HEAD START TO KINDERGARTEN
TRANSITIONS PROJECT

REPORT

Design Options for Head Start to Kindergarten Transitions Descriptive Study

OPRE Report #2022-203 | September 2022

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Overview

Introduction

The transition to kindergarten is an important milestone for children and families, and it sets a foundation for future success. This transition occurs between two distinct systems that each work within their own governance structures, philosophies, and accountability metrics. To date, much of what is known about supporting children's transition to kindergarten focuses on classroom-level practices implemented by early care and education (ECE) programs and kindergarten teachers, with little attention to the organizational conditions that support or hinder the implementation of those practices.

This design options report focuses on Head Start and proposes two descriptive study designs to illuminate those systems-level supports and cross-system collaborations. The overall goal of these proposed studies is to better understand the landscape of those systems-level approaches and how they may be associated with positive kindergarten transitions for children attending Head Start and their families.

Primary Research Questions

The outlined study designs would address four primary research questions:

1. What does collaboration between Head Start programs and local education agencies (LEAs)/schools to support children's transition to kindergarten look like at the systems level?
2. How do kindergarten transition approaches vary by system-level supports and cross-system collaborations?
3. What are the patterns of transition from Head Start programs to kindergarten in various schools?
4. What are the outcomes of successful transitions for leaders, teachers, families, and children?

Purpose

This report presents design options that will enable the field to fill current research gaps around strengthening kindergarten transitions. Documenting the current landscape of systems-level transition supports will help the field better understand how systems-level approaches to the kindergarten transition derive from the current policy landscape, how Head Start and LEAs currently implement these approaches, under which conditions there are facilitators and barriers, and how those approaches can be improved under various contexts.

These design options build upon a theory of change (Ehrlich et al., 2021) that emphasizes systems on both sides of the transition process—Head Start and kindergarten (embedded within the K-12 education system). This theory of change hypothesizes that when transition efforts are coordinated across these two systems, they are expected to lead to successful transitions for educators, families and—most importantly—children. This report presents design options for a descriptive study of Head Start-to-kindergarten transitions. One design includes an innovative sampling approach that focus on all programs and schools within certain geographic areas, while the second design builds upon traditional longitudinal designs by following individual children from one setting to another.

Highlights

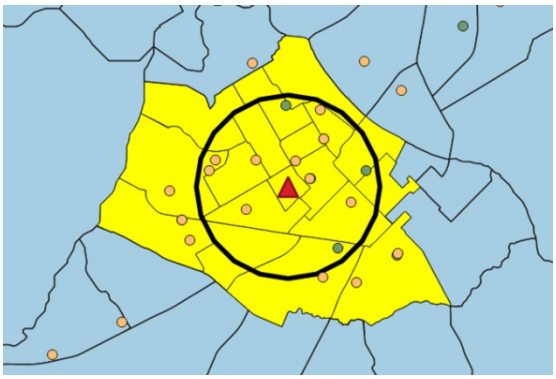
This report describes two design options that would address the proposed research questions. The design options are informed by current hypotheses that carefully organizing administrative-level systems, supports, and resources may bolster on-the-ground practices, providing more consistent kindergarten transition experiences for children, their families, and their teachers. Both design options presented in this report address multiple parts of the HS2K theory of change, studying within- and across-system perspectives, policies, professional supports, and practices (“4Ps”).

Design Option 1 takes a **“cluster” level approach** to sampling, data collection, and analyses of how Head Start programs and LEAs/elementary schools collaborate within sets of geographic areas. The goal of Design Option 1 is to understand the systems-level patterns of collaboration across multiple Head Start programs and LEAs within a geographic area (or cluster). Design Option 2 takes an **individual-level approach** to sampling and data collection. The goal of Design Option 2 is to follow groups of children from Head Start programs into kindergarten to capture their experiences and outcomes on both sides of the transition.

Methods

Design Option 1's **"cluster" level approach** identifies geographic clusters built by first sampling census tracts, then drawing a 2-mile radius around the census tract, and finally selecting all the census tracts touched by that radius (see **Figure 1**). Each cluster would include all Head Start programs and their corresponding centers, and all public elementary schools and their corresponding LEAs. This design can support examination of transition supports within geographic boundaries, while also taking into account program- and school-level characteristics and their associations with transition supports.

Figure 1: Geographic Cluster Example



Design Option 2's **individual-level approach** to sampling and data collection seeks to understand associations between those individual program- and school-level approaches to supporting kindergarten transitions and the outcomes of individual children. This design option samples Head Start programs from across the country and then follows children into kindergarten to sample elementary schools and LEAs for data collection. In addition to the systems-, teacher-, and family-level data collection efforts described under Design Option 1, Design Option 2 proposes to collect additional information from teachers and caregivers about individual children and would provide information on family experiences and outcomes at multiple timepoints.

Both options utilize a set of surveys under development, called the Kindergarten Transition System Supports (KTS^2). These focus on collecting information from Head Start program- and center-level administrators and K-12 LEA- and school-level administrators about systems-level supports and collaboration for kindergarten transitions. The designs also include teacher and family surveys.

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Executive Summary

The transition from early care and education (ECE) programs to kindergarten is an important milestone for children and families, and it sets a foundation for future success. This transition occurs between two distinct systems that each work within their own governance structures, philosophies, and accountability metrics. To date, much of what is known about supporting children's transition to kindergarten focuses on classroom-level practices implemented by ECE programs and kindergarten teachers, with little attention to the organizational conditions that support or hinder the implementation of those practices.

This report focuses on transitions from Head Start to kindergarten and outlines two design options for a future descriptive study. One design includes an innovative sampling approach that focuses on all programs and schools within certain geographic areas, while the second design builds upon traditional longitudinal designs by following individual children from one setting to another. The overall goal of the descriptive study is to illuminate system-level supports and cross-system collaborations to better understand how these approaches may be associated with positive kindergarten transitions for children attending Head Start and their families.

Primary Research Questions

The descriptive study would address four primary research questions:

1. What does collaboration between Head Start programs and local education agencies (LEAs)/schools to support children's transition to kindergarten look like at the systems level?
2. How do kindergarten transition approaches vary by system-level supports and cross-system collaborations?
3. What are the patterns of transition from Head Start programs to kindergarten in various schools?
4. What are the outcomes of successful transitions for leaders, teachers, families, and children?

Purpose

Both design options will enable the field to fill current research gaps around strengthening kindergarten transitions. Documenting the current landscape of systems-level transition supports will help the field better understand how systems-level approaches to the kindergarten transition derive from the current policy landscape, how Head Start and LEAs currently implement these approaches, under which conditions there are facilitators and barriers, and how those approaches can be improved under various contexts.

These design options build on the theory of change developed by the Understanding Children's Transitions from Head Start to Kindergarten (HS2K) project (Ehrlich et al., 2021) that emphasizes systems on both sides of the transition process—Head Start and kindergarten (embedded within the K-12 education system). This theory of change hypothesizes that when transition efforts are coordinated across these two systems, they are expected to lead to successful transitions for educators, families and—most importantly—children.

Key Highlights

This report describes two design options that would address the proposed research questions. The design options are informed by current hypotheses that carefully organizing administrative-level systems, supports, and resources may bolster on-the-ground practices, providing more consistent kindergarten transition experiences for children, their families, and their teachers. Both design options presented in this report address multiple parts of the HS2K theory of change, studying within- and across-system perspectives, policies, professional supports, and practices.

Design Option 1 takes a **"cluster" level approach** to sampling, data collection, and analyses of how Head Start programs and LEAs/elementary schools collaborate within bounded geographic areas. The goal of Design Option 1 is to understand the systems-level patterns of collaboration across multiple Head Start programs and LEAs within a geographic area (or cluster). Design Option 2 takes an **individual-level approach** to sampling and data collection. The goal of Design Option 2 is to follow groups of children from Head Start programs into kindergarten to capture their experiences and outcomes on both sides of the transition.

Methods

Table ES-1 below summarizes the key differences between the two design options. Design Option 1's **"cluster" level approach** identifies geographic clusters built by first sampling census tracts, then drawing a 2-mile radius around the census tract, and finally selecting all the census tracts touched by that radius. Each cluster would include all Head Start programs and their corresponding centers, and all public elementary schools and their corresponding LEAs. This design can support examination of transition supports within geographic boundaries, while also taking into account program- and school-level characteristics and their associations with transition supports.

Design Option 2's **individual-level approach** to sampling and data collection seeks to understand associations between those individual program- and school-level approaches to supporting kindergarten transitions and the outcomes of individual children. This design option samples Head Start programs from across the country and then follows children into kindergarten to sample elementary schools and LEAs for data collection. In addition to the systems-, teacher-, and family-level data collection efforts described under Design Option 1, Design Option 2 proposes to collect additional information from teachers and caregivers about individual children and would provide information on family experiences and outcomes at multiple timepoints.

Both options utilize a set of surveys under development, called the Kindergarten Transition System Supports (KTS^2). These focus on collecting information from Head Start program- and center-level administrators and K-12 LEA- and school-level administrators about systems-level supports and collaboration for kindergarten transitions. The designs also include teacher and family surveys.

Table ES-1. Overview of Two Design Options

	Overview of Design Option 1 (Cluster Approach)	Overview of Design Option 2 (Individual Approach)	Similarities and Differences
Research Questions	• RQs 1 – 3, focused on system-level and teacher-level collaboration • Inclusion of RQ 4 sub questions focused family experiences and outcomes	• RQs 1 – 4, including questions about child outcomes	• Mostly the same; additional questions about child outcomes in Design Option 2

	Overview of Design Option 1 (Cluster Approach)	Overview of Design Option 2 (Individual Approach)	Similarities and Differences
Design	• Survey • Within the same year in both systems (HS/K-12) • Focus on cluster-level patterns in addition to program-level patterns and factors	• Survey • Longitudinal (two times for families): once in Head Start and once in kindergarten • Focus on program and family/child-level patterns and factors with the selected Head Start programs as the "hub" and receiving elementary schools as the "spokes"	• Data collection approach similar (with some difference in measurement tools) • Different timelines • Some same, some different units of analyses
Sampling	• Identify initial sample based on census tracts and select all programs/schools around that initial sample	• Build from an existing sampling frame that captures nationally representative Head Start programs	• Entirely different approaches
Measures	• Inclusion of KTS^2 items of systems-level collaboration and supports • Inclusion of questions that focus on collaboration with community partners and system level strategies around community partner collaboration • Development of new teacher measure of transition practices and supports • Development of new family measure of experiences and outcomes • Use of existing data (e.g., Head Start administrative data, NCES, NIEER, U.S. Census data)	• Inclusion of KTS^2 items of systems-level collaboration and supports • Development of new teacher measure of transition practices and supports • Use of existing data (e.g., Head Start administrative data, NCES, NIEER, U.S. Census data) • Additional questions for teachers about child outcomes	• Design Option 1 would focus on cross-system partnerships and family experiences • Design Option 2 includes additional measures for teachers and families focused on child experiences and outcomes

	Overview of Design Option 1 (Cluster Approach)	Overview of Design Option 2 (Individual Approach)	Similarities and Differences
Analyses	• Descriptive • Levels of analyses: at the program/school/ LEA levels and the cluster level	• Descriptive • Levels of analyses: at the program/school/ LEA levels and family/child level	• Similar analyses but with a focus on different levels
Data Collection	• Web and phone-based surveys of administrators and teachers • One time point	• Web and phone-based surveys of administrators, teachers, and parents • One time point	• Design Option 2 would require an additional time point of data collection, and will collect information from teachers and parents about child outcomes

KTS^2 = Kindergarten Transition Systems Surveys

Implications & Next Steps

Findings from the HS2K transitions descriptive study will add to our understanding of transitions in multiple ways. First, it could be used to inform policies, regulations, and/or non-regulatory guidance that ACF provides to Head Start programs and other ECE programs around the transition to kindergarten. These could support programs' own practices, policies, and professional supports for their staff. Further, it could inform the work of ACF-funded training and technical assistance centers so that they can better support local Head Start and ECE programs' implementation of specific transition supports within their programs and communities.

While both Design Options could be used to address these key questions of interest, they each also bring unique contributions. Design Option 1 may have more capacity to identify patterns of collaborative practices and transition activities within communities and based on community characteristics. Design Option 2 has the benefit of providing child-level outcomes, which allows us to observe associations between transition approaches and child outcomes.

The proposed descriptive study could uncover additional areas for future research and move the field closer to testing causal associations between system-level supports for kindergarten transitions and program, family, and child-level outcomes. This information could help ACF's Office of Planning, Research, and Evaluation consider future research studies in an effort to continue improving supports for the transition to kindergarten.

Introduction

The transition to kindergarten is an important milestone for children and families, and it sets a foundation for success in elementary school. This transition also occurs between two distinct systems that each work under their own governance structures, philosophies, and accountability metrics. To date, much of what is known about supporting children's transition to kindergarten narrowly attends to the classroom-level practices implemented by early care and education (ECE) programs and kindergarten teachers, with little attention to the organizational conditions that support or hinder the implementation of those practices. The proposed Head Start to Kindergarten (**HS2K) Transitions descriptive study** is designed to illuminate those systems-level supports and cross-system collaborations to better understand supports for Head Start children and families during the transition to kindergarten. This report provides an overview of two design options for this descriptive study.

Studying Systems Approaches

The Understanding Children's Transitions from Head Start to Kindergarten (HS2K) Project (contract HHSP233201500048I) has reviewed existing literature, measures, and data sources that guided the development of the HS2K Transitions descriptive study design options. As identified in Ehrlich et al. (2021), the research on teacher - and classroom-level practices and activities supporting kindergarten transitions is far more abundant than research on what occurs at the organizational or system level. Findings from the HS2K Project's review of existing data sources and measures underscore this point: Our review revealed a lop-sided selection of information focused primarily on practices implemented by teachers, whereas there were almost no measures or data sources that focused on policies or systems-level implementation of professional supports (Darling et al., 2020).

To address this gap, the current design options for a future descriptive study follow the HS2K Theory of Change (TOC; Ehrlich, et al., 2021; see Appendix A) to focus on local Head Start and local education agency (LEA) systems-level factors. Within the last two decades, the federal government has activated a variety of policy levers intended to strengthen and systematize kindergarten transition supports. This includes components of the most recent reauthorizations of the Head Start Act (HSA; 2007) and The Every Student Succeeds Act (ESSA; 2015), which—for example—both require that Head Start

and K-12 entities[1] enter into formal agreements (primarily referred to as memoranda of understanding [MOUs]) that establish the terms of coordination and collaborative engagement. These agreements are mandated to include descriptions of how Head Start programs and LEAs will work together to ensure a smooth transition—from data-sharing agreements to shared professional development for teaching staff.

Despite the recent policy attention to the systems-level factors influencing a family and child's transition experience, the field knows little about how these federal policy mandates are actually implemented in Head Start centers and schools and how systems work together to support that implementation. For example, from an implementation standpoint, more robust studies are needed to understand the ways in which MOU requirements in the HSA are enacted. To understand systems approaches, implementation strategies need to be examined from multiple perspectives simultaneously. Therefore, continuing to use the MOU example, more robust studies are needed to understand how the HSA MOU requirements are being implemented *in coordination* with the MOU requirements under ESSA.

The design options presented here are informed by current hypotheses that carefully organized administrative-level systems, supports, and resources may bolster on-the-ground practices, providing more consistent kindergarten transition experiences for children, their families, and their teachers. These design options aim to illuminate the current landscape of systems-level transition supports so the field may better understand how systems approaches derive from the current policy landscape, how Head Start and LEAs currently implement these approaches, what facilitators and barriers exist under which conditions, and how those approaches can be improved under various contexts. Both design options presented in this report address multiple parts of the TOC studying within and across system perspectives, policies, professional supports and practices. Design option 2 also includes data collection that addresses the ultimate outcome of the TOC, specific outcomes for individual children.

Purpose & Goals of a Systems-Level Descriptive Study

The **HS2K Transitions descriptive study options** draw upon the TOC developed by the HS2K) project (Appendix A). The TOC guiding this descriptive study conceptualizes that the transition to kindergarten is two-sided, with the Head Start system as the "sending side" and kindergarten (embedded within the K-12 education system) as the "receiving side." The TOC hypothesizes that when transition efforts are coordinated

[1] ESSA only requires this for K-12 entities receiving Title I funding.

across these two systems, they lead to successful transitions for educators, families and—most importantly–children.

Both within and across the organizational systems, we posit that four main factors (the 4Ps) influence children's transition experiences. The first three Ps—(1) Perspectives, (2) Policies, and (3) Professional supports—intersect to influence the quantity, quality, and coordination of the fourth P, (4) Practices. The TOC also acknowledges that the Head Start and kindergarten systems, as well as child development processes, are all influenced by external sociocultural, historical, and other contextual factors. See Appendix B for definitions of the 4Ps.

As a guiding framework for this study, the TOC provides a systems-level view of transitions, and the 4Ps are an organizing principle for the identification of constructs to assess in the study and to guide the development of measures. This report provides design options for a descriptive study of Head Start children transitioning to kindergarten and includes recommendations about measurement, sampling, and analysis plans.

The HS2K Transitions descriptive study will examine within- and across-system approaches to supporting the transition to kindergarten for Head Start children and families. The goals of the descriptive study are to gain a deeper understanding of:

- how Head Start programs and local education agencies (LEAs)/schools collaborate to support children's transition to kindergarten;
- how kindergarten transition approaches vary by system-level supports and cross-system collaborations;
- the patterns of transition between Head Start programs and LEAs/schools; and
- outcomes of successful transitions for leaders, teachers, children, and families.

Definition of Terms

Alignment: We focus on alignment at the organizational level. Alignment refers to the enactment of a complex array of organization-level strategies and actions intended to strengthen the coordination between Head Start and K-12 to create meaningful similarities across the systems. Coordinated efforts are those that work together well; alignment of efforts is the process through which strategies become coordinated. Alignment can be applied to a range of variables, including leadership teams, professional learning opportunities, data systems, learning standards, assessment approaches, transition activities, family engagement strategies, and more (Kauerz,

2018). Successful alignment creates greater continuity and coherence between children's and families' experiences prior to elementary school.

Cluster: A geographic area surrounding a focal census tract. We use "clusters" as the unit for sampling for Design Option 1.

Collaboration: Efforts that bring together multiple parties in an effort to align and/or coordinate efforts.

Continuity: Continuity is an outcome of alignment strategies and is exhibited by the creation of predictable sequencing and progression of experiences across grade levels. Continuity is most likely to occur when there is an alignment of organization-level variables, standards, curricula, instructional practices, student assessment, and teacher professional learning (Kauerz, 2019; Kauerz & Coffman, 2019).

Early care and education (ECE): An umbrella term to encompass the range of learning-oriented programs and settings that children may experience before entering kindergarten. This includes Head Start; school-based pre-k; state-funded pre-k; center-based child care; preschool; home-based child care; and family, friend, and neighbor care.

Head Start program: A Head Start grantee or delegate agency providing direct services to children ages 3 – 5.

Local Education Agency (LEA): A public board of education or other public authority legally constituted within a State for either administrative control or direction of, or to perform a service function for, public elementary or secondary schools in a city, county, township, school district, or other political subdivision of a State, or for a combination of school districts or counties as are recognized in a State as an administrative agency for its public elementary schools or secondary schools.[2]

Perspectives (about kindergarten transitions): Different stakeholders' (child/family, educator, administrators/schools/centers) vision, values, and beliefs about transitions to kindergarten, including their and others' roles in supporting transitions to kindergarten.

Policies (around kindergarten transitions): Explicit (written/formal) documentation of organizational regulations; standards; agreements/Memoranda of Understanding (MOUs); procedures; and guidance around supporting transitions to kindergarten.

Practices (focused on kindergarten transitions): Concrete activities designed to support children/families during the transition to kindergarten. Staff in Head Start or kindergarten

[2] 34 CFR § 303.23

can enact transition practices separately or jointly through coordinated transition practices. Practices can also occur at various levels within/across each system (e.g., Head Start grantee/local education agency (LEA) leadership, Head Start directors/principals, teachers, staff).

Professional supports (for kindergarten transitions): Professional learning and other resources (e.g., training materials, shared planning time) that support teachers, site administrators, grantee/LEA administrators, and policymakers to enact strong transition approaches.

Successful transition practices: Concrete transition practices that meet the intended goal of supporting children and/or families during the transition to kindergarten. Successful transitions are those whereby teachers, families, and children have positive outcomes throughout the transition process and after the transition. For example, one outcome of successful transition practices is the *maintenance* of parent-teacher communication and parental involvement in school-based education when children enter kindergarten.

Transition to kindergarten: The period starting from the year prior to kindergarten entry, through entry into kindergarten, until the end of the kindergarten year. The transition itself is not considered an individual event, but a process that teachers, families, and children experience in preparation for, entry into, and adjustment to kindergarten.

Research Questions

To meet the goals of this descriptive study, the design options will address the following research questions and sub-questions:

Research Question 1: What does collaboration between Head Start programs and local education agencies/schools to support children's transition to kindergarten look like at the systems level?

a) In what ways do Head Start programs and LEAs/schools coordinate to align perspectives, policies, professional supports, and practices around the kindergarten transition?
b) How does coordination differ for programs/schools with different characteristics, including the children/students they serve and their educator characteristics?[3]

[3] Diverse/diversity throughout this memo refers to diversity in resources (e.g., income, social capital, housing), race/ethnicity, language, culture, and/or children's special needs.

c) How does Head Start-LEA collaboration in support of kindergarten transitions vary by state-level policy contexts?
d) What staff members play a role in supporting transitions (e.g., Head Start education coordinators, disabilities coordinators, program and center directors, elementary school principals, other elementary school staff, district central office staff)? What do their roles entail?
e) What other community organizations do Head Start programs and LEAs/schools partner with to support transitions to kindergarten?

Research Question 2: How do kindergarten transition approaches vary by system-level supports and cross-system collaborations?

a) What system- and program-level characteristics are associated with different transition supports available for teachers, families, and children?
b) In what ways do teachers' kindergarten transition practices differ by system-level supports and cross-system collaborations around kindergarten transitions?
c) Do teachers receive different types of system-level supports for improving kindergarten transitions depending on the students they serve (e.g., students with Individualized Education Programs (IEPs), English learners)?
d) In what ways do families' experiences with preparing their child for kindergarten and with their child's transition into kindergarten differ by system-level supports and cross-system collaborations around kindergarten transitions?

Research Question 3: What are the patterns of transition from Head Start programs to kindergarten in various schools?

a) What do Head Start teachers, center directors, and other Head Start personnel know about where their children will be transitioning to?
b) What is the prevalence of transition patterns between Head Start and kindergarten (e.g., how many different schools do children from Head Start centers transition into for kindergarten)?
c) Do transition patterns differ by contextual conditions such as location, state and district policies, and local demographics?

Research Question 4: What are the outcomes of successful transitions for leaders, teachers, families, and children?

a) How do leaders, teachers, and families define "successful transitions" to kindergarten?
b) In what ways do family outcomes related to children's transition into kindergarten (e.g., family-school communication, agency around child's educational needs,

stress, comfort with the transition, social capital) differ by system-level supports and cross-system collaborations around kindergarten transitions?

c) Do the associations between system-level supports and family outcomes vary for families with different needs and backgrounds (e.g., children with IEPs, who are homeless, who have experienced trauma, from migrant communities, with different levels of parental education, or children and families with varying cultural and linguistic backgrounds)?
d) In what ways do child outcomes related to the transition into kindergarten (e.g., social and behavioral adjustment, academic adjustment, dispositions towards school, approaches to learning) differ by systems-level supports and cross-system collaborations around kindergarten transitions?
e) Do the associations between systems-level supports and child outcomes differ for children with different needs and from different backgrounds (e.g., students with IEPs, English learners)?

Overall Approaches

In the two design options presented in this report, we focus solely on survey-based data collection efforts. Additional qualitative or interview work could supplement the designs described below. The design of those supplements would be best suited once the HS2K case studies being conducted are complete. Both designs build upon the HS2K team's current development of surveys to be completed by administrators in both the Head Start (sending) and K-12 (receiving) systems. We refer to those surveys as the **Kindergarten Transition Systems Surveys, or KTS[2]**.

This report provides an overview of two distinct—yet somewhat overlapping—design options. Design Option 1 takes a **"cluster" level approach** to sampling, data collection, and analyses of how Head Start programs and LEAs/elementary schools collaborate within sets of geographic areas. In other words, the goal of Design Option 1 is to be understand the patterns of collaboration across multiple Head Start programs and LEAs *within* geographic areas. It also includes a look at families' experiences and outcomes.

Design Option 2 takes an **individual-level approach** to sampling and data collection. It suggests selection of individual Head Start programs across the country, centers within programs, and then children/families within those centers. It then proposes data collectors track children as they transition into kindergarten to collect data from the elementary schools they enter.

While Design Option 1 focuses on what occurs within geographically-bounded areas to understand systems- and cluster-level findings, Design Option 2 focuses on a selection

of individual Head Start programs across the country along with the schools children from those programs transition into. Design Option 2 seeks to understand associations between those individual program-and school-level approaches to supporting kindergarten transitions and the outcomes of individual children.

Across both Design Option 1 and Design Option 2, there are many overlapping features. For example, both include survey data collection of administrators at various levels within the ECE system and K-12 system. They both build upon the HS2K's theory of change, with a particular interest in the 4Ps. However, the design options have different selection approaches. While Design Option 1 uses a geographic, population-level sampling approach to simultaneously select neighboring Head Start programs and elementary schools, Design Option 2 builds on a random sample of Head Start programs to follow a sample of children and families to *their* selected elementary schools. In addition, Design Option 2 is the only one that focuses on collecting individual-level data at the child level to track transitions into kindergarten and related outcomes. **Table 1** provides an overview of the similarities and differences across the two proposed designs in this report. Although the current plans for each design option focus on quantitative survey data collection across both design options, we also recommend future consideration of a qualitative component to address the study research questions (beyond the scope of this plan).

Table 1. Overview of Two Design Options

	Overview of Design Option 1 (Cluster Approach)	Overview of Design Option 2 (Individual Approach)	Similarities and Differences
Research Questions	• RQs 1 – 3, focused on system-level and teacher-level collaboration • Inclusion of RQ 4 sub questions focused family experiences and outcomes	• RQs 1 – 4, including questions about child outcomes	• Mostly the same; additional questions about child outcomes in Design Option 2
Design	• Survey • Within the same year in both systems (HS/K-12) • Focus on cluster-level patterns in addition to program-level patterns and factors	• Survey • Longitudinal (two times for families): once in Head Start and once in kindergarten • Focus on program and family/child-level patterns and factors with the selected Head Start programs as the "hub" and receiving elementary schools as the "spokes"	• Data collection approach similar (with some difference in measurement tools) • Different timelines • Some same, some different units of analyses

	Overview of Design Option 1 (Cluster Approach)	Overview of Design Option 2 (Individual Approach)	Similarities and Differences
Sampling	• Identify initial sample based on census tracts and select all programs/schools around that initial sample	• Build from an existing sampling frame that captures nationally representative Head Start programs	• Entirely different approaches
Measures	• Inclusion of KTS^2 items of systems-level collaboration and supports • Inclusion of questions that focus on collaboration with community partners and system level strategies around community partner collaboration • Development of new teacher measure of transition practices and supports • Development of new family measure of experiences and outcomes • Use of existing data (e.g., Head Start administrative data, NCES, NIEER, U.S. Census data)	• Inclusion of KTS^2 items of systems-level collaboration and supports • Development of new teacher measure of transition practices and supports • Use of existing data (e.g., Head Start administrative data, NCES, NIEER, U.S. Census data) • Additional questions for teachers about child outcomes	• Design Option 1 would focus on cross-system partnerships and family experiences • Design Option 2 includes additional measures for teachers and families focused on child experiences and outcomes
Analyses	• Descriptive • Levels of analyses: at the program/school/ LEA levels and the cluster level	• Descriptive • Levels of analyses: at the program/school/ LEA levels and family/child level	• Similar analyses but with a focus on different levels
Data Collection	• Web and phone-based surveys of administrators and teachers • One time point	• Web and phone-based surveys of administrators, teachers, and parents • One time point	• Design Option 2 would require an additional time point of data collection, and will collect information from teachers and parents about child outcomes

KTS^2 = Kindergarten Transition Systems Surveys

These two design options each seek to answer most of the research questions outlined in the previous section. They will draw on data collection tools and existing data as outlined in **Table 2**.

Table 2. Use of Existing or New Sources of Data for Each Research Question

	KTS[2] (under current development)	New survey measures to be developed[4]	Administrative data / Additional contextual data
Research Question 1: What does collaboration between Head Start programs and local education agencies/schools to support children's transition to kindergarten look like at the systems level?			
1a. In what ways do Head Start programs and LEAs/schools coordinate to align perspectives, policies, professional supports, and practices around the kindergarten transition?	✓		
1b. How does coordination differ for programs/schools with different characteristics, including the children/students they serve and their educator characteristics?	✓		✓
1c. How does Head Start-LEA collaboration in support of kindergarten transitions vary by state-level policy contexts?	✓		✓
1d. What staff members play a role in supporting transitions (e.g., (Head Start education coordinators, disabilities coordinators, program and center directors, elementary school principals, other elementary school staff, district central office staff)? What do their roles entail?	✓		✓
1e. What other community organizations do Head Start programs and LEAs/schools partner with to support transitions to kindergarten?	✓	✓	
Research Question 2: How do kindergarten transition approaches vary by system-level supports and cross-system collaborations?			
2a. What system- and program-level characteristics are associated with different transition supports available for teachers, families, and children?	✓		✓
2b. In what ways do teachers' kindergarten transition practices differ by system-level supports and cross-system collaborations around kindergarten transitions?	✓	✓	✓

[4] This includes new teacher surveys and family surveys.

	KTS[2] (under current development)	New survey measures to be developed[4]	Administrative data / Additional contextual data
2c. Do teachers receive different types of system-level supports for improving kindergarten transitions depending on the students they serve (e.g., students with Individualized Education Programs (IEPs), English learners)?	✓	✓	✓
2d. In what ways do families' experiences with preparing their child for kindergarten and with their child's transition into kindergarten differ by system-level supports and cross-system collaborations around kindergarten transitions?	✓	✓	
Research Question 3: What are the patterns of transition from Head Start programs to kindergarten in various schools?			
3a. What do Head Start teachers, center directors, and other Head Start personnel know about where their children will be transitioning to?		✓	
3b. What is the prevalence of transition patterns between Head Start and kindergarten (e.g., how many different schools do children from Head Start centers transition into for kindergarten)?	✓		✓
3c. Do transition patterns differ by contextual conditions such as location, state and district policies, and local demographics?	✓	✓	✓
Research Question 4: What are the outcomes of successful transitions for leaders, teachers, families, and children?			
4a. How do leaders, teachers, and families define "successful transitions" to kindergarten?	✓		
4b. In what ways do family outcomes related to children's transition into kindergarten (e.g., family-school communication, agency around child's educational needs, stress, comfort with the transition, social capital) differ by system-level supports and cross-system collaborations around kindergarten transitions?	✓	✓	

	KTS[2] (under current development)	New survey measures to be developed[4]	Administrative data / Additional contextual data
4c. Do the associations between system-level supports and family outcomes vary for families with different needs and backgrounds (e.g., children with IEPs, who are homeless, who have experienced trauma, from migrant communities, with different levels of parental education, or children and families with varying cultural and linguistic backgrounds)?	✓	✓	✓
4d. In what ways do child outcomes related to the transition into kindergarten (e.g., social and behavioral adjustment, academic adjustment, dispositions towards school, approaches to learning) differ by systems-level supports and cross-system collaborations around kindergarten transitions?	✓	✓	
4e. Do the associations between systems-level supports and child outcomes differ for children with different needs and from different backgrounds (e.g., students with IEPs, English learners)?	✓	✓	✓

Design Option 1: Cluster-Level Approach

Introduction

We first introduce Design Option 1, which focuses on understanding the patterns of collaboration across multiple Head Start programs and LEAs within a geographic area (or cluster). While allowing for cluster-level exploration, this design can also support examination of patterns of transition supports based on program- and school-level characteristics.

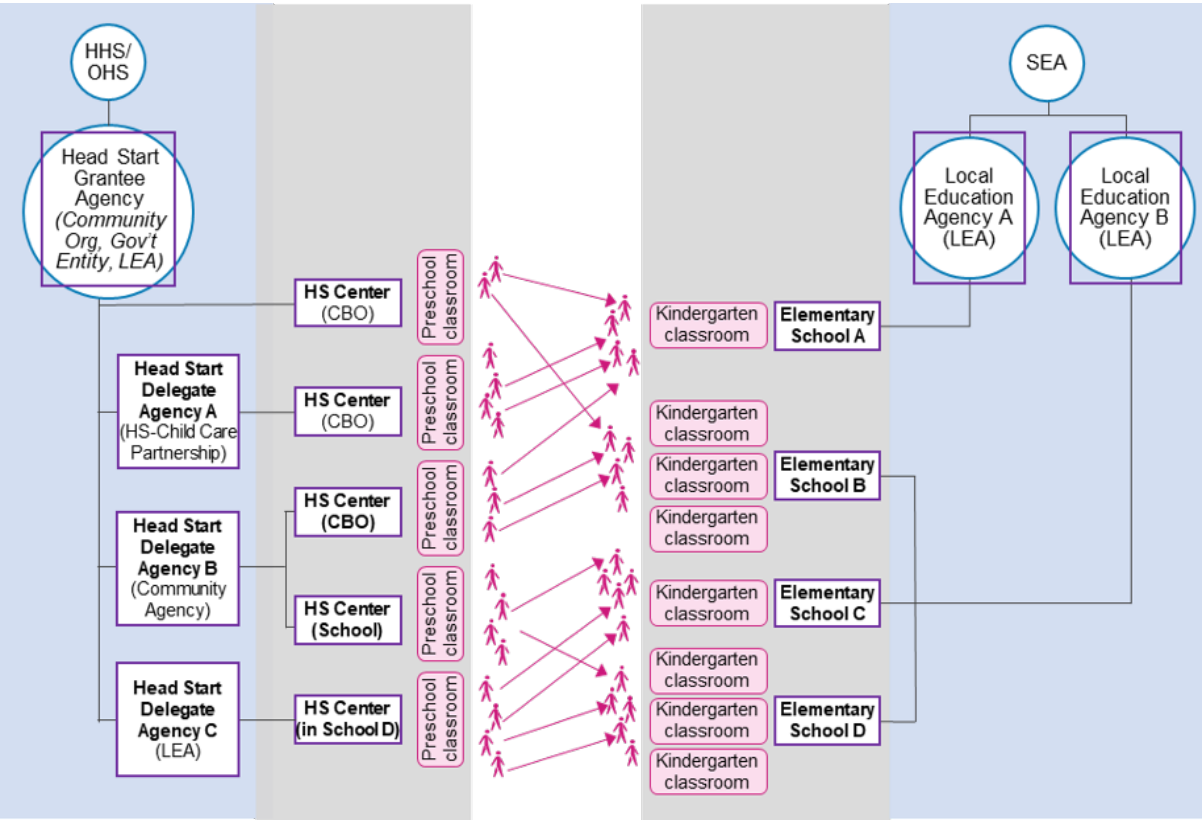
Trying to understand the transition from Head Start into kindergarten from a systems level can be complex. Most research has looked at transition supports at the individual classroom, program, or school. However, the goal here is to take it up to the level where we understand what collaboration might look like *between* and *among* different schools and Head Start programs that are near each other.

Figure 1 is a representation of what happens when children are transitioning from Head Start to kindergarten. We can quickly see the complexities of this, with a lot of crossovers in the middle. There are some cases where all children transitioning from one Head Start classroom move into one elementary school classroom together. In other cases, children in the same Head Start classroom transition into two (or more) different elementary classrooms that may or may not be in the same LEA. On the other side, there are kindergarten classrooms receiving children from different Head Start classrooms and programs.

However, the complexities of this are somewhat constrained. The locations of Head Start programs and elementary schools are the result of a combination of social and planning policies. Research consistently demonstrates that families prefer ECE arrangements that are close to home (see, for example, Davis et al., 2019; Greenberg et al., 2016). Similar findings exist in the K-12 literature, whereby families with school choice options most readily choose location over other factors (e.g., Hastings, Kane, & Staiger, 2006; Jacobs, 2011). Based on this knowledge of parent preference, we speculate that the sending and receiving sides of the transition are likely to be close to each other geographically (in most cases). Design Option 1 intends to capture that whole group of programs and schools at the same time. It would provide an innovative opportunity to identify patterns of collaboration between Head Start and elementary

schools that overlay broader issues of families' geographic access to education services.

Figure 1. Landscape of Kindergarten Transitions



This design is unique amongst the existing research focused on supporting transitions from ECE settings to kindergarten. Most existing studies mainly focus on what transition supports look like in individual programs, classrooms, or schools regardless of if they are the programs or schools that would be expected to collaborate (Ehrlich et al., 2021). They ignore the locality of programs and schools, or their proximity to one another, in understanding how they might work together to align their supports and how they jointly work with families to strengthen transitions. Design Option 1, however, allows for a descriptive examination of what transition supports look like from within a geographically bounded area. Within these geographic areas are embedded systems (Head Start and K-12) that may be more likely to partner and collaborate than systems that are further apart from each other. By looking within a geographic boundary, we can begin to see how those collaborations might look *across* both these different systems and different types of geographic areas (e.g., those serving different populations).

Sampling Plan and Overall Design

Design

The cross-sectional, descriptive study design for Design Option 1 would focus on Head Start programs (those serving children who would be transitioning into kindergarten) within selected geographic areas or clusters along with all elementary schools within the same cluster. The elementary schools may be overseen by either a single LEA or by multiple LEAs. The design addresses Research Questions 1-3 and focuses on program/center-LEA/school collaboration (what we consider to be "systems-level" in these designs) and the experiences of teachers in terms of the supports they receive and the practices they implement. As such, it attends to multiple levels of the service delivery system, including the Head Start program (grantee or delegate agency providing direct services), Head Start center, LEA, elementary school, and teacher levels. It also addresses questions under Research Question 4 related to parent/caregiver experiences and outcomes.

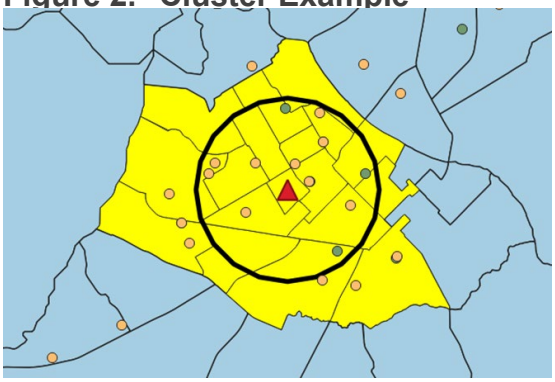
This design would represent a range of characteristics of locales across the country. (e.g., rural areas, specific focal states, demographic characteristics). This study is intended to describe systems-level variations in the characteristics of transition practices across these geographic areas. These characteristics would be collected through surveys administered to stakeholders at various levels of the system.

The sampling unit for this Design Option 1 could be geographic clusters and include data collection at the Head Start program/center and LEA/elementary school levels within each geographic cluster. This design description will focus on cluster-level characteristics that could intersect with collaboration approaches of Head Start programs, Head Start centers, LEAs, and elementary schools to support kindergarten transitions. For example, the sampling design could stratify or oversample on characteristics from census information or the number of Head Start programs and LEAs/elementary schools in the cluster. The cluster sampling unit is based on the approach used in the National Survey of Early Care and Education (NSECE; National Survey of Early Care and Education [NSECE] Project Team, 2013), which uses census-tract clusters to survey households and early care providers. While the geographic-driven approach is the same, the motivation of using this approach for Design Option 1 is based on selection by population-level characteristics, rather than the supply-and-demand perspective of the NSECE.

Sampling Specifications

Geographic clusters (the study sampling unit) could be built by first sampling census tracts. See **Box 1** for an explanation of why we start our sampling with census tracts rather than Head Start programs. After a census tract is selected, a 2-mile radius is drawn around the census tract (**Figure 2**). All census tracts within or touching that 2-mile radius, as well as the initially selected census tract, become the final geographic "cluster." This design would build on the sampling strategy for the NSECE. It has the benefit of defining a geographic area, which allows the study to account for service providers (Head Start programs, centers, LEAs, and elementary schools) at all levels of the transition. A cluster would include all Head Start programs and their corresponding centers, and all public elementary schools and their corresponding LEAs.[5] Note that the number of programs and schools within a cluster would vary depending on its location.

Figure 2. Cluster Example



Having these geographic boundaries also sets up a study that could explore the extent to which geographic proximity contributes to collaboration/cross-sector efforts. A cluster-based sampling design also leaves open the flexibility of including other *types* of ECE programs, if desired. For example, programs may be included in the design to support a study of potential new federal or state investments and/or how new universal preschool programs support kindergarten transitions. The number of Head Start programs and LEAs/elementary schools may vary depending on the population density of the cluster. For example, in more urban areas, a 2-mile radius may touch more census tracts, and therefore may include a higher number of elementary schools to serve enough children in a dense area. In a rural area, a 2-mile radius from the tract population center may not reach additional census tracts, and the cluster would therefore just include the one census tract.

The current research team opted to begin the design process by recommending 30 clusters, which anchors our cost estimates. Thirty clusters would allow for variation on several cluster-level characteristics simultaneously. For example, the team could select on key characteristics of interest including urbanicity, percent of population below poverty, percent of population that identifies as a racial minority, or the number of Head Start programs and elementary schools (many or few within the cluster). The team could also decide to select on focal states or locations to learn more about transition

[5] Early Head Start programs would be excluded from the study, as the focus of the study is on the transition of children into kindergarten.

experiences influenced by specific policies or combinations of policies. Key characteristics or focal locations should ultimately be determined in consultation with the Administration for Children and Families (ACF).

Box 1. Why define clusters based on census tracts?

Building around census tracts would create a cluster organized around a population center. From this population center, the design aims to capture all Head Start centers and schools with kindergarten classrooms that children may transition to or from. If, alternatively, we defined the clusters by selecting on Head Start programs or centers, the design might be less likely to identify multiple grantees within a geographic area. Using census tract selection instead may identify additional grantees around the edges of the cluster.

The census cluster-based design would select on a population center, or community characteristics, rather than Head Start program characteristics. This selection would reflect and generalize to population characteristics—which may better represent the fuller population of kindergarten students within an area rather than focusing more on Head Start centers and families. Furthermore, using the census tract as a sampling unit would easily facilitate linkages to other census-level data, including population demographic or employment characteristics, and community markers such as the Child Opportunity Index.

Analyses are currently underway to better understand the range of the number of Head Start programs/centers and LEA/schools that fall within this 2-mile radius cluster; this would help identify whether 2-miles is the right distance to use. Ideally, clusters would include a variation in the “inter-organizational configurations” between Head Start and K-12 entities (e.g., locales with one Head Start center and one elementary school, with one Head Start center and multiple elementary schools, with multiple Head Start centers and multiple elementary schools). They would also be large enough to capture *enough* sites to understand cross-system collaborative efforts around kindergarten transitions, without including *too many* sites to make it feasible to collect data.

Additional exploration would also be needed to determine how many variables to use in selecting census tracts, based on the number of Head Start programs and K-12 schools that will provide for the full sample. For example, it is likely that the selection of 30 census tracts based only on urbanicity will result in some urban clusters with multiple Head Start programs/LEAs and other rural clusters that may have one or fewer of these organizations. Selection on too many characteristics may lead to challenges in finding an adequate sample.

An initial recommendation is that a sample of 16 families/caregivers would be administered a survey about their experiences regarding the kindergarten transition within each Head Start center and elementary school with kindergarten. Because of the

nesting of families within centers, it is important to sample *enough* families to allow analyses to distinguish between within-center variance (differences that come from the families that attend the same Head Start center) and between-center variance (differences that capture something *shared* among families within the same center, but different from children in another center).

Calculating Power Estimates

Based on final decisions regarding survey instruments and analytic approaches, and prior to data collection, we recommend conducting power analyses to determine a final sample size. A thorough power analysis could help ensure the analyses have the adequate statistical power to estimate precise standard errors and support hypothesis testing. In other words, a power analysis could help ensure the study has sufficient statistical power to detect any meaningful differences in transition experiences across Head Start, LEA, and elementary school respondents.

There are several factors that should be considered in a power analysis, and these decisions will be driven by the final study design. Some of the key parameters include:

- Expected effect size.
- Estimate of variation for the outcome measures (e.g., standard deviation, intraclass correlation coefficient (ICC), reliability indices).
- The statistical approach for each analysis (e.g., t-test, chi-square tests, multiple regressions).
- The number of potential predictors or moderators in the model.

Depending on final design specifications, sample sizes may vary at each organizational level, and power analysis will need to account for different numbers of respondents across research questions. We recommend calculating estimates of the expected variation in the outcome measures once the survey instruments are finalized so that ICCs reflecting those instruments can be used. To better understand the limitations of the design to detect meaningful differences in transition experiences, the power analysis could be conducted across a range of plausible values for key parameters (e.g., small, medium, and large effect sizes).

Assumptions

Design Option 1 focuses on systems-level characteristics and data collection and does **not** include data collection about individual children. Instead, the study is designed to allow for descriptive analyses of geographic cluster types and sites (Head Start programs, Head Start centers, LEAs, or elementary schools). The study would focus on

the transition from center-based Head Start programs into public schools serving kindergarten students, excluding private schools or programs.[6]

Given the focus on the cluster level, the research team would benefit from creating inclusion criteria for clusters that define how many programs/schools (at minimum) must be within the cluster (e.g., at least one Head Start center and one elementary school). Analyses of NSECE data (or publicly available Census, NCES, and PIR data) would help clarify how many programs/schools exist within clusters and refine sample numbers. These additional analyses could also help ascertain the sample size and power required to test differences between groups at various levels (program/school, cluster). The research team could select clusters that vary by number of Head Start programs and elementary schools, to represent inter-organizational configurations.

This cluster-based design is not intended to be nationally representative. Rather, it is designed to sample for variation along key characteristics of interest for the study. This design would support descriptive analyses but may or may not have enough power to test differences at the cluster level. For example, if differences in kindergarten transition practices between urban and rural areas was of interest to the government, the research team may need to do power analyses to determine the number of clusters needed in both urban and rural areas to be able to test statistically for variation in kindergarten transitions by rural and urban geography.

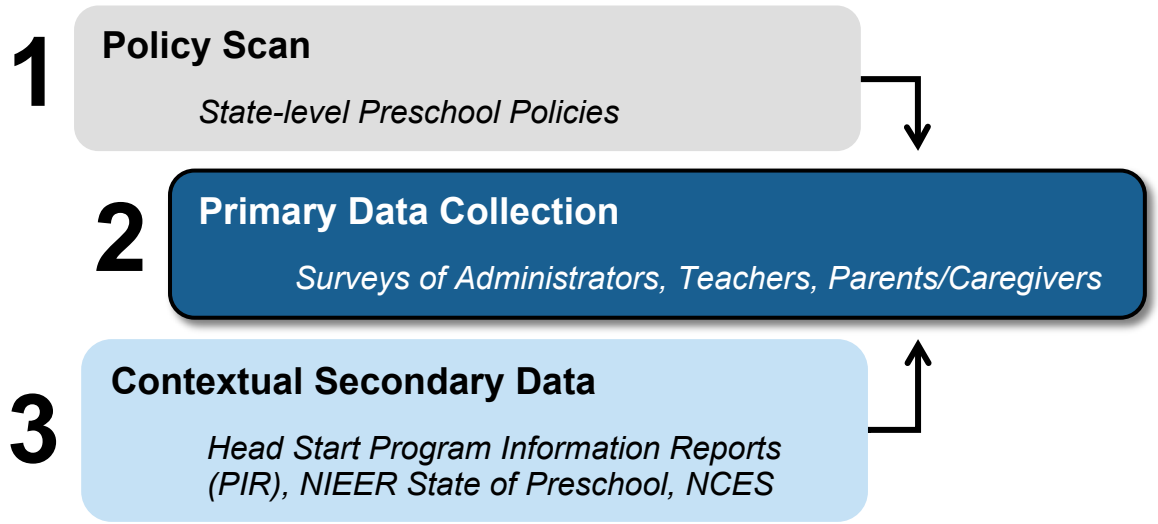
Finally, it should be made clear that the data collected (see more information about the instruments below) would not be asking about *specific* collaborations between each Head Start program and each elementary school/LEA within a cluster. Rather, they would aim to understand the broader levels of collaboration that occur amongst the set of programs and schools within a specific cluster. We anticipate that some clusters will exhibit higher or lower levels of transition supports (the 4Ps) both within and across systems. One aim of this approach to studying kindergarten transition supports is to identify whether those variations are potentially associated with some other factors, such as inter-organizational configuration between Head Start programs and elementary schools.

[6] We use the term “elementary school” to capture any public school that serves kindergarten students. This might include a school that only serves kindergarten students.

Data Collection Plans

Modes of data collection and timing

Primary data collection for Design Option 1 is designed to occur through web- and telephone-based surveys of Head Start program and center directors, LEA and school administrators (such as principals, assistant principals, or kindergarten coordinators), and Head Start teachers and kindergarten teachers. An option included in this design is the addition of parents/caregivers within the selected programs and schools. Secondary data, including information from the U.S. Census, Head Start Program Information



Reports (PIR), NIEER State of Preschool reports, and NCES data, could be merged with the survey files based on location (e.g., geographic cluster) to provide contextual and demographic information for better interpretation of findings. If the research team aims to include analyses of patterns of transition supports by state-level policies, a policy scan would likely be needed first, in order to identify related policies of interest for the selected clusters.

The design presented assumes that data collection occurs at a single time point in time, likely in the spring of the academic year. However, the timing could be adjusted based on project needs and questionnaire design. Surveys could be administered at that time for both Head Start and LEA/school staff. If access to restricted-use data (e.g., from NSECE or NCES) were needed, the research team could apply for restricted-use licenses prior to survey administration.

Instruments

Design Option 1 proposes that data collection be conducted via web- or telephone-based surveys. It would require seven survey instruments in total, one each for: (1) Head Start program administrators, (2) Head Start center administrators, (3) LEA administrators, (4) elementary school administrators, (5) Head Start teachers, (6) kindergarten teachers, and (7) parents/caregivers. Substantial measurement development work is currently underway focusing on surveys for Head Start program and LEA leadership as well as for Head Start center and elementary school leadership. Additional survey instruments for Head Start and kindergarten teachers would need to be newly developed. All data collection measures, whether using items from existing measurement sources or composed of newly developed items, will require pilot testing prior to use in data collection activities. In addition, secondary data sources such as PIR data, Census data, and local administrative data would need to be accessed and merged with the primary data from the surveys.

Existing measures: Items exist in an instrument already designed to measure the specific constructs of interest.

New measures: Items need to be newly created and/or are pulled from across numerous other measures to capture responses on a construct of interest.

We discuss each type of data collection instrument below. **Table 3 – Table 5** lay out the specific constructs proposed for each instrument and indicate whether each could be captured using *existing* measures or whether they would require *development* of a new measure. Under both circumstances (use of an existing or new measure), the research team may need to make adaptations to existing survey items. For example, an existing instrument may include items that tap into the right constructs but need to be revised for this particular study due to length or respondents. A newly developed measure could include the creation of completely new items and/or the use of individual items from existing measures that may also require some adaptation.

Head Start and LEA/School Administrator Surveys

The HS2K team has been drafting survey instruments for the administrators in the Head Start and K-12 systems at both the program/LEA and center/school levels. The four survey instruments currently under development include those aimed at:

1. Program-level administrators within Head Start (e.g., Head Start program director)

2. LEA-level administrators within the K-12 system (e.g., cabinet-level administrator)
3. Center-level administrators in Head Start (e.g., Head Start center director)
4. School-level administrators in K-12 (e.g., elementary school principal).

These four surveys are currently referred to collectively as the Kindergarten Transition Systems Surveys (KTS^2). The KTS^2 instruments are designed to measure four aspects of coordination between the Head Start and LEA systems: kindergarten transition perspectives, policies and procedures, professional supports, and practices (i.e., the 4Ps from the HS2K theory of change). Additional items in these surveys capture demographic characteristics of the respondent and program, and barriers and facilitators to implementing coordinated kindergarten transition practices, policies, and professional supports. Many of the survey items included in KTS^2 are newly developed to capture concepts that were not addressed in previous large-scale data collections. However, some items were modified or adapted from existing data sources listed in **Figure 3**.

Figure 3. KTS^2 Data Sources

- Early Childhood Longitudinal Study-Birth Cohort (ECLS-B)
- Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K)
- Head Start Family and Child Experiences Study (FACES)
- National Center for Early Development and Learning (NCEDL) Kindergarten Transition Project
- Head Start Program Information Report (PIR)
- Migrant and Seasonal Head Start Study (MSHS)
- Pre-Elementary Education Longitudinal Study (PEELS)
- National Center for Early Development and Learning's (NCEDL) Kindergarten Transitions Project (and related adaptations)
- Pre-Kindergarten Transition Practices Survey
- Teachers' Perceptions on Transition (TPOT)
- National Early Intervention Longitudinal Study (NEILS)

Limited cognitive testing of the KTS^2 instruments is currently underway to ensure items on the Head Start Program and LEA administrator surveys are understood by respondents and response categories can provide useful variability across respondents. However, testing of draft Head Start center and elementary school leadership surveys and further pilot testing of all KTS^2 instruments would be needed to ensure they provide valid and reliable information before use in a future study.

The four survey instruments that comprise the KTS^2 will serve as the foundation for the data collection tools developed for use with administrators in Design Option 1. However, if additional items are needed to address systems-level constructs, additional measurement development work, including cognitive testing of the new items and pilot testing of the revised survey instrument (or supplemental module), will be necessary.

Table 3 presents the full set of constructs that could be addressed in the administrator surveys for Design Option 1. (See Appendix C for a list of the acronyms and citations for study names listed in **Table 3**.) Although the KTS^2 instruments are still under development, we consider them measurement sources from which "existing" items could be used to answer research questions for Design Option 1 because new development would not be needed for the design options presented here. As noted in **Table 3**, many of the "existing" items that address constructs of interest for Design Option 1 come from the KTS^2, but other measurement sources that contain items specific to the Head Start to kindergarten transition exist as well.

The constructs that are important to capture in the administrator surveys for Design Option 1 include:

- Administrator demographics
- Transition practices
- Transition policies/procedures, especially at the building level
- Professional supports for kindergarten transition
- Perspectives about kindergarten transition
- Alignment factors
- Collaboration and coordination across systems
- Job titles and transition to kindergarten roles and responsibilities
- Organizational climate
- Leadership
- Community Partnerships

The KTS^2 instruments are the main source of existing survey items for the constructs related to the 4Ps and contain some demographic information about the respondent, including the respondent's role and title. Importantly, the KTS^2 instruments were designed to allow for within-system as well as across-system analysis of the 4Ps. As such, the survey items should allow for analyses to assess the level of *alignment* or *coordination* of kindergarten transition perspectives, practices, policies, and professional supports.[7] Existing measurement sources for capturing the construct of *organizational climate* include the Essential 0-5 Survey and the 2019 NSECE Workforce Provider

[7] The HS2K research team is in the process of setting up discussions with psychometricians to confirm that survey items are constructed in such a way as to allow for these "alignment" analyses and that analyses as planned for Design Option 1 and 2 will yield useful information.

Survey (see **Table 3**). Likewise, existing survey items about *leadership* exist from previous research (Cook, Coley, & Zimmerman, 2019).

Very minimal measurement development has been done around partnerships with community organizations around kindergarten transition. Any new item creation would require cognitive interviewing and pilot testing of brand-new items (beyond the items already available in the KTS^2 instruments). We therefore recommend that if additional measurement development is necessary to finalize Design Option 1 measurement tools, a Supplemental Module of these new items would be developed and tested as part of implementation of Design Option 1.

Another consideration is the response burden on survey participants. Decisions about prioritizing among constructs of interest for Design Option 1 may also be necessary to reduce survey response time.

Table 3. Administrator survey constructs and measures for Design Option 1

Construct	Possible measurement sources	Measure can be based on tool that already exists[8]	Measure would need to be developed
Administrator demographics	• KTS^2	✓	
Transition practices	• KTS^2	✓	
Policies/procedures	• KTS^2	✓	
Professional support	• KTS^2	✓	
Perspectives	• KTS^2	✓	
Alignment factors	• KTS^2	✓	
Collaboration and coordination across systems	• KTS^2	✓	
	• KTS^2	✓	

[8] By "already exists," we mean it would be in existence by the time this design option was implemented. This includes the CLIN 3 measure currently under development.

Construct	Possible measurement sources	Measure can be based on tool that already exists[8]	Measure would need to be developed
Job titles and Transition to kindergarten (TTK) roles and responsibilities	• Additional Items could be developed if more detail is desired		✓

Characteristics of children	• Additional items could be adapted, including:
	  ○ 2019 NSECE Center-based Survey:
	  ○ Number of children with physical disability/IEP
	  ○ Race/ethnicity of children
	  ○ Languages used by staff when working with children
	  ○ Number of children experiencing homelessness
			✓

Organizational climate	• Essential 0-5 Survey and 5Essentials Survey
	  ○ Collaborative teachers
	  ○ Supportive environment
	• Cook, Coley, & Zimmerman (2019):
	  ○ The ways in which practices change over time based on information gained from transition activities (and which activities)
	• 2019 NSECE Workforce Provider Survey:
	  ○ Perceived morale
		✓	

Leadership	• Cook, Coley, & Zimmerman (2019): ○ Whether activities have changed over time with new leadership • Early Care and Education Leadership Study (ExCELS) project leadership measure (currently under development)	✓	
Community Partnerships	• This measure would largely need to be generated.		✓

Head Start and kindergarten teacher surveys

The Head Start and kindergarten teacher surveys will need to be developed. We include voices of teachers to ensure we understand what types of transition approaches are more or less universal within a system (e.g., within a Head Start program) and to ensure we capture the supports teachers report receiving from their administrators. There are many existing instruments that could be used as models or where constructs could be pulled from directly. However, none of them fully capture the constructs under investigation for Design Option 1. Parts of the KTS[2] also could be adapted for use with Head Start and kindergarten teachers, but additional work would need to be done to make sure it is appropriate for use with this population. In short, there is no current survey that includes all required constructs that can be used to address the research questions. As included in **Table 4**, the constructs for which measures currently exist from which survey items could be **used "as is" or adapted** for use in Design Option 1 include:

- Transition practices
- Organizational climate
- Leadership
- Characteristics of children and families
- Teacher demographics

In addition, several measures will need to be **adapted or modified** for use in Design Option 1. In many cases, existing measures may suffice, but modifications in terms of response options (which often includes yes/no) in addition to other modifications or additional items may need to be made. The following lists constructs for teachers that may need to be adapted or modified from existing measures. Modifications can include incorporating items from different measures or changes to response options. It also could include analytic work to confirm the appropriateness of constructs, as is the case with Alignment and Collaboration below.

- Professional support/leadership
- Knowledge of K placement/Knowledge of Head Start experience
- Transition supports to children and families

In the case of *characteristics of families in classrooms*, **new measures** will need to be developed. This means that completely new items would need to be created, cognitively tested, and piloted before use in research studies. However, these items could likely be adapted from items measuring *characteristics of children*.

Table 4. Teacher-level survey constructs and measures for Design Option 1

Construct	Possible measurement sources	Measure can be based on tool that already exists [9]	Measure would need to be developed
Teacher demographics	• FACES • HSIS • Census	✓	

Transition practices	• Items and constructs can be derived from, for example:
	• KTS[2]
	• FACES:
	  ○ Information sharing of kindergarten teachers with parents
	  ○ Kindergarten teachers making home visits
	  ○ Parent visits to schools
	  ○ Parent orientation
	• ECLS-B:
	  ○ The extent to which teachers were involved in planning for transition from preschool special education
	  ○ Frequency of scheduled conferences with parents
	• Kraft-Sayre and Pianta, 2000 (Kindergarten Transition Practices Menu; which was adapted from NECDL) on:
	  ○ Family needs assessment
	  ○ Connect family to community resources
	  ○ Elementary school students' visits to preschool classroom
	  ○ Orientation for preschool children
	  ○ Preschool teacher contacting child and child's family after school starts
	• Forest et al. (2004; Elements for Transition to Kindergarten [ETK] Interview; for children with autism):
	  ○ Whether and perceived importance of creating timeline (and with roles and responsibilities of team members)
	  ○ Whether and perceived importance of identifying a contact person for parents and teachers
			✓

[9] By "already exists," we mean it would be in existence by the time this design option was implemented. This includes the CLIN 3 measure currently under development.

Construct	Possible measurement sources	Measure can be based on tool that already exists [9]	Measure would need to be developed

	• Semi-structured interview (Gill, Winters, & Friedman, 2006):
	  ○ Coordinating kindergarten registration
	• Teachers' Perceptions on Transition (TPOT; Quintero & McIntyre, 2011):
	  ○ Attending transition planning meeting with preschool/kindergarten staff
	  ○ Cohosting orientation with K teachers
	• PEELS, Early Childhood Teacher Questionnaire and Kindergarten Teacher Questionnaire
	  ○ Coordinated set of questions about transition practices from the perspective of the ECE and K teacher		

Professional support	• KTS[2]
	• Semi-structured interview (Gill, Winters, & Friedman, 2006):
	  ○ Joint trainings
	• PKTP:
	  ○ Whether teachers feel the transition is prioritized and supported by leaders
	  ○ The frequency in which challenges and each other's teaching methods are discussed in Teacher Transitions Team meetings
	• MEP interviews:
	  ○ Whether opportunities exist for teachers from sending and receiving programs to share information
	• 2019 NSECE Workforce Survey:
	  ○ Information on any trainings received
			✓

Construct	Possible measurement sources	Measure can be based on tool that already exists [9]	Measure would need to be developed

Perspectives	• KTS[2]
	• Kraft-Sayre and Pianta, 2000 (which was also adapted from NECDL):
	  ○ Barriers to transition (e.g., uninterested parents, unavailable resources)
	• NEILS:
	  ○ Kindergarten teacher's perceived level of difficulty of a child's transition to kindergarten
	  ○ The level of kindergarten's teacher's involvement in the transition
	  ○ Kindergarten teacher's perceived level of support provided to children and families from preschool special education
	• PKTP:
	  ○ The differences between preschool and kindergarten that teachers think might be troubling to children
	  ○ Teacher-rated importance of information parents provide to teachers
	  ○ Successes and challenges of transition practices
	  ○ Teacher-perceived value of working on transition as a community
	  ○ Perceived teachers' roles and expectations in TTK
	• MEP Interviews:
	  ○ Expectations and needs around transition supports
	  ○ Perceived skills/strengths around transition
			✓

Characteristics of children	• ECLS studies (includes many items about child characteristics)
	• 2019 NSECE Center-based Survey:
	  ○ Number of children with physical disability/IEP
	  ○ Race/ethnicity of children
	  ○ Languages used by staff when working with children
	  ○ Type and number of children funded by agencies/government programs
	  ○ Number of children experiencing homelessness
		✓	

Construct	Possible measurement sources	Measure can be based on tool that already exists [9]	Measure would need to be developed
Characteristics of families	• Information about characteristics of families can be adapted from existing surveys, but additional questions may need to be modified for use with families.		✓

Organizational climate	• Some items and constructs could come from the following surveys:
	• PKTP Teacher Interviews
	• The Essentials 0-5 Survey:
	  ○ Collaborative Teachers
	  ○ Involved Families
	  ○ Supportive Environment
	• Early Childhood Job Satisfaction Survey (ECJSS; Bloom, 2010)
	  ○ Working conditions
	  ○ Co-worker relations
	  ○ The work itself
	  ○ Supervisor relations
		✓	

Leadership	• There are several sources of questions about leadership that can be used or adapted for the potential study.
	• ECLS-K
	• PKTP:
	  ○ Teacher-rated usefulness of support provided by center/school leadership
	  ○ Desired structural change by teachers
	• 2019 NSECE Workforce Survey:
	  ○ Frequency of discussion with supervisor about skills to help children's behavior and their learning
	  ○ Perceived leadership
	• The Essentials 0-5 Survey:
	  ○ Effective Instructional Leaders
	• Leadership measure currently under development by the ExCELS project
		✓	

Parent/Caregiver Survey

A new parent/caregiver survey would be developed for this design option. The survey would collect information on caregivers' experiences related to transition supports. Information on parents/caregivers would include demographics (of caregivers and their

children), family experiences with the transition from Head Start to kindergarten, family-school communication, agency around the child's needs, comfort with the transition, social capital, and use of transition supports (**Table 5**). Items measuring demographics could be pulled from pre-existing measures. Some measures and items for the remaining constructs could be taken from pre-existing surveys and tools, but many of these items are limited and would likely need to be supplemented with new items or instruments that the research team would develop. More specifically, there are some pre-existing items about family experiences with transitions, but they are mostly limited to families' perceptions about roles during transitions or activities families have completed. More items about families' specific experiences during the transition would likely need to be developed. The research team could build on qualitative findings from case studies currently underway when developing these items. Similarly, there is some information from pre-existing studies that is peripherally related to agency around children's needs during transitions (i.e., items around parent-initiated transition activities and perceptions around what is needed for successful transitions), but it is not very specific to agency and thus we predict that some additional constructs and items would need to be added around additional areas of interest identified by the research team. As for use of transition supports, items are limited to more general questions about parents' involvement in the transition and usefulness of provided resources, but additional items would likely need to be developed that are more specific to parents' knowledge and use of and satisfaction with transition supports that were available to them.

There is slightly more information on family-school communication and social capital such that the study team may be able to use items from other surveys as they currently exist (with some potential wording changes to be specific to Head Start), though the study team will need to review these measures and items and determine if they will use items "as is" or adapt them more specifically for the study.

To our knowledge there are no pre-existing instruments on parents' and caregivers' comfort with the transition. A new instrument capturing this construct would therefore need to be developed.

Table 5. Parent/caregiver survey – information on parents/families

Construct	Considerations for Measurement	Measure can be based on tool that already exists	Measure would need to be developed
Parent/caregiver and child demographics	• FACES • HSIS • Census	✓	

Construct	Considerations for Measurement	Measure can be based on tool that already exists	Measure would need to be developed
Family experiences with transition	• PEELS: Perceptions about the school's role in transition • PKTP: The source through which parents learned about child's experience of TTK; workshop attendance; advice to educators about improving transition practices • NEILS: Perceptions about school's role in transition; family activities around transition • Kang, Horn, & Palmer (2017): Family activities around transition • Protocols and findings from HS2K case studies		✓
Family-school communication	• ECLS-K & ECLS-B: Communication from school around transition; transition activities (e.g., having child visit classroom) • Kang, Horn, & Palmer (2016): Contact and meeting with teachers regarding transition; Whether parents contacted school to see who their child's teacher would be • PKTP: Communication with K teachers • FEIT: Level of preparation parent feels preschool provided; Parent-perceived community involvement in TTK	✓	
Agency around child needs	• ECLS-B: Parent-initiated transition activities • PKTP: ○ Importance of getting support from preschool teachers on transition and the extent to which these occurred; perceptions around what is needed for successful transition		✓
Comfort with transition	Needs to be developed		✓
Social capital	• FACES: Opportunities to meet and socialize with other families • PKTP: PK parent-rated importance of meeting with other parents of children and the extent to which it was helpful preparing for their child's TTK		✓

Construct	Considerations for Measurement	Measure can be based on tool that already exists	Measure would need to be developed
Use of transition supports	• FEIT: Type of caregiver's involvement in transition • PKTP: Parent-rated usefulness of resources; Parents' experience with orientation		✓

Secondary Data sources for Design Option 1

In addition to developing instruments for primary data collection as described above, additional data could be derived from the data sources noted in **Table 6** in order to provide information about the contexts in which the programs in the clusters reside, or provide aggregated information about programs, LEAs, and schools.

These sources could be particularly useful for information about the staff, families, and children in Head Start and elementary schools, as well as any state, district, or neighborhood contexts that might affect the Head Start programs and LEAs/schools participating in the Design Option 1 study. Data from these secondary data sources would be merged onto the data files from primary data collection for each program within each cluster.

Table 6. Potential secondary data sources

Construct	Potential Source(s)
State policies/contexts	• NIEER State of Preschool yearbooks
District-level contexts	• Head Start Program Information Report (PIR) • NCES Common Core of Data (CCD) • NIEER
Neighborhood characteristics/ demographics	• U.S. Census • Consider Child Opportunity Index
Information on Head Start programs, including data on child, staff, and family demographics and program characteristics including data on physical health, mental health, disabilities, and family services	• Head Start PIR

Construct	Potential Source(s)
Information on LEAs, including enrollment and student characteristics, teacher count, student/teacher ratios, financing information	• NCES Common Core of Data (CCD) • State and district report cards

Field Data Collection Efforts

Timeline

Field data collection efforts would begin after approval from Office of Budget and Management (OMB) and required Institutional Review Boards (IRBs). Recruitment could then actively occur approximately three months prior to the anticipated date of data collection. During this three-month period, the research team could work to acquire letters of commitment from ACF to encourage engagement from Head Start programs. Active recruitment and attainment of letters of commitment could require significant outreach during this time period. During this time period, the programming of surveys could be finalized. After pre-data collection efforts are complete, data collection may take three to four months in the field.

Recruitment of sites

Recruitment of specific Head Start grantees and LEAs could take place after cluster site selection. Once a cluster is selected, the research team could compile a list of Head Start grantees, LEAs, and elementary schools within the cluster. Research staff could conduct outreach to the full list of organizations through direct phone calls and emails. During these calls, the research team would introduce the study and identify who is authorized to approve research. Once identified, a notification packet could be mailed to them containing information about study objectives and procedures. After study materials are mailed, data collection staff could contact grantee and school administrators to answer any questions they have about the study and to secure participation. The research team could determine procedures to implement if sites decline participation, or a minimum threshold for including a cluster. During the recruitment process, the research team could also identify a primary contact for ongoing coordination and who within the site should be invited to participate.

Data collection

Field staff will be assigned to specific cluster site(s) to support recruitment and data collection and will undergo training prior to site selection. The training would be designed to address all aspects of the project to ensure that data collection activities are

conducted in a consistent, efficient, and culturally responsive manner. The training could include such topics as study purpose, questionnaire content, sampling approach, data collection protocols, respondent privacy and informed-consent procedures, working with cultural and linguistic differences, and the computing systems used to support data collection.

After training, field staff could first work with identified sites to facilitate recruitment. This will include conducting phone calls and sending emails or other written notification about the study. After recruitment is complete, field staff could support online data collection by answering technical questions respondents have and monitoring the rate of data collection. Telephone outreach should be done to ensure adequate coverage from individuals who lack internet access, are uncomfortable with the literacy levels or technological requirements of the web questionnaire or may be otherwise reluctant to participate.

Field staff will work with a survey analyst on the research team to monitor responses to ensure high response rates.

Incentives

Providing incentives for study participants supports data collection efforts and is appropriate in exchange for the time and effort required of participants. Incentives should be provided at the organization level and to individual teachers and parents/. The research team could work with OPRE to determine appropriate incentives after finalizing measures and targeted response rates.

Analysis Plans

General Approach

To comprehensively address the four main research questions associated with Design Option 1, a combination of descriptive, inferential, and correlational analyses can be employed. While different sets of approaches are proposed for the analysis of each research question, some of which involve statistical tests of significance, all of the proposed analyses align with the intent of the descriptive study. Specifically, the menu of analytic approaches proposed here can be used to identify trends, mean differences, and correlational associations to describe system-level supports and cross-system collaborations in place for supporting Head Start children and families during the transition to kindergarten. Because of the study design, the use of statistical significance tests cannot test causal associations, but rather can help describe meaningful

differences across groups and associations amongst correlated variables. **Table 7 – Table 10** map the four main research questions and sub-questions to the constructs under study and specific analytic approaches designed to answer each question. Many research questions define subgroups of interest such as “cluster types” (e.g., by different Head Start-LEA configurations, by urbanicity), program or school characteristics (e.g., size, population served), or state-level contexts. To answer questions for these subgroups, analysis plans include details for varying groupings. The following sections provide details on the analytic approaches highlighted in Table 7 – Table 10 accounting for the nuances associated with each approach and data types.

Descriptive Statistics and Graphical Analyses

For survey items and scales, descriptive statistics and graphical analyses will provide numeric and visual understanding of data trends for the entire sample and specific subgroups defined in research questions. When descriptively analyzing full samples or sub-samples of interest, the same statistical and graphical approaches apply. However, the specific analyses vary by data type.

For continuously distributed data, descriptive statistics include measures of central tendency (e.g., median, mean), standard deviation, minimum, maximum, and skew. For the same continuously distributed data, univariate histograms and boxplots provide visual depictions of distributions that can be helpful for detecting univariate trends and examining distributional assumptions for variables in more advanced statistical models such as the multiple regression models described in a later section. For example, sub-research question 1a in **Table 7** includes a description of analyses for policy, perspective, professional supports, and practice scales. Assuming responses to these scales follow a normal distribution, an analyst can present results in a descriptive statistics table that includes means, standard deviations, minimum, and maximum statistics for Head Start and K-12 survey respondents. Likewise, histograms for each scale could show if the univariate scales have similar or different distributions for Head Start and K-12 settings.

For binary, ordinal, and multinomial variables, response option (e.g., yes/no for binary data) frequencies and percentages can be easily summarized in numerical tables used to detect trends. Helpful graphical analyses for these same types of data include bar graphs of response-option frequencies and percentages and grouped bar graphs to analyze response patterns by subgroups. For example, sub-research question 1e in **Table 7** asks what types of community organizations Head Start programs and LEAs/schools partner with. In the dataset, each organization could be coded yes/no, resulting in a host of binary items. In turn, an analyst may choose to create a table of

frequencies and percentages that displays how often Head Start and K-12 respondents indicated they partnered with each type of community agency.

Lastly, count data (e.g., the number of transition practices being implemented) requires careful attention as data are often skewed and do not follow a normal distribution. Appropriate descriptive statistics and graphical analyses for count data include approaches highlighted for continuously distributed data and paying particular attention to skew, in addition to approaches highlighted for ordinal data by grouping responses into logical categories based on the distribution (e.g., groups for 0 to 0.5, 0.5 to 1, 1 to 2, and 2+). For example, several sub-research questions in **Table 8** include transition practices as a construct of interest. An analyst may choose to create a variable with the total number of transition practices endorsed for each survey respondent. The resulting variable may have a small range (e.g., 0 to 7 or 8) and the distribution of this count of transition practices may skew toward one of tail of the distribution. In this example, displaying the count of the number of transition practices as a histogram will most likely reveal whether to treat the variable as a count or continuously distributed variable. If it is skewed, the analyst can group the data using logical categories such as 0 to 2 transition practices, 2 to 5 practices, and more than 5 practices. In turn, examining frequencies and percentages by these logical categories is appropriate.

Basic Inferential Statistics

Basic inferential statistics provide a concrete way to detect group differences for subgroups defined in research questions. Like descriptive analyses, basic inferential statistics differ by the type of data being analyzed. For continuously distributed variables, t-tests can be used to detect mean differences between two groups, and analysis of variance (ANOVA) can be used to detect average differences between more than two groups. Returning to the example for descriptively analyzing continuously distributed data, an analyst could use t-tests to compare means for transition policy, perspective, professional support, and practice scales between Head Start and K-12 respondents. For binary, ordinal, and multinomial variables, chi-square tests are appropriate methods for detecting group differences between two or more groups. Building upon the example previously mentioned related to partnering with different types of community agencies, chi-square tests can provide a test as to whether these proportions vary between Head Start programs and LEAs/schools. For count-type data, choice of the appropriate basic inferential tests depends on the distributional form. If count data is not skewed, analysts may choose to use methods appropriate for continuously distributed data. If count-type data is skewed, chi-square tests may be employed by grouping responses into logical categories as was described in the previous section.

Analyzing Associations and Correlations

Several questions, such as question 2a in **Table 8**, ask about the relationships among variables. These relationships, operationalized as correlations, can be analyzed in terms of bivariate and multivariate associations. Bivariate associations can be numerically assessed with correlations and associated statistical tests (e.g., Pearson correlations for continuous variables with linear associations). Multiple regression analyses can be used to assess multivariate correlations for linearly distributed outcomes and can be extended to outcome variables that are not continuously distributed using the appropriate form of the generalized linear model (GLM; e.g., logistic regression for binary outcomes, Poisson regression for outcomes with count distributions). Looking more closely at question 2a in **Table 8**, an analyst may want to run a multiple regression analysis with scales for each of the 4Ps predicting the extent to which teachers receive professional supports related to transitions. This statistical model would allow for testing parameter estimates for each of the 4Ps that effectively assess whether each variable is significantly correlated with the professional support outcome.

For research questions focused on correlations between family outcome variables in relation to theoretical/hypothetical models of transition processes and functions, structural equation models (SEMs) could be used. For example, the analysis plan for the questions 4c in **Table 10** proposes to use correlational analyses to unpack associations between system-level supports and family outcomes. An analyst could use SEMs to unpack the correlational relationship amongst a subset of variables, such as scales representing the 4Ps and families' comfort and agency in the transition process. The SEM could provide information on the *pathway* (or mechanisms) through which systems-level approaches and supports may be associated with different family outcomes. This model could provide information as to the extent to which scales representing the 4Ps correlate with one another, and the extent to which each of the 4Ps statistically predicts important family outcomes. It is worth noting, SEM is a flexible framework that can be readily extended to non-continuous data (e.g., binary data).

Mapping of analytic techniques to RQs

Table 7. Design Option 1 analyses for sub-research questions under RQ 1

Research Question 1: What does collaboration between Head Start programs and local education agencies/schools to support children's transition to kindergarten look like at the systems level?

Sub-Research Question	Constructs	Analyses
1a. In what ways do Head Start programs and LEAs/schools coordinate to align perspectives, policies, professional supports, and practices around the kindergarten transition?	Alignment of the following at the Head Start and LEA level and teacher level: • Policies • Perspectives • Professional supports • Practices	Descriptive statistics and graphical analyses of policy, perspective, professional support, and practice scales and items for the full sample, at the cluster level, and disaggregated by Head Start and K-12 administrators.
1b. How does coordination differ for programs/schools with different characteristics, including the children/students they serve and their educator characteristics?	• Policies • Perspectives • Professional Supports • Practices • Teacher characteristics • Child and family characteristics	Descriptive statistics and graphical analyses of policy, perspectives, professional support, and practice scales and items disaggregated by program-/school-level teacher and child/family characteristics. Basic inferential statistics to compare policy and professional support scale and item response patterns between groups defined by aggregated teacher and child/family characteristics.
1c. How does HS-LEA collaboration in support of kindergarten transitions vary by state-level policy contexts?	• Collaboration and coordination across systems • State-level contexts	Descriptive statistics and graphical analyses of collaboration scales and items disaggregated by state-level contexts. Basic inferential statistics to compare collaboration scales and items response patterns between groups defined by state-level contexts.
1d. What staff members play a role in supporting transitions (Head Start education coordinators, disabilities coordinators, program and center directors, elementary school principals, other elementary school staff, district central office	• Job titles • Job descriptions • TTK roles and responsibilities	Descriptive statistics and graphical analyses of items relating to the TTK roles and responsibilities. Analyses across the full sample and at the cluster level.

Research Question 1: What does collaboration between Head Start programs and local education agencies/schools to support children's transition to kindergarten look like at the systems level?		
Sub-Research Question	**Constructs**	**Analyses**
staff)? What do their roles entail?		
1e. What other community organizations do Head Start programs and LEAs/ schools partner with to support transitions to kindergarten?	• Community organization types (e.g., library) • Partnering to support TTK • Activities conducted in partnership with community organizations	Descriptive statistics and graphical analyses of community organization partnership frequencies disaggregated by Head Start and K-12 respondents and at the cluster level.

Table 8. Design Option 1 analyses for sub-research questions under RQ 2

Research Question 2: How do kindergarten transition approaches vary by system-level supports and cross-system collaborations?		
Sub-Research Question	**Constructs**	**Analyses**
2a. What system- and program-level characteristics are associated with different transition supports available for teachers, families, and children?	• Transition practices and professional supports at teacher level • Head Start and LEA characteristics	Correlational and regression analyses to unpack associations between system- and program-level characteristics and transition practices for children and families and professional supports for teachers, at full sample and cluster level.
2b. In what ways do teachers' kindergarten transition practices differ by system-level supports and cross-system collaborations around kindergarten transitions?	• Transition practices • Professional supports • Programmatic factors • Alignment factors • Coordination across systems	Descriptive statistics and graphical analyses of transition practices scales and items disaggregated by system-level supports and cross-system collaboration, at full sample and cluster level. Basic inferential statistics to compare response patterns on transition practice scales and items between groups defined by system-level supports and cross-system collaboration.
2c. Do teachers receive different types of system-level supports for improving kindergarten transitions depending on the children they serve (e.g., children with	• Professional supports • Transition practices • Child characteristics	Descriptive statistics and graphical analyses of professional support scales and items disaggregated by groups defined by characteristics of the

Research Question 2: How do kindergarten transition approaches vary by system-level supports and cross-system collaborations?		
Sub-Research Question	**Constructs**	**Analyses**
Individualized Education Programs (IEPs), English learners)?		children teachers serve at full sample and cluster level. Basic inferential statistics to compare response patterns for professional supports items and scales between groups defined aggregated characteristics of the children teachers serve at full sample and cluster level.
2d. In what ways do families' experiences with preparing their child for kindergarten and with their child's transition into kindergarten differ by system-level supports and cross-system collaborations around kindergarten transitions?	• Family experiences • Alignment factors • Coordinated transition practices	Descriptive statistics and graphical analyses for family experience scales and items disaggregated by system-level supports and cross-system collaboration Basic inferential statistics of family experience scale and item response patterns between groups defined by system-level supports and cross-system collaboration

Table 9. Design Option 1 analyses for sub-research questions under RQ 3

Research Question 3: What are the patterns of transition from Head Start programs to kindergarten in various schools?		
Sub-Research Question	**Constructs**	**Analyses**
3a. What information do Head Start teachers, center directors, and other Head Start personnel know about where their children will be transitioning to?	• Head Start personnel knowledge of children's kindergarten placement	Descriptive statistics and graphical analysis of kindergarten placement scales and items for full sample of Head Start respondents and disaggregated by job title. Basic inferential statistics of kindergarten placement variables between groups defined by job titles.
3b. What is the prevalence of transition patterns between Head Start and kindergarten (e.g., how	• Number of elementary schools and/or kindergarten classrooms to which each	Descriptive statistics and graphical analyses of the number of different schools Head Start

Research Question 3: What are the patterns of transition from Head Start programs to kindergarten in various schools?		
Sub-Research Question	**Constructs**	**Analyses**
many different schools do children from Head Start centers transition into for kindergarten)?	Head Start program/and or center sends children	programs and/or centers report sending children to, at full sample and cluster level.
3c. Do transition patterns differ by contextual conditions such as location, state and district policies, and local demographics?	• State- and district-level contexts • Neighborhood characteristics/ demographics	Descriptive statistics and graphical analyses of the number of different schools Head Start programs and/or centers report sending children disaggregated by contextual groupings. Basic inferential statistics to compare the counts of different schools where Head Start programs/centers send children between groups defined by contextual conditions.

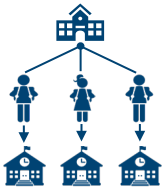
Table 10. Design Option 1 analyses for sub-research questions under RQ 4

Research Question 4: What are the outcomes of successful transitions for leaders, teachers, families, and children?		
Sub-Research Question	**Constructs**	**Analyses**
4a. How do leaders, teachers and families define “successful transitions” to kindergarten?	• Perspectives on beneficial transition practices • Perspectives on transition outcomes	Descriptive statistics and graphical analyses of survey items related to perspectives on transition practices and outcomes disaggregated by respondent type (i.e., leader, teacher, family member). Basic inferential statistics to determine if perspectives of “successful transitions” differ by respondent type (i.e., leader, teacher, family member).

4b. In what ways do family outcomes related to children’s transition into kindergarten (e.g., family-school communication, agency around child’s educational needs, stress, comfort with the transition, social capital) differ by system-level	• Family outcomes
	  ○ Family-school communication
	  ○ Agency around child needs
	  ○ Comfort with transition
	  ○ Social capital
		Descriptive and graphical analyses of family outcome variables disaggregated by different levels of system-level support and cross-system collaboration.

Research Question 4: What are the outcomes of successful transitions for leaders, teachers, families, and children?

Sub-Research Question	Constructs	Analyses
supports and cross-system collaborations around kindergarten transitions?		Basic inferential statistics of family outcome variables between groups defined by levels of system-level supports and cross-system collaboration. Linear and GLM (e.g., logistic) regression models w/ grouping indicators for relative support and collaboration and family outcome variables as the dependent variable.
4c. Do the associations between system-level supports and family outcomes vary for families with different needs and backgrounds (e.g., children with IEPs, who are homeless, who have experienced trauma, from migrant communities, with different levels of parental education, or children and families with varying cultural and linguistic backgrounds)?	• Family outcomes (see above) • Child and family characteristics	Correlational (including SEM analyses) and regression analyses to unpack associations between system-level supports and family outcomes. Correlational analyses can be extended by examining correlation matrices for different groups based on child and family characteristics, which can be accomplished using multiple group SEM analyses. Regression analyses predicting family outcomes can include indicators for child and family characteristics, in addition to interaction terms of these characteristics and system-level supports.



Design Option 2: Individual-Level Approach

Introduction

Design Option 2 presents a different approach to studying transitions from Head Start to kindergarten. Here, we offer a design that samples Head Start programs from across the country and then follows children into kindergarten to sample elementary schools and LEAs for data collection. The goal of Design Option 2 is to follow groups of children from Head Start programs into LEAs (for kindergarten) so we could capture their experiences and outcomes on both sides of the transition, understand the patterns of collaboration and supports across Head Start programs and LEAs, and explore whether those supports are associated with particular child and family experiences and outcomes over time. To do so, in addition to the systems-, teacher-, and family-level data collection efforts described under Design Option 1, Design Option 2 proposes to collect additional information from teachers and caregivers about individual children and would provide information on family experiences and outcomes at multiple timepoints. As such, Design Option 2 will allow for an examination of how system- and teacher-level approaches to supporting kindergarten transitions relate to child and family experiences and outcomes.

Sampling Plan and Overall Design

Design

Design Option 2's descriptive study would address research questions 1 – 4 and focus on system-, family-, and child-level characteristics, inputs, and outputs during the transition period. This study would include family- and child-level experiences and outcomes. This study is designed to build on a nationally representative sample of Head Start programs (although it would not be representative of children). The current design assumptions are that data collection would occur through survey administration to various levels of both the sending (Head Start) and receiving (K-12) system as well as families.

Sampling Specifications

The sampling unit for Design Option 2 is Head Start programs (i.e., grantees or delegates that provide direct services to children and families). As currently conceived, this sampling could build from an existing sampling frame of nationally representative programs. To begin, the research team could select 30 Head Start programs (inclusive of grantees or delegates that provide direct services, and exclusive of Early Head Start programs). Thirty Head Start programs represents half of the current FACES Classroom + Child Core Study sample. Beginning with a smaller number of programs has the benefit of focusing on more children within each center.

After selecting the initial sample of programs, the current design assumes the research team would randomly sample two centers under each program and extend data collection to all lead teachers in the centers. The team should aim to obtain high enough response rates to aggregate to program-/school-level measures.

We would then recommend that the study randomly sample at least 12 children/families per center and follow these children/families into kindergarten. This approach mirrors other ACF-funded studies, such as Head Start FACES (United States Department of Health & Human Services, 2020). Because of the nesting of children within centers, it is important to sample *enough* children to allow analyses to distinguish between within-center variance (differences that come from the individual children that attend the same Head Start center) and between-center variance (differences that capture something *shared* among children within the same center, but different from children in another center). The study would follow children into two elementary schools to collect information about their transition experiences. To select the elementary schools, the study team could select the two elementary schools where the most children transition into and keep the children in those schools in the sample. At the school level, the study design suggests the team sample all kindergarten teachers in those two elementary schools. The sample could be supplemented with additional randomly selected kindergarten students to achieve a sample of 12 children per elementary school. If appropriate, the team could select additional students in ways that ensure the sample includes a diverse group.

Calculating Power Estimates

Similar to Design Option 1, we will conduct a power analysis to determine a final sample size prior to data collection. This power analysis will consider similar parameters and consider a nested design with 12 children and families per center. The possibility to account for a cross-nested design with children nested in both Head Start centers and elementary schools should be considered, but the sample sizes are likely to be too

small to allow for this. The research team is advised to complete this analysis once survey instruments and the design are finalized.

Assumptions

Design Option 2 assumes the sampling frame will be built from an existing OPRE study. and that ACF is able to provide the sampling frame to the research team. One benefit of this approach is cost efficiency, gained by leveraging an existing study frame. However, this may place extra burden on programs that are already participating in other studies. The research team should plan carefully to avoid adding burden unnecessarily (for example, ensuring survey instruments are an appropriate length, supplementing program or demographic information with publicly available data).

Within the existing frame, there would need to be enough children/families clustered within Head Start programs and elementary schools to nest them for analyses. For example, if a Head Start program was selected where children disperse to multiple LEAs or elementary schools for kindergarten, it may be difficult to select two schools with at least six children from the Head Start program. The ability to conduct analyses when children are nested in Head Start programs and elementary schools allows for a stronger look at associations between program/school-level characteristics and child/family outcomes. Finally, this study design would assume a focus on program-level and individual-level analyses, but not classroom-level. The sampling strategy would be underpowered for classroom-level analyses.

Data Collection Plans

Modes of data collection and timing

This study design includes new data collection from surveys of Head Start families, teachers, administrators, center directors, and grantees, and personnel from elementary schools/LEAs. In addition to surveys, it includes reports on child-level outcomes from teachers and families using appropriate measures. Secondary data providing context of families/children's experiences could be collected from the Census, PIR reports, and NIEER State of Preschool reports.

Data collection for Design Option 2 are assumed to occur at two data collection time periods, likely once in the spring and once the following fall. Based on the currently conceived design, surveys of Head Start center directors and teachers would occur towards the end of the Head Start program year (spring). This may vary for programs; for example, some programs might end in late spring versus others in the summer.

Surveys of LEA administrators and teachers would occur at the beginning of the kindergarten year (fall). Surveys of parents and caregivers would occur at the end of the Head Start year and again at the beginning of the kindergarten year. With data collection over time, the research team could answer questions related to changes in family and/or child-level outcomes. The research team could then test potential associations of changes over time associated with system-level transition activities.

Data Collection Tools

Administrator Surveys

The same four Head Start and LEA administrator surveys described above for Design Option 1 from KTS[2] (i.e., surveys for the Head Start program administrator, Head Start center administrator, LEA administrator, and elementary school administrator) could also be designed and administered under this Design Option. These surveys could capture information on systems-level transition practices, policies/procedures, professional supports, and perspectives, among other systems-level constructs (see **Table 3** for a full list of constructs and measurement considerations for the administrator surveys).

Teacher Surveys

As with Design Option 1, the research team could also develop Head Start and kindergarten teacher surveys under this design option. The first part of the teacher surveys could include information on teacher perspectives, professional supports, and transition practices; organizational climate; leadership; and demographic information on teachers, families, and children. All of these constructs and measurement considerations are the same as those described for the teacher surveys under Design Option 1 (see **Table 4** for a full list of constructs). The second part of the teacher survey could include additional constructs for capturing information about the sampled children. These additional constructs could include information about sampled children's social and behavioral adjustment, academic adjustment, dispositions towards school, and demographics **(Table 11**). The design calls for teachers to complete surveys on these additional constructs for each sampled child in their classroom. Measures for these additional constructs on children already exist to some extent and can be taken from pre-existing surveys, but the research team would need to review these measures and instruments more carefully and determine which items can be taken "as is" and which would need to be adapted to more closely fit the specific needs of the study.

More specifically, the study team could likely take full scales that were included in the ECLS-K (i.e., teacher-reported social skills, teacher-reported Children's Behavior

Questionnaire, and teacher reported Academic Rating Scale) to measure for social, behavioral, and academic adjustment in the study's teacher questionnaire. For dispositions toward school, the research team could likely use full scales that were included in the ECLS-K (i.e., teacher-reported Approaches to Learning, student-teacher relationship scale) and would also review items about teachers' perception about children's difficulty with the transition to kindergarten from the NEILS and PEELS to determine whether these items would need to be modified for use in the study. Some items about child characteristics (e.g., child special needs, IEP information) could be adapted from existing nationally representative studies (e.g., ECLS-K, FACES). We note, however, that some demographic items of interest for children may have been gathered at the program or classroom level and not at the individual level in theses existing data sources. The research team would compile all of the items that can be taken "as is" from other surveys, the items adapted from the other surveys, and any additional items that would need to be developed, into one survey for teachers.

Table 11. Teacher survey – Child characteristics and outcomes

Construct	Considerations for Measurement	Measure can be based on tool that already exists	Measure would need to be developed
Social & behavioral adjustment	The ECLS-K includes the following scales that could be used: • Teacher-reported social skills • Teacher-reported Children's Behavior Questionnaire	✓	
Academic adjustment	The ECLS-K includes a Teacher-reported Academic Rating Scale	✓	

Dispositions toward school	• ECLS-K:
	  ○ Teacher-reported Approaches to Learning scale
	  ○ Student-Teacher relationship scale
	• NEILS & PEELS:
	  ○ Teacher-rated level of difficulty of child's experience with TTK
		✓	

Child demographic and other characteristics	• ECLS-K • FACES	✓	

Parent/Caregiver Survey

Design Option 2 would build upon the surveys developed for parents/caregivers under Design Option 1. The first part of the parent/caregiver surveys would collect information

on caregivers' experiences related to transition supports and benefits to them. Information on parents/caregivers would include demographics (of caregivers and children), family experiences with the transition from Head Start to kindergarten, family-school communication, agency around the child's needs, comfort with the transition, social capital, and use of transition supports (see **Table 5**).

Additional survey items under this design option would focus on children's kindergarten placement, children's social and behavioral adjustment into kindergarten, and children's dispositions towards school (**Table 12**). There is some information in pre-existing surveys related to children's kindergarten placement (i.e., child grade/program type) that could likely be taken "as is" from the FACES and HSIS surveys. There are also questions from the PKTP focus groups on information that was helpful in deciding where the child will enroll, but these items may need to be adapted for use in survey format. The research team would need to review these instruments and determine whether items are sufficient for the study needs, whether they would need to be adapted, and whether additional survey items would need to be developed.

For information on parents' report of children's social and behavioral adjustment and dispositions toward school, the study team could likely take full scales that were included in the ECLS-K (i.e., parent-reported social skills and parent-reported Approaches to Learning) for use in the study's teacher questionnaire. The study team would also need to review items about parents' perception about how transition to kindergarten has gone for the child to determine whether these items would need to be modified for use in the study.

Table 12. Parent/caregiver survey – Child outcomes

Construct	Considerations for Measurement	Measure can be based on tool that already exists	Measure would need to be developed
Child demographics	Can be pulled from multiple surveys (e.g., FACES, HSIS, Census)	✓	
Child kindergarten placement	Items could be adapted from the following sources: • FACES & HSIS: Information on what grade/program type the child is attending • PKTP Focus Groups: Information that has been most helpful in deciding where their child will enroll		✓

Construct	Considerations for Measurement	Measure can be based on tool that already exists	Measure would need to be developed
Social & behavioral adjustment	The ECLS-K includes a parent-reported social skills scale	✓	

Dispositions toward school	A few existing surveys have information and scales for parents about children's dispositions toward school that could be used:
	• ECLS-K:
	  ○ Parent-reported Approaches to Learning scale for parents
	  ○ Children's behaviors and feelings during the transition to school
	• ECLS-B:
	  ○ Child's feelings toward attending kindergarten
	• NEILS:
	  ○ How parents perceive the transition has gone for his/her child
		✓	

Availability and feasibility of using other existing data sources

As with the first design option, in addition to pulling instruments from existing data sources, additional data could be pulled from sources like the NIEER preschool yearbooks, the Head Start PIR, the Census, and others (see Design Option 1, **Table 6**).

Timeline

Field data collection efforts would begin after approval from Office of Budget and Management (OMB) and required Institutional Review Boards (IRBs). Recruitment could then actively occur approximately three months prior to the anticipated date of data collection. During this three-month period, the research team could work to acquire letters of commitment from ACF to encourage engagement from Head Start programs. Recruitment of children and families would take place after consent is obtained from Head Start programs. Active recruitment and attainment of letters of commitment could require significant outreach during this time period. During this time period, the programming of surveys could be finalized. After pre-data collection efforts are complete, data collection could occur in two phases:

1. A 3- to 4-month period during spring of a program year when children are finishing Head Start (along with data collection from Head Start program & center staff), and
2. A 3- to 4-month period during fall of a school year when children in the sample are in kindergarten (along with data collection from LEA and elementary school staff).

Recruitment of grantees and families

This study design will build from a pre-existing sample of Head Start grantees. From there, the research team will sample Head Start centers, and then children and families. Head Start grantees will already be part of the existing sample frame and may have experience participating in the existing study. Still, the research team will work with ACF to develop a relationship and recruitment procedure for engaging with grantees. From grantees, the research team will randomly select two centers across the grantees' available Head Start programs, and 12 children/families within each center. Once sampling is complete, field staff will mail physical copies of study information packets to centers, teachers, and families. Field staff will follow up with in-person visits and phone calls to answer questions about the study and to obtain consent (particularly from parents). Field staff will work closely with Head Start centers to obtain and collect consent forms.

This study will follow selected children/families into kindergarten. Recruitment of elementary schools/kindergarten sites will take place as children transition into kindergarten. At the end (spring) of the first year of data collection, the research team will collect information from families to determine where the 12 selected children will attend kindergarten. The research team will select two elementary schools/kindergarten sites to engage for data collection, based on where the highest number of children are transitioning to. The research team will conduct initial outreach to develop a relationship with schools and their LEAs. Depending on the dispersion of children across elementary schools, the sample may be supplemented with other children in selected kindergarten classrooms. The research team will work with the school to recruit new families. Field staff will follow up with in-person visits and phone calls to answer questions about the study and obtain consent from school administration, teachers, and any families that are new to the study.

Data collection

Field staff will be assigned to specific Head Start centers and elementary schools to support recruitment and data collection and will undergo training prior to site selection. The training would be designed to address all aspects of the project to ensure that data

collection activities are conducted in a consistent, efficient, and culturally responsive manner. The training should include such topics as study purpose, questionnaire content, sampling approach, data collection protocols, respondent privacy and informed-consent procedures, working with cultural and linguistic differences, and the computing systems used to support data collection.

After training, field staff could first work with identified Head Start grantees and LEAs to facilitate recruitment. This could include conducting phone calls and sending emails or other written notification about the study. After recruitment is complete, field staff could support online data collection by answering technical questions respondents have and monitoring the rate of data collection. Telephone, text-messaging, and in-person outreach should be done to ensure adequate coverage from individuals who lack internet access, are uncomfortable with the literacy levels or technological requirements of the web questionnaire or may be otherwise reluctant to participate.

Field staff will work with a survey analyst on the research team to monitor responses to ensure high response rates. If response rates appear disproportionately low in particular sites, the research team and field staff may direct additional resources toward those sites.

Incentives

Providing incentives for study participants supports data collection efforts and is appropriate in exchange for the time and effort required of participants. Incentives will be provided to participating Head Start programs and centers, LEAs, elementary schools, teachers, and participating families. The research team could work with OPRE to determine appropriate incentives after finalizing measures.

Analysis Plans

General Approach

The general approach for Design Option 2 will be similar to Design Option 1 with several substantive differences. First, Design Option 2 will include analyses of child outcomes. Second, the research questions for Design Option 2 require program-level analyses and detecting differences based on child and family characteristics rather than cluster-level analyses articulated in Design Option 1. To be more specific, the “groups” to be examined under Design Option 1 are based on Program or school characteristics (e.g., size, population served), and partnership classifications such as Head Start-LEA/school “partners” where more or fewer students transition together (e.g.,

programs/schools where a larger percent of students transition together vs. programs/schools where a small percent of students transition together). Third, analyses can look at changes in outcomes over time. While these substantive differences make Design Options 1 and 2 unique, the resulting descriptive analyses, basic inferential statistics, and correlational analysis are the same (please see the Analysis Plans for Design Option 1 for specific details). It is important to note that the study design of Design Option 2 does not permit interpreting statistical significance tests as causal associations. Significance tests can help describe meaningful differences across groups and amongst correlated variables to describe system-level supports and cross-system collaborations in place for supporting Head Start children and families during the transition to kindergarten.

Mapping of analytic techniques to RQs

In the tables below, we include all analyses to be conducted under Design Option 2.

- We shade the cells blue that are **unique** to Design Option 2.
- For questions that are included in Design Option 1 but are **not included** in Design Option 2, we have a strikethrough the text.
- All others are replicated from **Table 7 – Table 10** above for Design Option 1.

Table 13. Design Option 2 analyses for sub-research questions under RQ 1

Research Question 1: What does collaboration between Head Start programs and local education agencies/schools to support children's transition to kindergarten look like at the systems level?

Sub-Research Question	Constructs	Analyses
1a. In what ways do Head Start programs and LEAs/schools coordinate to align perspectives, policies, professional supports, and practices around the kindergarten transition?	Alignment of the following at the Head Start and LEA level and teacher level: • Policies • Perspectives • Professional supports • Practices	Descriptive statistics and graphical analyses of policy, perspective, professional support, and practice scales and items for the full sample level and disaggregated by Head Start and K-12 respondents
1b. How do coordination differ for programs/schools with different characteristics, including the children/students they serve and their educator characteristics?	• Policies • Perspectives • Professional Supports • Practices • Teacher characteristics • Child and family characteristics	Descriptive statistics and graphical analyses of policy, perspective, professional support, and practice scales and items disaggregated by program/school-level teacher and child/family characteristics Basic inferential statistics to compare policy, perspective,

Research Question 1: What does collaboration between Head Start programs and local education agencies/schools to support children's transition to kindergarten look like at the systems level?		
Sub-Research Question	**Constructs**	**Analyses**
		professional support, and practice scale and item response patterns between groups defined by program/school-level teacher and child/family characteristics
1c. How does HS-LEA collaboration in support of kindergarten transitions vary by state-level policy contexts?	• Collaboration and coordination across systems • State-level contexts	Descriptive statistics and graphical analyses of collaboration scales and items disaggregated by state-level contexts Basic inferential statistics to compare collaboration scales and items response patterns between groups defined by state-level contexts
1d. What staff members play a role in supporting transitions (Head Start education coordinators, disabilities coordinators, program and center directors, elementary school principals, other elementary school staff, district central office staff)? What do their roles entail?	• Job titles • Job descriptions • TTK roles and responsibilities	Descriptive statistics and graphical analyses of items relating to the TTK roles and responsibilities
1e. What other community organizations do Head Start programs and LEAs/schools partner with to support transitions to kindergarten?	• Community organization types (e.g., library) • Partnering to support TTK • Activities conducted in partnership with community organizations	Descriptive statistics and graphical analyses of community organization partnership frequencies disaggregated by Head Start and K-12 respondents

Table 14. Design Option 2 analyses for sub-research questions under RQ 2

Research Question 2: How do kindergarten transition approaches vary by system-level supports and cross-system collaborations?		
Sub-Research Question	**Constructs**	**Analyses**
2a. What system- and program-level characteristics are associated with different transition supports available for teachers, families, and children?	• Transition practices and professional supports at teacher level	Correlational and regression analyses to unpack associations between system- and program-level characteristics and transition

Research Question 2: How do kindergarten transition approaches vary by system-level supports and cross-system collaborations?

Sub-Research Question	Constructs	Analyses
	• Head Start and LEA characteristics	practices for children and families and professional supports for teachers
2b. In what ways do teachers' kindergarten transition practices differ by system-level supports and cross-system collaborations around kindergarten transitions?	• Transition practices • Professional supports • Programmatic factors • Alignment factors • Coordination across systems	Descriptive statistics and graphical analyses of transition practices scales and items disaggregated by system-level supports and cross-system collaboration Basic inferential statistics to compare response patterns on transition practice scales and items between groups defined by system-level supports and cross-system collaboration
2c. Do teachers receive different types of system-level supports for improving kindergarten transitions depending on the children they serve (e.g., children with Individualized Education Programs (IEPs), English learners)?	• Professional supports • Transition practices • Child characteristics	Descriptive statistics and graphical analyses of professional support scales and items disaggregated by groups defined by characteristics of the children teachers serve Basic inferential statistics to compare response patterns for professional supports items and scales between groups defined aggregated characteristics of the children teachers serve.
2d. In what ways do families' experiences with preparing their child for kindergarten and with their child's transition into kindergarten differ by system-level supports and cross-system collaborations around kindergarten transitions?	• Family experiences • Alignment factors • Coordinated transition practices	Descriptive statistics and graphical analyses for family experience scales and items disaggregated by system-level supports and cross-system collaboration Basic inferential statistics of family experience scale and item response patterns between groups defined by system-level supports and cross-system collaboration

Table 15. Design Option 2 analyses for sub-research questions under RQ 3

Research Question 3: What are the patterns of transition from Head Start programs to kindergarten in various schools?

Sub-Research Question	Constructs	Analyses
3a. What information do Head Start teachers, center directors, and other Head Start personnel know about where their children will be transitioning to?	• Head Start personnel knowledge of children's kindergarten placement	Descriptive statistics and graphical analysis of kindergarten placement scales and items for full sample of Head Start respondents and disaggregated by job title. Basic inferential statistics of kindergarten placement variables between groups defined by job titles.
3b. What is the prevalence of transition patterns between Head Start and kindergarten (e.g., how many different schools do children from Head Start centers transition into for kindergarten)?	• Number of elementary schools and/or kindergarten classrooms to which each Head Start program and/or center sends children	Descriptive statistics and graphical analyses of the number of different schools Head Start programs and/or centers report sending children to.
Included in Design Option 1 but not included in Design Option 2 ~~**3c.** Do transition patterns differ by contextual conditions such as location, state and district policies, and local demographics?~~	~~• State- and district-level contexts~~ ~~• Neighborhood characteristics/ demographics~~	~~Descriptive statistics and graphical analyses of the number of different schools Head Start programs and/or centers report sending children disaggregated by contextual groupings.~~ ~~Basic inferential statistics to compare the counts of different schools where Head Start programs/centers send children between groups defined by contextual conditions.~~

Table 16. Design Option 2 analyses for sub-research questions under RQ 4

Research Question 4: What are the outcomes of successful transitions for leaders, teachers, families, and children?

Sub-Research Question	Constructs	Analyses
4a. How do leaders, teachers and families define "successful transitions" to kindergarten?	• Perspectives on beneficial transition practices • Perspectives on transition outcomes	Descriptive statics and graphical analyses of survey items related to perspectives on transition practices and outcomes disaggregated by respondent type

Research Question 4: What are the outcomes of successful transitions for leaders, teachers, families, and children?

Sub-Research Question	Constructs	Analyses
		(i.e., leader, teacher, family member). Basic inferential statistics to determine if perspectives of "successful transitions" differ by respondent type (i.e., leader, teacher, family member).

4b. In what ways do family outcomes related to children's transition into kindergarten (e.g., family-school communication, agency around child's educational needs, stress, comfort with the transition, social capital) differ by system-level supports and cross-system collaborations around kindergarten transitions?	• Family outcomes
	  ○ Family-school communication
	  ○ Agency around child needs
	  ○ Comfort with transition
	  ○ Social capital
		Descriptive and graphical analyses of family outcome variables disaggregated by different levels of system-level support and cross-system collaboration.
		
		Basic inferential statistics of family outcome variables between groups defined by levels of system-level supports and cross-system collaboration.
		
		Linear and GLM (e.g., logistic) regression models w/ grouping indicators for relative support and collaboration and family outcome variables as the dependent variable.

4c. Do the associations between system-level supports and family outcomes vary for families with different needs and backgrounds (e.g., children with IEPs, who are homeless, who have experienced trauma, from migrant communities, with different levels of parental education, or children and families with varying cultural and linguistic backgrounds)?	• Family outcomes (see above) • Child and family characteristics	Correlational (including SEM analyses) and regression analyses to unpack associations between system-level supports and family outcomes. Correlational analyses can be extended by examining correlation matrices for different groups based on child and family characteristics, which can be accomplished using multiple group SEM analyses. Regression analyses predicting family outcomes can include indicators for child and family characteristics, in addition to interaction terms of these characteristics and system-level supports.

Research Question 4: What are the outcomes of successful transitions for leaders, teachers, families, and children?

	Sub-Research Question	Constructs	Analyses

Unique to Design Option 2	**4d.** In what ways do child outcomes related to the transition into kindergarten (e.g., social and behavioral adjustment, academic adjustment, dispositions towards school, approaches to learning) differ by systems-level supports and cross-system collaborations around kindergarten transitions?	• Child outcomes
		  ○ Social & behavioral adjustment
		  ○ Academic adjustment
		  ○ Dispositions towards school
		  ○ Approaches to learning
			Descriptive and graphical analyses of child outcome variables disaggregated by different levels of system-level support and cross-system collaboration
			
			Basic inferential statistics of child outcome variables between groups defined by levels of system-level supports and cross-system collaboration
			
			Linear and GLM (e.g., logistic) regression models w/ grouping indicators for relative support and collaboration and child outcome variables as the dependent variable

Unique to Design Option 2	**4e.** Do the associations between systems-level supports and child outcomes differ for children with different needs and from different backgrounds (e.g., students with IEPs, English learners)?	• Child outcomes (see above) • Child characteristics	Correlational (including SEM analyses) and regression analyses to unpack associations between system-level supports and child outcomes. Correlational analyses can be extended by examining correlation matrices for different groups based on child and family characteristics, which can be accomplished using multiple group SEM analyses. Regression analyses predicting child outcomes can include indicators for child and family characteristics, in addition to interaction terms of these characteristics and system-level supports.

Summary of Two Design Options

Key Differences of the Two Design Options

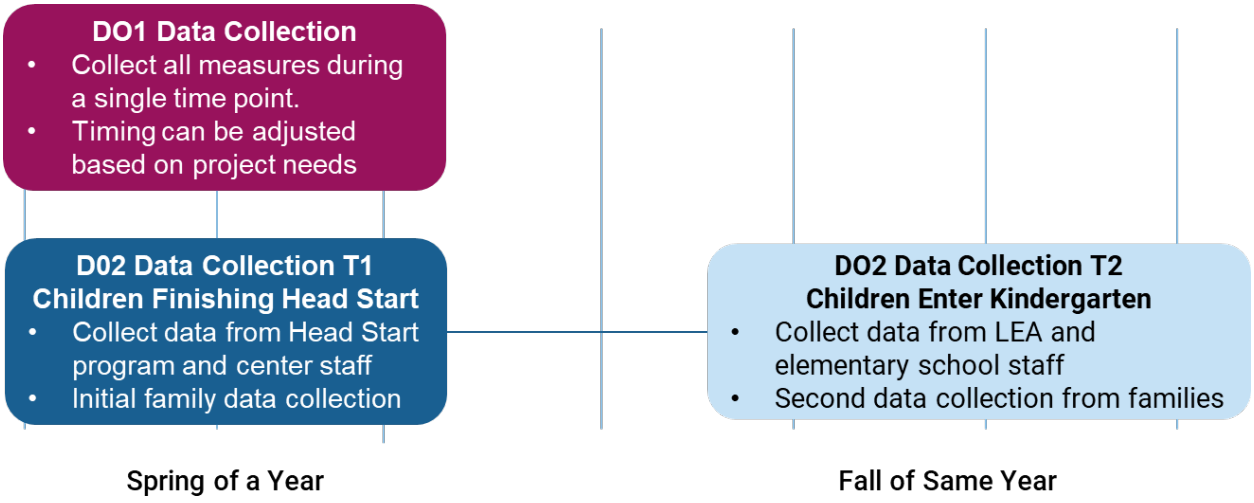
In this section, we return to the similarities and differences across design options (initially presented in Table 1).

Table 17. Summary of Key Differences between Design Options

	 **Design Option 1**	 **Design Option 2**
Sampling	• **Initial sample**: census tracts radius • Select all Head Start centers and elementary schools within this area	• **Initial sample**: existing sample of nationally representative Head Start programs • Selection of two centers within each program • Select children within those programs • Select two elementary schools where most children from each Head Start center transition into
Measures	Both design options will use KST[2] items on systems-level collaboration and supports as well as existing data (e.g., HS administrative data, NCES, NIEER, Census Data, etc.)	
	Focus on cross-system partnerships and family experiences • Administrator measures of transition practices • Teacher measure of transition practices and supports • Family measures of experiences	*Focus on child experiences and outcomes* • Administrator measures of transition practices • Teacher measure of transition practices and supports • Teacher and Family measures about child outcomes • Family measures of experiences and outcomes
Level of Analysis	• Program/school/LEA level • Cluster level	• Program/school/LEA level • Family/child level
Research Questions	• RQ1-3 with a focus on system-level and teacher-level collaboration • RQ4 sub-questions that focus on family experiences and outcomes	• RQ1-4 • Will address questions about child outcomes

There are also different timelines for the two design options, as noted in Figure 4. Design Option 1 occurs at one time-point during the spring of a year (in Head Start programs/centers, elementary schools, and LEAs) while Design Option 2 is intended to occur over two timepoints.

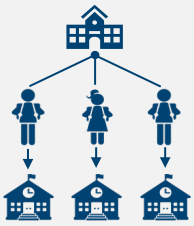
Figure 4. Comparison of Timelines for Design Options 1 and 2



Practical Considerations & Challenges

As with any study design, there are benefits and challenges to consider. Table 18 summarizes the benefits and challenges of each design option for future researchers and ACF to consider.

Table 18. Benefits and Challenges of Each Design Option

	Benefits	Challenges
Design Option 1 	• Unique contribution to existing research by focusing on the systems-level supports • Focuses on cross-system collaboration and alignment within a bounded geographic area • Shorter timeline • Builds from an existing but underutilized sampling approach	• We might find that clusters end up with either *many* programs/schools or *very few* programs/schools (currently under exploration) • Need for high response rates within clusters • Requires data collection from two systems involved in the transition process (Head Start and K-12)
Design Option 2 	• Looks at associations between program/center-level approaches to transition and child/family experiences across two time points • Cross-nested nature design that follows children over time	• Increased cost of following children from one setting (Head Start) to another (K-12) • Need for high response rate within centers and schools • Requires data collection from two systems involved in the transition process (Head Start and K-12)

Benefits and Other Considerations of Design Option 1

Design Option 1 is built to intentionally understand the collaborations among Head Start programs and LEAs that are close to one another in a geographic area (within a cluster). This can then capture a fuller system of Head Start programs and elementary schools, which enables exploration of geographically bound systems-level approaches to supporting kindergarten transitions. This is a unique contribution to the existing research on supporting kindergarten transitions, which largely focuses on what occurs within individual programs, schools, or even classrooms. This design bolsters the importance of cross-system collaboration and alignment as key to strengthening

kindergarten transition supports and also begins to describe what collaboration strategies exist when geographic proximity is a delimiting factor.

Additional benefits to Design Option 1 include:

- **Data collection timeline is shorter than Design Option 2**. Because the focus of this design is not about tracking children and families and their outcomes throughout the transition, data collection can occur at the same time in both Head Start and K-12 sites. The benefit of this—besides logistical considerations—is that it obtains a snapshot of what is occurring at one point in time from multiple perspectives. For example, researchers could better capture whether what respondents in Head Start report about collaborating with elementary school staff during a particular program/school year (or part of a year) corresponds well to what is reported by K-12 staff. If systematic collaboration is occurring among programs and schools within a cluster, one would expect more consistent responses to survey items. If collecting the data during the same time period, one would be less concerned that differences in reports could be due to respondents thinking about different time frames.

- **Design Option 1 builds off an existing, yet underutilized, sampling approach.** It identifies clusters as done for the NSECE while being flexible enough to shape the design to answer the particular questions of interest in this study. This design is not widely used but has the potential to support a strong descriptive study that represents the HS2K theory of change. The geographic cluster design provides an overall look at a fuller system of Head Start programs and schools that may be working together, rather than identifying single Head Start programs in varying geographic areas. This sampling approach also allows us to understand collaboration under circumstances where programs and schools are geographically close together – the most likely scenario under which we would see cross-system collaboration.

Potential Challenges for Design Option 1

Along with the benefits of Design Option 1, there are a number of potential challenges to consider:

- **The research team may find that clusters fall mostly into one of two categories:** clusters with lots of Head Start programs and elementary schools and clusters with very few Head Start programs and elementary schools. If this bi-modal distribution represents the way programs and schools are distributed across the country, this design would allow for a closer look at how cross-system

coordination may differ under these two circumstances. However, it might also mean that it could be difficult to empirically test differences within small clusters.

- **The focus on clusters requires a high response rate within those clusters.** While this is something that can be overcome with intense recruitment efforts, it may result in biases such that clusters included in the sample are more likely to be those who are willing to participate in research. This may over-represent clusters that engage in strong collaborative processes around kindergarten transitions.

- **This Design Option would require data collection from two sides of the transition process, including elementary schools.** (This is true for Design Option 2 as well.) One possible approach to help increase buy-in or responses from schools is to partner on this study with the Institute of Education Sciences to support the importance of a two-sided approach to supporting kindergarten transitions.

Benefits and Other Considerations for Design Option 2

Design Option 2 is intended to better understand what the experiences of children and their families are, over time, as they transition from Head Start to kindergarten. By following children over time and focusing on collecting survey-based information from their Head Start programs and elementary schools, the field could gain a beneficial three-way look at the transition (Head Start program – family – elementary school) that incorporates higher-level supports and an understanding of the coordination of activities between Head Start programs and elementary schools that serve some of the same students. Some additional concrete benefits of this design include:

- **Allows for an examination of associations between program/center-level approaches to transitions and child/family experiences and outcomes over time.** While both design options focus on collecting information from both the Head Start and K-12 system, only Design Option 2 follows children over time and collects information from teachers and families about children's outcomes.

- **Offers a cross-nested nature design that follows children over time.** Because Design Option 2 follows groups of children from Head Start into elementary school for kindergarten, it may allow for a deeper understanding of the *combinations* of transition supports provided to children and families over time that account for both their Head Start and kindergarten experiences. This design also helps to flesh out our understanding of transition *patterns* (i.e., the dispersion of children from Head Start into various elementary schools).

Potential Challenges for Design Option 2

As with any design, Design Option 2 comes with its own set of potential challenges. This includes the following:

- **There are increased costs to following children from one educational setting to another.** This would require collecting information from families and/or Head Start centers about where children were planning on attending kindergarten and then confirming they ended up in that elementary school. It is not uncommon for families to either decide to enroll their child in a different school or move in the summer prior to kindergarten. In addition to added costs, this could compromise the broader design, which is intended to follow *groups* of children from their Head Start center into elementary school.

- Because this design is concerned with collecting information at the Head Start center and school levels (in which children are clustered), **it would require high response rates within those centers and schools**, particularly from teachers. This is not dissimilar to challenges with Design Option 1.

- Also similar to Design Option 1, **this design would require data collection from two sides of the transition process, including elementary schools.** Again, one possible approach to help increase buy-in or responses from schools is to partner on this study with the Institute of Education Sciences to support the importance of a two-sided approach to supporting kindergarten transitions.

- There would likely be some limitations on the analyses, if there were an interest in looking beyond descriptives (e.g., multi-level analyses or looking at multiple child-level characteristics simultaneously), which could require a larger sample than feasible.

Conclusion

This report presents two possible design options for a descriptive study to better understand systems-level, program- and school-level, and teacher-level approaches to supporting the transition from Head Start to kindergarten. A final study design may take one of these designs, or it may develop variations that build upon these foundational ideas, including combining pieces across these two designs. However, the purpose here is to raise the possibility of various sampling approaches and allow for deep consideration of the best ways to capture data about kindergarten transitions—and

ultimately understand how those vary by locales and programs/schools as well as their associations with family experiences (and possibly child outcomes).

The information gleaned from the proposed **HS2K Transitions descriptive study** could be used by ACF in multiple ways. First, it could be used to inform policies, regulations, and/or non-regulatory guidance that ACF provides to Head Start programs and other ECE programs around the transition to kindergarten. These could support programs' own practices, policies, and professional supports for their staff. Further, it could inform the work of ACF-funded training and technical assistance centers such that they can better support local Head Start and ECE programs around implementation of specific transition supports within their programs and communities. Both Design Options could be used to address these key questions of interest. Design Option 1 may have more capacity to identify patterns of collaborative practices and transition activities within communities and based on community characteristics. Design Option 2 has the benefit of providing child-level outcomes, which allows us to observe associations between transition approaches and child outcomes. Finally, either option of the proposed study could uncover additional areas for future research and move the field closer to being able to test causal associations between supports for kindergarten transitions and program, family, and child-level outcomes. This information could help ACF's Office of Planning, Research, and Evaluation consider future research studies in an effort to continue improving supports for the transition to kindergarten.

Cost & Resource Estimates

Table 19 summarizes the cost ranges for Design Options 1 (with and without parent data collection) and Design Option 2. Design Option 1 with parent/caregiver data collection has a broader range because it assumes either sampling 16 parents/ caregivers per site or sampling all (at an average of 40) parents per site.

Table 19. Budget Estimates Per Task for Each Design Option

Task	Assumptions	Design Option 1 without Parent/Caregiver Data Collection	Design Option 1 with Parent/Caregiver Data Collection	Design Option 2
Task 1: Management and Communication	• Time for the PI/PD, project coordinator, and finance staff to ensure smooth management of the full project • Preparation of financial and project updates, regular meetings with ACF, and ongoing communication with ACF and project partners • Travel to Washington D.C. for two project leaders for a kick-off meeting • Printing and telephone/video-conferencing costs	$330,790 - $365,610	$330,790 - $365,610	$330,790 - $365,610
Task 2: Stakeholder and Expert Engagement	• Preparation of stakeholder and expert plans • Holding 7 stakeholder engagement meetings • Preparation for meetings (including potential fast-track OMB submissions), scheduling and recruitment for meetings, attending/holding meetings, and producing notes and follow-up steps • Honoraria for experts, $1,000 per day • Travel for two project staff to attend a Head Start Conference to engage with stakeholders at one point in time	$141,030.35 - $155,875.65	$149,004,65 - $164,689.35	$149,004,65 - $164,689.35

Task	Assumptions	Design Option 1 without Parent/Caregiver Data Collection	Design Option 1 with Parent/Caregiver Data Collection	Design Option 2

Task 3: Development of New Instruments	• Creation of questionnaire, including:
	  ○ consulting with experts
	  ○ pulling questions from existing surveys
	  ○ creating new questions and cognitive testing items where necessary
	  ○ conducting a pilot study
	  ○ consulting with psychometricians
	• Incentives for
	  ○ 100 cognitive interview participants ($50 each)
	  ○ 500 pilot test participants regardless of their position at $25 per person
	  ○ $50 per 50 cognitive interview participants for the parent/caregiver survey
		$399,531.05 - $441,586.95	$471,149.65 - $520,744.35	$506,892.45 - $560,249.55

Task 4: Costs of Obtaining Existing Data	• Ensuring any necessary data sharing agreements meet all requirements • Working with external partners on accessing data • Funds to pay for administrative data	$22,500.75 - $24,869.25	$22,500.75 - $24,869.25	$22,500.75 - $24,869.25
Task 5: OMB, IRB, and Study Registration	• Preparation of packages; respond to OPRE, OMB, and IRB questions; and prepare the study registration material • Anticipated fees from school districts associated with submitting IRB or research review protocols	$55,738.40 - $61,605.60	$55,738.40 - $61,605.60	$55,738.40 - $61,605.60

Task	Assumptions	Design Option 1 without Parent/Caregiver Data Collection	Design Option 1 with Parent/Caregiver Data Collection	Design Option 2
Task 6: Sampling	• Conducting sampling procedures prior to recruitment of Head Start centers and programs and elementary schools and LEAs • Hours to sample families when parent data is collected	$12,375.65 - $13,678.35	$21,008.30 - $23,219.70	$21,008.30 - $23,219.70
Task 7: Data Collection	• Programming of the surveys, recruiting and training staff, data collection, and data collection monitoring costs • Printing and mailing training materials, purchasing tablets and data plan costs, printing and mailing respondent materials and respondent fee • Respondent fees at $25 for 75% of all the Head Start, elementary school, and LEA staff and parents/caregivers • For data collection with parents. include: • Incentives for parents to complete a survey • Additional staff time for monitoring parent/guardian responses • Staff time to prompt parents/guardians for completion of survey	$690.726.95 - $763,435.05	$1,478,215.20 - $2,822,585.85	$2,320,969.70 - $2,565,282.30
Task 8: Data Cleaning & Analysis	• Cleaning the survey data, conducting descriptive analyses, and producing resulting tables and graphs, and preparing a report to OPRE based on the survey findings	$261,769,.65 - $289,324.35	$288,896.90 - $319,307.10	$298,282.70 - $329,681.10
Task 9: Data Archiving	• Preparation of a data archiving plan, conduct disclosure review of the data, and prepare documents for submission to the Child and Family Data Archive	$41,976.70 - $46,395.30	$49,259.40 - $54,444.60	$57,455.05 - $63,502.95

Task	Assumptions	Design Option 1 without Parent/Caregiver Data Collection	Design Option 1 with Parent/Caregiver Data Collection	Design Option 2
Task 10: Dissemination	• Conducting webinars, attending conferences and producing publicly facing reports • Preparation for two reports to be public (including 508-compliance), two briefs for sharing findings with various audiences, and three webinars • Travel for two staff attending one conference to present study findings Travel for two staff to present to ACF in person at a final briefing	$125,983.30 - $139,244.70	$125,983.30 - $139,244.70	$125,983.30 - $139,244.70
Total		**$2,082,422.80 – $2,301,625.20**	**$2,992,547.50 – $4,496,321.55**	**$3,888,626.45 – $4,297,955.55**

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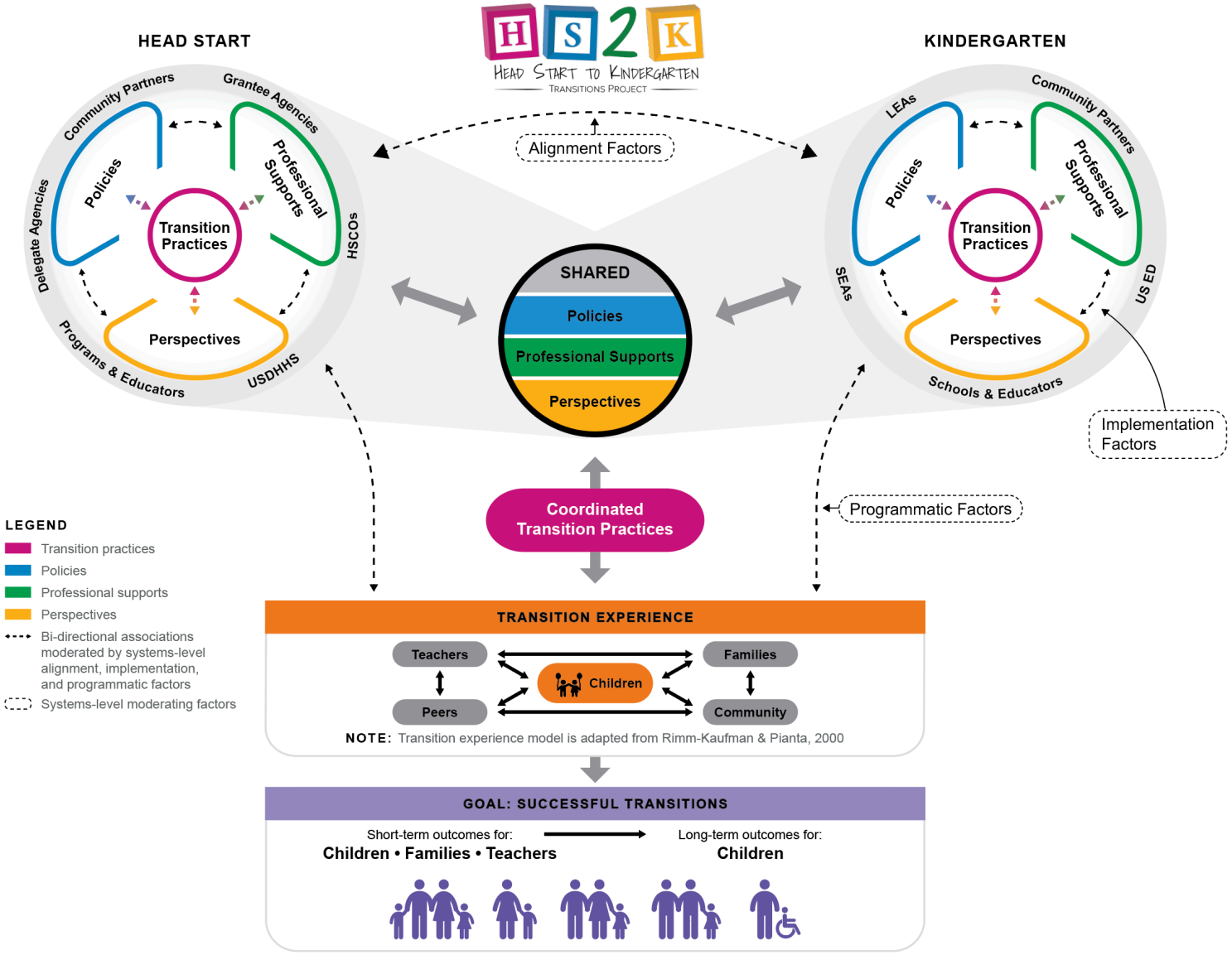
Appendix A: HS2K Theory of Change



Appendix B: Definitions of the 4Ps

Perspectives

Perspectives are different stakeholders' (child/family, teacher, administrators/schools/centers) visions, values, and beliefs about transitions to kindergarten, including their and others' roles in supporting transitions to kindergarten. What does it mean to be ready for kindergarten? What is the role of the parent versus teacher versus administrator/school? What is the role of Head Start versus kindergarten?

Alignment of perspectives is the extent to which (1) each key stakeholder is a part of the process, and (2) there are shared and/or complementary understandings of kindergarten transitions among stakeholders, both within and across the Head Start and K-12 systems.

Policies

Policies are the explicit (written/formal) documentation of organizational regulations, standards, agreements, procedures, and guidance around supporting transitions to kindergarten (e.g., transition policies and structures such as records transfers, shortened days at the start of kindergarten).

Alignment of policies across systems is the extent to which Head Start and K-12 systems have explicit, substantive policies about transitions that complement each other (e.g., MOUs and interagency agreements, data sharing agreements, explicit accountability for discrete activities occurring).

Professional Supports

Professional supports are professional development/learning opportunities and other resources that support teachers, site administrators, grantee/LEA administrators, and policymakers to enact strong transition approaches (e.g., professional development, coaching, dedicated planning time).

Alignment of professional supports is the extent to which Head Start and kindergarten sides (both across schools/centers within systems and across systems) provide explicit supports to promote adult learning related to enacting transition efforts that complement each other (e.g., joint professional development opportunities, data walks or other efforts that provide the opportunity for teachers to observe each other's practices in the classroom, other shared activities that bring together teachers and administrators across the two systems).

Practices

Concrete activities designed to support children/families during the transition to kindergarten. Transition practices can be enacted by Head Start or kindergarten separately or jointly through coordinated transition practices. They can also occur at various levels within/across each system (e.g., Head Start Grantee/LEA leadership, Head Start directors/principals, teachers, and staff).

Alignment of practices is the extent to which Head Start and kindergarten implement practices (both *across schools/centers within systems* and *across systems*) that complement each other, work in alignment, or involve communication within and between the two systems.

Appendix C: Acronyms and Measures Sources

2019 NSECE Center-based Survey: 2019 The National Survey of Early Care and Education, Center-based Provider Questionnaire

2019 NSECE Workforce Survey: 2019 The National Survey of Early Care and Education, Classroom Staff (Workforce) Questionnaire

Census: The Census Bureau

Cook, Coley, & Zimmerman (2019): Qualitative interview with Head Start Directors from Cook, K. D., Coley, R. L., & Zimmermann, K. (2019). Who benefits? Head start directors' views of coordination with elementary schools to support the transition to kindergarten. *Children and Youth Services Review, 100,* 393-404.

ECLS – B: Questionnaire from Early Childhood Longitudinal Studies (ECLS) Program – Birth Cohort.

Essential 0-5 Survey: https://startearly.org/resources-professionals/professional-development/essential-survey/
(Validation Study: Ehrlich, S. B., Pacchiano, D., Stein, A. G., Wagner, M. R., Park, S., Frank, E,…Young, C. (2019). Early Education Essentials: Validation of surveys measuring early education organizational conditions. Early Education and Development, 30, 540-567. https://www.doi.org/10.1080/10409289.2018.1556969)

ETK: Elements for Transition to Kindergarten (ETK) Interview from Palmieri, L. (2020). Parallels in time: Exploring present and future transitional strategies for kindergarten students with disabilities.

FACES: Questionnaire from Head Start Family and Child Experiences Survey (FACES)

Gill, Winters, & Friedman (2006): Semi-structed Survey (Untitled) from Gill, S., Winters, D., & Friedman, D. S. (2006). Educator's views of pre-kindergarten and kindergarten readiness and transition practices. *Contemporary Issues in Early Childhood, 7*(3), 213-227.

HS PIR: Questionnaire from Head Start Program Information Report

HSIS: Spring 2003 Care Provider Interview from Head Start Impact Study (2002-2006).

Kraft-Sayre and Pianta, 2000 (which was also adapted from NECDL): Kindergarten Transition Practices Menu from Kraft-Sayre & Pianta (2000). Enhancing the transition to kindergarten: Linking children, families, & schools. *National Institute on Early Childhood Development and Education.*

Madison Education Partnership (MEP) interviews: Protocols Semi-structured Interview Questions – Principals from Woo, M., Lauter, L., Jeppson, A., Graue, E., Grodsky, E., & Vaade, E. (2019) Combined project briefs: Improving the transition for students, families, and teachers. Madison, WI: Madison Education Partnership. pp. 1-40.

MSHS: Program and Center Director Survey from Caswell, L., Bumgarner, E., Barrueco, S., López, M., Wolf, A., Layzer, C., Gutmann, B., Segovia, S., & Broene, P. (2017-2018). The Migrant and Seasonal Head Start Study. Inter-university Consortium for Political and Social Research.

NEILS: Questionnaire from National Early Intervention Longitudinal Study (NEILS)

PEELS: Questionnaire from Pre-Elementary Education Longitudinal Study (PEELS)

PKTP: Teacher and family survey, teacher and family focus group protocols from Spain, A., K., Ehrlich, S. B., Cowhy, J. R., Dasgupta, D. K., & Lockaby, T. (2018). *A community effort to support the transition from Pre-K to kindergarten*. Chicago, IL: University of Chicago Consortium on School Research and Chapin Hall at the University of Chicago.

School Community Partnerships: Moving Pre-K Forward Survey: Questionnaire from Holcomb, B. & Teija, S. (2014). School-community partnerships in New York state: Snapshot of trends as Pre-K expands, school community partnerships project.

TPOT: The Teachers' Perceptions on Transition (TPOT) from Quintero, N. & McIntyre, L. L. (2011). Kindergarten transition preparation: A comparison of teacher and parent practice for children with autism and other developmental disabilities. *Early Childhood Education Journal, 38,* 411-420.