Abstract

This study examines the allocation of instructional time in pre-Kindergarten (pre-K), focusing on the differences between half-day and full-day programs in one public school district. Using data from the Full-Day Pre-K Study (FDPK) randomized control trial, we conduct an in-depth descriptive analysis of 114 full-day classroom observations, coding for content and activities, and up to 14 repeated observations per teacher over two years. Our findings reveal substantial variation in time allocation between half- and full-day classes, notably the inclusion of nap time in full-day. Importantly, we discover notable differences in the amount of time dedicated to instructional and non-instructional activities, suggesting potential dissimilarities in learning opportunities across the school year. This study highlights the complexity of time use in early childhood education (ECE) settings, as a substantial portion of classroom time is devoted to activities with mixed content delivery. Our findings offer crucial insights to policymakers trying to understand the implications of extending pre-K programs from half- to full-day.

Keywords: early childhood, educational policy, time use, descriptive analysis

Where has all the Time Gone? Describing Time Use in Full- vs. Half-day Pre-Kindergarten

High-quality early childhood education (ECE) can have profound positive effects on child development and yield substantial social returns (Blau & Currie, 2006; Deming, 2009; Heckman, 2006; Shonkoff et al., 2000; Weiland & Yoshikawa, 2013; Wong et al., 2008). Yet, ECE effects have been variable, raising concerns that initial positive impacts might diminish as students advance into higher grades (Fitzpatrick, 2008; Li et al., 2020; Lipsey et al., 2018; Magnuson et al., 2007). Our study extends the seminal research of Early et al. (2010), who provides insights into classroom practices within state-funded pre-K settings. We focus on an unexplored area—time allocation in half- versus full-day programs. Using rich observational data from a recent data collection effort, we address this gap and offer a new perspective on the 'black box' of ECE (Phillips et al., 2017).

The length of the pre-K day, a key program characteristic, has garnered considerable attention as a potential ECE policy lever. The current paper is part of the broader Full-Day Pre-K (FDPK) Study—a first-of-its-kind randomized control trial (RCT) conducted in the majority-Hispanic, Westminster Public School (WPS) district. For the RCT portion of the FDPK Study, families indicated on a pre-K application if they had interest in the new full-day classes WPS was piloting (relative to half-day, business-as-usual, classes). Given more interest than availability, families were randomly offered spots in either a full- or half-day class. Published work has documented substantial experimental impacts of full- versus half-day pre-K offers on academic outcomes by the end of the pre-K year (Author(s), n.d.).

To make these findings actionable for school districts and policymakers, the current descriptive paper documents how teachers in WPS full-day classes use additional class time compared to teachers in half-day classes. Our study does not perform formal mediation analyses

for the observed effects of full-day pre-K on child outcomes due to limited sample size and statistical power at the class level. However, our approach still offers valuable insights about time allocation in a public school-based pre-K setting.

Characterizing typical time-use in pre-K classrooms presents a unique challenge due to the prevalence of 'mixed-use' teaching strategies. These strategies blend different content areas within a single instructional activity—contrasting with the more segmented, single-subject approach found in elementary grades (e.g., a math block). We document that pre-K teachers often teach multiple content areas simultaneously. Describing time use in pre-K is further complicated because time can be coded not only for its content focus (e.g., math instruction), but also simultaneously for the activity type (e.g., teacher-directed whole group, child-directed centers, etc.).

As an illustrative example, consider a typical scenario in a pre-K classroom—children are encouraged to select one of several learning stations set up throughout the room. Imagine that at one of these stations, children practice writing their names on paper and then decorating it with different art mediums. One could categorize this time at the writing center in terms of the content children are practicing (English Language Arts [ELA] and art/music), the activity grouping the teacher has chosen for the class (free choice/centers), or the nature of this activity (child-directed). Additionally, children who choose a different station may be engaged in other content areas (e.g., math, science, etc.) while their peers are writing. As such, these complexities require us to describe typical time in a manner that reflects the frequent integration of multiple content areas and emphasizes that pre-K children will cycle through many different activity structures throughout a day.

The current study addresses these complexities by employing an intensive, in-classroom data collection effort to accurately depict classroom experiences. By using observational data, we

document nuances in how time is allocated across content areas and activity types in both full- and half-day pre-K classes. Our results provide researchers with holistic and accurate insights about time allocation in a public school-based pre-K day.

The paper makes an important contribution to the literature on ECE time use. We are the first study to capture how pre-K time is used differently in full- versus half-day classes among teachers working in the same district, using the same curriculum, and during the same academic year. This novel contribution to the literature on pre-K has important policy implications for thinking about how the ECE experience might be enhanced or deepened when a district considers supplementing a predominantly half-day program with a full-day option. While the data used herein were collected as part of the larger FDPK Study RCT, the current paper does not estimate causal effects, but rather provides rich descriptive context for causal effects documented in prior published work (Author(s), n.d.).

Research Questions

The current paper provides detailed insights to policymakers as it describes how one public school district, WPS, used the extra time when it experimented with offering full-day pre-K. In addition to giving a high-level description of average time allocation in full- and half-day, we answer sub-questions about what occurred in the FDPK Study classes, in order to help school leaders think about how one might implement full-day classes and what one might expect from those additional hours. To that end, we tackle the following research questions:

1. *How was time typically used in half-day pre-K, and how does it differ in full day?*

    1A. How much time is spent on non-instructional activities in full- and half-day pre-K?

    1B. Does doubling the school day double instructional activities?

    1C. How much of the pre-K day is content-free in full- and half-day?

1D. How much academic content do pre-K children receive in full- and half-day pre-K?

2. *How often are content areas mixed together in full- and half-day pre-K, and which content areas?*

Relevant Literature

Our research questions build upon two key areas of prior research. First, we briefly outline three competing hypotheses regarding how teachers might approach allocating the extra class time afforded by full- (versus half-) day pre-K to improve student outcomes. Second, we review empirical findings on typical classroom time-use for young children in pre-K, which sheds light on understudied aspects of prior work that make the current study a unique contribution.

Competing Hypotheses about Pre-K Time Use

Three distinct possibilities emerge regarding the potential allocation of additional time when adding a full-day pre-K option to the existing half-day program, each supported by existing literature. In our paper, we find evidence that a combination of all three is being used. First, teachers could focus the extra time on core academic subjects such as ELA and math, given the documented positive associations between these subjects and student learning (Baroody & Diamond, 2016; Bratsch-Hines et al., 2019; Burchinal et al., 2021; Claessens et al., 2014; Engel et al., 2013; Hofer et al., 2013; Howes et al., 2008; Piasta & Wagner, 2010). Additionally, there is some evidence that whole-group activities are associated with better student performance (Baroody & Diamond, 2016; Camilli et al., 2010; Connor et al., 2006; Goble & Pianta, 2017; Milesi & Gamoran, 2006).

Alternatively, teachers might opt for a developmental approach, wherein organized play and child-directed activities are prioritized to leverage the additional time (Baroody & Diamond, 2016; Connor et al., 2006; Goble & Pianta, 2017; Golinkoff et al., 2006; Milesi & Gamoran,

2006; Piasta & Wagner, 2010; Stipek et al., 1995; Vitiello et al., 2012). Emerging literature suggests that developmental skills, including working memory and early attention, could be more critical to sustaining long-term pre-K effects compared to intensive math and literacy instruction (Durkin et al., 2022).

Lastly, some of the structural components of full-day pre-K—like regulating child nap/sleep cycles or providing nutritional lunches—could be the main drivers of time-use in the full-day setting. There is evidence that indicates these activities could improve student outcomes (Cabell et al., 2013; Frisvold, 2015; Nores et al., 2022; Schumacher et al., 2017).

In summary, the literature presents conflicting evidence on whether teachers would prioritize a more academic approach or a developmental approach when allocating additional pre-K class time. Another hypothesis is that the structural features of a full pre-K day, including an additional meal and nap, might independently lead to positive outcomes. All three possibilities remain plausible for our current study, and we aim to shed light on these competing perspectives.

Prior Work on Time Allocation in Pre-K

The current study fits within the broader context of research examining variation in ECE across different settings. This area of literature has explored various aspects of ECE, illuminating the factors that influence the quality and outcomes of these programs. For instance, Thorpe et al. (2020) examine how Classroom Assessment Scoring System (CLASS) scores in ECE vary with the timing and structure of content/activities. They find that scores fluctuate throughout the day, with higher associated with whole and small group activities, as well as subjects such as science, math, and social studies. Similarly, other studies have explored the structural distinctions across care types in the U.S.—ranging from center-based to family childcare homes and relative care (e.g., Bassok et al., 2016; Dowsett et al., 2008; Reid et al., 2021). Notably, a pattern emerges

where classroom process quality differs by ECE program type and center-based care exhibits more indicators of quality relative to informal care settings (Bassok et al., 2016; Dowsett et al., 2008). Furthermore, socioeconomic factors play a role in influencing the quality-of-care children receive. Higher-income families often have access to ECE programs that offer greater classroom process quality (Dowsett et al., 2008; Phillips et al., 2009). Moreover, Gordon et al. (2013) find positive associations between center-based care and some academic child outcomes compared to home or relative care. Collectively, these studies contribute to our understanding of the nuanced factors influencing the quality and outcomes of different ECE care types. From assessment timing and activity groupings to structural differences and socioeconomic disparities, they provide insights into how program type may influence children's experiences in ECE.

To shape our expectations for the current study on time allocation in pre-K, we draw insights from three recent Early Learning Network (ELN) investigations. Weiland et al. (2023) fin in Boston Public Schools' pre-K classrooms 55% of observed time is dedicated to either ELA or math (35% and 20%, respectively), with about 38% of time spent on non-instructional activities (e.g., routines, off-task behavior, meals). Similarly, Justice et al. (2022) report that most observed pre-K time involves whole group (33%), small group (28%), and individual student activities (15%), with free play/center content constituting nearly half of the observed time. Pianta et al. (2018) school- and community-based pre-K programs, noting that children spend approximately 28% of their day in whole group activities, 30% engaged in free play, and 32% in non-instructional activities. "Academic content," or content that encompassed language, literacy, math science, and social studies, was present for about 35% of the day. Together, this set of studies suggests that while academic content occupies a substantial portion of the pre-K day, a considerable amount of time is also spent on whole group, free play/centers, or activities where instruction is not present.

We have compiled analogous information from other pre-K studies regarding classroom time allocation, presented in Table 1. Here, we provide a summary of this information, which shows consistent trends observed across various pre-K studies conducted over the past 15 years. Notably, an overarching pattern emerges where pre-K-aged children are observed spending more time on ELA content in comparison to any other subject.

[Insert Table 1 about here]

In terms of activity focus, a majority of studies concur that pre-K children tend to spend slightly more of their day engaged in free choice/centers (~33%) compared to whole group activities (~30%) (Booren et al., 2012; Bratsch-Hines et al., 2019; Burchinal et al., 2021; Chien et al., 2010; Justice et al., 2022; La Paro et al., 2009; Nores et al., 2022; Pianta et al., 2005; Pianta et al., 2018). Moreover, a substantial portion of the pre-K day is often dedicated to activities without an instruction focus (~29%), as indicated by previous literature (Booren et al., 2012; Cabell et al., 2013; Chien et al., 2010; Coelho et al., 2021; Early et al., 2010; Nores et al., 2022; Pianta et al., 2005; Pianta et al., 2018; Weiland et al., 2023).

These consistent findings across prior studies offer valuable insights into the prevailing patterns of time allocation within pre-K classrooms. Importantly, the Early et al. (2010) study provides foundational insights into pre-K classroom time allocation. This seminal work highlights how time is used in both instructional and non-instructional activities. However, despite the abundant evidence on pre-K time-use, our current study still uniquely contributes to the field by explicitly comparing time-use between entire half-day and full-day classes. This novel comparison encourages researchers to consider how structural program characteristics influence time-use allocation decisions. By exploring this aspect, we hope to push the existing literature forward and provide valuable insights into the time allocation practices of pre-K teachers in full-day programs

versus half-day programs, which is particularly crucial in light of recent policy shift towards expanding pre-K programs to include full-day options.

The Current Study: WPS and its Pre-K Offerings

The data used in the current, observational study were collected as part of a broader RCT on the causal effects of full- vs. half-day pre-K. The larger study is referred to as the Full-Day Pre-K (FDPK) Study and took place in Westminster Public Schools (WPS), a predominantly Hispanic and low-income school district near Denver that serves about 10,000 students annually. The child-level randomization is not relevant for the current paper's descriptive analyses, as the present study is concerned with the classroom level. However, we briefly introduce the larger Study and its initial findings to provide context for describing ECE time use. Due to data agreements with the district and state, the specific data used in this study are not publicly available.

All the FDPK Study classrooms were located within the public-school district of WPS. In 2015-16, 83% of the district's student population was eligible for the federal free/reduced-price lunch (FRPL) program and 77% identified as Hispanic (U.S. Department of Education, National Center for Education Statistics, 2016). WPS also serves a sizeable English Language Learner population (34%). The demographic composition of WPS make this a critical context for ECE research. Studies have demonstrated the pronounced benefits of ECE for low-income (Deming, 2009; Magnuson et al., 2007; Weiland & Yoshikawa, 2013) and Hispanic children (Currie & Thomas, 1999; Gormley & Gayer, 2005). Similar to WPS, many U.S. school districts serve a predominantly FRPL-eligible student population. Although WPS has a higher-than-average proportion of Hispanic students, about 20% of U.S. public school districts consist of at least 25% Hispanic students (Reardon et al., 2021).

Prior to the FDPK Study, WPS only offered half-day pre-K classes (4 days per week for 3 hours per day in an AM or PM session), located primarily at a single public-school building dedicated to ECE classrooms. In 2016-17, WPS piloted 7 new full-day classes, each added to an existing elementary school site in the district. Full-day classes met 5 days per week for about 7 hours a day, more than doubling pre-K time from about 510 total hours to 1,190 hours across the pre-K year. Due to high demand for its new full-day classes, WPS implemented a randomized lottery to fairly allocate these limited spots to eligible families across three consecutive cohorts of pre-K applicants: Cohort 1 in 2016-17, Cohort 2 in 2017-18, and Cohort 3 in 2018-19. The current paper uses class-level observational data, which were only collected in Cohorts 2 and 3. Thus, the study sample includes 571 children who were randomly offered a spot in either full- or half-day pre-K. In total, we have 114 repeated observations of 34 pre-K classes across these two cohorts as part of the larger FDPK study. We describe these data in more detail below.

A few other aspects of the WPS setting are relevant for framing expectations about pre-K class time-use. First, all ECE classes—AM, PM, and full-day—had approximately 16 students. All teachers taught a full day schedule (half-day teachers taught both AM and PM). Although we did not ask teachers directly about their curricular adjustments, the district administration reported that all pre-K teachers used the same curricular resources throughout the FDPK Study. These included *Little Treasures*—a comprehensive curriculum, *Incredible Years* for social-emotional learning, and *Hand Writing without Tears* for motor skills development. Given that these curricula do not specifically dictate time allocation and are adaptable for various class formats, we expect that the curricula did not dictate observed time use. Additionally, WPS's ECE program, described as "play-based" and focused on preparing children holistically for elementary school (Westminster

Public Schools, 2021), suggests a preference for group- and play-based instructional methods among these teachers.

The preschool standards set by the state might also shape how WPS teachers allocate time in full-day schedules. The Colorado Academic Standards, originally adopted in 2009-2010, set guidelines across 10 content areas for preschool education. Assuming that the number of standards in each content area reflects the amount of time needed for coverage, these standards could inform hypotheses regarding time use in WPS classrooms. The standards indicated an emphasis on ELA (33 separate standards) and social studies (23 standards). In contrast, math and drama/theater having the fewest standards at 9 and 7 respectively, might receive less class time.

Methods

Data Collected on Pre-K Time Use

The research team collected classroom data by having trained observers conduct full-day visits to each study classroom multiple times per year. We used an adapted version of the *Advanced Narrative Record Observation for Classrooms*, developed by Farran et al. (2015), as our observational protocol. The Narrative Record combines observational and instructional notes in an open-ended format, providing an uninterrupted account of classroom happenings. It provides detailed information on instructional practices, including the time students spent on various content areas and activities (further details on the observational protocol are provided below). Half-day students did not have a lunch period, either leaving before or arriving after lunchtime. In full-day classrooms, we excluded the lunch/recess block from time-use analyses. In total, we coded over 260 hours of classroom observations for this study.

Analytic Sample Sizes and Descriptives

The current paper is limited to the half- and full-day classes from the FDPK Study's second and third cohorts, as observational data was not collected for the first cohort. With several teachers instructing in both cohorts, and six teaching in both AM and PM classrooms, a total of 26 classrooms were led by 16 unique teachers (6 half-day and 10 full-day). The strength of the current data lies in the depth of insight into classrooms, rather than breadth across teachers that would allow for inferences to be made about class-level relationships (e.g., between teacher characteristics and time-use). This paper, consequently, does not attempt to establish a causal relationship between the type of class (full-/half-day) and time-use, nor does it aim to estimate causal effects or address potential biases in these effects.

Nonetheless, we consider the characteristics of full- vs. half-day teachers before examining our descriptive findings. We might interpret patterns differently if, for instance, full-day teachers were always more experienced, had more certifications, and had higher levels of education. In general, we do not find systematic differences in experience, certifications, or education levels between the two groups, although full-day teachers are slightly less experienced but more likely to hold a BA or higher degree. All teachers are certified. Unsurprisingly, given the small number of teachers in our sample, these differences are not statistically significant.

The study classrooms are spread across 10 school sites. Initially, WPS's half-day classrooms were located primarily at a single school site dedicated to ECE. When WPS piloted new full-day classrooms, they were each added to a different elementary school. Since WPS is geographically small and has a large majority of both Hispanic and low-income K-12 students in its overall student population, there is limited heterogeneity in student demographics across school

sites. The percentage of pre-K children identified as Hispanic ranges from 59% to 75% across the 10 school sites, while the percentage of children who are FRPL-eligible ranges from 55% to 75%.

Observed Time-Use Measure

We collected data on time-use using teacher surveys and an observation protocol (Farran et al., 2015). However, we chose to use only direct observations, as they are better at capturing the complexities of classroom activities and content areas in real-time. This approach is particularly suitable for ECE, where teaching often involves integrating learning across different content areas and activities. In Cohort 2, trained observers conducted in-person visits using the protocol, while in Cohort 3, they applied the protocol to high-quality video recordings of classrooms. This video component was added to the final cohort to create a lasting data source for emerging hypotheses regarding classroom dynamics. The videos were professionally produced using three cameras and audio recorders per class session. While we recognize the possibility for discrepancies in coding between live observations in Cohort 2 and videotaped observations in Cohort 3, evaluating differences by coding modality is outside the scope of this study. Any observed differences might result from the observation method or could be influenced by teacher characteristics, cohort-specific factors, or rater bias. Therefore, our analysis focuses on providing descriptive statistics that aggregate data from both cohorts.

To fill out the time-use protocol, observers captured ‘time-use episodes’ throughout the pre-K day. Logged time-use episodes serve as a record of events that happen in the classroom. New time-use episodes begin when the activity type or content type changes and lasts more than a minute. A single time-use episode is continued until 75% of the students have started a new activity or are engaged in new content. An example of a completed time-use protocol can be found in Farran et al. (2010).

Time is coded in several ways during the classroom observations, two of which are central to our analyses. First, observers identified the type of activity that was taking place during the episode. The possible activity codes included: (1) Meals & snacks, (2) Transitions, (3) Napping, (4) Playground, (5) Whole group, (6) Small group only (no centers), (7) Small group + centers, (8) Centers only (no small groups), and (9) Specials. Second, observers identified between zero and up to three different content areas being targeted within the given episode. The possible content codes were: (1) Reading, language arts, & literacy (combined into one); (2) Math; (3) Science & social studies (combined into one); (4) Music and visual arts (combined into one); (5) Gross motor; and (6) Other. Observers could also select (7) "No content", or (8) "Not applicable." We added a code (9) for "missing content" for the rare cases in which the observer was not clear about the episode content. Thus, time was simultaneously coded for activity and content area(s) in the observation protocol.

In episodes where activities were not accompanied by any content area instruction (e.g., napping), content was coded as either "no content observed" or "not applicable." Whenever we present the percentage of the school day spent on a given activity or content area, we always do include time spent napping in the denominator of the full-day school day, unless otherwise noted. The regulation of children's sleep schedules may be supported by the afternoon nap and could potentially play a role in the benefits of full day. We, therefore, do not wish to exclude it.

Some content/activities coded separately in the time-use protocol were combined. For example, the observational protocol had separate categories for "reading", "language arts", and "literacy." These were combined into a single category. Additionally, we combined time devoted to science and social studies. Finally, time observed on music/movement and art was combined into one content area.

We initially code instances when observers noted multiple content being taught simultaneously as "mixed" content. For example, an episode of shared book reading with a discussion of friendship would be coded as involving both ELA and Science/Social Studies. Thus, this example time-use episode would be coded as "whole group" in activity type and "mixed" in content. We subsequently disaggregate these "mixed" content episodes into primary and secondary content area combinations to document the most commonly combined content areas.

Beyond coding classroom activities, the frequency and timing of our observations also played an important role in capturing the dynamics of pre-K classroom time use. Cohort 2 classrooms were observed up to three times per year (Nov/Dec, Feb/Mar, and Apr/May), and each Cohort 3 classroom was observed up to four times per year (adding a Jan/Feb window). Table 2 summarizes the number of observations per teacher (N=16 teachers total) over the two years.

[Insert Table 2 about Here]

Summarizing for Cohort 2, we observed a total of 13 teachers on up to 3 different days over the course of the school year, resulting in 47 total observations across pre-K classrooms out of a possible 51 (a 92% Cohort 2 coverage rate). In Cohort 3, we observed a total of 13 teachers on up to 4 different days throughout the school year, resulting in 67 total observations across pre-K classrooms out of a possible 68 (a 99% coverage rate). In total, we collected 114 (of 119 possible) class-year observations (96%) across both cohorts.

Analytic Strategy

In addressing our set of research questions, we computed both the absolute amount of time in addition to the proportion of time devoted to each activity type and content area. We are then able to provide important descriptive statistics for time use in our sample, both visually and numerically. In the few instances where we refer to a percentage of the "awake school day" in our

analyses, we have chosen to exclude the nap as part of that denominator calculation. In all other cases, percentages of the school day count the nap as part of the denominator for total time in a school day. This detailed examination aimed to provide insights into time use within the context of full- and half-day pre-K programs within one district with public school-based options.

Results

RQ 1: How Does Class Time Allocation Differ between Full- and Half-day Pre-K?

Averaging across the 34 unique class-years, we illustrate the typical half- and full- day time allocation by presenting the mean number of minutes spent daily on each of the activity types (Figure 1), and then recoded in terms of content areas (Figure 2). Since we will want to consider time use both proportionally and in an absolute sense, Figure 1 reports time use both as a percent of the day (in bar labels) *and* as minutes spent on each activity type (y-axis). We also report the percent of time per day in Table 3, where descriptive statistics for each activity type are reported in the upper panel and those for content area are in the lower panel.

[Insert Table 3 about here]

[Insert Figure 1 about here]

Looking at Figure 1, the most immediate difference in activity time use across half- and full-day classrooms is that full-day students take naps (on average, 71 minutes or 19% of the full-day) while half-day students do not. This is expected, because the school district only requires full-day classrooms to set aside an hour per day for napping or quiet resting.

Aside from napping, half-day classes are similar, proportionally, to full-day classes. Indeed, the proportions of time spent in most activities are all within a few percentage points of one another (the exceptions being whole group activities [27% vs. 17%] and small group plus centers [10% vs. 3%]). Of course, since the full-day is twice as long as the half-day class, we would

expect students in full-day to spend around double the number of *minutes* in these activities. This is the case for eating, transitions, small group only, and centers only activities.

1A. How Much Time is Spent on Non-Instructional Activities in Full- and Half-Day Pre-K?

Figure 1 also illustrates that a sizeable portion of the WPS school day is spent on non-instructional activities (i.e., eating, transitions, and playground time). Children in half-day typically spend about 41% of their day—about 76 minutes—on these non-instructional activities. Children in full-day classes spend a similar proportion of their time on those activities (38%). Still, with the addition of full-day nap time, the proportion of time spent in non-instructional activities in full-day is quite high—57% or about 212 minutes per day. Even when excluding the full-day nap, children in WPS full-day classes spend a larger proportion of time on non-instructional activities than what has previously been reported (see Table 1).

1B. Does Doubling the School Day Double Instructional Activities?

One hypothesis about how to use the extra hours afforded by full day would be to dedicate them primarily to academic instruction. However, the observations reveal clearly that full-day teachers did not simply double the time spent in activities associated with instruction. That said, we will see that the increases they did make, which may seem modest on a day-to-day basis, accumulate to meaningful differences.

First, we consider time allocated to whole-group activities, which we would expect is most expressly used to deliver instruction. In half-day, teachers dedicate, on average, 51 minutes (27%) of the day to whole group instruction, while full-day teachers only spend slightly more time—62 minutes (17%) of the day in whole group activities. This finding is interesting because although full-day teachers have about 3 more hours in their school day than half-day teachers (or 2 hours if we exclude napping), they are only spending an average of about 11 more minutes per day in a

whole-group setting. When compared to the extent literature, we see that time devoted to whole-group activities in half-day is like what has been previously documented, but it is quite a bit less in full-day classrooms, proportionately, than what has previously been found.

In addition to whole-group activities, we would expect to see instruction taking place in the following three 'group-based' activity settings: small groups only, centers only, and small groups + centers. We observe that half-day teachers spend an average of 55 minutes (29%) of their day in these three activities together, compared to an average of 86 minutes (23%) in full-day classrooms. This amounts to children in full-day classrooms participating in about 30 more minutes per day in group-based activities, relative to their half-day peers. Combining time spent in these group-based activities with time spent in whole group, children in half-day spend about 106 minutes (56%) of the day on activities in which we would expect to see instruction. Had full-day teachers been truly doubling the time spent in instructional settings, we would expect to see an average of 212 minutes per day. In practice, full-day classes spend only about 148 minutes per day on these four instructional activities—far from a double dose.

In sum, when we examine the school day through the lens of activity types, we find that the additional 3 hours available in the full-day setting are used first to add a nap and then to spend 10 to 20 extra minutes on each of the activities taking place in the half-day setting. This suggests the additional time is not used to dramatically alter the proportion of time spent on any particular activity (other than napping) but rather to increase time spent on class activities in a somewhat balanced manner. At first, this may not seem like a particularly 'intensive' use of the extra hours in full-day classes. Yet the absolute differences add up across the week. In total, full-day students spend on average 5.3 additional hours each week on these four instructional activities, relative to their half-day counterparts.

We also analyze pre-K classroom observations by identifying the primary content focus of time-use episodes. In Figure 2, time with more than one simultaneous content focus is initially coded as "mixed content." This is explored in more detail within the results for RQ2.

1C. How Much of the Pre-K Day is Content-Free in Full- and Half-Day?

About 30% of awake pre-K time does not involve content delivery—both in half- and full-day. In the typical half-day class, 56 minutes (29%) have no content. Turning to full-day, if we exclude the average 71 minutes per day spent napping (refer back to Figure 1), 101 minutes are without a content focus (33% of the awake full day). If we also include the nap as no-content time, 172 minutes, or nearly half of the day (46%), is without instructional content in full-day. The pre-K classrooms in WPS included about the same amount of content-free time in the awake day compared to what previous literature has found, but slightly more time without content when napping is included.

[Insert Figure 2 about here]

1D. How Much Academic Content Do Pre-K Children Receive in Full- and Half-Day Pre-K?

Turning to the class time that *did* have a content focus, the first clear finding is that pre-K teachers quite often engage children in activities with more than one simultaneous content focus. Indeed, "mixed content" is the modal content delivered in both half-day (89 minutes or 48% of the day) and full-day settings (128 minutes or 35% of the day). Since mixing content is so prevalent, we will turn to a more in-depth discussion of mixed content in its own research question below.

In both half- and full-day classes, teachers dedicate about 10% of the day to single academic content areas delivered on their own (e.g., ELA, math, science/social studies, etc.). However, the absolute difference in daily time again adds up across the week. Relative to their

counterparts in half-day classes, children in full-day classes receive, on average, 73 additional minutes focused exclusively on one of these subjects. As expected, most of this single-content instructional time is dedicated to ELA (between 12 and 16 minutes, daily). However, if we fail to look more closely into mixed content, it appears that very little time is dedicated to math in either setting (2 to 3 minutes).

RQ 2. How Often Are Content Areas Mixed Together in Full- and Half-Day Pre-K, and Which Content Areas?

In WPS pre-K classes, it is much more common to observe teachers weaving multiple content areas together than teaching one content area at a time. Across all pre-K classrooms, we commonly observed mixed content in whole group activities, like morning meeting, in which teachers would switch topics quickly (e.g., counting days on the calendar to identifying the weather to singing a greeting song). Mixed content also frequently occurred during group-based activities (i.e., small groups, centers only, and small groups + centers). We observed students either choosing from a number of different activities (centers only) or rotating through a set of activities (small groups) that included a variety of content areas such as blocks, dramatic play, art, math games, sensory exploration (i.e., water tables), and literacy stations.

For an example, consider students using paintbrushes to make artwork of their names. We would code this example as mixed content delivery since this task simultaneously serves multiple developmental purposes, including learning the alphabet (ELA) and using a visual art medium (music/art). In half-day classes, almost 50% of the school day involves mixed content delivery (about 89 minutes). In full-day, children engage in more mixed content learning in an absolute sense (about 128 minutes), though that represents less time in a proportional sense (about a third of the day).

What content areas were most often mixed together? Table 4 provides descriptive statistics in minutes for the 10 most frequently observed content combinations identified as mixed content. Content combinations are listed in order of the frequency in which they were observed in half-day classrooms. About 92% of mixed content episodes are contained in this top-ten list. The mixed content code is used most frequently to describe time with both ELA and social studies/science content. On average, pre-K teachers devoted about 17 minutes per day to this particular content combination across full and half-day settings.

[Insert Table 4 about here]

When we look more closely into mixed content, we get a very different sense of how much ELA and math content children are receiving. ELA content was included in half of the 10 most frequent mixed content combinations. If we sum the average time devoted to mixed content in which ELA is present, we find that half-day teachers spend about 88 minutes per day (and full-day teachers about 76 minutes per day) on mixed content that includes ELA. If we next consider math, most instruction in these pre-K classrooms occurred mixed in with other content areas. Observers rarely recorded teachers delivering only math (see Figure 2). However, in half-day classes, math appears to be mixed into about 71 minutes of the day (and 54 minutes per day for full-day classrooms).

Discussion

Study Objectives and Summary of Findings

The current paper shows how an intensive, in-classroom data collection effort allows researchers to capture unique aspects of time allocation in pre-K settings. Over the course of two years, the research team conducted 114 pre-K classroom observations. We address a set of sub-questions related to the following overarching research question: How do teachers typically

allocate time differently when one structural feature of pre-K programming—length of the pre-K day—changes?

We could hypothesize several different ways teachers might adapt time-use to the longer school day setting. One approach would be to allot the extra time in the more-than-doubled pre-K school day to increasing the dosage of instructional activities or core content areas (e.g., ELA, math, science, or social studies). Another possibility is that children this age would most benefit from learning embedded within play-based activities. A third approach might be to proportionally increase the time spent on each of the activities/content areas that take place in the half-day setting. Finally, the extra time could be used to engage in brand new activities that were not feasible in a three-hour window.

We find that, except for a nap period afforded only to students in full-day, the time allocated to most activities increases proportionally in the full-day setting. Our results, therefore, do not support the hypothesis that the doubling of the school-day was used to essentially double the delivery of academic content or time spent in instructional activities. While time-use looks similar across settings in a proportional sense, differences still translate to a sizable, absolute increase in full-day children's exposure to academic content and instruction. Full-day students spend about 177 additional hours on instructional activities throughout the pre-K year, relative to half-day.

We also briefly summarize two other key takeaways. First, we find that much of class time in both half- and full-day settings are coded as non-instructional activity types (about 40% of the day) and/or without content (30% in half-day and 46% in full-day). This finding contributes to our body of knowledge on pre-K time use as previous literature has reported anywhere between 10% and 43% of the observed instructional time did not contain content (Cabell et al., 2013; Connor et al., 2006; Early et al., 2010; Farran et al., 2017, 2017; Justice et al., 2022; La Paro et al., 2009;

Pianta et al., 2018). Our findings also highlight that WPS pre-K teachers are much more likely to weave multiple content areas together than deliver content in isolated blocks. In fact, 48% of the observed time in half-day and 35% in full-day classrooms is coded as mixed content. The substantial use of mixed content in WPS pre-K contrasts sharply with what Engel, Jacob, Claessens, and Erickson (2021) find in low-income New York City kindergarten classrooms—wherein only 4% of the day is coded as mixed content. This finding is interesting to consider that once formal schooling begins, teachers may be required to adopt more traditional content blocks in lieu of mixing content together. Recent research has started to investigate how time use differs between pre-K and kindergarten, focusing particularly on how time is allocated differently in each setting (Justice et al., 2022; Weiland et al., 2023). In the context of WPS pre-K, restricting observers to code only a single content area per activity could result in overlooking content delivery that was taking place.

Conclusions for Research and Policy

First, our results may be particularly useful for researchers studying ECE classroom experiences, highlighting the multidimensionality of teaching practices. These include the use of diverse activity types (e.g., centers, whole group, structured/unstructured play, etc.) and the frequent integration of multiple content areas within a single activity. From a policy perspective, these uniquely complex features of time allocation in ECE should inform, and complicate, efforts to identify how time *should* be used to maximize students' readiness for kindergarten.

Turning to the broader objectives of the FDPK Study, evaluating whether full-day pre-K is a promising policy lever for improving child outcomes, previously published FDPK research documented significant effects in receptive vocabulary (+0.28 standard deviations [*SD*s], $p < .001$), a developmental screening tool (+0.10 *SD*s, $p > .05$), and six exploratory Teaching Strategies

GOLD outcomes (+0.15 *SD*s to +0.39 *SD*s, $p < .05$) by the end of pre-K (Author(s), n.d.). If these promising findings persist as FDPK Study children move through school, understanding how WPS teachers used the additional class time becomes important, particularly given the absence of clear guidance from prior research on optimal time allocation. Our paper's findings not only make the FDPK results more actionable for policymakers but also may generate hypotheses about how structural features of ECE shape children's learning opportunities.

Limitations and Lessons Learned

We conclude by acknowledging several limitations and propose directions for future research. Primarily, our study is based on a small sample from one district serving a predominantly Hispanic student population–an important, but not nationally representative group of students. The demographic composition of WPS creates unique dynamics in its learning environment, which may limit the generalizability of our results to other educational contexts. Furthermore, we cannot infer that teachers' time allocation in WPS represents what we would expect to find in ECE settings across the United States. To that end, our observations covered only a fraction of the school year—about 3% of the total instructional days—offering a detailed yet limited snapshot of classroom time-use in half- and full-day pre-K.

Second, the FDPK Study's design lacked sufficient power to precisely estimate class-level associations between time-use and outcomes. Recall that the unit of randomization was at the child-level, and so while the broader FDPK study design can yield causal estimates of the effects of full- vs. half-day pre-K on child-level outcomes, it is not designed nor adequately powered to estimate causal effects at the class- or teacher-level. It is also worth keeping in mind that the FDPK Study team chose to not randomly assign teachers to full- vs. half-day classes. This was an active

choice between two imperfect options—either also randomize teachers to classes or follow business-as-usual teacher assignment practices to reflect real-world district practices more closely.

We chose the latter for two reasons: First, it simply was not feasible to ask the district to randomize teachers to the schools/classes in which they worked. Second, we expect that future districts that add full-day classes to their offerings will also use business-as-usual practices to assign teachers to classes, not randomly assign them. Our decision not to randomize teachers to full- or half-day classes, opting instead for the more realistic reflection of district practices, further limits our ability to address potential biases resulting from teacher characteristics. For instance, teachers who select into teaching full-day pre-K could also possess characteristics that incline them to teach more math or incorporate more mixed content into their instruction.

Third, while our observational data provides a rich, detailed snapshot of pre-K instructional content and groupings, they are also limited in some ways. The lack of direct teacher input on their time allocation or the inclusion of lesson plans in our study means that we cannot speak to *why* teachers mix content and activities. We suggest that future studies combine observational data with teacher interviews and lesson plans to provide a more comprehensive view of instructional decision-making in public school-based pre-K. This type of approach could reveal how these practices align with developmental theories and support educational outcomes.

Finally, we recognize the limitation of not having directly validated our observational protocol within the specific cultural context of Hispanic communities. Historically, educational research has been grounded in Western middle-class values, frequently neglecting the distinct experiences and cultural contexts of children from minoritized backgrounds. Such oversight risks misinterpretations and inadequate representation in research. Unfortunately, our literature review revealed that our observation protocol lacks specific validation for Hispanic populations. Prior

applications of the protocol in diverse settings (Aydoğan et al., 2015; Maier & Kou, 2019), while encouraging, do not fully address the need for specific validation within Hispanic communities. Given the significant impact of cultural norms and values on children's learning and classroom experiences, we urge readers to be mindful that our data interpretations may inadvertently reflect Western-centric educational norms on the observed classroom behaviors and interactions. Future research should focus on developing and validating observational instruments that are culturally relevant to the specific student populations being studied.

Despite these limitations, our descriptive results offer important insights for policymakers, as they (1) provide contextual insights into the dynamics within this particular sample of classrooms during the course of the RCT and (2) highlight the differences in time use between half- and full-day public school-based pre-K classrooms. Focusing on teacher- or class-level variation in time-use seems like an important next step for ECE time-use researchers and has been taken up in recent studies (e.g., Weiland et al., 2023). In conclusion, our study illuminates the complexities of time allocation in pre-K classrooms, underscoring its pivotal role in shaping early childhood educational experiences.

Tables

Table 1.
Previous Studies of Time Allocation in K and Pre-K, by Content Area and by Activity Type

			CONTENT AREA FOCUS			
Dataset	**Authors**	**Grade**	**ELA**	**Math**	**All Other Subjects**	**No Content / Instruction**
NCEDL	La Paro et al., 2009	Pre-K	14% of observed time	6%	35%	44%
NCEDL and SWEEP	Chien et al., 2010	Pre-K	19% of observed time	8%	57%	N/A
NCEDL and SWEEP	Early et al., 2010	Pre-K	17% of observed time	8%	57%	44%
NCRECE-PD Study	Cabell et al., 2013	Preschool & Head Start	31% of cycles	7%	47%	10%
Rural counties in central and eastern North Carolina	Burchinal et al., 2021	Pre-K, school- & community-based preschool, & Head Start	29% of observed time	16%	N/A	N/A
2 urban areas in the southeastern region of the U.S.	Coelho et al., 2021	Pre-K, public & private preschool, & Head Start	15% of observed time	6%	N/A	N/A
1 urban midwestern school district	Connor et al., 2006	Preschool & Head Start	22% of day*	3%	31%	43%
1 urban southern school district	Farran et al., 2017	Pre-K	16% of observed time	5%	38%	41%
2 large midwestern public school districs	Justice et al., 2022	Pre-K, public & private preschool	14% of observed time	4%	9%	23%
Classrooms in PA and NJ	Nores et al., 2022	Pre-K, public & private preschool, & Head Start	30% of observed time	19%	57%	N/A
1 large, suburban county	Pianta et al., 2018	Pre-K, public & private preschool	N/A	N/A	N/A	22%
1 midwestern, suburban school district	Piasta et al., 2014	Pre-K, public & private preschool, & Head Start	N/A	24% of observed time	26% on science	N/A
Classrooms in Tulsa, OK	Phillips et al., 2009	Pre-K & Head Start	30% of observed time	14%	57%	N/A
Classrooms in Boston Public Schools	Weiland et al., 2023	School-based Pre-K	35% of observed time	29%	46%	N/A
		Range Across Studies	**14% - 35%**	**3% - 29%**	**9% - 57%**	**10% - 43%**
		Median Across Studies	**21%****	**8%**	**46%**	**41%**

(Table 1 continues on next page…)

(…Table 1 continued from previous page)

			ACTIVITY FOCUS			
Dataset	**Authors**	**Grade**	**Free Choice / Centers**	**Whole Group Activities**	**Small Groups*** **	**Non-instructional Activities**** **
NCEDL	La Paro et al., 2009	Pre-K	33% of observed time	23%	6%	N/A
NCEDL	Pianta et al., 2005	Pre-K	35% of observed time	24%	N/A	20% on routines
NCEDL and SWEEP	Chien et al., 2010	Pre-K	30% of observed time	27%	6%	33%
NCEDL and SWEEP	Early et al., 2010	Pre-K	29% of observed time	37% in whole group, small group, and individual time		34%
NCRECE-PD Study	Cabell et al., 2013	Preschool & Head Start	32% of cycles	37%	4%	27%
NCRECE-PD Study	Goble & Pianta, 2017	Preschool & Head Start	32% of observed time	36%	N/A	N/A
Classrooms in mid-Atlantic state	Booren et al., 2012	Preschool	32% of cycles	25%	8%	35%
6 rural counties in North Carolina*****	Bratsch-Hines et al., 2019	Publicly-funded Pre-K	49% of observed time	35%	8%	N/A
Rural counties in central and eastern North Carolina	Burchinal et al., 2021	Pre-K, school- & community-based preschool, & Head Start	47% of observed time	37%	8%	N/A
2 urban areas in the southeastern region of the U.S.	Coelho et al., 2021	Pre-K, public & private preschool, & Head Start	14% of observed time	25%	4%	53%
2 large midwestern public school districts	Justice et al., 2022	Pre-K, public & private preschool	49% of observed time	33%	28%	N/A
1 large, suburban county	Pianta et al., 2018	Pre-K, public & private preschool	30% of observed time	28%	6%	32%
Classrooms in PA and NJ	Nores et al., 2022	Pre-K, public & private preschool, & Head Start	40% of observed time	25%	6%	27%
Classrooms in Boston Public Schools	Weiland et al., 2023	School-based Pre-K	34% of observed time	44%	6%	28%
		Range Across Studies	**14% - 49%**	**23% - 44%**	**4% - 28%**	**20% - 53%**
		Median Across Studies	**32%**	**28%**	**6%**	**30%**

Note. NCEDL = National Center for Early Development and Learning's Multi-State Study of Pre-K. SWEEP = State-Wide Early Education Programs Study. NCRECE-PD = National Center for Research on Early Childhood Education (NCRECE) Professional Development Study. Selection criteria for this table included studies that (1) provided descriptive information about more than one category of time allocation (e.g., ELA and math); (2) examined time allocation in classrooms serving pre-K aged children; (3) took place in the United States; and (4) defined content/activity codes in a way that enabled comparison with other studies. *We used "class" mean amounts in minutes per day divided by the total mins. reported in Fig. 2 to calculate these proportions (i.e., X mins / 58 mins per day). **More specifically, "for Pre-K" means for children who are Pre-K aged. ***Small Groups also include "Structured Group Work". ****Non-instructional activities include basics/routines, directions, transitions, meals, and recess. *****Although Bratsch-Hines et al. (2019) and Burchinal et al. (2021) appear to use the same data, there are small discrepancies in the description of the sample and the statistics, so we chose to report these two papers separately in this table.

Table 2.
Classroom Observation Counts and Minutes by Cohort, Teacher, and Class Type

		Classes by Cohort		Classroom Totals	
Teacher (N=16)	Classrooms (N=22)	2	3	Total # Obs	Total Mins
A	AM	2	4	6	1080
	PM	3	4	7	1260
B	AM	3	4	7	1260
	PM	3	4	7	1260
C	AM	--	4	4	720
	PM	--	4	4	720
D	AM	3	--	3	540
	PM	3	--	3	540
E	AM	2	--	2	360
	PM	2	--	2	360
F	AM	--	4	4	720
	PM	--	4	4	720
G	Full	3	4	7	2520
H	Full	3	4	7	2520
I	Full	2	4	6	2160
J	Full	3	4	7	2520
K	Full	3	4	7	2520
L	Full	3	--	3	1080
M	Full	3	4	7	2520
N	Full	3	4	7	2520
O	Full	3	4	7	2520
P	Full	--	3	3	1080
Cohort Totals	**Total Completed**	**47**	**67**	**114**	**31,500**
	Total Planned	51	68	119	32,760
	% Completed	*92.2*	*98.5*	*95.8*	*96.2*

Note. An "--" indicates that the given teacher was not present in WPS in the given cohort year; “Obs” = Observation; “Mins” = Minutes. The max number of entire class-period observations logged in Cohort 2 was three: (1) Nov/Dec, (2) Feb/Mar, and (3) Apr/May. The max number of entire class-period observations logged in Cohort 3 was four: (1) Oct/Nov, (2) Jan/Feb, (3) Feb/Mar, and (4) Apr/May. “Classrooms,” indicates the number of unique classrooms per teacher in each cohort, which differs from the “Classes” counts. “Classes” refers to the distinct groups of students a teacher has in a year, such as AM and PM sessions for half-day teachers. For example, in each year/cohort, a half-day teacher has one classroom, but two classes of students (AM and PM). Classroom observations were not collected for Cohort 1. Observational rubrics were applied by in-person observers in Cohort 2 and were applied to classroom video recordings in Cohort 3. Classes were always observed for their entire day (i.e., all 3 hours for a half-day class, all 6 hours for a full-day class.

Table 3.
Descriptive Statistics in Average Percent per Day from Observed Time Use Collected during Classroom Observations

	Half Day (AM & PM) n = 16				Full Day n = 18			
Activity Type	Mean	SD	p25	p75	Mean	SD	p25	p75
Napping	0.0	0.0	0	0	19.3	3.4	17	22
Eating	8.5	2.6	7	9	8.1	4.2	4	11
Transitions	19.5	4.5	16	23	20.1	4.3	18	23
Playground	12.7	4.5	10	16	10.4	3.0	8	12
Whole Group	26.7	6.7	22	31	16.8	3.7	15	19
Small Groups	5.4	6.5	1	8	6.5	4.0	3	9
Small Group & Centers	10.3	7.0	6	16	2.9	3.8	0	4
Centers	13.7	6.9	9	18	13.7	5.6	10	16
Specials	3.2	3.5	0	4	2.2	2.7	0	3
	100.0				*100.0*			
Content	Mean	SD	p25	p75	Mean	SD	p25	p75
Not applicable	23.2	14.8	7	35	37.4	10.2	34	42
No Content Observed	6.9	10.2	0	11	9.2	10.0	0	19
Mixed Content	47.8	10.9	39	52	34.7	8.4	29	41
ELA	5.8	5.1	1	10	4.4	4.5	2	5
Science & Soc. Stud.	4.0	2.9	2	5	4.2	3.3	1	6
Music and Visual Arts	2.7	2.2	0	5	4.1	3.7	1	5
Gross Motor	2.7	4.0	0	5	1.7	2.4	0	4
Math	1.6	2.3	0	3	0.6	0.8	0	1
Other Content	5.4	4.4	1	8	3.6	2.9	1	6
	100.0				*100.0*			

Note. ELA = English Language Arts; Soc. Stud. = Social Studies; SD = Standard Deviation; p25 = 25th percentile; p75 = 75th percentile. Cell contents report the percent of time per day observed on each activity type (upper panel) or content area (lower panel). Results for half-day classes are shown on the left (N=16 total class-years), and full-day classes are shown on the right (N=18). Each panel totals 100% of the observed school day.

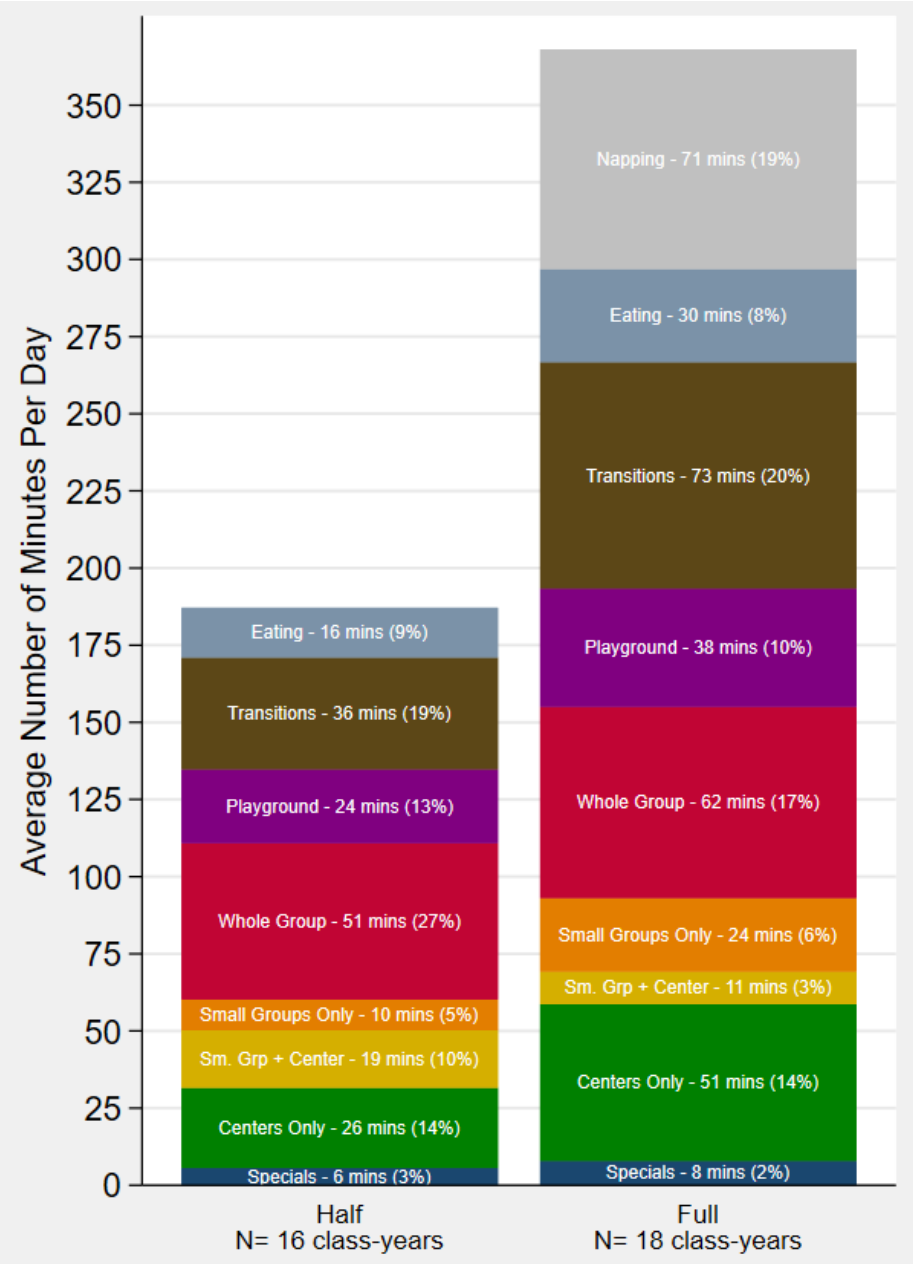
Table 4.
Descriptive Statistics for the Ten Most Frequently Observed Content Combinations of Mixed Content across Observation Windows, Classrooms, and Cohorts

	Half Day (AM & PM)					Full Day				
	Number of Times	Descriptives for Minutes Spent per Day in a Given Content Combination				Number of Times	Descriptives for Minutes Spent per Day in a Given Content Combination			
Content Combinations within Mixed Content	Combination Observed	Average Minutes	SD of Minutes	Minimum Minutes	Maximum Minutes	Combination Observed	Average Minutes	SD of Minutes	Minimum Minutes	Maximum Minutes
ELA + Soc. Stu./Science	65	18.7	7.3	5	38	43	15.2	6.2	5	38
ELA + Music/Art	51	19.5	10.4	5	49	42	13.7	3.2	9	20
Soc. Stu./Science + Music/Art	50	14.2	6.2	5	25	32	15.8	9.1	6	41
ELA + Math	44	18.1	7.0	3	35	24	12.7	6.2	3	23
Music/Art + Other	36	25.9	10.5	5	58	25	19.3	6.6	8	40
ELA + Other	28	18.6	12.1	5	48	17	18.5	10.9	2	45
Soc. Stu./Science + Other	19	15.1	5.8	10	28	17	16.8	13.4	5	55
Math + Music/Art	18	28.2	19.9	2	75	21	18.6	6.8	8	35
ELA + Gross Motor	17	13.4	5.0	4	19	13	15.5	7.7	3	27
Math + Other	11	24.4	18.2	6	69	8	22.5	15.0	4	44

Note. ELA = English Language Arts; Soc. Stu. = Social Studies. Table 4 is limited to time-use episodes that are coded as more than one simultaneous focal content area. The table reports descriptive statistics (count, mean, standard deviation ("SD"), minimum, and maximum) of distinct time-use episodes that are coded as one of the top ten most common content combinations. 92% of all mixed content episodes are contained in this top ten. Rows are sorted from most- to least- frequent combinations among half-day classes.

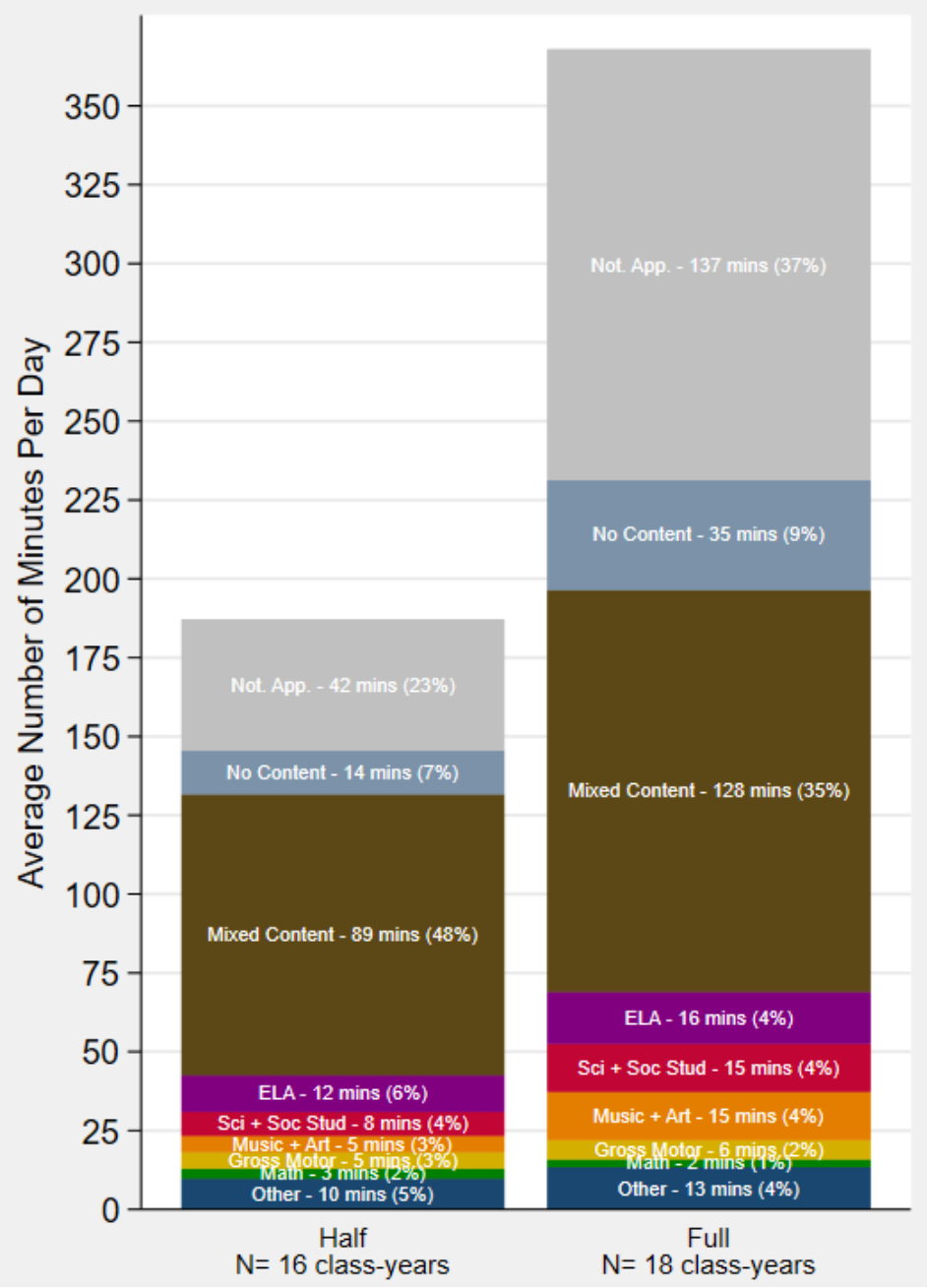
Figures

Figure 1.
Average Minutes Observed per Day in Mutually Exclusive, Activity Types, by Half- and Full-Day



Note. Sm. Grp. = Small Groups. Data was collected using classroom observations. Data are pooled across cohorts and presented separately by half- and full-day programs. This results in 16 unique half-day class-years and 18 unique full-day class-years, where class-years are identical to the 'classes' described in Table 2.

Figure 2.
Average Minutes Observed per Day on Mutually Exclusive Content Areas, by Half- and Full-Day



Note. Not. App. = Not Applicable; ELA = English Language Arts; Sci. = Science; Soc. Stud. = Social Studies. Data was collected using classroom observations. Data are pooled across cohorts and presented separately by half- and full-day programs. This results in 16 unique half-day class-years and 18 unique full-day class-years, where class-years are identical to the 'classes' described in Table 2.

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