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Profiles of Classroom Engagement in Head Start Children: Associations with Academic Readiness

Tracy Carter

University of Miami, t.carter3@umiami.edu

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UNIVERSITY OF MIAMI

PROFILES OF CLASSROOM ENGAGEMENT IN HEAD START CHILDREN:
ASSOCIATIONS WITH ACADEMIC READINESS

By

Tracy Michele Carter

A DISSERTATION

Submitted to the Faculty
of the University of Miami
in partial fulfillment of the requirements for
the degree of Doctor of Philosophy

Coral Gables, Florida

May 2015

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Tracy Michele Carter

Approved:

Rebecca Bulotsky Shearer, Ph.D.
Associate Professor of Psychology

Heather Henderson, Ph.D.
Adjunct Associate Professor
of Psychology

Daryl Greenfield, Ph.D.
Professor of Psychology

Christine Delgado, Ph.D.
Research Assistant Professor
of Psychology

Neena Malik, Ph.D.
Scientist,
Department of Pediatrics

M. Brian Blake, Ph.D.
Dean of the Graduate School

CARTER, TRACY MICHELE

Profiles Of Classroom Engagement in Head Start Children:
Associations with Academic Readiness

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Head Start has the strategic opportunity to address the school readiness needs of children from low-income families and to narrow the national achievement gap. Research suggests that targeting domain-general skills during preschool is effective in increasing readiness across multiple domains. Children's classroom engagement, or *how* children interact with teachers, peers and tasks in the classroom, is recognized as one such malleable and domain-general skill serving a critical foundation to supporting academic development. However, children enter the classroom with unique sets (or profiles) of competencies and needs in their ability to engage successfully in the classroom. Research is needed to examine children's engagement profiles so teachers have tools to identify the children in greatest need of intervention before they transition to kindergarten. This study used observations of 527 children's engagement with teachers, peers and tasks to identify their membership in engagement profiles. Specifically, this study used a latent profile approach to analyze data collected through a larger University-Head Start partnership research project. This study extends prior work in several important ways. First, by using a child-centered analytic approach to identify profiles of children's classroom engagement within a culturally and linguistically diverse sample of Head Start children. Second, by examining whether children's patterns of classroom engagement changed across a year in Head Start and whether child- and classroom-level factors were

associated with that change. Finally, by examining differential associations between patterns of engagement and gains in academic skills. Results revealed three unique profiles of children's classroom engagement, *positively engaged*, *independently engaged*, and *negatively engaged*, that remained stable across the year (structural stability). A majority of children in the sample (60%) remained in qualitatively similar profiles across the year, whereas 40% transitioned to qualitatively different profiles. Most children ended the year in the independently engaged profile. Child age, sex, ethnicity and classroom emotional and instructional support were significant predictors of children's transition pattern membership; remaining in the negatively engaged profile across the year was associated with greater academic difficulty. Implications for policy and practice are discussed.

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Chapter 1

Introduction

The national achievement gap between children from low-income homes and their peers from middle to high-income homes is evident prior to kindergarten entry (Denton, Flanagan, & McPhee, 2009) and is particularly pronounced for children from culturally and linguistically diverse backgrounds (Galindo & Fuller, 2010). To narrow this gap, there is a need to target more domain-general skills that are predictive of later social-emotional adjustment and academic achievement (McClelland et al., 2007). Children's classroom engagement (i.e., *how* they interact with teachers, peers, and tasks in the preschool classroom) has been increasingly recognized as a critical, malleable and domain-general skill that supports the development of more domain-specific skills, such as literacy and numeracy (Downer, Booren, Lima, Luckner, & Pianta, 2010). Conversely, difficulties engaging in the classroom are linked to more behavior problems, lower social competence and lower academic achievement (Birch & Ladd, 1997). Children's positive behavioral engagement within the classroom context, therefore, is a foundational skill critical to supporting academic learning during the preschool period (Downer et al., 2010).

However, children enter preschool classrooms with unique sets of competencies and needs in their capacity to engage in the learning environment, and this is particularly the case for children from low-income households (Raver, 2002). While it is difficult for preschool teachers to meet the individual instructional needs of 18-20 children in their classroom, research can provide an empirical understanding of early patterns of behavioral engagement through child-centered analytic approaches, such as latent profile analysis (LPA), which yield heuristic tools teachers can use to tailor classroom-based strategies.

Head Start, our nation's largest and most comprehensive early childhood intervention program, serving nearly one million children per year (Office of Head Start, 2014), has the strategic opportunity to address and promote the school readiness of children from low-income families, especially the growing number of culturally and linguistically diverse children the program serves (Office of Head Start, 2014; Snyder & Dillow, 2011). Given Head Start's comprehensive "whole-child" approach to intervention, this dissertation project focused on understanding children's classroom engagement as a critical context for supporting academic readiness skills. This study examined profiles of children's engagement within the Head Start classroom context and associations with academic readiness skills through a University-partnership with the Miami-Dade County Head Start program.

Need for Current Study

While recent early childhood studies have examined the contribution of children's classroom engagement to social and academic readiness skills, they are limited in informing tailored interventions within Head Start programs serving diverse children for several reasons. First, these studies have primarily used variable-centered analytic approaches that identify the linear association between children's engagement and social and academic outcomes. However, children's engagement with classroom resources, such as interactions with teachers, peers, and tasks, may relate in a non-linear way; there may be unique patterns of engagement that can shape children's school readiness in different ways (Boyce et al., 1998). Additionally, prior studies have used measures that assess children's engagement with teachers, peers *or* tasks, rather than using a comprehensive, contextual measure that assesses children's engagement across all three classroom contexts (e.g.

Hamre & Pianta, 2005; McDermott, Leigh, & Perry, 2002). It is important to capture children's naturally occurring engagement with teachers, peers, and tasks in the classroom during a typical morning. Incorporating a contextual focused measure of children's engagement into a child-centered analytic approach is needed to provide a comprehensive, child-centered picture of children's unique patterns of dynamic engagement within classroom contexts, which may be masked when only examining linear associations based on the average child (Denham et al., 2012).

Only one study to date has examined whether there are profiles, or subgroups, of children who display patterns of engagement early in the preschool year (Maier, Downer, Vitiello, & Booren, in press). This study was conducted within a mixed-income sample and did not include a large percentage of children from culturally and linguistically diverse, low-income backgrounds. Additionally, no study has examined whether there is stability or change in engagement profiles over the course of a preschool year, or whether there are child and classroom-level practices associated with stability and change. Finally, there is limited research examining whether profiles are differentiated by gains in academic skills. Taken together, it is clear there is much to be learned from applying a child-centered approach to identify longitudinal patterns of the domain-general, foundational skill of classroom engagement using a validated contextual observation tool for diverse Head Start children.

Theoretical Framework to Guide Inquiry

In accord with the bioecological model, children's development occurs within the context of several nested systems, with proximal settings, such as the home and preschool environments, most directly influencing the child (Bronfenbrenner, 1979). Opportunities

for children to practice and master developmental challenges are embedded within interactions in these proximal contexts (Kontos & Keyes, 1999). For example, as children interact with teachers, peers and instructional materials in the classroom, they have direct opportunities to master social and academic tasks (Downer et al., 2010; Pianta, 2006). It is through children's interactions in the classroom that school readiness skills develop over time (Bronfenbrenner & Morris, 1998; Carta & Greenwood, 1985). Children acquire early social and academic skills by engaging with classroom resources, such as through interactions with teachers, peers and tasks (Downer et al., 2010; Ladd, 2005; Pianta & Walsh, 1996). Therefore, it is critical to study children's engagement within the preschool classroom as it occurs naturally within these teacher, peer, and task contexts.

This theoretical model also suggests that the extent to which children are successful in engaging within the classroom context may depend upon both the child's individual profile of developmental capacities at preschool entry, as well as the quality of the classroom environment. The nature and quality of children's engagement is transactional within the classroom context and teachers play an important role in supporting children's engagement in learning. Teachers' decisions about how they structure the classroom, provide activities for children and effectively interact with children (Booren, Downer, & Vitiello, 2012; Kontos & Keyes, 1999) may support children's ability to successfully engage in social interactions and learning activities (Vitiello, Booren, Downer, & Williford, 2012). The influence of high quality teacher-child instructionally or emotionally supportive interactions, however, may depend on the child's profile of developmental risk or resilience at preschool entry. In accord with an ecological perspective and person by environment model, individual children may vary in

their reactions to the same environment and different environments may produce the same outcomes for different children (Downer, Rimm-Kaufman, & Pianta, 2007; Vitiello, Moas, Henderson, & Greenfield, 2012). Thus, it is critical not only to examine children's profile of engagement within the preschool context but also to examine classroom-level practices that may differentially benefit children who enter the classroom with unique profiles of risk (or resilience).

Children's Engagement in the Classroom as a Foundation for Preschool Learning

As children develop across the preschool years, their engagement within social and learning contexts becomes more complex and is associated with later school functioning (e.g. popularity with peers, problem behaviors with teacher and academic achievement; Denham & McKinley, 1993; Downer et al., 2010). The extent to which young children actually *engage* in the preschool classroom supports their capacity to take advantage of classroom resources (such as, teachers, peers and tasks) and learn. Conversely, lack of engagement with teachers, peers and tasks is associated with more behavior problems, less social competence and greater academic difficulty (e.g., Birch & Ladd, 1997). The *Individualized Classroom Assessment Scoring System* (inCLASS; Downer et al., 2010) is a recently developed, validated contextual measure of children's classroom engagement within the context of interactions with teachers, peers and tasks and was used in this study. Below, research is reviewed to provide an empirical rationale for the need to study children's engagement within these key contexts in the preschool classroom.

Positive engagement with teachers. Engagement within teacher-child interactions is defined by the degree to which children share an emotional connection with their teachers and initiate and maintain communication (Downer et al. 2010). Early social and

language skills observed within teacher-child interactions are one of the most salient predictors of children's early school success, such as improved social-emotional skills and academic achievement and these associations have been shown to persist over time (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002).

Positive engagement with peers. Engagement within peer interactions is defined by the degree to which children share positive emotions and behaviors with peers, initiate and maintain communication and use positive strategies to initiate and lead interactions with peers (Downer et al., 2010). Positive engagement within peer interactions has important implications for children's development, such that children who are able to successfully negotiate peer relationships display more prosocial behaviors and less externalizing behaviors (Criss, Pettit, Bates, Dodge, & Lapp, 2002) and also demonstrate higher literacy and mathematics skills (Pellegrini, 1984). In contrast, difficulty engaging with peers is associated with lower academic performance, as well as difficulties in areas that support academic achievement (e.g., approaches to learning and problem behavior; Bulotsky-Shearer, Bell, Romero, & Carter, 2013).

Positive engagement within tasks. A child's engagement within tasks is defined by the degree to which they are able to stay on-task, remain attentive and enthusiastic, while independently managing social and academic classroom demands. It essentially captures children's approach to learning, which is associated with academic competence in kindergarten and first grade (DiPerna, Lei, & Reid, 2007; McClelland, Acock, & Morrison, 2006). In preschool studies, a more eager approach to learning has been associated with less problem behavior (Bulotsky-Shearer, Fernandez, Dominguez, & Rouse, 2011), less disruptive and disconnected behaviors with peers (Coolahan,

Fantuzzo, Mendez, & McDermott, 2000; Fantuzzo, Perry & McDermott, 2004; McDermott et al., 2002) and higher reading and math skills (Denton et al., 2009).

Conflict engagement. Conflictual engagement in the classroom can occur across social and task-focused contexts. It is characterized by physically or verbally aggressive behaviors, in addition to attention seeking behaviors (e.g. whining, crying, pouting), and noncompliant or uncooperative behaviors with teachers or peers (Downer et al., 2010). These conflictual behaviors have been associated with more behavior problems, less social competence and greater academic difficulty early in school (Pianta & Stuhlman, 2004). Conflictual behaviors with peers, specifically, have been linked to greater adjustment problems (Crick, Casas, & Ku, 1999) and even peer rejection (Ostrov, & Keating, 2004).

Contextual-Focused Examination of Children's Classroom Engagement

Recently, the National Research Council (2008) has pointed to the importance of: (a) using purposeful and systematic assessments that include social emotional domains; (b) using assessments gathered from multiple perspectives; and (c) focusing on children's competencies within naturalistic contexts, such as while children are interacting with their peers (Bagnato & Neisworth, 1991). Current recommendation for best practice in early childhood assessment is the use of a comprehensive, contextually relevant approach that is sensitive to diverse populations and children's behavior as it emerges dynamically within the demands of classroom contexts (National Research Council, 2008; AERA, APA & NCME, 1999).

A recent series of studies have focused on a contextual understanding of children's classroom behavior. This research has documented considerable variation in

children's behavior when observed across interactions with teachers, peers and tasks (Bulotsky-Shearer, Fantuzzo, & McDermott, 2008). In Head Start samples, this variation across contexts in children's behavior has been found to be uniquely and differentially associated with academic and social outcomes during preschool and elementary school (Bulotsky-Shearer et al., 2008; Bulotsky-Shearer & Fantuzzo, 2011); and thus provides a more comprehensive understanding of the academic and social needs of children as they naturally occur within the preschool classroom (NAEYC, 2009).

As the limited research suggests, it is critical to consider context when examining children's classroom engagement and learning. A few analytic approaches have been used to incorporate context in early childhood research. These have included, documenting the context in which the child spends the most time (teacher versus child-directed settings, for example) and describing children's levels of engagement across contexts (Booren et al., 2012). In addition, multilevel growth models have been used to examine variance attributable to changes in children's engagement across these settings (Vitiello et al., 2012a). However, these studies have only examined variability in engagement descriptively and have not incorporated context in the calculation of children's engagement scores, which is necessary for examining associations with children's contextualized engagement scores. Therefore, this study included a series of measurement steps to account for the context in which children were observed engaging in the classroom; providing a more nuanced picture of children's behavior in the context of the differential opportunities and demands of the classroom.

Child-Centered Approach to Identifying Profiles of Classroom Engagement

From a resiliency-oriented framework, identifying and promoting children's competencies within early learning contexts can set children on positive developmental trajectories (Luthar, Cicchetti & Becker, 2000). To best support children's unique profiles of developmental competencies and needs at preschool entry, early childhood researchers are beginning to employ child-centered analytic approaches. In accord with the "whole child" approach of Head Start, this study focused on identifying unique patterns of behavioral engagement within the individual child. This approach holds intuitive appeal to parents and teachers who tend to focus on individual children, simultaneously considering both children's competencies and their needs (Denham et al., 2012; McWayne & Bulotsky-Shearer, 2013; McWayne, Fantuzzo, & McDermott, 2004; Sabol & Pianta, 2012).

Additionally, child-centered approaches may be more easily applied to intervention efforts tailored to the common patterns of behavior children exhibit in the classroom. For example, children who show low engagement with their peers, but display high engagement in learning tasks may benefit from a particular intervention that targets enhancing engagement with peers while building on their skills within learning tasks. Child-centered approaches can identify profiles of children exhibiting common sets of competencies and needs so that those children in greatest need of intervention can be reached prior to kindergarten entry (Ramey & Ramey, 1998).

Initial research with preschool children from mixed-income homes identified three unique profiles of children's classroom engagement: *positively engaged*, *independently engaged*, and *negatively engaged* (Maier et al., in press). See Figure 1. The independently engaged profile was the most prevalent (68.4%), followed by the positively engaged profile

(22.4%), and finally the negatively engaged profile (9.2%). The engagement profiles were differentially associated with social and academic outcomes, such that, children in the positively engaged profile demonstrated higher achievement on all measured school readiness indicators relative to their peers in the independently and negatively engaged profiles (Maier et al., in press). Specifically, children in the positively engaged profile outperformed their peers on receptive vocabulary, executive control and impulse control. Children in the independently engaged profile outperformed children in the negatively engaged profile on measures of executive control and impulse control. More studies are needed to extend this research to inform program practices with culturally and linguistically diverse children from low-income backgrounds. These children are at greatest risk for poor school success and are in critical need of extra support during the preschool years.

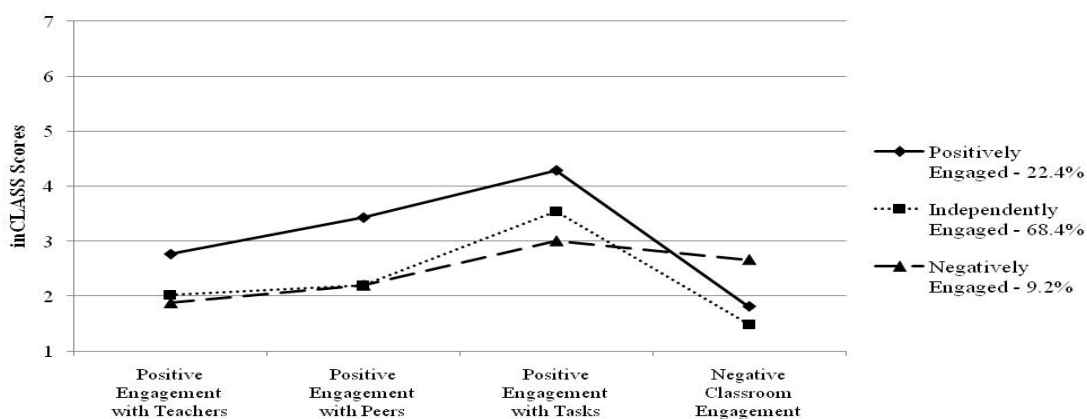


Figure 1. Classroom Engagement Profiles from Maier et al. (in press).

Importance of Examining Profiles across a Head Start Year

As children enter preschool, their initial capacity to engage in the classroom provides an important starting point for supporting their learning. Children exhibit variability in their individual profiles of competencies and needs and it is important to

understand this variability at preschool entry (Downer et al., 2007). In addition, the preschool period is a time of rapid and dynamic growth and development. Across a preschool year, children may learn to navigate the demands of the setting and build upon their initial skills or, conversely, struggle to meet the challenges of the classroom.

Therefore, it is important to understand changes in children's profiles across a year in Head Start. Early success supports later success (Duncan et al., 2007; McWayne & Bulotsky-Shearer, 2013); how children's engagement profile membership changes during preschool has implications for children's future academic success. While a few recent early childhood studies have examined stability and change in profiles of social-emotional readiness (Denham et al., 2012; McWayne & Bulotsky-Shearer, 2013), no study to date has examined stability and change in profiles of classroom engagement. This study extends previous research by using the inCLASS, a contextual measure of children's engagement. Furthermore, this study is the first to examine child- and classroom-level variables associated with stability or change in engagement profiles across a Head Start year.

Child- and Classroom-Level Characteristics Associated with Stability and Change

Children's development during preschool is dynamic and rapidly changing. Identifying child- and classroom-level factors that hinder or promote children's classroom engagement across a year in Head Start can lead to tailored support for children in greatest need within the classroom.

Child-level characteristics. Age. Research suggests that self-regulation and social skills increase rapidly with maturation and development during the preschool years and children are better able to regulate the demands of the setting and successfully engage in

the classroom (Downer et al., 2010). Therefore, older children may be more likely to begin in, and transition to, more adaptive engagement profiles across the year.

Sex. Developmental research also suggests that sex differences in behavior begin to emerge during preschool (Bulotsky-Shearer, Bell, Romero & Carter, 2012; Keenan & Shaw, 1997). Specifically, girls show an advantage over boys in their ability to engage in social interactions (Keenan & Shaw, 1997), suggesting that girls may be more likely to begin in and transition to more adaptive engagement profiles across the year.

Teacher-child language match. No study to date has examined whether the match between the predominant classroom language and the child's home language is associated with children's engagement with teachers, peers and tasks in the classroom. Engaging in high quality interactions may be particularly challenging for children who speak a language other than the predominant language spoken in the classroom. A mismatch in children's classroom and home languages has been associated with less social engagement and more learning problems (Garnica, 1983). These findings suggest that children who experience a language mismatch may be more likely to begin and remain in less adaptive profiles. Given the extremely limited empirical evidence examining profile change during preschool, it is critical to examine these child-level risk and protective factors so we can begin to understand how they influence stability and change.

Classroom-level practices. In addition to intra-individual factors, there are influences outside of the child that can contribute to stability and change across the year. Research documents the important role of high quality classroom experiences in supporting the development of children's positive engagement in learning during the preschool year (Howes et al., 2008; Mashburn et al., 2008). There has been recent

attention paid to the importance of classroom *process* quality, which captures the quality of teachers' interactions with children in the classroom and the extent to which teachers create a positive classroom environment that supports academic learning (Hamre & Pianta, 2005). Domains of high quality processes include emotional support, classroom organization and instructional support and are associated with social, emotional and academic skill development (Howes et al., 2008; Mashburn et al., 2008).

Classrooms characterized by warm, responsive and encouraging environments are associated with higher social and emotional skills (Mashburn et al., 2008). Well-organized classrooms are associated with increased child engagement, behavioral adjustment and decreased behavioral problems (Howes et al., 2008). Additionally, classroom organization has been associated with greater gains in literacy and language in preschool (Maier, Vitiello & Greenfield, 2012) and literacy and mathematics in first grade (Ponitz, Rimm-Kaufman, Brock, & Nathanson, 2009). Instructionally supportive classrooms, which provide cognitively stimulating environments, are associated with gains in academic achievement, such as literacy, language and mathematics (Burchinal et al., 2008; Howes et al., 2008; Mashburn et al., 2008).

Classroom process quality is particularly important for children at risk for poor school readiness (Downer et al., 2007). High-quality classrooms differentially benefit the academic achievement of children from low-income families relative to their peers from lower risk backgrounds (Hamre & Pianta, 2005). Because high quality classroom practices play an important role in supporting at-risk children's development and are amenable to change, this project examined whether classroom process quality was associated with positive change in children's engagement profiles.

Current Study

Preschool is a time to foster skills that will set children on positive trajectories. To address this goal, teachers must have tools to identify children early on who are in greatest need of intervention. The purpose of this study was to use contextualized observations of children's engagement in the classroom, a malleable and domain-general skill, to empirically identify profiles of children's individual competencies and needs. The study extended prior research in several ways. First, this study empirically identified profiles of classroom engagement for a culturally and linguistically diverse sample of children from low-income backgrounds. Second, this study examined whether children's engagement patterns changed across a preschool year and whether classroom quality was associated with that change, providing a better understanding of natural points of intervention during the year. Finally, this study examined the association between engagement profiles and gains in academic skills, which helps to identify which groups of children demonstrate resilience and which are in need of intervention. This study was guided by three main questions and based on prior research the following results were expected.

Research Question 1. Can profiles of classroom engagement be empirically identified for culturally and linguistically diverse Head Start children?

Hypothesis 1. This study extended the work of Maier et al. (in press) by examining the nature and prevalence of children's engagement profiles within a culturally and linguistically diverse sample of children from low-income backgrounds. It was expected that similar profiles would emerge within the Miami-Dade Head Start sample. Child-level variables (e.g. age, sex, ethnicity and teacher-child language match) associated with profile membership were also examined. Based on previous research, it

was expected that older children and girls would be more likely to be members of more adaptive profiles (i.e. positively or independently engaged) than younger children and boys (Maier et al., in press). Because samples in previous studies were not ethnically or linguistically diverse, differences in ethnicity across profiles were exploratory. In addition, it was expected that children who experienced a mismatch in the language spoken in the classroom and the language spoken at home would be classified in less adaptive profiles due to the difficulties they may face engaging in the classroom.

Research Question 2. Is there stability and change in engagement profiles across the Head Start year and are there child and classroom-level characteristics associated with stability and change?

Hypothesis 2. Latent transition analysis (LTA) was used to examine both *structural* and *individual* stability and change in engagement profiles across a Head Start year. Structural stability and change pertains to profile features, such as whether similar profile groups emerge in fall and spring. Individual stability and change pertains to children's membership in the profile groups; namely, whether children remain in a similar profile across the year or transition to a qualitatively different profile. No study to date has examined stability and change in engagement profiles. Based on prior research on stability and change in profiles of social-emotional readiness (McWayne & Bulotsky-Shearer, 2013), it was expected that similar profiles would emerge in the fall and spring (structural stability). It was also expected that most children would stay in similar profiles across the year (individual stability), while some children would transition to different profiles (individual change), demonstrating improvements or declines in their ability to engage in the classroom.

Child-level variables (e.g. age, sex, ethnicity and teacher-child language match) associated with individual stability and change in profile membership were also examined. It was expected that one source of individual change could be attributed to some natural maturation toward more adaptive profiles (those with patterns of higher positive engagement) as children grow older. In addition, for children in classrooms where there was a match between the predominant classroom language and the child's home language it was expected that these children would be more likely to transition to more adaptive profiles across the Head Start year. Classroom-level characteristics (emotional support, classroom organization and instructional support) were also examined as predictors of individual stability and change in profile membership. It was expected that children in well-organized classrooms would be most likely to transition to more adaptive profiles across the year. Classrooms characterized by warm, supportive, and responsive interactions would also be likely to promote children's transition into more adaptive profiles across the year.

Research Question 3. Are patterns of engagement differentiated by gains in academic readiness skills at the end of the preschool year?

Hypothesis 3. Based on prior research, it was expected that children following a transition pattern in which they were in the positively engaged profile either initially or at the end of the year would demonstrate the greatest gains in academic readiness skills. In addition, children following a transition pattern in which they were in the independently engaged profile either initially or at the end of the year were expected to show greater gains in academic readiness skills relative to children following a transition pattern in which they were in the negatively engaged profile either initially or at the end of the year.

The children following a transition pattern in which they were in the negatively engaged profile either initially or at the end of the year were expected to demonstrate the least gains in academic readiness.

Chapter 2

Method

Participants

The proposed study was a secondary analysis of data collected through a larger University-Head Start partnership research project conducted in collaboration with the University of Miami and Miami-Dade County Community Action Agency/Human Services Head Start program. The larger study was an Institute of Education Sciences funded project (Grant# R305A100233; PI: Rebecca Bulotsky-Shearer, Ph.D.) to extend the cultural and linguistic validity of a preschool emotional and behavioral rating scale for teachers (*Adjustment Scales for Preschool Intervention*, ASPI; Lutz, Fantuzzo, & McDermott, 2002). During two project years (2011-2012; 2012-2013) a large-scale data collection of 4,195 children across 234 classrooms in 61 centers was conducted. From the larger sample, approximately 527 children across 72 classrooms (6-9 children per classroom) in 16 centers were randomly selected, stratified by age, sex, and ethnicity to be representative of the Miami-Dade Head Start program. This subsample of children participated in a more-in depth multi-method, multi-source set of assessments of their social-emotional and academic readiness skills to establish concurrent validity of the Spanish ASPI. Children in the subsample ranged in age from 36 to 59 months ($M = 47.83$, $SD = 6.71$ months) and sex was split evenly with 49% boys. The majority of children were Hispanic (56.4%) or African American (43.6%). All families met the federal criteria for enrollment in the Head Start program (annual income of \$23,050 for a family of 4; Federal Register, 2012).

Demographic information from the lead Head Start teachers who participated, indicated that 100% were female, 74.3% Hispanic or Latino, 24.3% Black or African

American, 55.7% White, and 18.6% Other. Approximately 18.6% of teachers had a master's degree, 55.7% a bachelor's degree, 15.7% an associates degree, and 10% child development associate credentials. On average, teachers reported working as a preschool teacher for 12.54 years ($SD = 7.21$, range = 1-35 years). Teachers reported on their language use in the classroom and indicated that 40% of teachers spoke English and Spanish equally in the classroom, 22.9% spoke English most of the time, 7.1% spoke Spanish most of the time, and 11.4% spoke English all the time. 70.8% of children were in classrooms where at least one teacher (either the lead teacher or the teacher assistant) predominantly spoke the same language as the child. Specifically, teacher/child language was considered as matched if greater than or equal to 60% of teacher talk in the classroom was the same as the child's primary language.

Measures

Observed classroom engagement. The *Individualized Classroom Assessment Scoring System* (inCLASS; Downer et al., 2010) was used to assess children's classroom engagement. The inCLASS is a child-focused observational assessment of individual children's engagement with teachers, peers and tasks. It is comprised of 10 reliable dimensions, which have been validated for use with low-income, diverse preschool samples (Vitiello et al., 2012a). Construct validity studies established four reliable and valid domains: Positive Engagement with Teachers, Peers, Tasks and Conflict Interactions (Cronbach's alphas, .80, .92, .72, and .71, respectively; Downer et al., 2010).

Positive Engagement with Teachers captures the degree to which children are emotionally connected to their teacher and initiate and sustain conversations with them. Dimensions include: Positive Engagement with Teacher (e.g., attunement), and Teacher

Communication (e.g., sustaining conversations). *Positive Engagement with Peers* captures the degree to which children share positive emotions with their peers and initiate and sustain conversation and interactions. Dimensions include: Peer Sociability (e.g., proximity seeking), Peer Assertiveness (e.g., leadership), and Peer Communication (e.g., initiating communication). *Positive Engagement with Tasks* captures children's consistent and active involvement in maintaining their attention and focus on classroom tasks and taking learning into their own hands. Dimensions include: Engagement with Tasks (e.g., sustaining attention), and Self-Reliance (e.g., personal initiative). Finally, *Conflict Interactions* captures the degree to which interactions with teachers or peers are marked by tension, resistance, and negativity. Dimensions include: Teacher Conflict (e.g., aggression), Peer Conflict (e.g., negative affect), and low Behavior Control (e.g., patience) (Downer et al., 2010). After each 10-minute observation period, the target child is rated on the ten dimensions. Each dimension is assigned a code based on a seven-point scale, with higher ratings indicating better quality and/or more frequent positive interactions, with the exception of teacher/peer conflict, for which higher ratings are indicative of more negative interactions. Codes are based on detailed behavioral descriptions.

The inCLASS observation protocol includes a checklist to record classroom context related factors that occur during observation cycles. Classroom contexts were recorded throughout the observation including the following response options: whole group, small group, individual time, free choice, outdoor time, meals, and routines/transitions. Definitions for each of these classroom contexts are provided in the coding manual and adapted from Ritchie and colleagues' Emerging Academic Snapshot (Ritchie, Howes, Kraft-Sayre & Weiser, 2001). Data collectors recorded the classroom context throughout

each observation cycle, indicating which context the target child was in, as well as start and end times for the context through use of a stopwatch.

To become certified observers for this measure, research assistants completed an intensive observation training conducted over two days by an inCLASS-certified trainer. Observers were required to reliably code five video training segments within 80% of Master codes determined by expert coders from the University of Virginia's inCLASS team. Upon successful completion of the training, observers completed four 10-minute cycles followed by 5 minutes of real time coding for each participating child in the fall and spring of each project year. Final scores for each dimension were computed by averaging scores across each of the child's observation cycles. Domain scores were obtained by averaging the respective dimension scores. To monitor observer drift during the observation period, 20% of observations were double coded.

Observed classroom process quality. The *Classroom Assessment Scoring System* (CLASS; Pianta, La Paro, & Hamre, 2008) was used to assess classroom process quality. The CLASS is an observational tool used to assess the quality of the interactions between teachers and children. The CLASS has been demonstrated as a valid and reliable measure in bilingual Spanish speaking classrooms (Downer et al., 2012). The CLASS measures three domains of classroom quality: (1) *Emotional Support*, which consists of four dimensions: Positive Climate, Negative Climate, Teacher Sensitivity, and Regard for Student Perspective; (2) *Classroom Organization*, which consists of three dimensions: Behavior Management, Productivity, and Instructional Learning Formats; and (3) *Instructional Support*, which consists of three dimensions: Concept Development, Language Modeling, and Quality of Feedback (Cronbach's alpha = .89, .77, .83,

respectively, LaParo, Pianta & Stuhlman, 2002). Each dimension is rated on a 7-point scale ranging from low to high quality interactions. The CLASS manual provides detailed examples of behaviors that exemplify the low, medium and high range to guide observer ratings.

To become certified observers for this measure, research assistants completed an intensive observation training conducted over two days by a CLASS-certified trainer. Observers were required to reliably code five video training segments within 80% of Master codes assessed via a web-based interface published online by Teachstone at the University of Virginia. Upon successful completion of the training, observers completed four 20-minute cycles followed by 10 minutes of real time coding for each participating classroom in the winter of each project year. Final scores for each of the 10 dimensions were computed by averaging each score across each of the observation cycles. Domain scores were obtained by averaging the respective dimension scores. To control for observer drift during the observation period, 20% of observations were double coded.

English language screener. Children's English language proficiency was assessed using the *Preschool Language Assessment Scale* (PreLAS; Duncan & De Avila, 1998). The PreLAS is designed to assess receptive and expressive language skills, syntax, vocabulary and command of grammatical phrases. The first two subscales of the PreLAS2000 have been widely used as part of an English language routing procedure in national studies of Head Start children (Puma, Bell, Cook, & Heid, 2010; Vogel et al., 2008). In this study, the first two (out of five) subscales were used: "Simon Says" and "Art Show", which measure expressive and receptive English language skills. According to the published

manual, Cronbach's alphas are .88 and .90 for "Simon Says" and the "Art Show" respectively (Duncan & De Avila, 1998).

Academic readiness. The *Learning Express* (LE; McDermott et al., 2009) was used as a direct assessment of children's literacy and mathematics skills at the beginning and the end of each year. The assessment is comprised of four subscales: Alphabet Knowledge, Vocabulary, Mathematics and Listening Comprehension. Items in each subscale are in order of increasing difficulty, with the number of items administered determined by basal and ceiling rules. The LE was developed specifically for use with low-income, Head Start children. Construct validity studies with a large sample of ethnically diverse Head Start children revealed high internal consistency for each of the subscales; .98 for Alphabet Knowledge, .96 for Vocabulary, .96 for Mathematics and .93 for Listening Comprehension. Convergent and divergent validity has been established by correlations between the four subscales and teacher ratings of children's literacy, mathematics and science skills, as well as direct assessments of early reading ability, receptive vocabulary and early mathematics ability (McDermott et al., 2009).

Procedure

Approval for the larger study, as well as for this dissertation study, was obtained from the director of Miami-Dade County Head Start and the Parent Policy Council. These projects have also received approval through the University of Miami's Institutional Review Board. In the fall of each year (2011 and 2012), Dr. Shearer, the PI, and our research team worked directly with Ms. Jane McQueen, the director of Miami-Dade County Head Start, to recruit Head Start centers to participate in the project. Consent was

first obtained from the center directors, then teachers, and finally parents of children in participating classrooms.

During the 2011-2012 and 2012-2013 academic years, data collection for this project occurred at three time points (fall, winter and spring). Demographic information for all children was obtained through center records and verified by teachers. Children were individually observed in the classroom using the inCLASS (Downer et al., 2010) in the fall and spring of each year. inCLASS observers completed four 10-minute cycles followed by 5 minutes of real time coding for each participating child. Throughout the observation, data collectors recorded the classroom context the target child was participating in, noting the time spent in each context. At the end of the observation cycle, the start and end times were used to determine which classroom context had taken up the majority of the observation period, and this setting was recorded as the primary context (Vitiello et al., 2012a). In addition, to assess the classroom process quality, observations of participating classrooms were conducted using the CLASS (Pianta et al., 2008) in the winter of each project year. CLASS observers completed four 20-minute cycles followed by 10 minutes of real time coding for each classroom.

Direct assessments of academic skills (language, literacy and mathematics) were conducted in the fall and spring of each year. All direct assessments were conducted in English, due to the lack of culturally and linguistically equivalent measures in Spanish sensitive to detect changes in academic skills in Head Start children (Espinosa, 2005; McDermott et al., 2009). Due to the linguistic diversity of the sample, children were screened for their English proficiency prior to conducting direct assessments using the PreLAS2000. Only children determined to be proficient enough in English were assessed

based on a cutoff score, as guided by criteria used in previous national studies of children from low-income backgrounds (Puma et al., 2010; Vogel et al., 2008). Children who passed the language screener (98%) were directly assessed on the *Learning Express*. Trained research assistants administered direct assessments to children in a quiet space outside of the classroom. Children received several stickers for their participation.

Data Analytic Approach

Before conducting analyses, variables were examined for outliers, homoscedasticity and kurtosis to ensure data were normally distributed and there were no violations of assumptions. Once data were examined, a series of structural equation models (SEM) were built using *MPlus* Version 6.0 (Muthén & Muthén, 1998–2010) to address the project objectives. SEM was chosen as the most appropriate data analytic strategy for two reasons: (a) profiles of children could be empirically identified based on observed variables, and (b) the nested structure (or hierarchical nature) of the data could be accounted for through the use of a sandwich estimator in *MPlus* (Kline, 2005; Jacobucci, Saldanha, & Deng, 2007). In this study, children were nested within classrooms. This violated the assumption of independence between observations (Raudenbush & Bryk, 2002). *MPlus* uses a conservative correction (Type = Complex) by adjusting standard errors of the parameter estimates, analogous to what is done within a multilevel framework (Muthén & Muthén, 1998–2010). Missing data in the models was accounted for using Full Information Maximum Likelihood (FIML; Hancock & Mueller, 2006; Kline, 2005). FIML uses all available data for each case when estimating parameters and has been shown to be unbiased when data are missing completely at random (MCAR; Enders & Bandalos, 2001). Modern

methods for handling missing data, such as FIML, have been suggested as best practice for developmental research (McCartney, Burchinal & Bub, 2006).

Contextualized analytic approach. It is recognized that incorporating classroom context into analyses of children's behavior is a challenging, yet critically important task. Prior to identifying latent profiles of Miami-Dade Head Start children's engagement, each observation cycle was classified as teacher-directed or child-directed based on the percentage of time children spent within the context of the respective setting. Children's "contextualized" scores accounted for the opportunities present for them to engage with teachers, peers or tasks based on the context they were primarily exposed to during each cycle. Descriptive analyses of these contextualized scores were conducted to determine whether accounting for the context in the overall average score of each child across domains was the most appropriate approach before continuing with subsequent analyses.

Research Question 1. Can profiles of classroom engagement be empirically identified for culturally and linguistically diverse Head Start children? A series of Latent Profile Analyses (LPA) were conducted in SEM to empirically identify profiles of children based on their scores on the four domains of the inCLASS (Positive Engagement with Teachers, Peers, Tasks and Conflictual Engagement) in the fall of children's Head Start year. LPA identifies individuals who display similar patterns of behavior and classifies them into homogeneous groups (Giang & Graham, 2008). Models were estimated with an increasing number of profiles and the optimal number of profiles was determined once acceptable model fit was achieved with the least number of profiles (DiStefano & Kamphaus, 2006).

Four model fit indices were used to guide selection of the optimal profile solution: Akaike Information Criterion, Bayesian Information Criterion, entropy, and Vuong-Lo-Mendell-Rubin Likelihood Ratio test. The Akaike Information Criterion (AIC; Akaike, 1974) and the Bayesian Information Criterion (BIC; Vermunt & Magidson, 2002) are parsimony criteria, with lower values indicating better model fit (Muthén & Muthén, 1998-2010). The entropy value (an index of classification accuracy) is the average probability that each individual is correctly classified into a profile (DiStefano & Kamphaus, 2006). Entropy values closer to 1.00 indicate better model fit. The Vuong-Lo-Mendell-Rubin Likelihood Ratio test (VLMR; Lo, Mendell & Rubin, 2001) tests the relative fit between the model being tested and a model with one less profile group. The VLMR provides a p value to indicate if this difference is significant, if not, the more parsimonious model should be retained (Herman, Ostrander, & Tucker, 2007). Model fit statistics (AIC, BIC, Entropy and VLMR), as well as parsimony and theoretical and practical appeal of the profiles were examined to determine the best fitting number of profiles for the data.

Child-level variables associated with engagement profiles. Within *MPlus*, each latent engagement profile was regressed on child-level characteristics (age, sex, ethnicity and teacher-child language match) to obtain the probability of classification in each profile at the beginning of the year based on these characteristics. In this analysis, a multinomial logistic regression analysis yields an odds ratio (relative risk ratio) indicating the increase in the log-odds of being classified in each of the profile types (relative to the reference group, negatively engaged profile) as a function of child-level characteristics (Jung & Wickrama, 2008).

Research Question 2. Is there stability and change in engagement profiles across the Head Start year and are there child and classroom-level characteristics associated with stability and change? Latent transition analysis (LTA), a special case of the latent profile model for longitudinal data, was conducted in SEM to examine structural and individual stability in engagement profiles across two time points (fall and spring). LTA uses an autoregressive modeling approach to determine the probability of transitioning from one profile at one time point to a profile at another time point (Nylund, Muthén, Nishina, Bellmore, & Graham, 2006). This change is estimated using Markov chain models (Nylund, Asparouhov, & Muthén, 2007). The flexibility of the LTA model allows for the integration of developmental theories directly into the statistical model. Modeling steps proceeded as recommended by Nylund et al. (2007). For the latent transition model, the recommended approach is to use all available information: children who have data at both or only one of the time points (Muthén & Muthén, 1998-2010). As indicated above, FIML was used to address missing data and to allow for inclusion of all available data.

First, fall and spring latent profile models were estimated separately and the optimal solution was selected based on the LPA criteria above; then both fall and spring models were estimated simultaneously. Structural stability of the profiles was examined through consistency in the number of profiles and pattern of engagement that emerged over time. Second, individual stability and change was examined by regressing children's latent profile membership at Time 2 (spring) on their profile membership at Time 1 (fall), thus yielding transitional probabilities. A multinomial logistic regression analysis yielded an odds ratio indicating the increase in the log-odds of being classified in each of the

profile types relative to the reference profile group, namely the positively engaged group (Jung & Wickrama, 2008).

Child and classroom-level variables associated with stability and change.

Two sets of variables were examined for their association with children's categorical latent transitional probabilities estimated in the LTA step described above. First, children's latent transitional probabilities were regressed on child demographic variables (child age, sex, ethnicity and teacher-child language match). A multinomial logistic regression was conducted in the same manner described to address research question 1, yielding an odds ratio indicating the increase in the log-odds of being classified in each transition pattern (relative to the reference transition pattern) as a function of demographic characteristics (Jung & Wickrama, 2008). Second, to examine classroom practices associated with stability and change, children's most likely transition pattern membership across the two time points was exported into a data file (based on posterior probabilities). Based on prior research, it was predicted that there would be 9 possible transition patterns (e.g., 3 profiles in the fall, 3 profiles in the spring, among which children stay or move). Per McWayne and Bulotsky-Shearer (2013), children's membership in these transition patterns was dummy coded and statistical differences among the transition patterns in mean levels of emotional support, classroom organization, and instructional support were examined within a multi-level ANOVA. In this way, the hypothesis that children's individual transition patterns depend on (i.e., is moderated by) classroom quality was tested.

Research Question 3. Are patterns of engagement differentiated by gains in academic readiness skills at the end of the preschool year? Once the optimal LTA

solution was identified, gains in academic readiness skills assessed on the *Learning Express* (alphabet knowledge, vocabulary, mathematics and listening comprehension) were estimated across each latent transition pattern. Significant mean differences across academic readiness skills were determined by conducting one-way analysis of variance (ANOVA). The procedure provides an overall significance test (F-test) as well as pairwise comparisons of mean differences among the profile types through post hoc analyses. Multiple regression analyses were also conducted to test the relation between children's latent transition pattern membership and their gains in academic readiness skills, controlling for child demographic covariates.

Power Analyses

A sample size of 527 children across 72 classrooms was sufficient to address the research questions using the analyses described above. For LPA, there are no available guidelines regarding total sample size and no packaged software currently exists to generate sample size specifications. For LPA, adequate sample size depends on numerous factors including the number of variables, the number of profiles and the reliability of the measures (Lubke & Muthén, 2005). Lubke and Neal (2006) state that a within-profile sample size of 75 participants is sufficient to identify an optimal solution. Based on the number of profiles identified by Maier et al. (in press), it was expected that 3 profiles would be identified. A sample size of 225 participants would satisfy the requirement for 75 participants within each profile. Therefore, the sample size of 527 was more than adequate for carrying out the analyses for this study.

To account for the nested structure of the data, the number of estimated model parameters must exceed the number clusters (i.e., number of classrooms; Asparouhov,

2005). In the largest model, it was expected that 64 parameters would be estimated (means and variances for 4 inCLASS domains in the fall and spring, means and variances for 8 hypothesized transitional patterns, and means and variances for 4 child demographic variables). Based on these calculations, the cluster size of 72 classrooms was sufficient.

Results

Descriptive Statistics

To ensure all data were normally distributed, variables were examined for outliers, homoscedasticity and kurtosis. No violations of assumptions were found. See Tables 1 and 2 for descriptive statistics. Next, as guided by previous descriptive studies with the inCLASS, inCLASS cycle level data was dummy coded as either a “teacher-directed” (i.e. whole group, small group, individual time, meals/snacks, or routines/transitions) or “child-directed” setting (i.e. outdoor time, or free play) based on the primary context the child participated in during that cycle (Vitiello et al., 2012a). To ensure the contextualized variables were normally distributed, the data were again examined for skewness and kurtosis. Two variables at each time point were found to violate the assumption of normality and therefore the variables for conflict in teacher-directed settings (fall: skew = 2.87; kurtosis = 11.39; spring: skew = 3.24; kurtosis = 16.58) and conflict in child-directed settings (fall: skew = 3.28; kurtosis = 14.37; spring: skew = 3.28; kurtosis = 14.37) were log transformed for analyses (Kline, 2005).

Paired samples t-tests were conducted comparing scores across cycles of primary teacher-directed and child-directed settings. Results revealed that children displayed significantly higher positive engagement with teachers in teacher-directed settings than in child-directed settings (fall: $t(439) = 7.02, p < 0.001$; spring: $t(414) = 8.10, p < 0.001$). Conversely, children displayed significantly higher positive engagement with peers (fall: $t(439) = 15.40, p < 0.001$; spring: $t(414) = 16.89, p < 0.001$) and tasks (fall: $t(439) = 13.01, p < 0.001$; spring: $t(414) = 13.33, p < 0.001$) in child-directed settings than in teacher-directed settings. Children also displayed significantly higher conflict

engagement in child-directed settings than in teacher-directed settings (fall: $t(438) = 4.73, p < 0.001$; spring: $t(414) = 2.69, p < 0.01$). Given the significantly different scores across classroom contexts, separate scores for cycles capturing teacher-directed settings and cycles capturing child-directed settings were used to conduct subsequent analyses.

Latent Profile Analysis

A series of Latent Profile Analyses (LPA) were conducted in SEM to empirically identify profiles of children based on their scores in teacher- and child-directed settings on the four domains of the inCLASS (positive engagement with teachers, peers and tasks, and conflict engagement) in the fall of children's Head Start year. Model fit statistics, as well as parsimony and theoretical and practical appeal of the profiles, were examined to determine the best fitting LPA model for the data. Based on these selection criteria, a 3-profile solution was determined to be the most appropriate model (AIC = 8419.52; BIC = 8590.20; Entropy = 0.84; VLMR-LRT, $p = 0.03$). Fit statistics for 1-4 profile solutions are presented in Table 3. The three profile groups are presented in Table 4 and Figure 1 and described below.

Independently engaged (IE). The most prevalent profile was an independently engaged group of children (62.62% of the overall sample), displaying low levels of social engagement with teachers and peers. Children in this profile displayed moderate levels of positive engagement within tasks, particularly in child-directed settings compared to teacher-directed settings. Finally, children in this profile showed low levels of conflict engagement in teacher- and child-directed settings.

Positively engaged (PE). The second most prevalent profile to emerge was a positively engaged group of children (27.51% of the overall sample). Children in this

profile displayed higher levels of social engagement with teachers and peers across both teacher- and child-directed settings. Their positive engagement with teachers was particularly high in teacher-directed settings in the classroom. Additionally, children in this profile displayed the highest levels of positive engagement within tasks across both settings. Similarly to the independently engaged profile, children in this profile showed low levels of conflict engagement in teacher- and child-directed settings.

Negatively engaged (NE). Children in this profile (9.87% of the overall sample) displayed low levels of positive engagement with teachers and peers, and moderate levels of engagement within tasks. These children seemed to be more engaged with peers and tasks in child-directed settings. This profile is distinct due to the elevated levels of conflict in both teacher- and child-directed settings.

Child-level variables associated with fall engagement profiles. Within *MPlus*, each latent engagement profile was regressed on child-level characteristics (child age, sex, ethnicity and teacher-child language match) to obtain the probability of classification in each profile at the beginning of the year based on these characteristics. See Table 8 for parameter estimates and odds ratios for the multinomial logistic regression analyses. The NE profile was used as the reference group to aid in comparisons with the more adaptive profiles. Child age, gender, ethnicity and teacher-child language match were all significant predictors of children's latent profile membership in the fall. As indicated by the significant odds ratios, older children were more likely to be classified within the PE profile than the NE profile ($B = 0.09, p < 0.01$). Each month increase in age increased the likelihood of children's classification in the PE profile as compared to the NE profile. Additionally, girls were more likely to be classified in the IE ($B = 1.27, p < 0.01$) or PE

($B = 1.30, p < 0.01$) profile than the NE profile. In other words, being a girl increased children's likelihood of classification in the more adaptive profiles, IE and PE, relative to the NE profile. Finally, both Hispanic children ($B = 0.78, p < 0.05$) and children who experienced a match in their own primary language and the predominant language spoken in the classroom by either the teacher or teachers assistant ($B = 0.78, p < 0.05$) were more likely to be classified in the IE profile as compared to the NE profile. Other profile comparisons for child demographic variables were not significant.

Latent Transition Analysis

The latent transition analysis (LTA) was conducted through a series of steps to examine structural and individual stability and change in engagement profiles across the two time points (fall and spring).

Structural stability and change. Structural stability of the profiles was examined through consistency in the number of profiles and pattern of engagement scores that emerged over time. To examine this, fall and spring latent profile models were estimated separately and the optimal solution at each time point was selected based on the four LPA criteria discussed previously (i.e., AIC, BIC, Entropy, & VLMR-LRT). Similar to the profiles estimated at the fall time point, model fit statistics, as well as parsimony and theoretical and practical appeal of the profiles indicated that a 3-profile solution was the best fitting model for the spring time point as well. Fit statistics for the spring 1-4 profile solutions are presented in Table 5. A description of the differences in the three profile groups from fall to spring is provided next and the spring profiles are presented in Table 6 and Figure 2.

Similar to the fall, the most prevalent spring profile was the independently engaged profile (IE; 68.04% of the overall sample). The pattern of classroom engagement was nearly identical to the fall IE profile. The spring positively engaged profile (PE; 18.56% of the overall sample) had a similar pattern of classroom engagement as the fall PE profile. Of note, the spring PE profile showed higher levels of positive engagement with peers in child-directed settings than the fall PE profile. Finally, the spring negatively engaged profile (NE; 13.4% of the overall sample) displayed slightly lower levels of positive engagement with peers across settings (especially for teacher-directed settings), and slightly lower levels of engagement within tasks during teacher-directed settings compared to the fall NE profile. There were also slightly lower levels of conflict displayed across settings.

Child-level variables associated with spring profiles. Results from multinomial logistic regression analyses in the spring indicated that child age and ethnicity were significant predictors of children's spring latent profile membership. See Table 8 for parameter estimates and odds ratios across the profiles. As indicated by the significant odds ratios, older children were more likely to be classified within the PE profile than the NE profile ($B = 0.07, p < 0.05$). Each month increase in age increased the likelihood of children's classification in the PE profile as compared to the NE profile. Additionally, Hispanic children were more likely to be classified in the IE ($B = 0.82, p < 0.05$) or PE ($B = 1.09, p < 0.05$) profiles as compared to the NE profile. In other words, being Hispanic increased children's likelihood of classification in the more adaptive profiles, IE and PE, relative to the NE profile. Other spring profile comparisons on child gender and teacher-child language match were not significant. Given the remarkably stable structure of the

profiles across the fall and spring time points when models were estimated separately, full measurement invariance was assumed in the subsequent analyses (Nylund et al., 2006).

Individual stability and change. Fall and spring profiles were estimated simultaneously by regressing the spring profiles on the fall profiles to examine individual stability and change in children's latent profile membership from fall to spring. The latent transition patterns are presented in Table 9 and Figures 3-5. Latent transitional probabilities yielded 9 transition patterns based on children staying in a qualitatively similar profile from fall to spring (individual stability) or moving to a qualitatively different profile across the year (individual change).

Independently engaged. The majority of the overall sample (64.33%; $n = 339$) started the year in the independently engaged profile. Of those children, 77.0% ($n = 261$) remained in the independently engaged profile across the year (IE-IE); 11.2% ($n = 38$) transitioned into the positively engaged profile (IE-PE); and 11.8% ($n = 40$) transitioned into the negatively engaged profile (IE-NE).

Positively engaged. Of the overall sample, 26.0% ($n = 137$) of children started the year in the positively engaged profile. Of those children, 29.2% ($n = 40$) remained in the positively engaged profile across the year (PE-PE); 63.5% ($n = 87$) transitioned into the independently engaged profile (PE-IE); and 7.3% ($n = 10$) transitioned into the negatively engaged profile (PE-NE).

Negatively engaged. Of the overall sample, 9.68% ($n = 51$) of children started the year in the negatively engaged profile. Of those children, 33.3% ($n = 17$) remained in the negatively engaged profile across the year (NE-NE); 51.0% ($n = 26$) transitioned into the

independently engaged profile (NE-IE); and 15.7% ($n = 8$) transitioned into the positively engaged profile (NE-PE).

In summary, the majority of children (60.3%) remained in qualitatively similar profiles across the year, while some moved to qualitatively different profiles (39.66%).

Child- and classroom-level variables associated with stability and change.

Prior to conducting the regression analyses, children's most likely latent transition pattern membership was estimated using LTA-posterior probabilities (McWayne & Bulotsky-Shearer, 2013). Children's latent transition pattern membership was exported and dummy coded in order to include children's movement among the engagement profiles across the year in the regression analyses. A series of multiple regression analyses were conducted to examine the extent to which children's transition patterns were associated with child- and classroom-level variables across the preschool year. First, child-level variables (child age, sex, ethnicity, and teacher-child language match) were regressed on children's latent transition pattern membership. Results indicated that compared to all other groups, children following the IE-IE transition pattern were more likely to be younger; whereas, children following the PE-IE and PE-PE transition patterns were more likely to be older. In other words, older children were more likely to remain in the positively engaged profile or begin the year in the positively engaged profile and transition to the independently engaged profile from fall to spring than to follow any other transition pattern across the year. Younger children were more likely to remain in the independently engaged profile across the year than to follow any other transition pattern. Children following the NE-NE transition pattern were more likely to be boys and of non-Hispanic background (i.e. Black or African American children) compared to all other groups.

Meaning, boys and children of non-Hispanic background were more likely to remain in the negatively engaged profile from fall to spring than to follow any other transition pattern across the year. Standardized path coefficients are presented in Table 11. All other associations with latent transition patterns and children's age, sex, ethnicity and teacher-child language match were not significant.

Second, to examine classroom practices associated with stability and change, a multi-level ANOVA was conducted with the three CLASS domains of classroom quality (emotional support, classroom organization, and instructional support) and children's exported latent transition pattern membership. Results indicated that following the PE-IE transition pattern was associated with being in classrooms with higher emotional support. In other words, children in classrooms with higher levels of warm, responsive and encouraging interactions were more likely to begin the year in the positively engaged profile and transition into the independently engaged profile by the spring.

Additionally, following the PE-PE transition pattern was associated with being in classrooms with higher instructional support. In other words, children in classrooms marked by more cognitively stimulating interactions were more likely to remain in the positive engaged profile across the year. Standardized path coefficients are presented in Table 12. All other associations with latent transition patterns and classroom quality were not significant.

Differential Associations between Latent Transition Patterns and Gains in Academic Readiness across the Preschool Year

Using children's exported latent transition pattern membership, a series of analyses were conducted to examine whether there were differential gains in academic readiness skills across the year based on children's transition pattern membership. First,

to gain a descriptive understanding of the relationships, a set of one-way analysis of variance (ANOVA) models were conducted. Results indicated overall models across the transition patterns for children's fall and spring academic readiness skill scores were significant for alphabet knowledge ($F(8, 485) = 4.53, p < 0.001$), vocabulary ($F(8, 485) = 2.53, p < 0.05$), mathematics ($F(8, 485) = 4.40, p < 0.001$) and listening comprehension ($F(8, 485) = 2.98, p < 0.01$). Post hoc analyses (Tukey's HSD, $p < 0.05$) are presented in Table 13. The general pattern of post hoc findings indicated that being in a more adaptive profile (independently or positively engaged) at some point over the year was associated with greater academic readiness skills both initially and at the end of the year. Remaining in the negatively engaged profile across the year was associated with the least favorable academic skill scores.

Next, a series of path analyses were conducted in *MPlus* (using TYPE = COMPLEX) to examine the relationship between children's latent transition pattern membership (with the IE-IE transition pattern as the reference group) and their spring academic readiness skills, controlling for child demographic covariates and fall academic skills. Results indicated that children following the NE-NE transition pattern displayed significantly fewer gains in alphabet knowledge across the year than children in the IE-IE transition pattern (see Table 14 for path coefficients).

Chapter 4

Discussion

Research documents the importance of targeting domain-general skills, such as classroom engagement, during preschool to enhance children's readiness across multiple developmental domains (Birch & Ladd, 1997; Downer et al., 2010; McClelland et al., 2007). This study used a child-centered approach to examine children's patterns of classroom engagement across a preschool year. Furthermore, child- and classroom-level factors associated with children's patterns of engagement across the year were examined, as well as differential associations among children's academic readiness across the transition patterns. The hypothesis that three unique classroom engagement profiles would emerge across the year was supported. Hypotheses regarding child- and classroom-level factors associated with children's patterns of engagement across the year were partially supported and some differential associations among children's academic readiness were revealed. This study extends previous literature by suggesting that taking a "whole child" approach, by examining children's competencies and needs simultaneously, provides a more nuanced understanding of how to support children's academic and social development. Findings support the need to examine more carefully the classroom conditions under which children's unique patterns of classroom engagement are best supported.

Contextual-Focused Examination of Children's Classroom Engagement

The classroom context in which children's engagement was observed was incorporated into children's scores to gain a more dynamic understanding of how children were engaging, while considering the opportunities and demands placed on

children's behavior in teacher- vs. child-directed contexts. Findings indicated that the degree to which children engaged with their teachers, peers and within tasks in the classroom varied depending on the context in which they were interacting. This finding is supported by previous research documenting that children display increased levels of positive engagement with teachers in teacher-directed contexts and increased levels of positive engagement with peers and within tasks, as well as increased conflict engagement in child-directed contexts (Booren et al., 2012; Bulotsky-Shearer et al., 2008; Bulotsky-Shearer & Fantuzzo, 2011; Vitiello et al., 2012a). Findings from this study are consistent with previous literature and make visible the importance of accounting for classroom context when measuring children's classroom engagement.

In addition to incorporating context into the measurement of children's engagement, this study incorporated these contextualized scores into child-centered LPA and LTA analyses. Findings further demonstrate how the variation in children's behavior across teacher- vs child-directed contexts reflects unique patterns of children's competencies and needs in classroom engagement. Given recent calls from the field for assessment measures to capture children's behavior as it emerges dynamically within the demands of classroom contexts (National Research Council, 2008; AERA, APA & NCME, 1999), more research is needed to examine how to account for these classroom demands in evaluating, understanding and supporting children's behavior prior to kindergarten entry (Ramey & Ramey, 1998). For instance, a child who has difficulties engaging positively with their peers in child-directed free play contexts, may more easily engage in positive ways during teacher-directed independent learning tasks or structured small group time (Bulotsky-Shearer et al., 2008). Understanding where and how children

are engaging in the classroom will help teachers tailor their support to meet the individual needs of those children.

Latent Profile Analysis

As hypothesized, a latent profile analysis revealed three unique fall engagement profiles: *independently engaged*, *positively engaged* and *negatively engaged*. These three engagement profiles replicated those found by Maier and colleagues (in press) using the same latent profile approach in a primarily White, mixed-income sample. The most prevalent profile that emerged was the independently engaged profile, followed by the positively engaged profile and finally the negatively engaged profile.

The latent profile approach provides a more nuanced and complex picture of behavioral engagement that children display; providing an advantage over the more conventional variable centered approach (Beg, Casey, & Saunders, 2007; Bulotsky-Shearer et al., 2008). In this study, the independently engaged profile (62.62%) was characterized by low to moderate levels of social engagement with teachers and peers across classroom contexts, moderate to high levels of engagement within tasks, and low levels of conflict engagement; suggesting that these children are independent. Children in the independently engaged profile sought out and experienced few social interactions, yet remained well-regulated and displayed self-reliance in their ability to stay on-task.

Unlike the independently engaged profile, children classified in the positively engaged profile (27.51%) displayed higher levels of social engagement with teachers and peers, as well as the highest levels of positive engagement within tasks and lowest levels of conflict engagement across classroom contexts. Findings suggest that these children had high levels of overall positive engagement in the classroom both in terms of their

social interactions and their enthusiasm and active involvement in classroom tasks and activities.

Finally, children in the negatively engaged profile (9.87%) were relatively disengaged in the classroom. They showed lower levels of social engagement with teachers and peers, and less enthusiasm and active engagement within classroom tasks and activities than children in any other profile. Furthermore, children in this profile displayed the highest levels of conflict engagement in the classroom. Findings suggest that children in the negatively engaged profile tended to be dysregulated and, during the few interactions they did engage in, their experiences were likely characterized by conflict, negativity, and a lack of self-control.

This study extends the findings by Maier et al. (in press) in several important ways. First, classroom context was incorporated into the identification of children's engagement profiles. Second, latent profiles were identified within a sample of culturally and linguistically diverse children from low-income backgrounds. The study population included a large proportion of bilingual Spanish-speaking Latino children enrolled in an urban Head Start program in the Southeast. More work in this area is needed to inform program practices specific to this population, as these children are at greatest risk for poor school success and are in critical need of extra support during the preschool years.

Child-level variables associated with fall engagement profiles. To further understand the children being classified in each engagement profile, differences across the profiles on several child-level variables were examined. Child age, gender and ethnicity were associated with children's probability of membership in the three engagement profiles. As expected, older children were more likely to be classified in the positively

engaged profile than the negatively engaged profile. This finding is supported by previous research documenting the rapid increase in self-regulation and social skills during the preschool period (Downer et al., 2010). As children mature and develop, they are better able to navigate the demands of the setting and successfully engage in the classroom. Older children are better able to regulate their behavior (Brocki & Bohlin, 2004; Dowsett & Livesey, 2000) and tend to have more positive engagement with teachers and peers (Almqvist, 2006; Coolahan et al., 2000). It logically follows that the older children in the classroom (closer to 5 years of age) were more likely to be in the profile characterized by the greatest levels of social engagement and lowest levels of conflict engagement.

Additionally, girls were less likely to be classified in the negatively engaged profile than either of the other profile groups. Prior developmental research has suggested that sex differences in behavior begin to emerge during preschool, such that girls show an advantage over boys in their ability to engage in social interactions (Bulotsky-Shearer et al., 2012; Keenan & Shaw, 1997). Finally, Hispanic children and children who experienced a match in the predominant language spoken in the classroom by either the teacher or teachers assistant and the child's own primary language were more likely to be classified in the independently engaged profile as compared to the negatively engaged profile. No study to date has examined the influence of children's ethnicity and language match on their engagement profile membership; however, there is a growing body of literature focused on classroom engagement, and the related construct of approaches to learning, within samples of Latino children. These studies suggest that relative to their African American peers, being of Hispanic or Latino background is associated with higher levels of classroom engagement (e.g. DeFeyter & Winsler, 2009; Fuller & Garcia Coll, 2010). Furthermore,

there is some empirical evidence to suggest that the use of the home language in early childhood classrooms (teacher-child language match) can be a positive, moderating factor for dual language learners' social-emotional development (Halle, et al., 2014). It is important to continue this line of work as our nation's population of diverse learners continues to grow.

Latent Transition Analysis

Before conducting the latent transition analysis, the latent profile structure was tested separately at each time point (fall and spring) to examine structural stability over time. As hypothesized, three qualitatively similar engagement profiles emerged in the spring of the preschool year, with the independently engaged profile being the most prevalent, followed by the positively engaged and finally the negatively engaged profile. Again, consistent with our hypothesis, older children were more likely to be classified in the positively engaged profile than the negatively engaged profile. Hispanic children were less likely to be classified in the negatively engaged profile than either of the other profiles.

Next, to examine individual stability and change in children's engagement profile membership over time, the spring engagement profiles were regressed on the fall engagement profiles to reveal children's latent transition patterns. As hypothesized, most children (60.3%) remained in qualitatively similar profiles across the year, while some moved to qualitatively different profiles (39.66%). Most of this individual stability came from children who remained in the independently engaged profile from fall to spring (IE-IE; 49.52% of overall sample; $n = 261$). In fact, of those children who began the year in the positively or negatively engaged profiles only 7.6% (PE-PE; $n = 40$) and 3.2% (NE-NE; $n = 17$) of the overall sample remained in those profiles across the year. While the overall

individual stability found in this study is supported by a recent early childhood study conducted with the national Head Start FACES 2006 sample, that demonstrated similar movement among profiles characterizing children's social-emotional skills across a preschool year (McWayne & Bulotsky-Shearer, 2013); findings from this study reveal a more nuance stability by profile relationship.

Children who remained in the independently engaged profile across the year maintained their independent engagement style; engaging in few social interactions with their teachers or peers, yet remaining well regulated and self-sufficient. Due to the high prevalence of this profile across the year, this transition pattern, IE-IE, can therefore be thought of as the normative group. Perhaps, the most concerning transition pattern for children to follow was remaining in the negatively engaged profile from fall to spring (NE-NE; 3.23% of overall sample; $n = 17$). The limited interactions these children engaged in across the year were marked by tension, negativity, and a lack of self-control. This study extends prior work by showing how children's patterns of classroom engagement, a domain general skill, changed across a preschool year using a contextual observation measure of preschool children's social-emotional readiness.

Child-level factors associated with stability and change. To understand the extent to which children's transition patterns were associated with characteristics of the child, child-level variables (child age, sex, ethnicity, and teacher-child language match) were regressed on children's latent transition pattern membership. In support of our hypotheses, findings indicated that sex was a significant predictor of children's transition patterns, such that boys were more likely to follow the most concerning transition pattern (NE-NE). Age was a significant predictor of following a transition pattern in which

children remained in the independently engaged profile (IE-IE) or started out in the positively engaged profile and either remained in that profile or transitioned to the independently engaged profile (PE-PE or PE-IE). Finally, language match was not a significant predictor of children's transition patterns. Since this was the first study to examine children's language match as a predictor of latent transition membership, this analysis was exploratory. One potential explanation for this finding is that most children in this study's sample (70.8%) experienced a language match in the classroom. There may not have been enough variability in the language match of this sample to detect an effect. Future work focused on classroom language composition is needed to inform program practices that can support linguistically diverse early learners.

Classroom-level factors associated with stability and change. To understand the extent to which children's transition patterns were associated with characteristics of the classroom, teacher-child interaction quality (measured by the CLASS domains of emotional support, classroom organization and instructional support) was examined within a multi-level ANOVA framework. It was hypothesized that children in well-organized classrooms (classroom organization) would be most likely to transition to more adaptive profiles across the year. It was also expected that classrooms characterized by warm, supportive, and responsive interactions (emotional support) would be likely to promote children's transition into more adaptive profiles across the year. In large-scale studies, both classroom organization and emotional support have been found to be associated with social-emotional skills, and classroom learning behaviors (Burchinal et al., 2008; Maier et al., 2012; Ponitz et al., 2009)

Findings from our study did not provide support for our specific hypotheses; however, two interesting findings did emerge. First, following the PE-IE transition pattern was associated with being in classrooms with higher emotional support. These warm, responsive and encouraging environments may provide children with the comfort to explore on their own. This finding is supported by attachment theory, which posits that a child who feels securely attached to their caregiver, in this case their teacher, will explore freely and independently (Ainsworth, 1978). Children's attachment is largely influenced by the teacher's sensitivity to the child's needs (Ainsworth, 1978); emotionally supportive classrooms are characterized by teacher sensitivity, such as a teacher's awareness of children's needs, responsiveness to their needs, and a regard for their perspective and expression (Pianta et al., 2008).

Second, remaining in the PE profile across the year was associated with being in a classroom with higher instructional support. Why could this be so? Much of the learning that occurs in the preschool classroom is socially mediated (McCune, 1995; Vygotsky, 1978); one possible explanation for these findings is that classrooms characterized by higher instructional support are providing intellectually stimulating environments for children to engage in positive ways with their teachers and peers while children are actively engaged in the learning tasks at hand. It may be that only children who enter the preschool classroom with the propensity to engage socially are able to benefit from this environment. Prior literature has demonstrated that instructionally supportive classrooms are associated with gains in academic achievement, such as literacy, language and mathematics (Burchinal et al., 2008; Howes et al., 2008; Mashburn et al., 2008). While an interesting finding, in this study the association between stability in the PE profile

from fall to spring and high instructional support was correlational. It could be the case that children who began the year in the positively engaged profile displayed a high level of skills and therefore could benefit more from instructionally supportive classroom environments. Highly instructionally supportive environments expand children's language, vocabulary and cognitive problem solving skills, thus deepening their ability to engage positively with their teachers and peers.

It is important to note that we did not find significant associations between any other transition patterns and classroom quality variables. To begin to understand our lack of findings, we must keep in mind that classrooms are dynamic environments and the way in which teachers structure the daily routine, provide activities for children and effectively interact with children (Booren et al., 2012; Kontos & Keyes, 1999) may differentially support children's ability to successfully engage in social interactions and learning experiences (Vitiello et al., 2012a; Vitiello et al., 2012b). This may depend on the child's profile of developmental risk or resilience at preschool entry. For instance, teachers may have had a more difficult time including children who began the preschool year in the negatively engaged profile in cooperative classroom tasks and activities. Therefore, classroom-level practices may have had a diminished impact on their pattern of classroom engagement across the year. With limited early childhood studies examining stability and change in profiles of social-emotional readiness (Denham et al., 2012; McWayne & Bulotsky-Shearer, 2013), findings from this study contribute to our understanding of how culturally and linguistically diverse classroom contexts influence children's learning and development using contextual observation measures of children's engagement, and classroom process quality within Head Start.

Differential Associations between Latent Transition Patterns and Gains in Academic Readiness across the Preschool Year

In partial support of initial hypotheses, when associations between children's engagement patterns across the year and their gains in academic readiness skills were examined, one significant negative association was found. Remaining in the negatively engaged profile across the year was associated with significantly fewer gains in alphabet knowledge relative to remaining in the independently engaged profile across the year. This finding is supported by prior early childhood studies that document the link between conflict behaviors and academic difficulty (Pianta & Stuhlman, 2004). This negative association is heightened when conflict behaviors are maintained across the year. In addition, post-hoc follow up analyses indicated a general pattern of significant findings, such that being in a more adaptive profile (positively or independently engaged) was associated with greater academic readiness skills both initially and at the end of the year. This pattern of findings is consistent with the growing body of work that documents the association between prosocial engagement and academic achievement (Denham & McKinley, 1993; Downer et al., 2010) as well as the negative association between a lack of engagement and academic difficulty (e.g., Birch & Ladd, 1997). Findings from this study extend previous work by replicating these patterns of association within a contextual-focused, child-centered approach.

Chapter 5

Limitations and Future Directions

Although results from this study contribute significantly to the existing literature, there are several limitations that must be acknowledged. First, children's classroom engagement scores were based on a single observational visit on a typical morning during which children were observed across an average of four cycles. The inCLASS observation protocol suggests that conducting four observation cycles is adequate for obtaining reliable estimates (Downer, et al., 2010); however, we know that children's behavior may vary across a single day or week. Therefore, a single observational visit may not provide a complete picture of a child's typical classroom engagement, and more observational visits may be necessary to obtain a more comprehensive understanding of children's behavior. Future studies could extend this work by conducting more observation cycles per child, across multiple observation days. Future studies could also consider conducting targeted observations, such that children are captured in a variety of classroom contexts that are of interest to the research team.

Additionally, the CLASS data was collected at one point in time during the school year, and the CLASS and inCLASS observations were not simultaneously coded. Children's classroom engagement, as captured by the inCLASS, was observed in the fall and spring; the classroom process quality, captured by the CLASS, was observed in the winter. As noted, children's behavior varies across a single day, as well as, across the week; so too may teachers' behavior. Future studies could consider conducting simultaneous observations to ensure that the observation protocols are capturing the same climate and events (Jeon et al., 2010).

Second, due to the complexity of the models, children's most likely transition pattern membership was exported, and dummy-coded variables were used to examine child- and classroom-level variables associated with children's transition patterns and academic readiness skills. This practice is supported by previous studies (McWayne & Bulotsky-Shearer, 2013); yet findings from these models should be interpreted with caution, as the standard errors may be underestimated. Future work should examine these same relationships with a larger sample to allow for estimation of the transition patterns simultaneously within the model in MPlus. Additionally, children were only observed at two time points across the year, fall and spring. With three or more time points, it is possible to create a higher order latent variable that captures children's stability and change among profiles across time (i.e. mover/stayer latent variable; Nylund et al., 2006). This higher order latent variable can be used to predict distal, or longitudinal, outcomes within a latent transition analysis framework (Nylund et al., 2006). Since this study was limited by only two time points it was not possible to model the relationship in this way. Future studies should consider examining this association across a longer period of time to allow for the parsimonious estimation of children's transition patterns using a mover/stayer variable. This may aid in identifying the contribution of children's patterns of classroom engagement to their academic skill development by allowing children more time to change and by capturing greater variability in academic growth trajectories (Singer & Willet, 2003).

Finally, this study focused on key child- and classroom-level variables associated with children's classroom engagement profiles. It is important to extend this work by examining other relevant variables that may be associated with children's profile

membership. These may include other social-emotional contributors to children's classroom engagement, such as behavior problems, social competence and emotion regulation (McWayne & Bulotsky-Shearer, 2013). Future work should also examine other moderating factors that may promote children's transition to more adaptive profiles across the year. These might include family demographic characteristics, or other characteristics of the teachers, such as years of experience or level of education (Aber, Brown & Jones, 2003; McWayne & Bulotsky-Shearer, 2013).

Chapter 6

Implications for Policy and Practice

Increasing numbers of children are enrolled in early childhood educational programs than ever before (Snyder & Dillow, 2011). Children's experiences in these programs are critical to setting them on a positive trajectory to early school success (Chatterji, 2006). Using a child-centered approach to examine the malleable and domain general skill of classroom engagement, the study findings revealed a comprehensive picture of children's dynamic experiences across different classroom contexts. These findings can be used by teachers as a tool to identify specific competencies and needs for children. Often times, a child is labeled as "bad", "shy" or even "hyperactive". These labels follow a child throughout the classroom and ignore the competencies they may possess. By incorporating the classroom context into our understanding of a child's behavior, we start to see that a child is not simply a "bad kid" rather they may just have trouble navigating the cognitive or social demands of the setting.

Teachers can use information from the engagement profiles to structure supports for children in a way that sets them up for success. For instance, a child who has difficulty regulating his/her behavior while standing in line during a transition may benefit from visual cues in the classroom that indicate what happens before, during and after a transition. It may also help for the teacher to clearly state the expectations of the child during the transition (e.g. keeping hands to self, using walking feet, or having still lips). Recent advances in professional development resources for teachers have started to incorporate this contextual focused lens to viewing and supporting children's behavior to

great success (LOOK project, funded by an Institute of Education Sciences Development Research Grant).

By examining children's movement among the engagement profiles across a Head Start year, we gain yet another window into understanding how to support children's healthy growth and development. Examining child- and classroom-level influences on children's classroom engagement offers information on points of intervention for children at greatest risk for poor school readiness; understanding how engagement profiles differ on gains in academic readiness helps to identify which patterns of behavioral engagement are associated with greatest gains in academic skills. Contrary to what was expected, children in the independently engaged profile (either initially or at the end of the year) in general, did just as well academically as those children who were in the positively engaged profile at some point over the year. Currently, the early childhood field emphasizes the importance of social engagement in children's learning experiences in the classroom setting (Raver, 2002); and while the importance of social engagement should not be discredited, in a time of budget constraints and limited resources, it is important to note that a child displaying an independent engagement style is fairing just as well in their academic readiness as a child displaying higher quality social interactions. Focus and resources, may instead be better placed on figuring out ways to move children out of the negatively engaged profile.

Of greatest concern, were children who remained in the negatively engaged profile across the year—they were least likely engaged in productive interactions with teachers, peers, and tasks in the fall and the spring, and performed the worst academically. The pattern of findings, although not significant, suggested that

transitioning out of the negatively engaged profile in the fall and into a more adaptive profile in the spring could have important benefits for children's academic skill development. Most children who began the year in the negatively engaged profile transitioned into the independently engaged profile across the year. This was a positive transition for children, as transitioning into the independently engaged profile by the spring was associated with better academic outcomes compared to children who remained in the negatively engaged profile across the year. In future research, it would be critical to take a closer look at this group of children and examine *why* they may move into more adaptive profiles. Classroom practices did not influence this group of children globally, however this could be due to the restricted range of scores on the measure of classroom quality that was used (CLASS), or the fact that this group is represented by a very small number of children in this sample. It is also possible that there is some other factor all together that is driving this change (e.g., development or maturation, adjustment to the classroom context etc.). Thoughtful reflection and analysis is needed to understand how to support healthy development among this group of children who enter the Head Start classroom displaying profiles of negative engagement. Identifying naturally occurring activities in which positive and cooperative interactions can be integrated within classroom routines particularly for this group of children entering with behavioral risks (Luther et al., 2000).

Results help us understand factors that promote positive change in children's classroom engagement and how this is associated with academic readiness. Findings from this study enhance our understanding of how to best support this vulnerable group of children from low-income backgrounds so we can set them on a path toward positive

school success beginning as early as the preschool years. The information from this study will be shared with the Miami-Dade County Head Start Program, which will help Head Start teachers tailor curriculum and interventions to best support children's individual competencies and needs and improve children's school readiness by tailoring supports to meet the common patterns of behavioral engagement children display in the classroom.

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Table 1
Descriptive Statistics for Classroom Engagement in the Fall and Spring.

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>
Fall					
<i>Standard inCLASS Scores</i>					
Pos. Engagement w/ Teachers	527	2.55	1.04	0.87	0.51
Pos. Engagement w/ Peers	527	2.57	0.89	0.85	0.91
Pos. Engagement w/ Tasks	527	3.43	0.86	0.75	0.86
Conflict Engagement	527	1.74	0.49	1.27	2.40
<i>Contextualized inCLASS Scores</i>					
Pos. Engagement w/ Teachers	447	2.27	1.30	1.20	0.99
Pos. Engagement w/ Peers (C)	447	3.08	1.26	0.42	-0.53
Pos. Engagement w/ Tasks (C)	447	3.87	1.11	0.23	-0.32
Conflict Engagement (C)	447	1.35	0.54	2.27	6.08
Pos. Engagement w/ Teachers	520	2.73	1.15	0.68	-0.03
Pos. Engagement w/ Peers (T)	520	2.24	0.90	1.10	1.50
Pos. Engagement w/ Tasks (T)	520	3.18	0.99	0.72	0.60
Conflict Engagement (T)	520	1.23	0.40	2.87	11.39
Spring					
<i>Standard inCLASS Scores</i>					
Pos. Engagement w/ Teachers	485	2.34	0.99	1.09	1.16
Pos. Engagement w/ Peers	485	2.57	0.90	0.78	0.45
Pos. Engagement w/ Tasks	485	3.33	0.76	0.36	0.17
Conflict Engagement	485	1.29	0.36	1.66	3.11
<i>Contextualized inCLASS Scores</i>					
Pos. Engagement w/ Teachers	418	2.00	1.18	1.74	3.29
Pos. Engagement w/ Peers (C)	418	3.18	1.27	0.36	-0.10
Pos. Engagement w/ Tasks (C)	418	3.73	0.94	0.13	-0.22
Conflict Engagement (C)	418	1.20	0.38	3.24	16.58
Pos. Engagement w/ Teachers	482	2.52	1.16	0.97	0.65
Pos. Engagement w/ Peers (T)	482	2.20	0.89	1.20	1.97
Pos. Engagement w/ Tasks (T)	482	3.10	0.87	0.51	0.87
Conflict Engagement (T)	482	1.14	0.30	3.28	14.37

Table 2

Bivariate Correlations between Contextualized Classroom Engagement Scores and Academic Skills in the Fall.

	1	2	3	4	5	6	7	8	9	10	11	12
Contextualized inCLASS Scores												
<i>Teacher-Directed Contexts</i>												
1. Pos. Eng. w/ Teachers	—	.36**	.59**	-.13**	.41**	.21**	.20**	-.08	.08	.15**	.19**	.19**
2. Pos. Eng. w/ Peers		—	.48**	.03	.20**	.38**	.26**	.12*	.14**	.17**	.19**	.21**
3. Pos. Eng. w/ Tasks			—	.20**	.25**	.25**	.32**	-.11*	.12**	.16**	.25**	.23**
4. Conflict Eng.				—	.03	-.04	-.11*	.28**	-.05	.01	-.09*	-.07
<i>Child-Directed Contexts</i>												
5. Pos. Eng. w/ Teachers					—	.02	.12**	-.06	.03	.12*	.07	.13**
6. Pos. Eng. w/ Peers						—	.42**	-.01	.15**	.17**	.24**	.21**
7. Pos. Eng. w/ Tasks							—	-.19**	.14**	.06	.16**	.13**
8. Conflict Eng.								—	-.08	.01	-.04	-.02
Learning Express												
9. Alphabet Knowledge									—	.42**	.63**	.38**
10. Vocabulary										—	.62**	.54**
11. Mathematics											—	.50**
12. Listening Comprehension												—

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 3

Bivariate Correlations between Contextualized Classroom Engagement Scores and Academic Skills in the Spring.

	1	2	3	4	5	6	7	8	9	10	11	12
Contextualized inCLASS Scores												
<i>Teacher-Directed Contexts</i>												
1. Pos. Eng. w/ Teachers	—	.40**	.50**	-.09	.42**	.26**	.24**	-.03	.05	.01	.09*	.08
2. Pos. Eng. w/ Peers		—	.50**	-.02	.29**	.41**	.34**	-.07	.06	.01	.03	.10*
3. Pos. Eng. w/ Tasks			—	-.27**	.23**	.27**	.39**	-.12*	.13**	.07	.17**	.13**
4. Conflict Eng.				—	-.01	-.08	-.07	.31**	-.13**	.05	-.10*	-.05
<i>Child-Directed Contexts</i>												
5. Pos. Eng. w/ Teachers					—	.07	.29**	-.01	-.04	.05	.03	.03
6. Pos. Eng. w/ Peers						—	.41**	-.11*	.16**	.10*	.15**	.16**
7. Pos. Eng. w/ Tasks							—	-.18**	.16**	.12*	.13**	.14**
8. Conflict Eng.								—	-.24**	-.03	-.13*	-.02
<i>Learning Express</i>												
9. Alphabet Knowledge									—	.34**	.64**	.38**
10. Vocabulary										—	.51**	.59**
11. Mathematics											—	.47**
12. Listening Comprehension												—

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 4
Descriptive Statistics for Classroom Quality Covariates and School Readiness Skills.

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>
Fall					
<i>Learning Express</i>					
Alphabet Knowledge	511	191.05	48.90	-0.19	-0.20
Vocabulary	511	177.09	54.96	-0.15	-0.63
Mathematics	511	180.81	46.54	-0.03	0.05
Listening Comprehension	511	187.02	45.63	-0.63	-0.26
Winter					
<i>CLASS</i>					
Emotional Support	519	5.36	0.68	-0.69	0.51
Classroom Organization	519	4.79	0.76	-0.32	-0.49
Instructional Support	519	2.59	0.73	0.20	-0.47
Spring					
<i>Learning Express</i>					
Alphabet Knowledge	486	229.01	44.95	-1.00	1.25
Vocabulary	486	213.26	45.68	-0.62	0.08
Mathematics	486	210.13	39.90	-0.94	0.87
Listening Comprehension	486	224.41	42.80	-0.05	-0.11

Note. Means on all Learning Express dimensions are significantly higher in the spring than in the fall ($p < 0.001$).

Table 5

Model Fit Results for the One-, Two-, Three-, and Four-Profile Solutions in the Fall.

	1-Profile Solution	2-Profile Solution	3-Profile Solution	4-Profile Solution
<i>Fit Statistics</i>				
Loglikelihood	- 7041.28	-4277.55	-4169.76	-4169.76
AIC	14126.55	8611.09	8419.51	8443.51
BIC	14220.43	8730.58	8590.20	8665.41
Entropy	N/A	0.80	0.84	0.87
Adjusted LRT	N/A	$p = 0.001$	$p = 0.03$	$p = 0.50$

Note. AIC = Akaike Information Criteria; BIC = Bayesian Information Criterion; Adjusted LRT = Adjusted Lo-Mendell-Rubin Likelihood Ratio Test.

Table 6

Means and Standard Errors of the Three Fall Contextualized Classroom Engagement Profiles.

	Independently Engaged (IE; 62.62%)		Positively Engaged (PE; 27.51%)		Negatively Engaged (NE; 9.87%)	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
<i>Positive Engagement with Teachers</i>						
Teacher-Directed Setting	2.29	0.10	3.97	0.18	2.16	0.14
Child-Directed Setting	1.98	0.10	3.04	0.19	2.12	0.21
<i>Positive Engagement with Peers</i>						
Teacher-Directed Setting	1.91	0.05	2.97	0.16	2.28	0.20
Child-Directed Setting	2.86	0.09	3.69	0.17	2.88	0.23
<i>Positive Engagement within Tasks</i>						
Teacher-Directed Setting	2.82	0.07	4.28	0.17	2.46	0.14
Child-Directed Setting	3.73	0.09	4.42	0.14	3.33	0.22
<i>Conflict Engagement</i>						
Teacher-Directed Setting	1.11	0.01	1.13	0.02	2.08	0.06
Child-Directed Setting	1.23	0.02	1.26	0.04	1.71	0.09

Note. Classroom engagement scores are on a scale from 1 (low quality) to 7 (high quality), with the exception of conflict engagement, for which higher ratings are indicative of more conflict in interactions.

Table 7
Model Fit Statistics for the One-, Two-, Three-, and Four-Profile Solutions in the Spring.

	1-Profile Solution	2-Profile Solution	3-Profile Solution	4-Profile Solution
Fit Statistics				
Loglikelihood	-6352.83	-3598.33	-3429.62	-3337.60
AIC	12749.65	7252.67	6939.24	6779.19
BIC	12843.53	7369.82	7106.60	6996.77
Entropy	N/A	0.84	0.90	0.91
Adjusted LRT	N/A	$p = 0.003$	$p = 0.03$	$p = 0.17$

Note. AIC = Akaike Information Criteria; BIC = Bayesian Information Criterion; Adjusted LRT = Adjusted Lo-Mendell-Rubin Likelihood Ratio Test.

Table 8

Means and Standard Errors of the Three Spring Contextualized Classroom Engagement Profiles.

	Independently Engaged (IE; 68.04%)		Positively Engaged (PE; 18.56%)		Negatively Engaged (NE; 13.40%)	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
<i>Positive Engagement with Teachers</i>						
Teacher-Directed Setting	2.24	0.09	3.65	0.14	2.33	0.11
Child-Directed Setting	1.73	0.09	3.01	0.22	1.96	0.14
<i>Positive Engagement with Peers</i>						
Teacher-Directed Setting	1.89	0.05	3.36	0.20	2.12	0.09
Child-Directed Setting	2.93	0.07	4.32	0.26	2.87	0.19
<i>Positive Engagement within Tasks</i>						
Teacher-Directed Setting	2.91	0.05	4.10	0.12	2.61	0.13
Child-Directed Setting	3.53	0.06	4.68	0.12	3.43	0.12
<i>Conflict Engagement</i>						
Teacher-Directed Setting	1.04	0.01	1.04	0.01	1.73	0.03
Child-Directed Setting	1.13	0.02	1.08	0.02	1.41	0.05

Note. Classroom engagement scores are on a scale from 1 (low quality) to 7 (high quality), with the exception of conflict engagement, for which higher ratings are indicative of more conflict in interactions.

Table 9
Descriptive Statistics Across Fall and Spring Classroom Engagement Profiles.

	<i>Classroom Engagement Profiles</i>											
	Fall IE		Fall PE		Fall NE		Spring IE		Spring PE		Spring NE	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age (in months)	46.66	6.50	50.86	6.29	46.67	6.56	47.36	6.76	50.36	6.16	47.08	6.43
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Girls	175	53.4	81	55.1	13	25.0	194	52.3	45	50.0	30	45.5
Hispanic	185	56.4	92	62.6	23	44.2	216	58.2	60	66.7	24	36.4
Matched Lang.	242	73.8	965	65.3	35	67.3	258	69.5	61	67.8	54	81.8
Total	328	62.2	147	27.89	52	9.9	371	76.50	90	18.55	66	12.52

Table 10

Multinomial Logistic Regression Estimates and Odds Ratios for Child Demographic Variables Associated with Fall and Spring LPA Models.

Child demographic variables	Classroom Engagement Profiles							
	Fall IE (62.62%)		Fall PE (27.51%)		Spring IE (68.04%)		Spring PE (18.56%)	
	<i>B</i> (SE)	Odds ratio	<i>B</i> (SE)	Odds ratio	<i>B</i> (SE)	Odds ratio	<i>B</i> (SE)	Odds ratio
Age (in months)	-0.01	1.0	0.09**	1.10	0.01	1.01	0.07*	1.07
Sex (girls=1)	1.27**	3.56	1.30**	3.68	0.33	1.39	0.21	1.23
Ethnicity (Hispanic=1)	0.78*	2.19	0.79	2.20	0.82*	2.28	1.09*	2.98
Teacher-Child Lang. (Matched=1)	0.78*	2.18	0.44	1.54	-0.22	0.80	-0.25	0.78

Note. Parameter estimates for each profile are relative to the reference profile *negatively engaged*, adjusted for all other variables in the model. Odds-ratios are exponentiated parameter estimates presented in the second column.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 11

Transition Probabilities between Fall and Spring Contextualized Classroom Engagement Profiles.

	<i>Spring</i>		
	IE (68.04%; <i>n</i> = 330)	PE (18.56%; <i>n</i> = 90)	NE (13.40%; <i>n</i> = 65)
<i>Fall</i>			
IE (64.33%; <i>n</i> = 339)	77.0%; <i>n</i> = 261	11.2%; <i>n</i> = 38	11.8%; <i>n</i> = 40
PE (26.0%; <i>n</i> = 137)	63.5%; <i>n</i> = 87	29.2%; <i>n</i> = 40	7.3%; <i>n</i> = 10
NE (9.68%; <i>n</i> = 51)	51.0%; <i>n</i> = 26	15.7%; <i>n</i> = 8	33.3%; <i>n</i> = 17

Table 12
Descriptive Statistics Across Transition Groups.

	<i>Latent Transition Pattern</i>																	
	IE-IE		IE-PE		IE-NE		PE-IE		PE-PE		PE-NE		NE-IE		NE-PE		NE-NE	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age (in months)	46.72	6.67	49.16	5.78	46.57	6.46	49.98	6.71	50.53	6.36	51.30	5.83	46.81	6.23	49.37	8.43	46.41	6.52
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Girls	140	53.6	21	55.3	21	52.5	46	52.9	21	52.5	5	50.0	9	34.6	2	25.0	4	23.5
Hisp.	146	55.9	27	71.1	16	40.0	57	65.5	25	62.5	5	50.0	17	65.4	3	37.5	4	23.5
Matched Lang.	187	71.6	25	65.8	35	87.5	58	66.7	28	70.0	6	50.0	15	57.7	6	75.0	13	76.5
Total	261	49.52	38	7.21	40	7.59	87	16.50	40	7.59	10	1.90	26	4.93	8	1.52	17	3.23

Table 13

Associations between Child Age, Sex, Ethnicity, and Teacher-Child Language Match and Children's Latent Transition Pattern Membership.

	<i>Latent Transition Pattern</i>																	
	IE-IE		IE-PE		IE-NE		PE-IE		PE-PE		PE-NE		NE-IE		NE-PE		NE-NE	
	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>
Age	-.05***	.01	.03	.02	-.02	.02	.06**	.02	.07*	.03	.09	.05	-.03	.03	.04	.07	-.02	.04
Sex	.21	.18	.17	.35	.10	.32	.08	.26	.06	.37	-.09	.62	-.75	.41	-1.16	.85	-1.26*	.54
Ethnicity	.02	.23	.63	.48	-.43	.45	.34	.24	.19	.39	-.71	.77	-.20	.44	-.96	.99	-1.72***	.48
Teacher-Child Lang.	.07	.22	.02	.46	.91	.55	-.06	.26	.08	.43	-.77	.73	-.58	.37	-.28	1.06	-.63	.56

Note. Estimates represent unstandardized path coefficients. Child sex, ethnicity and teacher-child language are dummy coded variables, with girls = 1; Hispanic = 1; match between teacher/TA and child language = 1. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 14

Multi-Level ANOVA of Classroom Quality and Children's Latent Transition Pattern Membership.

	<i>Latent Transition Pattern</i>																	
	IE-IE		IE-PE		IE-NE		PE-IE		PE-PE		PE-NE		NE-IE		NE-PE		NE-NE	
	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>
<i>Classroom Quality</i>																		
Emotional Support	-.29	.26	.56	.57	-.38	.40	.54*	.24	-.09	.45	.60	.65	.12	.41	-.07	.81	-.18	.73
Classroom Organization	.06	.23	.45	.41	-.54	.35	.18	.22	.03	.34	-.56	.64	-.38	.34	-.03	.42	-.64	.60
Instructional Support	-.15	.23	-.20	.39	.43	.35	-.24	.26	.76*	.37	-.34	.77	.14	.39	.17	.67	.03	.42

Note. Estimates represent unstandardized path coefficients. CLASS codes are on a scale from 1 (low quality) to 7 (high quality).

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 15

Means and Standard Deviations for Fall and Spring Academic Readiness Skills across Latent Transition Patterns.

	<i>Academic Readiness Skills</i>															
	Alphabet Knowledge				Vocabulary				Mathematics				Listening Comprehension			
	Fall		Spring		Fall		Spring		Fall		Spring		Fall		Spring	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
IE-IE	187.09	47.82	226.15 ^a	45.95	171.68	54.56	208.69	44.63	174.39 ^a	45.19	220.36	43.09	179.93 ^a	45.74	207.12	40.94
IE-PE	204.47	48.85	243.49 ^a	32.58	176.21	61.61	212.94	45.00	189.24	49.32	233.16 ^a	33.27	196.49	48.90	211.88	33.50
IE-NE	185.12	41.68	220.85 ^a	41.18	169.01 ^a	53.44	215.88	45.68	175.04	41.80	212.91	39.46	182.07	38.16	207.23	33.84
PE-IE	196.78	48.03	239.08 ^a	40.48	185.53	51.66	218.77	45.90	190.02	40.88	235.00 ^a	39.64	196.93	42.06	217.78 ^a	37.38
PE-PE	198.41	47.88	235.47 ^a	44.62	192.06	52.70	230.50	32.70	204.92 ^{b,c}	40.39	242.04 ^a	33.92	211.72 ^{b,c}	32.83	223.32 ^a	34.68
PE-NE	212.23	72.11	257.05 ^a	45.78	229.38 ^b	38.41	252.44	49.59	223.28 ^{b,c}	51.27	256.69 ^a	52.79	214.09 ^d	30.09	237.06 ^a	28.04
NE-IE	202.87	52.20	225.02 ^a	44.84	169.02	54.74	203.34	50.61	175.50	55.93	215.52	47.30	169.22	49.90	203.62	42.93
NE-PE	170.04	58.62	228.34	29.31	187.59	70.78	208.04	72.84	166.59	66.98	212.76	59.79	189.27	62.96	208.88	32.62
NE-NE	167.77	51.35	179.82 ^b	53.41	177.96	52.69	196.71	46.59	157.79 ^d	46.89	194.00 ^b	44.54	185.22	55.21	179.98 ^b	58.18
Overall	191.09	48.90	229.01	44.95	177.09	54.96	213.26	45.68	180.81	46.54	224.41	42.80	187.02	45.63	210.13	39.90

Note: Significant comparisons noted by superscripts, *a* is significantly different from *b*; *c* is significantly different from *d* ($p < 0.05$).

Table 16
Multiple Regression Analyses for Relation between Children's Latent Transition Pattern Membership and Gains in Academic Readiness Skills.

	<i>Spring Academic Readiness Skills</i>							
	Alphabet Knowledge		Vocabulary		Mathematics		Listening Comprehension	
	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>
<i>Covariates</i>								
Age	1.15***	0.29	0.84**	0.28	0.73***	0.21	1.23***	0.31
Sex	3.22	3.34	4.74	3.22	-1.08	2.20	7.34*	3.22
Ethnicity	9.00*	3.89	-3.42	4.05	7.35*	3.25	-0.23	4.25
T-C Lang.	-4.0	3.39	-0.15	4.23	-5.27	3.43	-5.97	3.99
Fall Alpha	0.45***	0.03						
Fall Vocab			0.50***	0.04				
Fall Math					0.62***	0.04		
Fall Listening							0.29***	0.04
<i>Transitions</i>								
IE-PE	5.76	5.02	1.00	4.87	1.77	4.44	-2.93	5.00
IE-NE	-1.51	5.63	8.46	7.08	-4.75	4.71	1.14	6.56
PE-IE	2.61	4.21	-0.12	4.45	1.37	4.74	1.77	4.69
PE-PE	0.29	7.02	9.33	5.65	1.14	3.95	3.04	5.57
PE-NE	15.17	9.88	11.41	10.86	3.98	9.83	14.47	7.23
NE-IE	-10.32	6.64	-3.33	7.18	-5.44	5.66	-0.32	7.44
NE-PE	10.36	6.15	-9.53	14.81	-2.23	8.89	-1.27	7.70
NE-NE	-32.13**	12.29	-14.37	9.95	-11.91	8.14	-25.34	15.46

Note. Estimates represent unstandardized path coefficients. Child sex, ethnicity, teacher-child language and all transitions are dummy coded variables, with girls = 1; Hispanic = 1; match between teacher/TA and child language = 1; classification in given transition = 1. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

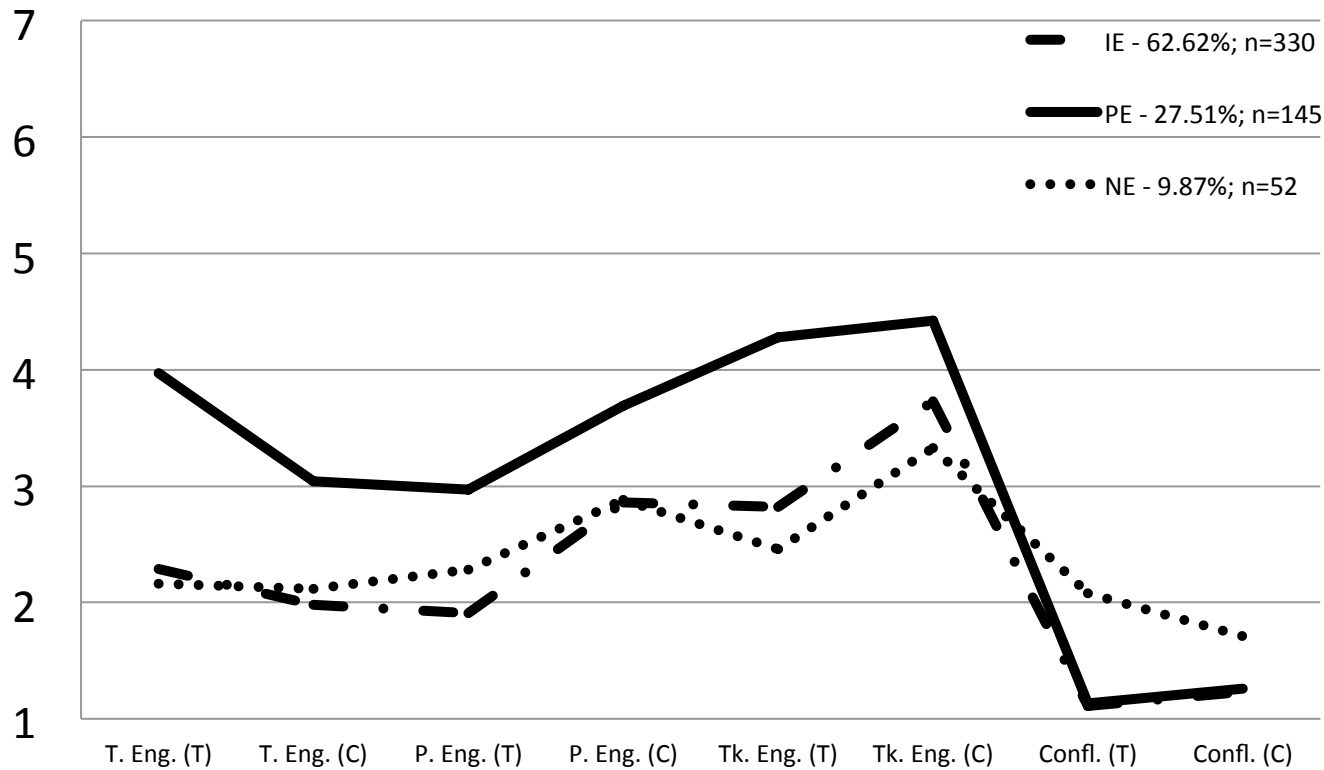


Figure 2. Graphical representation of the three classroom engagement profiles in the fall.

Note. T. Eng.(T) = Positive engagement with teachers in teacher-directed settings; T. Eng. (C) = Positive engagement with teachers in child-directed settings; P. Eng.(T) = Positive engagement with peers in teacher-directed settings; P. Eng. (C) = Positive engagement with peers in child-directed settings; Tk. Eng.(T) = Positive engagement within tasks in teacher-directed settings; Tk. Eng. (C) = Positive engagement within tasks in child-directed settings; Confl.(T) = Conflict engagement in teacher-directed settings; Confl.(C) = Conflict engagement in child-directed settings.

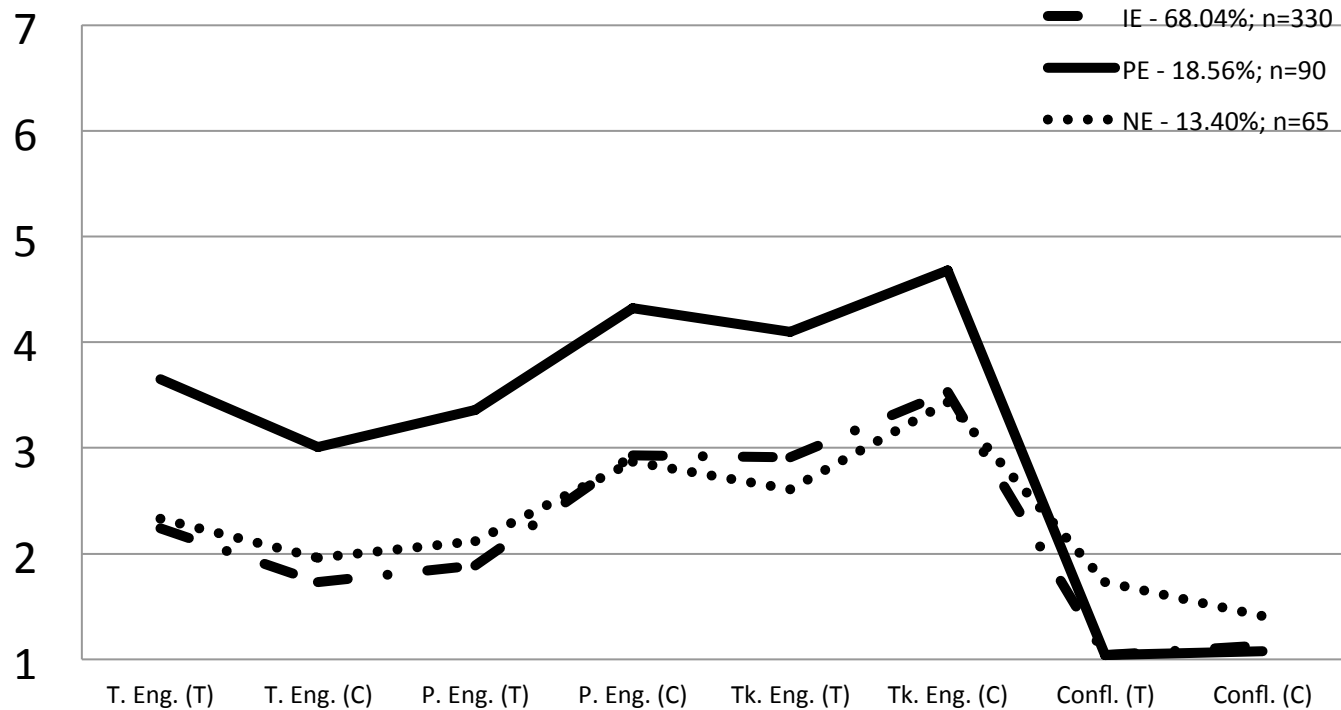


Figure 3. Graphical representation of the three classroom engagement profiles in the spring.

Note. T. Eng.(T) = Positive engagement with teachers in teacher-directed settings; T. Eng. (C) = Positive engagement with teachers in child-directed settings; P. Eng.(T) = Positive engagement with peers in teacher-directed settings; P. Eng. (C) = Positive engagement with peers in child-directed settings; Tk. Eng.(T) = Positive engagement within tasks in teacher-directed settings; Tk. Eng. (C) = Positive engagement within tasks in child-directed settings; Confl.(T) = Conflict engagement in teacher-directed settings; Confl.(C) = Conflict engagement in child-directed settings.

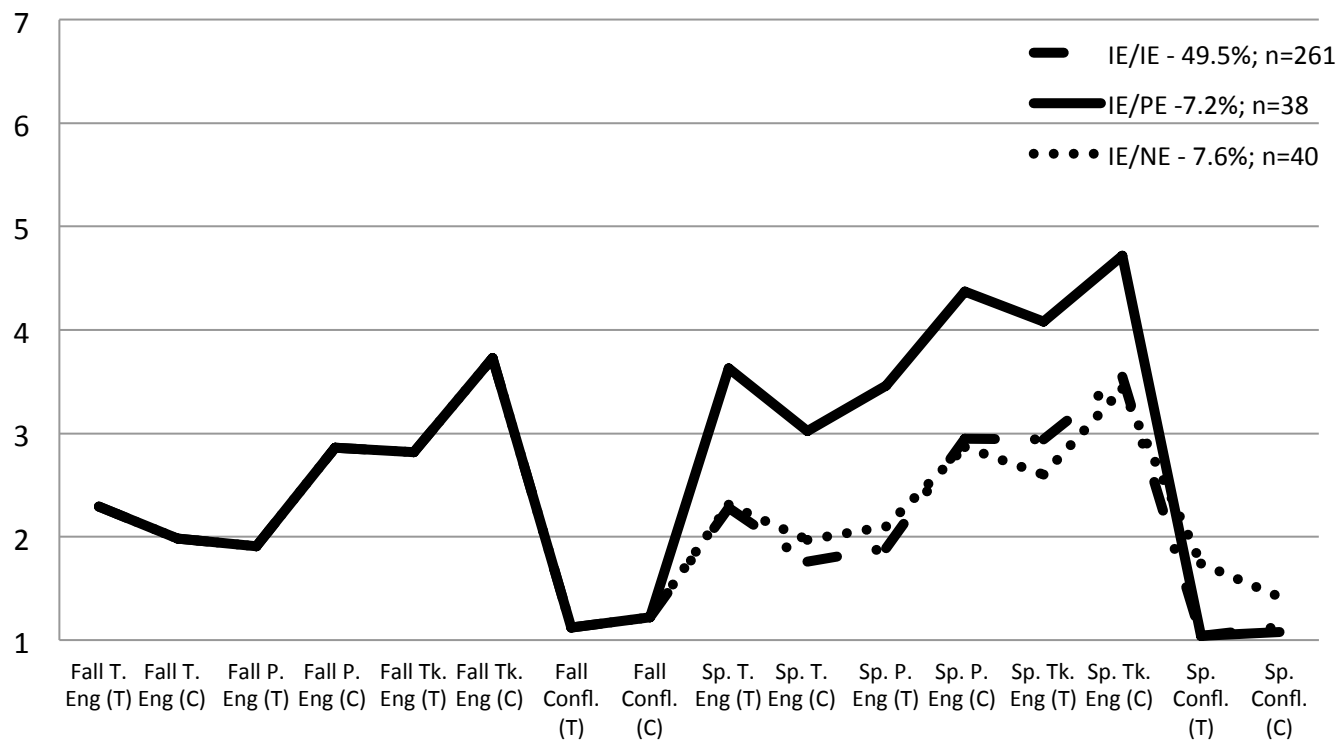


Figure 4. Graphical representation of the transition patterns from the fall independently engaged profile.

Note. T. Eng.(T) = Positive engagement with teachers in teacher-directed settings; T. Eng. (C) = Positive engagement with teachers in child-directed settings; P. Eng.(T) = Positive engagement with peers in teacher-directed settings; P. Eng. (C) = Positive engagement with peers in child-directed settings; Tk. Eng.(T) = Positive engagement within tasks in teacher-directed settings; Tk. Eng. (C) = Positive engagement within tasks in child-directed settings; Confl.(T) = Conflict engagement in teacher-directed settings; Confl.(C) = Conflict engagement in child-directed settings.

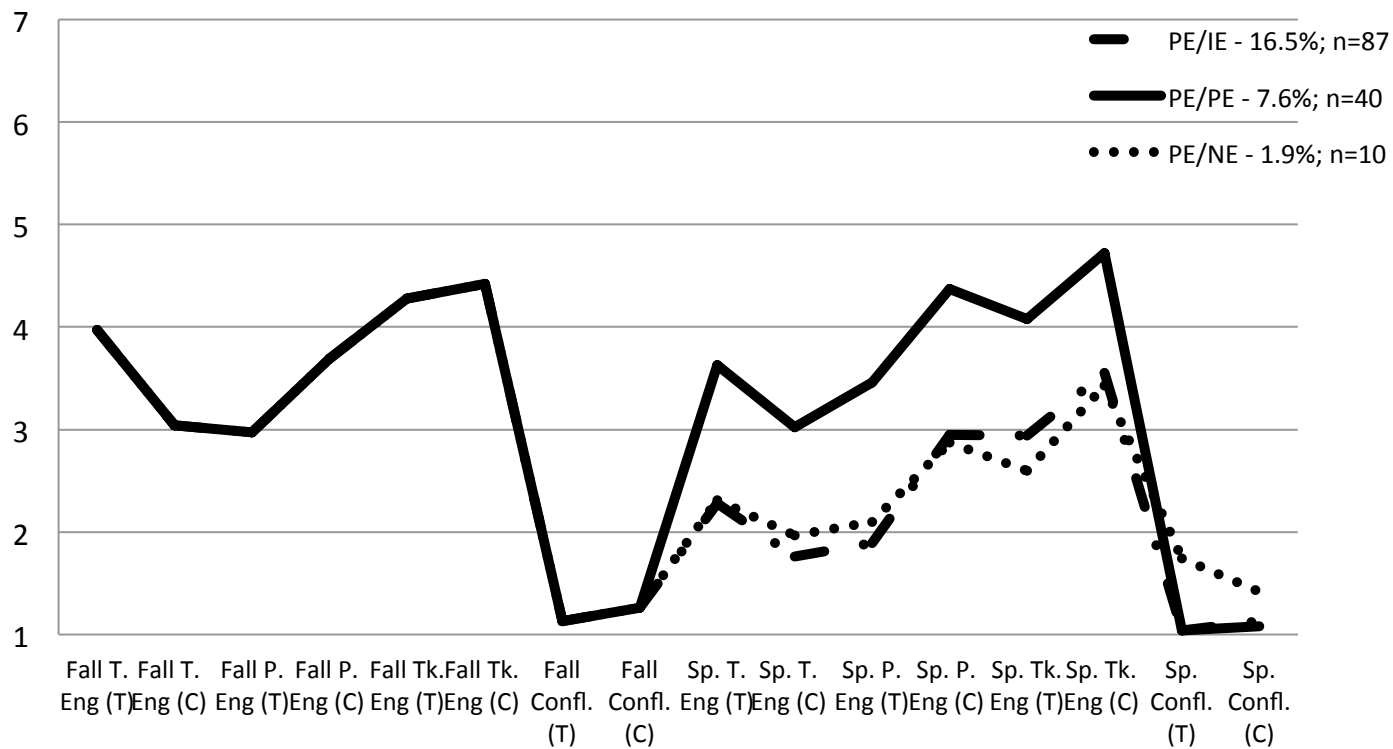


Figure 5. Graphical representation of the transition patterns from the fall positively engaged profile.

Note. T. Eng.(T) = Positive engagement with teachers in teacher-directed settings; T. Eng. (C) = Positive engagement with teachers in child-directed settings; P. Eng.(T) = Positive engagement with peers in teacher-directed settings; P. Eng. (C) = Positive engagement with peers in child-directed settings; Tk. Eng.(T) = Positive engagement within tasks in teacher-directed settings; Tk. Eng. (C) = Positive engagement within tasks in child-directed settings; Confl.(T) = Conflict engagement in teacher-directed settings; Confl.(C) = Conflict engagement in child-directed settings.

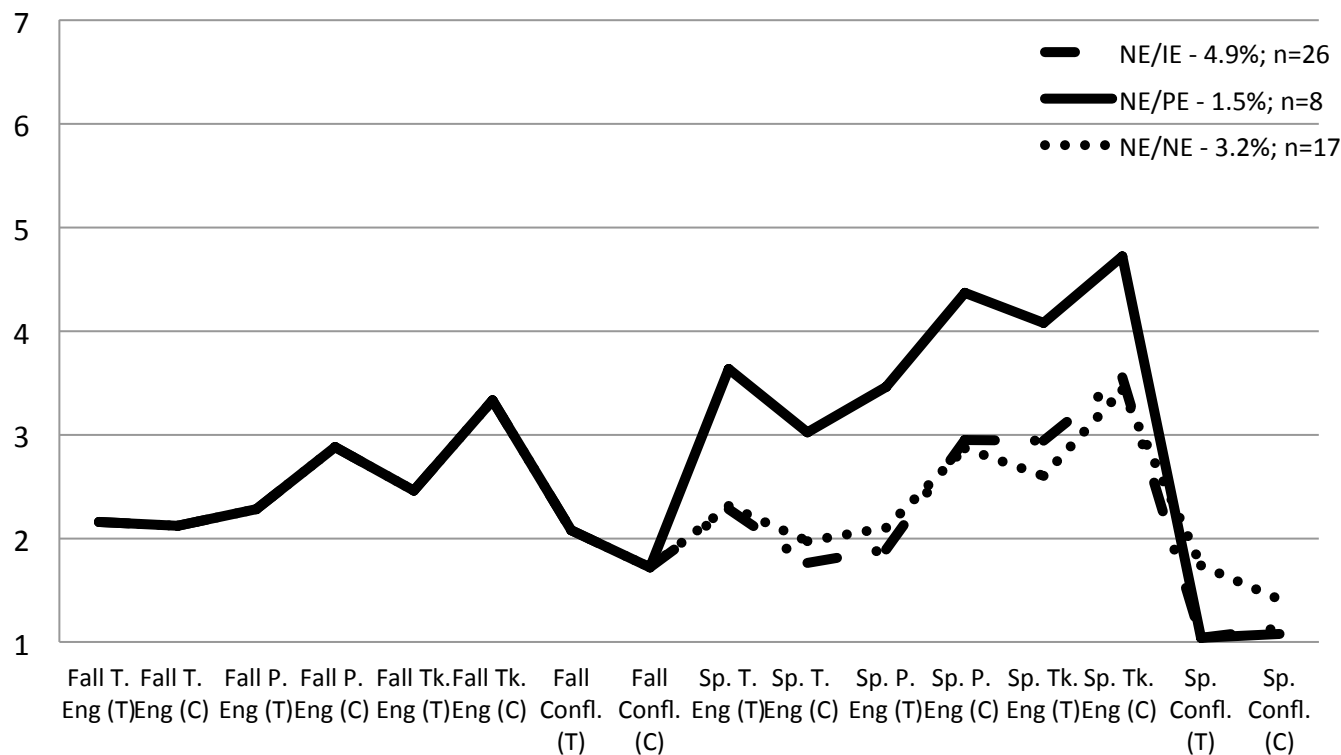


Figure 6. Graphical representation of the transition patterns from the fall negatively engaged profile.

Note. T. Eng.(T) = Positive engagement with teachers in teacher-directed settings; T. Eng. (C) = Positive engagement with teachers in child-directed settings; P. Eng.(T) = Positive engagement with peers in teacher-directed settings; P. Eng. (C) = Positive engagement with peers in child-directed settings; Tk. Eng.(T) = Positive engagement within tasks in teacher-directed settings; Tk. Eng. (C) = Positive engagement within tasks in child-directed settings; Confl.(T) = Conflict engagement in teacher-directed settings; Confl.(C) = Conflict engagement in child-directed settings.