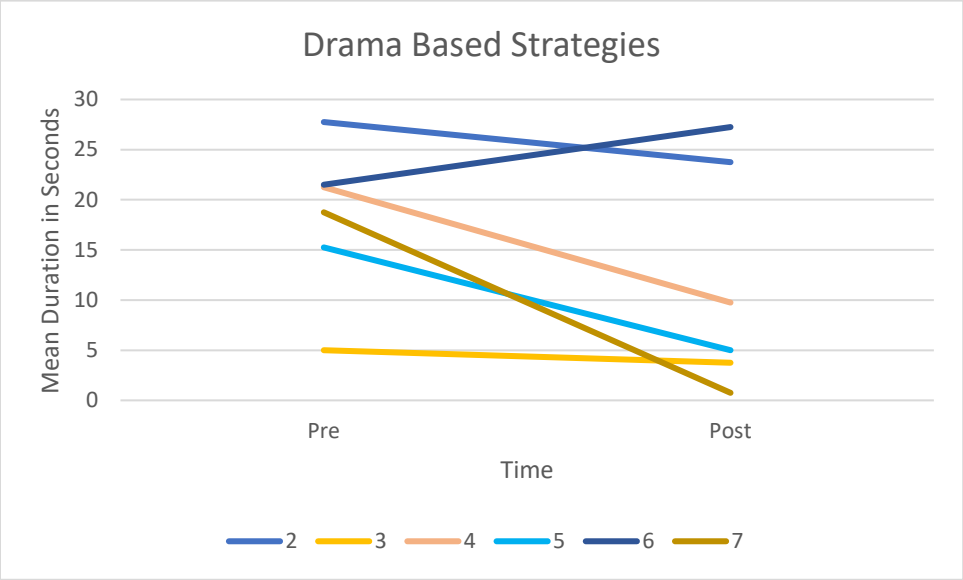
TUSSD Results: Mean Frequency of Drama-Based Strategies Used by Individual Teachers over Time



Note: Blue shades represent intervention group teachers; Yellow shades represent control group teachers.

Figure 6

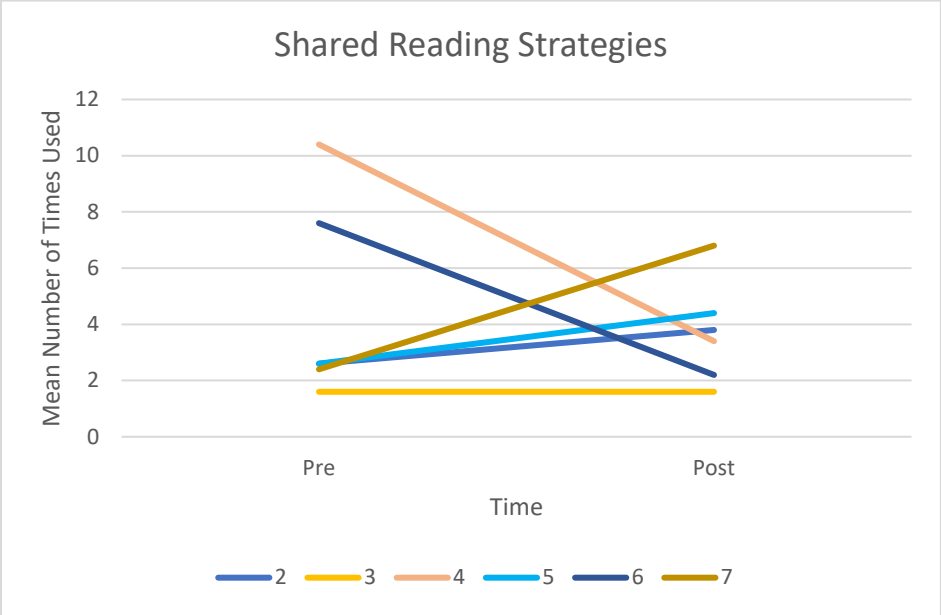
TUSSD Results: Mean Duration of Drama-Based Strategies Used by Individual Teachers over Time



Note: Blue shades represent intervention group teachers; Yellow shades represent control group teachers.

Figure 7

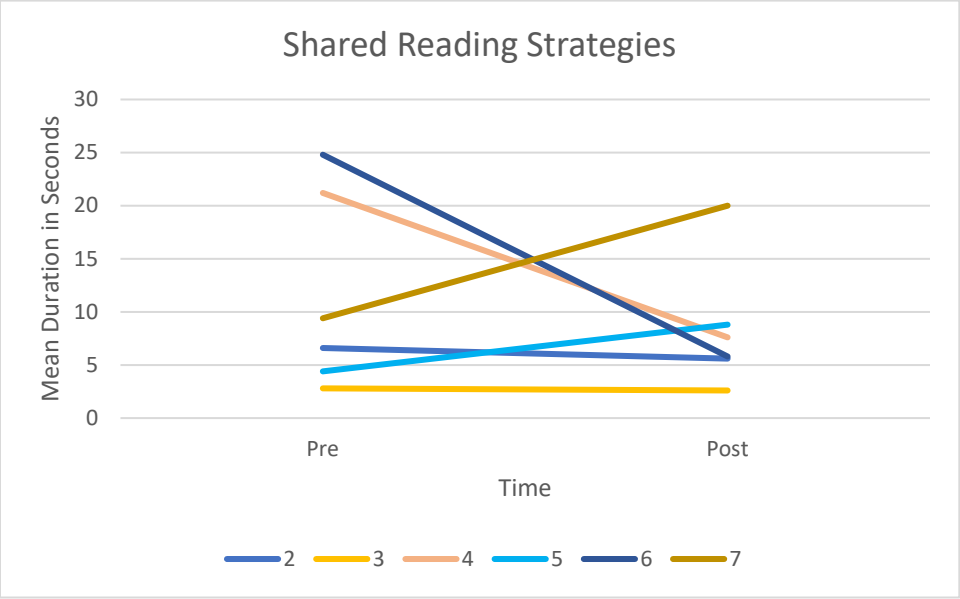
TUSSD Results: Mean Frequency of Shared Reading Strategies Used by Individual Teachers over Time



Note: Blue shades represent intervention group teachers; Yellow shades represent control group teachers.

Figure 8

TUSSD Results: Mean Duration of Shared Reading Strategies Used by Individual Teachers over Time



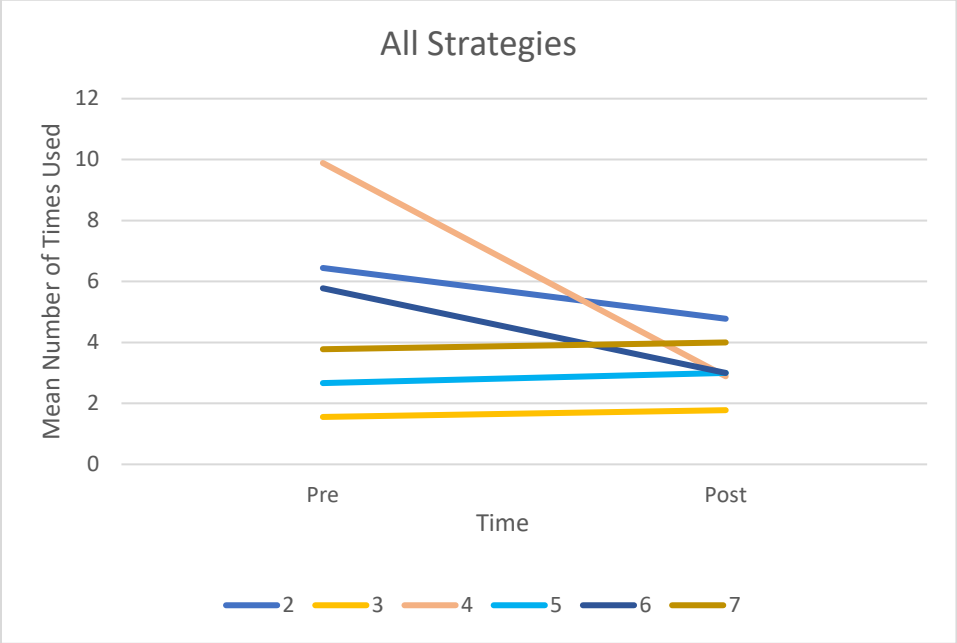
Note: Blue shades represent intervention group teachers; Yellow shades represent control group teachers.

Drama-based strategies trended downward between pre and posttest in frequency for all but two teachers (one control and one intervention). Meanwhile, duration trended upward for only two out of the six teachers (one control and one intervention). A pattern within groups did not emerge. Shared reading strategies also showed variability across teachers and groups with four out of five trending upward in frequency and duration (two control and two intervention). Like drama-based strategies, no clear pattern emerged between the groups. Frequency of using all strategies from both categories trended upward in frequency in both groups for half of the teachers (two control and one

intervention), and downward for duration for two teachers while the rest remained steady (Figures 9-10).

Figure 9

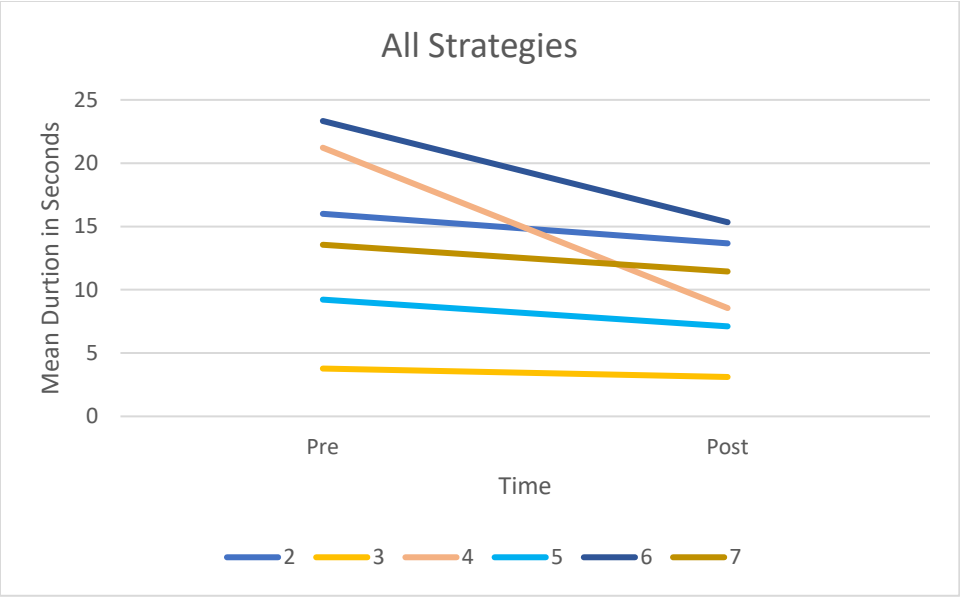
TUSSD Results: Mean Frequency of All Strategies Used by Individual Teachers over Time



Note: Blue shades represent intervention group teachers; Yellow shades represent control group teachers.

Figure 10

TUSSD Results: Mean Duration of All Strategies Used by Individual Teachers over Time

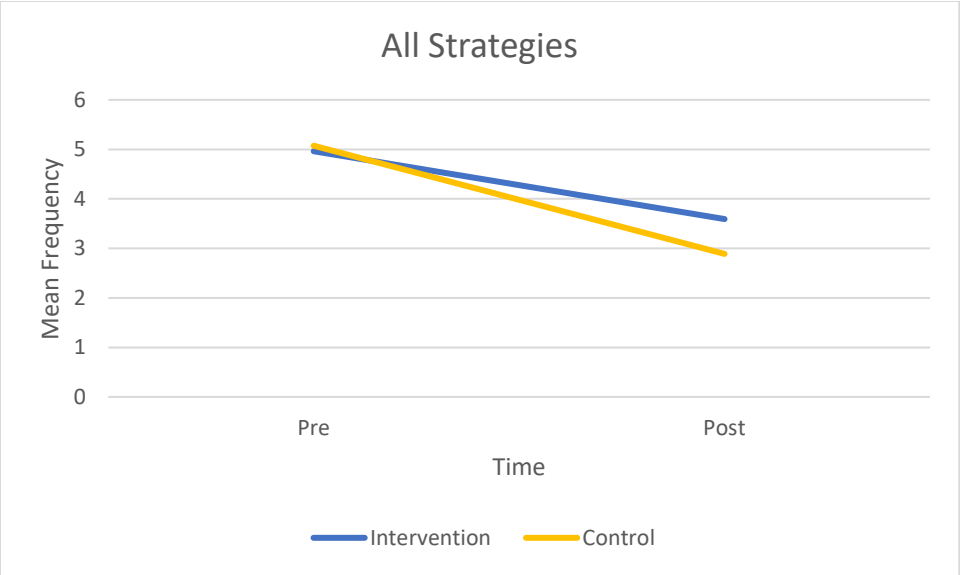


Note: Blue shades represent intervention group teachers; Yellow shades represent control group teachers.

In observing the mean trends for frequency and duration over time (Figures 11-12), trends were also downward for both groups, with a steeper decline in duration.

Figure 11

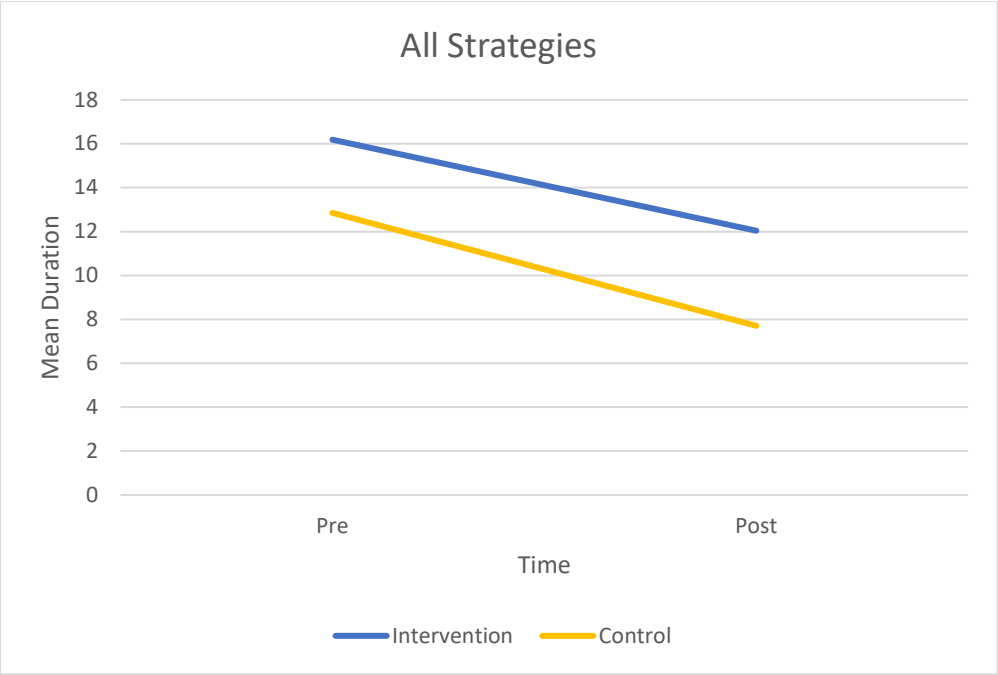
TUSSD Results: Mean Frequency of All Strategy Use over Time by Condition



Note: $N_{Control}$ = 3; $N_{Intervention}$= 3

Figure 12

TUSSD Results: Mean Duration of All Strategy Use over Time by Condition



Note: $N_{Control}$ = 3; $N_{Intervention}$= 3

These figures should be interpreted with caution, however, because the small number of teachers in each group, and differences in book choices, allows single teachers to affect the means substantially. Note that though every teacher provided a video for both time points, teachers 3 and 5's videos were short at pretest (1:22 and 3:36, respectively) due to a technical glitch for 3 and a short story time for 5. The middle of their posttest videos were matched for length before coding, while the rest of the teachers had the middle five minutes of each video coded at both time points. This difference in video length very likely affected the frequency and duration totals for these two teachers when compared to the rest. This and other contributions to the variability in TUSSD outcomes across teachers are presented in the discussion section.

CHAPTER 6

DISCUSSION

This project tested the hypothesis that a drama-based story time intervention with preschoolers, would support significant gains in children's emotion knowledge, story retell, and story comprehension skills over and above dialogic book reading alone. This study is based on a framework of multiple evidence-based instructional strategies: dialogic book reading, embodied language learning, drama-based instruction, and instruction of narrative elements. The children in the intervention group were guided to take on the identity of the main character in the stories, and it was hypothesized that through this method, an improvement in their emotion knowledge would yield improvements in their narrative retell and comprehension skills. Students in the intervention group did not significantly improve their narrative retelling skills, nor did they make significant gains in emotion knowledge or story comprehension over the control group students. Detailed interpretation of results is presented below.

Emotion Knowledge

Analyses revealed that both intervention and control students improved over time on the EMT. These results suggest that verbally drawing students' attention to the emotions of the main character with questions such as, "How does [character] feel?" throughout the lesson increased their emotion knowledge. The addition of taking on the main character's identity before moving and acting out emotions (and hearing questions such as "How do [you] feel?"), did not seem to impact EMT scores. Although there were no significant differences between the groups or a time by group interaction, change over

time was significant and had a large effect size for the intervention group when probing simple effects. This suggests that the addition of movement did provide some impact for intervention group students.

There are several possible explanations for the lack of a main effect of group, including individual student variation evidenced by large standard deviations in the scores of both groups (Table 1). Additionally, the small sample size may have produced inflated *p* values (Sullivan & Feinn, 2012). It is also possible that with more frequent sessions over a longer period, students' emotion knowledge would increase more substantially and show group differences. The PIES program only lasted eight sessions over four weeks. Moreover, the emotion link was targeted indirectly. Several studies have directly targeted increasing emotion knowledge directly in young children through interventions that include drama and storytelling (Mori & Cigala, 2019) by teaching the meaning of emotion terms, discussion, and review of these terms. PIES, alternatively, emphasized emotions but did not teach them in this explicit manner. In PIES, the principal goal was teaching the children to comprehend the stories and produce improved story retells and comprehension. It is difficult to compare these emotion knowledge results with other narrative intervention studies because most report a full macrostructure score rather than outcomes for individual story elements that make up the macrostructure score, such as "internal response" – the element that reflects a character's feelings (e.g., Hessling & Schuele, 2020).

Narrative Retell

Results of the NAP-2 analysis showed that the intervention was not effective over time, nor were there group differences or a time by group interaction. Nonetheless, probing for simple effects revealed a significant change in NAP-2 results from pre to posttest for only intervention group students, with a large effect size. This suggests that drama-based instruction somewhat encouraged students' ability to remember and retell story elements more than dialogic reading strategies alone. Moreover, this outcome was observed using a distal measure of narrative retell, the NAP-2, after a limited dosage of four weeks of lessons (totaling about 40 minutes per week). It is conceivable that more frequent or longer drama-based story instruction may yield the hypothesized main effect of time by group interaction, and stronger effect sizes.

Improvements in story retell skills for the intervention group (as judged by the large effect size in pre-post change) reflect extant research showing that the addition of embodied activities to more traditional shared reading enhances these skills (Murachver & Pipe, 1996; Wall et al., 2022). Drama-based instruction incorporates embodiment into the lessons. The PIES program is different from previous research because it does not require any materials apart from the book itself. Previous studies have used props (Berenhaus et al., 2015; Glenberg et al., 2004; Ionescu & Ilie, 2018; Marley et al., 2007; Murachver & Pipe, 1996) to encourage embodied movements representing the story events, while others used technology, such as tablet based (Wall et al., 2022) or even robot-prompted activities (Kory Westlund et al., 2017). Though Berenhaus et al. (2015) also included a group that acted out events without props, this group did not show

significant gains compared to the group that did use props, likely due to the short duration of only one session. The PIES drama-based instruction relies exclusively on imagination and pretend, yet still shows promise for students who participate. The lack of materials that need to be purchased contributes to PIES' practicality as a school-based intervention, though not using props may increase the necessary dosage for significant outcomes, and impact which students benefit the most from the intervention (e.g., poor comprehenders as in Berenhaus et al., 2015).

The intervention students' simultaneous observation of the teaching artists' actions *and* acting out the events and emotions in the story themselves may have driven their more pronounced change in scores than the control group. These results are consistent with previous work that showed that observing (Dargue & Sweller, 2018b; Guilbert, Sweller, & Bergen, 2021; Macoun & Sweller, 2016) and carrying out (Bernstein et al., 2022; Cutica et al., 2014) semantically relevant gestures improves children's recall. Concurrent observation and action without props is unique to PIES and may be the factor supporting intervention students' notable gains in narrative retell over time. Perhaps this factor helped them gain skills at a faster pace than control students.

Finally, individual variation amongst students likely impacted the NAP-2 results. Preschool is recognized as a dynamic period in young children's narrative development, and the participating students were a range of ages reflecting different expected abilities during this period (Khan et al., 2016). The fact that age was a predictor variable reflects this diversity in ability and may also contribute to students' variability in responses and

the amount of increase in their scores over time. If this is the case, perhaps age is a determinant for *who* benefits from drama-based story instruction the most.

Narrative Comprehension

In addition to the distal EMT and NAP-2 measures, the SRA, a researcher-designed measure of story comprehension, was administered following each week's lesson to evaluate children's understanding of the books. Questions represent story grammar elements, and students can earn additional points for providing accurate details about other elements when answering questions (see Appendix B for an example of the scoring system). Results of the SRA did not show significant differences for time, group, or time by group interactions, and all had small effect sizes. The measure was administered after each lesson. Therefore, students had already had a PIES lesson at the first time point because the measure assesses comprehension of books used in the intervention. As mentioned previously, the SRA was impacted by listwise deletion in the analysis, meaning that inconsistent student attendance over the four weeks may have impacted the results. No growth pattern emerges for either group over time, suggesting that the PIES program may be too short to result in any cumulative improvements in story comprehension, or that differences between the books affected the results at individual time points.

Previous research on comprehension during preschool story-time narrative tasks and interventions indicates that use of semantically relevant gestures supports young children's comprehension. (Macoun & Sweller, 2016) found that preschoolers answered questions about a story more accurately if they heard it while the narrator gestured;

however, these students were tested after only one session. Results of the current study are not consistent with these results, even though intervention students observed teaching artists carrying out the actions in addition to carrying them out themselves in a longer program. In this example and in other studies, proximal measures of narrative comprehension are typically administered after fewer than three sessions and do not include a measure following each lesson (Berenhaus et al., 2015; Ionescu & Ilie, 2018). Other studies include comprehension questions as part of the intervention lessons, but not as an outcome measure (e.g., (Petersen et al., 2022). Nonetheless, some school based studies have used narrative comprehension as an outcome in their analyses. (Spencer et al., 2013) observed improvements in five preschoolers' comprehension outcomes after a 24 session program in a multiple baseline, multiple probe design. Bowyer-Crane et al. (2008) also noted gains in narrative comprehension in preschool students who attended two 10-week oral language interventions in which narrative instruction was part of half of the sessions and delivered individually. Fricke et al. (2017) also observed gains in preschool aged children's narrative comprehension following a 20- or 30-week multifaceted oral language intervention which included narrative instruction as a component. These examples show that it is possible to observe increases in narrative comprehension skills throughout an intervention with preschool students and that higher dosage may contribute to that growth.

Students showed variability in their engagement while answering the comprehension questions, despite active engagement during the story lessons. Levels of distraction in the room were also inconsistent across classrooms and days. The

interventionists showed very good procedural reliability, so impacts to the SRA results were more likely due to other factors, such as book differences, environmental characteristics such as distracting noise levels, and student engagement.

In summary, results indicate that PIES intervention students may benefit from the program in pre to posttest change for story retelling skills and emotion knowledge skills. Improvements to story comprehension were not observed, but results may have been impacted by extraneous factors. The overall results seem to reflect that the study is underpowered, but due to the pandemic additional data was difficult to obtain. Nevertheless, the significance by group when probing simple effects for retell and emotion knowledge suggests that drama-based instruction has the potential to trigger the advantage of using movement to enhance story time. A longer program delivered with more frequency may show more gains in all three areas: story retell, story comprehension, and emotion knowledge.

Teachers' Beliefs about Drama

All participant teachers completed a survey evaluating their beliefs about drama-based instruction before and after the implementation of the PIES lessons. Visual analysis of results and comparisons of descriptive data between the groups showed an increase for all teachers in their positive perceptions about drama-based instruction (Figure 5, Table 10). This included their perceptions of the importance of drama in general, and their belief in the usefulness of drama-based instruction. The teachers' increased positive attitudes after observing the lessons likely contributed to teachers' increased use of certain strategies themselves (see TUSSD section below).

Teachers' Use of Strategies for Story Time Drama (TUSSD)

We hypothesized that teachers in the intervention group would demonstrate increased frequency and duration of their use of drama-based strategies after observing lessons in the PIES program in their classrooms. Due to the small sample size of six teachers, analyses were not performed in favor of discussion of descriptive results ($N_{Control}$ = 3; $N_{Intervention}$= 3). Results showed high variability amongst individual teachers in both groups, and stable or downward trends when looking at group means. Most teachers increased their use of picture referencing and questioning techniques in both frequency and duration, both of which are shared reading strategies. Drama-based strategies were more variable between the groups, with some teachers increasing and others decreasing in their use of pantomime, directed pantomime and vocal variety. Character development was rarely used.

Inconsistencies between and within the groups were likely impacted by several factors. First, as described in the results section, two teachers provided pretest videos that were quite short, meaning their window of time to use strategies at all was limited and the coded segments of their posttest videos were matched for length. Mean differences should be interpreted with caution due to the small sample, and the fact that a single teacher can substantially influence the mean. Also, certain teachers were observed to be somewhat uncomfortable recording themselves and made eye contact with the camera several times. If they were uncomfortable, the recorded story time may not reflect what they typically do in the classroom with full accuracy. Finally, because these videos were "business as usual", differences in the types of books they used were present. One teacher

read *The Paper Bag Princess* by Robert Munsch, while two others read *The Grouchy Ladybug* by Eric Carle. The former is more aligned with books used in the PIES program because it includes many story grammar elements and episodes, while the latter is a sequential story with fewer elements represented and less plot elaboration.

All teachers were in the classrooms while the PIES lessons were delivered and observed every lesson. Thus, teachers in both groups saw examples of shared reading strategies which may have led to their increased use. At pretest, teachers' use of discourse-supporting strategies such as questioning techniques was more pronounced than drama-based strategies. However, many teachers used yes/no and labeling questions rather than prediction and connection to the children's personal lives. This profile of question types is considered typical in diverse preschool Head Start classrooms (Jacoby & Lesaux, 2017). By posttest, control and intervention teachers had increased their frequency of using questions and it was noted that several employed question types that were more supportive of discourse.

Emerging research has shown that when teachers increase their use of drama-based strategies (e.g., directed pantomime, pantomime, character development and vocal variety), children improve story comprehension (Pierce et al., 2022). Since only one intervention teacher showed a downward trend in drama-based strategies while the other two were stable and increased in frequency, this may have contributed to group differences on the students' story retell and comprehension measures. In contrast, two of the control teachers trended downward while the other was stable (Figure 10). This explanation supports previous research linking children's observation of gestures with

improved story recall skills in that if teachers were using more drama-based strategies during their normal story time (outside of the PIES lessons but during the same weeks), this may have contributed to the students' overall higher comprehension skills in the intervention group on the SRA (Dargue & Sweller, 2018a; Macoun & Sweller, 2016).

Past research shows that, though DBI can have positive effects on student outcomes when delivered by classroom teachers, these teachers may feel ill equipped to provide such instruction (Garvis & Pendergast, 2012), and these positive effects may be more related to the length of DBI programs that classroom teachers can provide over a full school year, which last substantially longer than those delivered by visiting teaching artists (B. K. Lee et al., 2015). When teachers receive direct instruction in how to use DBI effectively, they are more apt to use these strategies independently (Lee et al., 2013). Thus, the indirect learning of DBI for PIES teachers may not have been sufficient to impact changes in their behavior. Overall, the TUSSD results imply some effects of observing drama on teachers' use of similar strategies, but with considerable individual variation.

CHAPTER 7

LIMITATIONS

Certain limitations impacted the PIES project in the planning, implementation, and analysis stages. While planning, managing the schedule of Teaching Artists and Research Assistants in delivering the intervention was difficult due to a Covid-19 related regulation that only one outside visitor could be present in each classroom per day. Because of this, the control lessons were delivered by a Research Assistant and the principal investigator rather than the Teaching Artists, as was originally planned. Though procedural fidelity was very good, differences in professional experience across these interventionists should be considered in the interpretation of results.

Further threats to external validity should be considered for teacher participants that are not as relevant for student participants when interpreting these results. All participating teachers volunteered after recruitment materials were shared with the Head Start during a regularly scheduled teacher meeting. Though control group teachers did not observe drama-based lessons in their own classrooms during the program, it is likely that all participating teachers conversed and shared their thoughts as they have a shared work room at the school site. This may be considered experimental treatment diffusion due to the spreading of ideas about drama amongst the teachers (Bellini et al., 2003). An additional threat to validity of the teachers' outcomes is the "Hawthorne Effect" because teachers may have wanted to demonstrate positive feelings about drama-based instruction for the sake of the principal investigator and research team. Nevertheless, all teachers in the study did report positive beliefs about drama-based instruction and anecdotally shared

their enjoyment of having the research team visit, demonstrate lessons, and share the books and lesson plans after the end of the project for their own use.

During the pretesting and post-testing portions of the study implementation, environmental issues arose. Tests were administered inside the classroom. Though RAs used the quietest and least distracting space available, such as a small table in the corner, the students were distracted by noise and classroom activities, which may have resulted in lower cooperation with the testing and less care in responding. Additionally, RAs were required to wear masks while administering the pre and posttest measures which may have impacted the students' ability to hear the stories or words that were required. We should also consider, for the EMT measure specifically, that these students have had limited exposure to seeing faces of people from outside their household over the last two years due to the ongoing pandemic and masking requirements. This reduced visual input of faces and facial expressions may have impacted their ability to label photographs of emotional facial expressions as is required on the EMT (Gori et al., 2021). Apart from masking, the EMT may not have shown significant results for group or interaction because it is a distal measure of emotion knowledge does not align closely with the skills highlighted during the lessons in either group.

Finally, as mentioned in the results section, the nested nature of this data could not be accounted for statistically without reducing power to a point where results would not be interpretable. Despite small ICCs and regressing outcome variables on teacher dummy variables to assess variance, a nested model may have been more appropriate if it were possible to maintain power. Though in the present study ANCOVA was adequate,

future iterations with more students and classrooms will necessitate analyses that accommodate nesting and missing data more effectively. Multilevel modeling is one option, as well as a linear mixed model. Bayesian analysis is also a worthwhile future approach. By relying on the characteristics of the specific sample rather than the general population, a Bayesian approach may provide a more accurate representation of the effectiveness of the PIES program.

CHAPTER 8

FUTURE DIRECTIONS

The promising results presented here support future iterations of the PIES program with some adjustments, as well as a more detailed examination of certain variables in the data collected in this first iteration. In future iterations researchers should expand recruitment efforts to include a large enough sample to complete a multilevel analysis and account for the nested nature of the data. Also, a larger recruitment net will likely yield a more diverse sample, particularly with dual language learners. Several studies have shown the benefits of observing and carrying out embodiment in second language vocabulary teaching (Gámez et al., 2017; Wang & Plotka, 2018). An adequate number of dual language learners in the sample will allow using this characteristic as a grouping variable in analyses, enabling researchers to test whether the PIES intervention is more effective for DLLs than their monolingual peers or vice versa. The format of both observing and carrying out embodied, drama-based movements simultaneously during stories distinguishes PIES from previous research involving DLLs' embodied vocabulary learning. A related future direction is implementing the PIES program in other languages, with a different set of story books chosen accordingly. Narrative comprehension and retell outcomes could be examined in both languages to evaluate the presence of transfer, an outcome of great interest to supporters of bilingual education. In addition to DLLs, recruiting students who have disabilities is also an important area of exploration based on promising research using drama-based story instruction with children who have diagnoses that impact their communication (e.g., So et al., 2019).

Other possible adaptations involve increasing the dosage. Though session length was determined after discussion with teachers and based on fitting the lessons into their typical story time schedule to preserve ecological validity, the number of weeks or sessions per week could easily be increased. This may result in stronger effects, though some research shows no difference in student outcomes after delivery of the same intervention with varying frequency (Bellon-Harn, 2012). Repetition of the stories is another adjustment that may yield stronger effects of the PIES program, as it is associated with increased language output and complexity for preschoolers (Ackerman, 1976; McGee & Schickedanz, 2007). Including parents and teachers in the delivery of the lessons is yet another area for consideration. Some professional development programs teach the use of drama-based instruction to classroom teachers (e.g., the Early Years Educators at Play [EYEPlay] program), with promising results on student language outcomes. Similar training could be applied with PIES. Parents and caregivers are also an excellent option as they are often invited to deliver story time in their child's classroom.

Deeper analysis of narrative microstructure outcomes is an additional direction that can be pursued with the current data set. The NAP-2 measure scores several microstructure features in addition to the macrostructure, and these contribute to the total score (e.g., use of tier two verbs, adverbs and adjectives, use of elaborated noun phrases, and emotion references). Most narrative intervention studies with preschool children focus on macrostructure; however, in typically developing children microstructure may also improve with interventions (e.g., Peña et al., 2006; Runnion et al., 2022). Students' use of emotion references is particularly suitable for analysis because the PIES program

emphasizes the main characters' emotions in both control and intervention groups. Assessing this specific NAP-2 test item will allow us to see whether intervention students used emotion terms with more frequency than their control group peers, which may justify revisiting the original hypothesis that it is emotion knowledge driving students' narrative retell outcomes.

In addition to closer analysis of data that is already collected, future iterations of PIES may include additional measures to assist in interpretation of results. Using the children's pretest scores as a covariate in the analysis may account better for individual differences that were observed. Also, an English language proficiency measure for students classified as DLL would serve as a worthwhile covariate and may provide useful information about students' participation during lessons (Malloy, 2020).

CHAPTER 9

CLINICAL IMPLICATIONS

The addition of embodiment via drama-based instruction to preschoolers' story time results in significant gains in students' story retell skills over and above those produced by traditional dialogic book reading. Because story retell skills are predictive of later reading comprehension ability, this type of intervention can provide important support in this area for all students, as it can be delivered during the regular school day. Moreover, increased student engagement during drama-based instruction was reported by the PIES teachers, and has also been reported in other studies (e.g., Bernstein et al., 2021; Kilinc et al., 2017). Participation in story time that does not require verbal communication would offer a more inclusive option for students with communication disorders while tapping into embodiment as a language learning strategy. For example, a speech-language pathologist could preprogram key vocabulary words such as emotion terms into a child's speech generating device before the lessons begin, allowing that student to "call out" answers with their classmates. Students with diverse abilities can act out emotions and events in a variety of ways, with adaptations in place as needed. Finally, drama-based instruction during whole class story time can be efficiently adapted to smaller groups in Response-to-Intervention (RTI) or Multi-Tier Systems of Support (MTSS) contexts and may serve as a foundational or preventative language learning tool. Students who struggle with attention may especially benefit from participation with a smaller group. Altogether, the PIES program shows promising implications for a variety

of student groups while offering flexibility for use in a wide array of contexts and populations.

CHAPTER 10

CONCLUSIONS

PIES is a promising contribution to research on the effects of drama-based instruction with preschool students and teachers. Teachers may need direct instruction in use of drama-based strategies to incorporate these into their daily instruction. Acting out the events of the story appears to be a supportive ingredient in improving story retell and comprehension for preschoolers, but further research is needed to evaluate effects with different dosage and participant characteristics.

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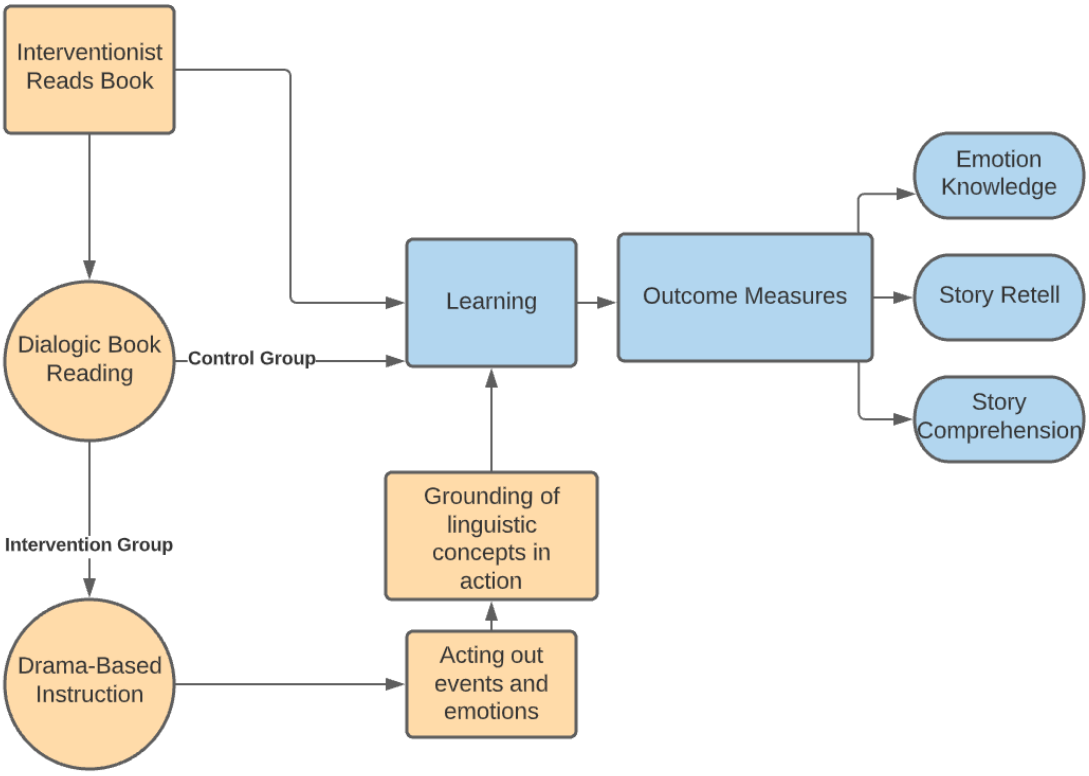
APPENDIX A

PIES LEARNING MODEL


Interventionist Reads Book
Dialogic Book Reading
Control Group
Intervention Group
Drama-Based Instruction
Learning
Grounding of linguistic concepts in action
Acting out events and emotions
Outcome Measures
Emotion Knowledge
Story Retell
Story Comprehension

APPENDIX B

EXAMPLE SRA SCORE SHEET

Story Recall Assessment

"A Visitor for Bear" by Bonny Becker

Point values are bolded.

1. Who was the story about? (*Character*)

   (The/A) bear AND the mouse **3**

   The bear **2**

   Only mouse/animal **1**

   No Response/ Wrong Answer **0**

2. Where was Bear in the story? (*Setting*)

   Action plus home (making breakfast/cooking)/kitchen **3**

   Action plus home (making breakfast/cooking)/kitchen (*one of these answers*) **2**

   Forrest (*non-specific answers*) **1**

   No Response/Wrong Answer **0**

3. What surprise happened when Bear was at home one day? (*Initiating Event*)

   He heard a knock at the door and saw mouse/mouse was there **3**

   Someone knocked at the door/mouse **2**

   Mouse/door/knocked OR tap on table (*verbalized or physically*) **1**

   No Response/Wrong Answer **0**

4. What was the problem? (*Problem*)

   Bear does not like visitors AND wants mouse to leave **3**

   Mouse keeps trying come in/Bear does not like visitors AND wants mouse to leave (*one of the answers*) **2**

Mention No Visitor Sign in a way/bear did not like the mouse **1**

No Response/Wrong Answer **0**

5. How did Bear feel? (*Internal Response*)

   Angry OR mad/grumpy **3**

   Sad OR bad/mouse kept coming (*sad valance*) **2**

   Sad OR bad/mouse kept coming (*one of the answers*) **1**

   No Response/Wrong Answer **0**

6. What did Bear do next? (*Attempt*)

   Mention bear repeatedly keeps mouse out (*one specific way OR mentions two things*) **3**

   Mention bear repeatedly keeps mouse out (one or other answer) **2**

   Bear said go away **1**

   No Response/Wrong Answer **0**

7. What did Bear do when Mouse was persistent? (*Resolution*)

   Let's mouse in the house AND one activity OR two activities **3**

   One activity OR lets mouse in **2**

   Non-specific activity that makes sense **1**

   No Response/Wrong Answer **0**

8. What happened at the end of the story? (*Conclusion*)

   Bear and Mouse were friends AND Bear didn't want Mouse to leave **3**

   Bear and Mouse were friends AND Bear didn't want Mouse to leave (*One or another of the answers*) **2**

Bear was alone/mouse said Goodbye OR Bear sad (*Non-specific answer*) **1**

No Response/Wrong Answer **0**

9. Any correct 3-point answer that was mentioned while answering a different question (*worth 1 point*). No cap.

- Tally each one that the child said below and write the total in this box. _____

Total Score: _____

94

APPENDIX C

ADAPTED TUSSD STRATEGY DESCRIPTIONS BY CATEGORY

Strategy Name	Type	Description
FB about Task	Shared Reading	Teacher gives feedback on how well tasks are understood or performed - corrective feedback
FB about Self as Person	Shared Reading	Teacher gives personal evaluations and affects (usually positive) about the learner - simple praise (simple yes responses, nodding or repeating student answers were coded as not present).
Print Referencing	Shared Reading	References that the teacher makes about the actual text of the book
Picture Referencing	Shared Reading	References that the teacher makes about the illustrations of the book, directing students' attention to what is happening in the pictures
Questioning Techniques	Shared Reading	Teachers engage students by asking questions about the story, encouraging them to recall events, analyze the events, predict future events, and connect the story to their lives.
Directed Pantomime	Drama-based	Teacher directs statements asking students to embody the story - using the body to illustrate the story
Pantomime	Drama-based	Teacher acts out parts of the story, role plays, uses props, - the use of iconic movements to illustrate the story
Character Development	Drama-based	Teacher encourages students to take on a being outside of themselves through voice and body and to experience emotion through the character as well as express events from the characters' point of view.
Vocal Dramatic Elements	Drama-based	Teacher uses inflection and voices while telling the story

Note: The Facial Expression category was removed from this table, and Vocal Variety is classified as "Drama-based". In the original TUSSD it is classified as "Overlapping".

APPENDIX D

TEACHER SURVEY ABOUT PERCEPTIONS OF DRAMA

Drama Beliefs and Practices

1. Do you have any background or training in using drama in the classroom? If so, please describe.

   _____
   _

_____
___

For the following items, please select the number that corresponds with how you would fill in the blank (0= not important, 5 = extremely important).

1. It is _____ for children to have stories read to them individually and/or on a group basis.

2. It is _____ for children to dictate stories to the teacher.

3. It is _____ for children to participate in dramatic play.

4. It is _____ that children participate in creative movement during the school day (e.g., drama, dancing, etc.)

5. It is _____ for children to learn through interaction with other children.

6. It is _____ for the teacher to talk to the whole group and make sure everyone participates in the same activity.

How much do you agree or disagree with the following statements? Please circle a number, with 1 = disagree strongly, 2 = disagree, 3 = neutral, 4 = agree, and 5 = agree strongly.

1. Drama helps children express their feelings.

1	2	3	4	5
Disagree strongly				Agree strongly

Appendix D (continued)

2. Drama helps shy students participate at story time.

1	2	3	4	5
Disagree strongly				Agree strongly

3. Drama helps dual language learners (DLLs) participate at story time.

1	2	3	4	5
Disagree strongly				Agree strongly

4. Adding drama can make story time a more effective learning activity.

1	2	3	4	5
Disagree strongly				Agree strongly

5. Using drama during story time keeps students engaged in the activity longer.

1	2	3	4	5
Disagree strongly				Agree strongly

6. Drama supports children's understanding of feelings.

1	2	3	4	5
Disagree strongly				Agree strongly

7. Drama helps children develop empathy for others.

1	2	3	4	5
Disagree strongly				Agree strongly

8. Drama helps children identify others' feelings.

1	2	3	4	5
Disagree strongly				Agree strongly

9. Drama helps children manage their own feelings.

1	2	3	4	5
Disagree strongly				Agree strongly

10. Drama helps children improve their communication skills.

1	2	3	4	5
Disagree strongly				Agree strongly

APPENDIX E

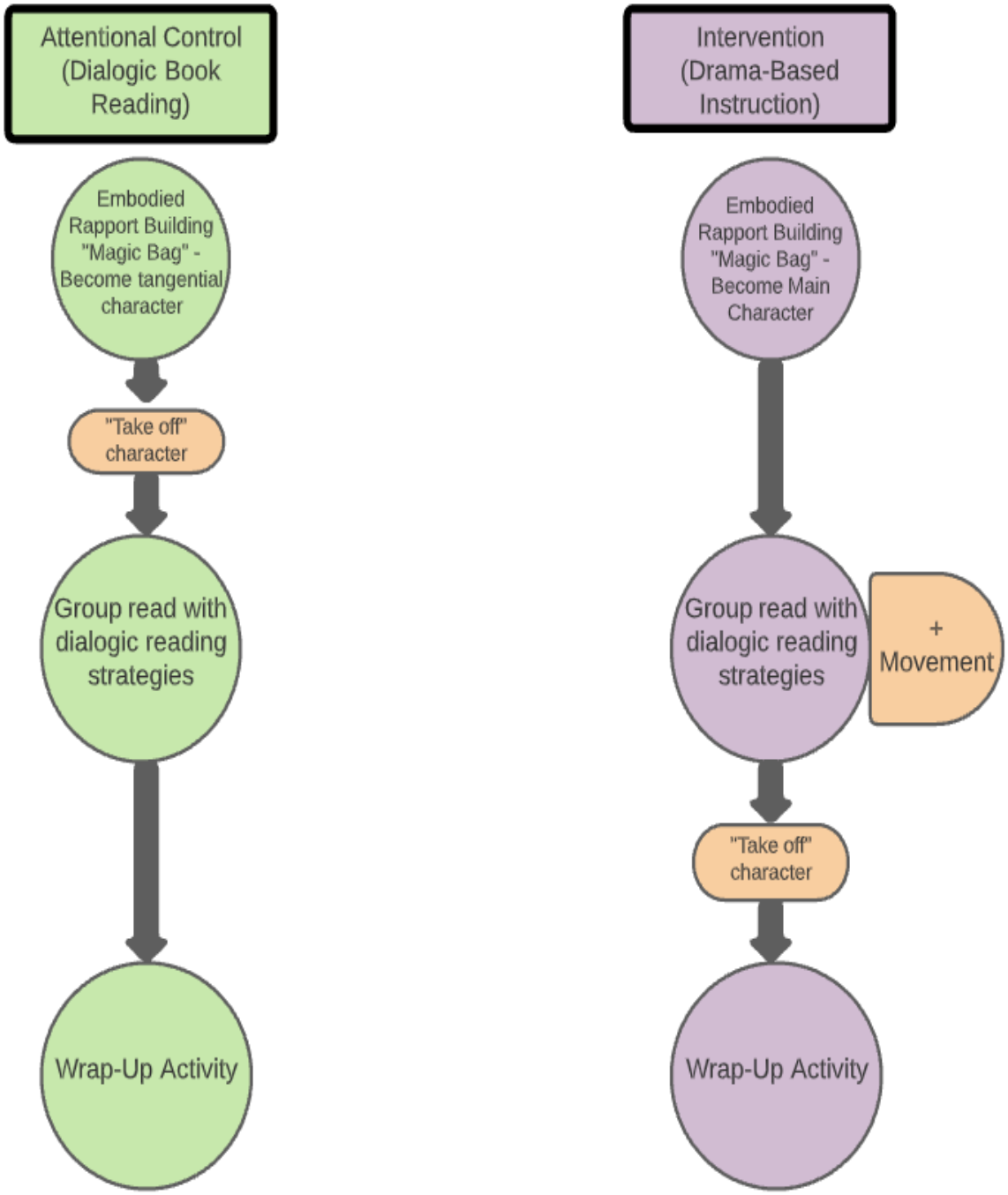
HOME LITERACY ENVIRONMENT QUESTIONNAIRE

Parent Literacy Involvement
1. About how many times per week do you read to your child at home?
2. About how many times per month do you go to the library with your child?
3. About how often do you try to teach your child the letters of the alphabet?
4. how often do you play rhyming games with your child?
5. About how often do you point out words to your child and tell him/her what they say?
Parent Literacy Habits
6. About how often do you read for fun and pleasure?
7. About how often does your spouse read for fun and pleasure?
8. How often does your child see you or your spouse reading for enjoyment?
Child Literacy Interest
9. About how many times per week does your child ask to be read to?
10. About how many times per week does your child look at books by himself/herself?
11. About how often does your child ask you what printed words say?
12. About how often does your child attempt to write words?
13. About how often does your child play with alphabet games?

Note: Lonigan & Farver (2002).

APPENDIX F

PIES LESSON PLAN COMPARISON


Attentional Control (Dialogic Book Reading)
Embodied Rapport Building "Magic Bag" - Become tangential character
"Take off" character
Group read with dialogic reading strategies
Wrap-Up Activity
Intervention (Drama-Based Instruction)
Embodied Rapport Building "Magic Bag" - Become Main Character
Group read with dialogic reading strategies
+ Movement
"Take off" character
Wrap-Up Activity

APPENDIX G

EXAMPLE CONTROL GROUP LESSON PLAN

PIES Lesson Plan
Shared Reading (Control) Group
2-Sessions

"Mother Bruce" by Ryan T. Higgins
Interventionist: _____
Date: _____

<table>
<tr><th colspan="2">Day 1:</th></tr>
<tr><td>Background Knowledge (2-3 Min)</td><td>• Talk about what the children know about bears and the forest, about geese (fly south in the winter, come from an egg), taking care of babies</td></tr>
<tr><td>Magic Bag (5-7 Min)</td><td>Research Assistant guides children through "Magic Bag" to take on the identity of a forest animal (NOT that of the main character- Bear). Use for rapport building and engagement.
• Group pulls a bag from the ceiling.
• Children "put on" deer characteristics.
0. Grow long skinny legs.
1. Put on soft fur.
2. Put on big almond shaped eyes.
• Children move like deer.
0. Lean down and eat the flowers.
1. Trot around quickly.
Group takes off deer personas and pushes bag back to ceiling.</td></tr>
<tr><td>Embodied Reading (15 Min)</td><td><u>Exploring the Setting:</u>
Dialogic Reading Questions:
• My forest has a lot of trees and animals. What is your forest like? Would you be grumpy in the forest like Bruce?
• Where is Bruce going? What is he looking for? Why?
• What does Bruce hear? What does he see? What does he taste? What does he smell?
How does Bruce feel?

<u>Introduce Problem:</u></td></tr>
</table>

	Dialogic Reading Questions: • What's happening in this picture? (goslings in the pan, goslings won't leave him alone) How does Bruce feel? **Internal Response:** Dialogic Reading Questions: • How does Bruce feel? I think he feels very _____! (surprised, mad). Is he still hungry? (no) How does Bruce feel?
Wrap-Up Activity (3-5 minutes)	• Sitting in small group, research assistant asks a "distancing" question (from CROWD) format: • Have you ever helped to take care of or teach a baby? Group sings goodbye song together.

Day 2:	

Background Knowledge (2-3 minutes)	• Talk about what children remember from Day 1 Lesson. Cue with pictures.
	  ○ Bruce is a big bear. He found baby geese/goslings.
	  ○ What happened when he tried to return them to their mom?
	  ○ Why is he feeling surprised/mad?

Magic Bag (5-7 minutes)	Research Assistant guides children through "Magic Bag" to take on the identity of a forest animal (NOT that of the main character- Bear). Use for rapport building and engagement.
	• Group pulls a bag from the ceiling.
	• Children "put on" deer characteristics.
	  ○ Grow long skinny legs.
	  ○ Put on soft fur.
	  ○ Put on big almond shaped eyes.
	• Children move like deer.
	  ○ Lean down and eat the flowers.
	  ○ Trot around quickly.

<table>
<tr><td></td><td>

- Group takes off deer personas and pushes bag back to ceiling.

</td></tr>
<tr><td>Embodied Reading (15-20 minutes)</td><td>

Attempts:

<table>
<tr><td>Dialogic Reading Questions:</td></tr>
<tr><td>

- Bruce was very frustrated! What did he do to get rid of the goslings?
  - Returned Goslings to nest
  - Told them to go away
- Roared at them

</td></tr>
<tr><td>How does Bruce feel?</td></tr>
</table>

Resolution:

<table>
<tr><td>Dialogic Reading Questions:</td></tr>
<tr><td>

- Bruce is going to make the best of it! Wow! He is going to take care of the goslings. Would you take care of them?

</td></tr>
<tr><td>

- I wonder what Bruce will do to take care of the goslings...

</td></tr>
<tr><td>

- Bruce is feeling tired! Why is he tired?
  - Bruce saw the other geese flying south! He wants to teach his geese how to fly. How did he try to teach them?

</td></tr>
<tr><td>How does Bruce feel?</td></tr>
</table>

Conclusion:

<table>
<tr><td>Dialogic Reading Questions:</td></tr>
<tr><td>

- The geese wouldn't fly away alone. Bruce took the bus with them to the beach where they all relaxed. What are they doing at the beach?

</td></tr>
</table>

</td></tr>
</table>

	How does Bruce feel?

Wrap-Up Activity (3-5 minutes)	• Group gathers and pulls empty bag from ceiling. • Sitting in small group, research assistant asks "distancing" question (from CROWD) format: • Have you ever helped to take care of or teach a baby? Group sings goodbye song together.

APPENDIX H

EXAMPLE INTERVENTION GROUP LESSON PLAN

PIES Lesson Plan
Drama/Embodied Intervention Group
2-Sessions

"Mother Bruce" by Ryan T. Higgins

Interventionist: _____

Date: _____

<table>
<tr><th colspan="2">Day 1:</th></tr>
<tr><td>Background Knowledge (2-3 Min)</td><td>• Talk about what the children know about bears and the forest, about geese (fly south in the winter, come from an egg), taking care of babies</td></tr>
<tr><td>Magic Bag (5-7 Min)</td><td>Research Assistant guides children through "Magic Bag" to take on the identity of the main character- Bear). Use for rapport building and engagement.
• Group pulls a bag from the ceiling.
• Children "put on" black bear characteristics.
o Grow big paws.
o Put on soft fur.
o Put on big teeth and a big strong nose.
• Children move like a bear.
o Smell for honey.
o Bear walk around the floor.
• Group leaves the bear characteristics on for the story.</td></tr>
<tr><td>Embodied Reading (15 Min)</td><td><u>Exploring the Setting:</u><table><tr><td>Dialogic Reading Questions:</td><td>Example Embodied/Drama Activity:</td></tr></table></td></tr>
</table>

• My forest has a lot of trees and animals. What is your forest like? Would you be grumpy in the forest like Bruce?	• Be grumpy – stomp feet, frown, furrow brows
• Where are you going? What are you looking for? Why?	• Sniff around in the air for eggs • Tummy growling/hungry
• What do you hear? What do you see? What do you taste? What do you smell?	• Gets wet catching salmon • Tastes the sweet honey
Show me how you feel with your face and body.	

Introduce Problem:

Dialogic Reading Questions:	Example Embodied/Drama Activity:
• What's happening in this picture? (goslings in the pan, goslings won't leave him alone)	• Jump back in surprise, make a surprised face with hands on cheeks • Hear the birds tweeting, saying mama (cup ear)
How do you feel, Bruce?	

Internal Response:

<table>
<tr><td></td><td>
<table>
<tr><td>Dialogic Reading Questions:</td><td>Example Embodied/Drama Activity:</td></tr>
<tr><td>• How do you feel? I think you feel very _____! (surprised, mad). Are you still hungry? (no)</td><td>• Act out surprised, mad emotions</td></tr>
<tr><td colspan="2">How do you feel, Bruce?</td></tr>
</table>
</td></tr>
<tr><td>Wrap-Up Activity (3-5 minutes)</td><td>
• Group gathers and pulls empty bag from ceiling.
• Group takes off bear characteristics and returns them to the bag (e.g. fur, big paws, big teeth, big nose).
  ○ Return to appearance of children.
• Group “shakes it out” and walks around as children again.
  ○ Return to movement of children.
• Sitting in small group, research assistant asks “distancing” question (from CROWD) format:
  • Have you ever helped to take care of or teach a baby?
• Group sings goodbye song together.
</td></tr>
<tr><td colspan="2">Day 2:</td></tr>
<tr><td>Background Knowledge (2-3 minutes)</td><td>
• Talk about what children remember from Day 1 Lesson. Cue with pictures.
  ○ Bruce is a big bear. He found baby geese/goslings.
  ○ What happened when he tried to return them to their mom?
  ○ Why is he feeling surprised/mad?
</td></tr>
</table>

<table>
<tr><td>Magic Bag (5-7 minutes)</td><td>Research Assistant guides children through “Magic Bag” to take on the identity of the main character- Bear). Use for rapport building and engagement.
Group pulls a bag from the ceiling.
Children “put on” black bear characteristics.
Grow big paws.
Put on soft fur.
Put on big teeth and a big strong nose.
Children move like a bear.
Smell for honey.
Bear walk around the floor.
Group leaves the bear characteristics on for the story.</td></tr>
<tr><td>Embodied Reading (15-20 minutes)</td><td><u>Attempts:</u><table><tr><td>Dialogic Reading Questions:</td><td>Example Embodied/Drama Activity:</td></tr><tr><td>You were very frustrated! What did you do to get rid of the goslings?
Returned Goslings to nest
Told them to go away
Roared at them</td><td>Walk and look back to see if goslings are following. Turn head back a few times, tell them “go away”
Roar</td></tr><tr><td colspan="2">How do you feel, Bruce?</td></tr></table><u>Resolution:</u></td></tr>
</table>

Dialogic Reading Questions:	Example Embodied/Drama Activity:
• You are going to make the best of it! Wow! You are going to take care of the goslings. Will you take care of them?	• Put them in the pool; get splashed and wet
• I wonder what you will do to take care of the goslings...	• Paint with them, eat with them (pretend paint a few strokes, pretend to eat and feed them)
• You are feeling tired! Why are you tired?	• Take a rest (pretend sleep with head on hands, snoring sounds)
• You saw the other geese flying south! You want to teach your geese how to fly. • How did you try to teach them?	• Point at the sky when the other geese fly over • Pretend to fly to show the geese.
How do you feel, Bruce?	

Conclusion:

Dialogic Reading Questions:	Example Embodied/Drama Activity:
• The geese wouldn't fly away alone. You took the bus with them to the beach where they all relaxed. What are	• • Sigh with frustration • Sit in a row on the floor to ride the bus

	they doing at the beach?	• Feel the sunshine on the beach, pretend to do one of the pictured activities (make a sandcastle, float in the water, lay in the sun, drink lemonade)
	I can't wait until next time we go to the forest or the beach with you…..The end!	

Wrap-Up Activity
 	
(3-5 minutes)
	• Group gathers and pulls empty bag from ceiling.
	• Group takes off rabbit characteristics and returns them to the bag (e.g. fur, buck teeth, long ears).
	  ○ Return to appearance of children.
	• Group "shakes it out" and walks around as children again.
	  ○ Return to movement of children.
	• Sitting in small group, research assistant asks "distancing" question (from CROWD) format:
	• Have you ever helped to take care of or teach a baby?
	• Group sings goodbye song together.

APPENDIX I

EXAMPLE PROCEDURAL FIDELITY CHECKLIST – CONTROL GROUP LESSON

Example Procedural Fidelity Checklist – Control

TID: _____
Date: _____

Preschool Intervention for Embodied Storytelling (PIES)
Procedural Fidelity Checklist
Attentional Control Group (Shared Book Reading)
"Mother Bruce" by Bonny Becker
Day 1

If the Teaching Artist delivered the guidance or question, circle the "1". If s/he did not, circle the "0".

Background Knowledge			
Talk about what the children know about bears and the forest, about geese (fly south in the winter, come from an egg), taking care of babies		**0**	**1**
Magic Bag			
Guides group to pull bag from ceiling		**0**	**1**
Guides children "put on" deer characteristics		**0**	**1**
Guides children move like deer		**0**	**1**
Guides group to "take off" deer characteristics and return them to bag, push bag back up to ceiling.		**0**	**1**
Shared Book Reading			
Exploring Setting	My forest has a lot of trees and animals. What is your forest like? Would you be grumpy in the forest like Bruce?	**0**	**1**
	Where is Bruce going? What is he looking for? Why?	**0**	**1**
	(Asks at least 3 of the following) What does Bruce hear? What does he see? What does he taste? What does he smell?	**0**	**1**
	How does Bruce feel?	**0**	**1**
Introduce Problem	What's happening in this picture? (goslings in the pan, goslings won't leave him alone)	**0**	**1**
	How does Bruce feel?	**0**	**1**
Internal Response	How does Bruce feel? I think he feels very _____! (surprised, mad). Is he still hungry? (no)	**0**	**1**
Wrap-Up Activity			
Asks distancing question: Have you ever helped to take care of or teach a baby?		**0**	**1**
Group sings "goodbye song" together.		**0**	**1**

Total: _____/14
Percent Accurate: _____

Rate the level of distraction in the room: **None** **Some** **A Lot**
Rate the children's overall level of participation: **None** **Some** **A Lot**

TID: _____
Date: _____

Preschool Intervention for Embodied Storytelling (PIES)
Procedural Fidelity Checklist
Attentional Control Group (Shared Book Reading)
"Mother Bruce" by Bonny Becker
Day 2

If the Teaching Artist delivered the guidance or question, circle the "1". If they did not, circle the "0".

Background Knowledge			
Talked about what the children remember from Day 1 lesson.		**0**	**1**
Magic Bag			
Guides group to pull bag from ceiling		**0**	**1**
Guides children "put on" deer characteristics		**0**	**1**
Guides children move like deer		**0**	**1**
Guides group to "take off" deer characteristics and return them to bag, push bag back up to ceiling.		**0**	**1**
Shared Book Reading			
Attempts	Bruce was very frustrated! What did he do to get rid of the goslings?	**0**	**1**
	How does Bruce feel?	**0**	**1**
Resolution	Bruce is going to make the best of it! Wow! He is going to take care of the goslings. Would you take care of them?	**0**	**1**
	I wonder what Bruce will do to take care of the goslings...	**0**	**1**
	Bruce is feeling tired! Why is he tired? Bruce saw the other geese flying south! He wants to teach his geese how to fly. How did he try to teach them?	**0**	**1**
	How does Bruce feel?	**0**	**1**
Conclusion	The geese wouldn't fly away alone. Bruce took the bus with them to the beach where they all relaxed. What are they doing at the beach?	**0**	**1**
	How does Bruce feel?	**0**	**1**
Wrap-Up Activity			
Asks distancing question: Have you ever helped to take care of or teach a baby?		**0**	**1**
Group sings "goodbye song" together.		**0**	**1**

Total: /14

Percent Accurate: _____

Rate the level of distraction in the room: **None** **Some** **A Lot**
Rate the children's overall level of participation: **None** **Some** **A Lot**

APPENDIX J

EXAMPLE PROCEDURAL FIDELITY CHECKLIST – INTERVENTION GROUP LESSON

TID: _____
Date: _____

Preschool Intervention for Embodied Storytelling (PIES)
Procedural Fidelity Checklist
Attentional Control Group (Shared Book Reading)
"Mother Bruce" by Ryan T. Higgins
Day 1

If the Teaching Artist delivered the guidance or question, circle the "1". If s/he did not, circle the "0".

	Background Knowledge			
Talk about what the children know about bears and the forest, about geese (fly south in the winter, come from an egg), taking care of babies			**0**	**1**
	Magic Bag			
Guides group to pull bag from ceiling			**0**	**1**
Guides children "put on" bear characteristics			**0**	**1**
Guides children move like bears			**0**	**1**
Guides group to return bag back up to ceiling while remaining as bears			**0**	**1**
	Shared Book Reading			
	Questions	**Movements**		
Exploring Setting	My forest has a lot of trees and animals. What is your forest like? Are you grumpy in the forest like Bruce?	Cues children to act grumpy – stomp feet, frown, furrow brows	**0**	**1**
	Where are you going? What are you looking for? Why?	Cues children to sniff around in the air for eggs Tummy growling/hungry	**0**	**1**
	(Asks at least 3 of the following) What do you hear? What do you see? What do you taste? What do you smell?	Cues children to pretend to get wet catching salmon Tastes the sweet honey	**0**	**1**
	Show me how you feel with your face and body.	Cues children to show feeling hungry with face and body.	**0**	**1**
Introduce Problem	What's happening in this picture? (goslings in the pan, goslings won't leave him alone)	Cues children to jump back in surprise, make a surprised face with hands on cheeks Hear the birds tweeting, saying mama (cup ear)	**0**	**1**
	How do you feel, bears?	Cues children to show feeling frustrated with face and body.	**0**	**1**
Internal Response	How do you feel, Bruce? I feel very _____!	Cues children to act surprised, mad	**0**	**1**
	Wrap-Up Activity			

Guides children to pull Magic Bag back down from the ceiling.	**0**	**1**
Guides group to take off their bear characteristics and return to being children.	**0**	**1**
Guides group to "shake it out" and walk around as children again.	**0**	**1**
Asks distancing question: Have you ever helped to take care of or teach a baby?	**0**	**1**
Group sings "goodbye song" together.	**0**	**1**

Total:_____/17

Percent Accurate:_____

Rate the level of distraction in the room: **None** **Some** **A Lot**
Rate the children's overall level of participation: **None** **Some** **A Lot**

TID: _____
Date: _____

Preschool Intervention for Embodied Storytelling (PIES)
Procedural Fidelity Checklist
Intervention Group (Drama Based Instruction)
"Mother Bruce" by Ryan T. Higgins
Day 2

If the Teaching Artist delivered the guidance or question, circle the "1". If s/he did not, circle the "0".

	Background Knowledge			
Talk about what the children remember from Day 1 lesson			**0**	**1**
	Magic Bag			
Guides group to pull bag from ceiling			**0**	**1**
Guides children "put on" bear characteristics			**0**	**1**
Guides children move like bears			**0**	**1**
Guides group to return bag back up to ceiling while remaining as bears			**0**	**1**
	Shared Book Reading			
	Questions	**Movements**		
Attempts	You were very frustrated! What did you do to get rid of the goslings?	Cues children to walk and look back to see if goslings are following. Turn head back a few times, tell them "go away" Cues children to roar	**0**	**1**
	How do you feel?		**0**	**1**
Resolution	You are going to make the best of it! Wow! He is going to take care of the goslings. Would you take care of them?	Cues children to put them in the pool; get splashed and wet	**0**	**1**

	I wonder what you will do to take care of the goslings...	Cues children to paint with them, eat with them (pretend paint a few strokes, pretend to eat and feed them)	**0**	**1**
	You are feeling tired, Bruce! Why are you tired? You saw the other geese flying south! You want to teach your geese how to fly. How did you try to teach them?	Cues children to take a rest (pretend sleep with head on hands, snoring sounds) Cues children to point at the sky when the other geese fly over	**0**	**1**
	How do you feel?	Children show feeling with face and body.	**0**	**1**
Conclusion	The geese wouldn't fly away alone. You took the bus with them to the beach where they all relaxed. What are they doing at the beach?	Cues children to pretend to fly to show the geese + 1 of the below: • Sigh with frustration • Sit in a row on the floor to ride the bus Cues children to pretend to feel the sunshine on the beach, pretend to do one of the pictured activities (make a sandcastle, float in the water, lay in the sun, drink lemonade)	**0**	**1**
	I can't wait until next time we go to the forest or the beach with you…..The end!		**0**	**1**
Wrap-Up Activity				
Guides group to pull Magic Bag from ceiling, take off their rabbit characteristics and return to being children .			**0**	**1**
Asks distancing question: Have you ever helped to take care of or teach a baby?			**0**	**1**
Group sings "goodbye song" together.			**0**	**1**

Total: _____ /16

Percent Accurate: _____

Rate the level of distraction in the room: **None** **Some** **A Lot**

Rate the children's overall level of participation: **None** **Some** **A Lot**

APPENDIX K

INITIAL IRB APPROVAL

APPROVAL: EXPEDITED REVIEW

Maria Restrepo

CHS: Health Solutions, College of
602/496-2536

Laida.Restrepo@asu.edu

Dear Maria Restrepo:

On 2/19/2021 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Preschool Intervention for Embodied Storytelling
Investigator:	Maria Restrepo
IRB ID:	STUDY00013392
Category of review:	
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• PIES_Child_Assent, Category: Consent Form; • PIES_EmotionMatching_ScoreForm, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • PIES_ExampleLesson_Control, Category: Participant materials (specific directions for them); • PIES_ExampleLesson_Intervention, Category: Participant materials (specific directions for them); • PIES_IRB_2, Category: IRB Protocol; • PIES_NAP2_Example_AdminstrationInstructions, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • PIES_NAP2_Example_Pictures, Category: Measures (Survey questions/Interview questions

	/interview guides/focus group questions); • PIES_NAP2_Example_ScoreForm, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • PIES_NAP2_Example_Script, Category: Measures

	(Survey questions/Interview questions /interview guides/focus group questions); • PIES_Parent_Consent, Category: Consent Form; • PIES_Questionnaire_Parent, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • PIES_Questionnaire_Teacher, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • PIES_SELPS_Example_ScoreForm, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • PIES_StoryRecallAssessment, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • PIES_Teacher_Consent, Category: Consent Form;

The IRB approved the protocol from 2/19/2021 to 2/18/2022 inclusive. Three weeks before 2/18/2022 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 2/18/2022 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB
Administrator

cc: Melissa Pierce
Maria Restrepo
Melissa Pierce

APPENDIX L

CONTINUATION IRB APPROVAL

APPROVAL:
CONTINUATION

Maria Restrepo

CHS: Health Solutions,
College of 602/496-2536

Laida.Restrepo@asu.ed

u Dear Maria Restrepo:

On 2/25/2022 the ASU IRB reviewed the following protocol:

Type of Review:	Continuing Review
Title:	Preschool Intervention for Embodied Storytelling
Investigator:	Maria Restrepo
IRB ID:	STUDY00013392
Category of review:	7
Funding:	Name: HHS: Administration for Children and Families (ACF), Grant Office ID: AWD00036381, Funding Source ID: 90YR0124-01-00
Grant Title:	None
Grant ID:	None
Documents Reviewed:	None

The IRB approved the protocol from 2/25/2022 to 2/24/2026 inclusive. Three weeks before 2/24/2026 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 2/24/2026 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

REMINDER - - Effective January 12, 2022, in-person interactions with human subjects require adherence to all current policies for ASU faculty, staff, students and visitors. Up-to-date information regarding ASU's COVID-19 Management Strategy can be found here. IRB approval is related to the research activity involving human subjects, all other protocols related to COVID- 19 management including face coverings, health checks, facility access, etc. are governed by current ASU policy.

Sincerely,

IRB Administrator