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Prevalence and prediction of kindergarten-transition difficulties

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ABSTRACT

The transition to formal schooling is a large contextual change, which for many children in U.S. begins with the year of kindergarten. To better understand the challenges of this transition, the present study examines the extent to which children experience transition difficulties in five salient areas: making friends, following schedules, meeting academic demands, working within groups, and being organized.

Using a sample of 688 kindergarteners from 45 classrooms, we found that challenges in the transition to kindergarten were prevalent based on teacher report. More than 70% of the children were reported to have difficulty in at least one area, and over 30% of children had challenges in all five areas. Meeting academic demands and being organized were two of the most common challenges kindergarteners experienced. Gender and IEP status consistently predicted transition difficulties, in that boys struggled more than girls, and children with disabilities (on the basis of IEP provision) were more likely to have difficulties than those without IEPs. Overall, this work highlights the need to support children during the transition to kindergarten.

1. Introduction

Transitions are key points in developmental trajectories in which individuals need to adapt to their changing environments (Elder, 1998). One of the earliest transitions that children in the U.S. experience is the transition to formal schooling, which for many children begins with kindergarten at about 5 years of age. The success of this transition has lasting consequences, as the kindergarten year is considered a critical developmental period for shaping children's short- and long-term well-being (Duncan et al., 2007; Entwisle & Alexander, 1989).

When children start kindergarten, they are transitioning into a context that is distinct from their earlier experiences. Although many children experience some sort of 'school-like' setting prior to kindergarten, such as preschool, estimates suggest that only about 60% of children experience a center-based care setting as their primary care arrangement in the year before kindergarten (Rathbun, Zhang, & Snyder, 2016). For the other 40% of children, one might imagine that adjustment to the kindergarten context may be challenging. Moreover, even children who attend center-based settings prior to kindergarten experience dramatic shifts as they enter kindergarten, in both environmental experiences and expectations. As compared to preschool, kindergarten has more formal classroom experiences, larger class sizes, fewer child-directed activities, and less frequent parent-teacher communication (Rimm-Kaufman & Pianta, 2000). Children are also held to different expectations in the kindergarten setting, relative to preschool, including behavioral expectations, such as staying on task and adhering to stricter routines, and academic expectations, as seen in the larger emphasis on skill development and time spent in learning-focused activities (Rimm-Kaufman & Pianta, 2000).

For some time, researchers have discussed the importance of developing strategies to enhance children's transition to kindergarten, as well as the risks that many children face in experiencing transition difficulties (McIntyre, Eckert, Fiese, DiGennaro Reed, & Wildenger, 2007; McIntyre, Eckert, Fiese, DiGennaro Reed, and Wildenger, 2010; Rimm-Kaufman, Pianta, & Cox, 2000). Some evidence suggests that difficulties with the transition to kindergarten may contribute to parent and teacher efforts to retain children in preschool until the time-point at which they are deemed ready; up to 10% of children are 'red-shirted,' with parents purposefully delaying their entrance to kindergarten so that they can be physically and socially mature at kindergarten entrance (Bassok & Reardon, 2013). Importantly, such concerns may be increasing, as recent work suggests an increased 'academicization' of kindergarten (Bassok, Latham, & Rorem, 2016). Comparing two nationally representative samples of kindergarten classrooms, Bassok and colleagues documented changes in the kindergarten environment and expectations over the span of two decades. Their work showed that kindergarten teachers today spend more time in math and liter-

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acy instruction, and more time focused on more advanced skills within these domains, than in prior years. Also, today's kindergarten teachers have higher expectations for children: In 1998, only 31% of teachers expected children to learn to read in kindergarten, compared to 80% in 2010. This suggests that children's transition to kindergarten may be particularly challenging.

The purpose of the present study is to improve fundamental understanding of children's transition to kindergarten, especially the extent to which children experience difficulties with this transition. We examine the transition to kindergarten for children entering primary schooling in the 2017–2018 academic year by addressing three specific aims. The first aim was to examine the general incidence of kindergarten-transition difficulties among children in the fall of kindergarten, based on teacher report. Prior investigations of kindergarten-transition difficulties, using large-scale survey methods, found that nearly one in five children (16%) had challenges transitioning into the kindergarten setting (Rimm-Kaufman et al., 2000), suggesting that a non-trivial number of children may experience transition difficulties. However, Rimm-Kaufman and colleagues' study involved asking teachers to approximate the percentage of students they perceived as entering the kindergarten classroom successfully (very successful transition/ no transition problems), somewhat successfully (some minor transition problems), or not successfully (difficult transition with many problems). Data were not collected at the level of the individual student. It is difficult to infer whether teacher-report at the aggregate level of the classroom validly represents transition-related difficulties for individual students.

To this point, some subsequent studies suggest that a relatively higher percentage of children may experience kindergarten-transition difficulties, based on evaluation of school-readiness skills in the fall of the kindergarten year. For instance, Hair and colleagues (2006) conducted secondary analyses of the Early Childhood Longitudinal Study—Kindergarten Class of 1998–1999 (N = 17,219) to examine whether profiles of kindergarten school-readiness were evident based on indices of physical well-being and motor development, social and emotional development, language development, cognition and general knowledge, and approaches to learning. Among the four profiles identified in the sample, 27% of children fell into a profile of "social-emotional risk," characterized by scores below average in all four areas of readiness with especially low scores on social-emotional measures. Because these readiness profiles were derived from fall-of-kindergarten assessments, many involving teacher report, we might infer that children profiled as having social-emotional risk may have also experienced difficulties with the transition to kindergarten. Children in this profile, compared to two more-positive profiles, were more likely to be boys, to have diagnosed disabilities, to reside in a one-parent household, and to have parents with relatively low educational attainment. An important contribution of the Hair et al. study is the demonstration that fall-of-kindergarten readiness profiles were significantly associated with first-grade reading, math, and social-emotional outcomes, highlighting the importance of kindergarten-entry skills and their school transition to children's future outcomes.

The second aim of the present study is to explore more proximal areas of potential kindergarten transition difficulty, in an effort to determine whether there were certain areas in which difficulties were heightened among children. Perry and Weinstein (1998) suggested that successful school adjustment transcends three areas, namely *academic functioning*, *social functioning*, and *behavioral functioning*. This perspective helps to articulate the important role that social-behavioral competencies may serve in successful kindergarten transitions, as scholars have suggested that children who are able to self-regulate their emotions and behaviors at kindergarten entry are better able to engage in content-area learning (Blair & Razza, 2007). Consequently, we examined kindergarten-transition difficulties with respect to children's ability to handle the academic demands of the kindergarten curriculum, as well as two aspects of social functioning (making friends, working in groups) and two aspects of behavioral functioning (following schedules, being organized). We propose that these indices of behavioral functioning are manifestations of a child's ability to self-regulate in the classroom, which may be a particularly important aspect of school adjustment (e.g., Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). In addition, prior work has suggested that difficulties specific to behavioral functioning in the kindergarten classroom, such as difficulty following directions, are particularly common transition difficulties for children (Rimm-Kaufman et al., 2002).

The third aim of this study was to identify salient predictors of kindergarten-transition difficulties. While some studies, such as that previously referenced by Hair and colleagues (2006), showed that characteristics of children were associated with fall of kindergarten readiness skills, such as race, ethnicity, and family structure, there has been limited empirical examination of child characteristics that specifically predict kindergarten-transition difficulties. For this aim, we considered whether the entering kindergartener had prior center-based preschool experience, encompassing public school pre-kindergarten, Head Start, or private preschool. In many states, including the one in which this study was conducted, support of kindergarten transition is an explicit component to child-care regulations, as is the case with national Head Start guidelines (U. S. Department of Health & Human Services, 2020). We anticipated that children with prior preschool experience may, in turn, have fewer transition difficulties than children without such prior experience. In addition, we also speculated that children with preschool experience would have more exposure to formal classroom settings, and the routines and expectations that characterize them, which also would likely reduce transition challenges.

In addition to preschool experience, we also considered a number of demographic factors as potential predictors of kindergarten-transition difficulties, including child gender, child race and ethnicity, disability status, household income, maternal education, number of children in the home, and home language. These candidates were selected based on prior studies showing links between these factors and kindergarten readiness (e.g., Hair, Halle, Terry-Humen, Lavelle, & Calkins, 2006; Halle, Hair, Wandner, & Chien, 2012; Justice, Bowles, Pence Turnbull, & Skibbe, 2009). We theorized that they may also be associated with kindergarten-transition difficulties.

Therefore, the purpose of the present study was three-fold: To examine the prevalence of kindergarten-transition difficulties; to determine areas in which difficulties were heightened; and to identify variables that predicted challenges in children's transition to kindergarten.

2. Methods

2.1. Procedure

Data for this study were collected as part of a larger project on the classroom ecology and children's learning from preschool through third grade that included three studies of different methodologies. One study, which is underway and is the focus herein, involved a longitudinal evaluation of children's development from preschool or kindergarten to grade three, which included careful evaluation of children's transition to kindergarten. For this longitudinal study, a subset of children was recruited during the preschool year and followed into district kindergarten classrooms (year 1 recruits), at which time all of their kindergarten classmates were recruited to join into the longitudinal study (year

2 recruits). In total, a sample of 801 kindergarten children were recruited in the first two years of the study.

Study activities involved a partnership with a large school district in Ohio featuring significant geographical and economic diversity within its borders. To recruit the sample in year 1, the research team held informational sessions at preschool programs located within district boundaries, and teachers voluntarily signed up to participate in the study. Participating teachers received financial incentives for completing study activities (e.g., filling out questionnaires on teacher background, classroom information, and child characteristics). All children attending classrooms of enrolled teachers were eligible to participate in the study if they were age-eligible to attend kindergarten the following year. With full caregiver consent, children were followed from preschool (year 1 recruits) to kindergarten, at which time the research team solicited consent from all classmates of the year 1 recruits.

2.2. Participants

The full longitudinal sample consisted of 801 kindergarteners from 64 classrooms across 15 schools within a large school district in the mid-western United States. Given the focus of the study, only children who had data on kindergarten transition difficulties were included in the analytical sample (n = 688, representing 86% of the full sample). Table 1 provides descriptive information for the full and analytical samples.

Of the 688 children in the analytical sample, 51% were boys; 14% were Hispanic or Latino(a) (86% non-Hispanic); and the majority were white (71%), with 8% of children black, 11% other races, and 11% multiracial. At the entrance of kindergarten, the participants averaged 5 years, 7 months (SD = 4 months) of age. Eight percent of children had an individualized education plan (IEP) in place during the kindergarten year. Family income information was reported in $10,000 ranges and recoded into four quartiles (22% $20,000 or less, 25% $20,001 to $40,000, 28% $40,001 to $80,000 and 25% $80,001 or more). In terms of maternal education (highest degree earned), 45% reported having a high school diploma or GED, 17% completed a two-year degree, whereas 24% had attained a four-year college degree or above. The average household had two adults and two children, and English was the primary home language spoken in 89% of the households. Comparison between the analytical sample and the excluded sample revealed that children in the analytical sample were significantly more likely to be white, non-Hispanic, come from English-speaking homes, and reside in households with fewer children.

Out of the 45 participating kindergarten teachers who filled out the teacher questionnaire, the majority were white (95%), non-Hispanic (98%), certified (97%), and had attained a master's degree as their highest credential (73%). The average class size was 25, with 52% of boys, 21% of English language learners (ELL). On average, 8% of children within a classroom had IEPs.

2.3. Measures

2.3.1. Kindergarten transition challenges

Kindergarten teachers completed questionnaires on their students in the fall and spring of the academic year. Of relevance to this study, from November to early January of the fall semester, teachers completed a questionnaire focused on each participating child's challenges in the transition to kindergarten in five areas: making friends and interacting with classmates, following schedule and routine, adjusting to academic demands, working within groups in the classroom, and being organized. The specific items were derived by carefully examining prior literature on this topic (Hair et al., 2006; Rimm-Kaufman & Pianta, 2000; Rimm-Kaufman et al., 2000). Teachers were asked to rate each child's difficulty in each of the five areas on a scale of 0 (no difficulty) to 4 (great difficulty). The reliability of the five-item scale was high (Cronbach's alpha = .922). The mean rating of transition difficulties across the five areas was negatively correlated with scores of concurrent standardized assessments of early literacy skills (Woodcock, McGrew, & Mather, 2007) and self-regulation (Ponitz et al., 2008) (ps < .01), although the coefficients were low (r = -0.1 to -0.3). This may suggest that the measures of kindergarten readiness are related to but distinct from kindergarten-transition problems.

2.3.2. Child and family characteristics

Child and family characteristics were mostly ascertained through caregiver report, except for children's disability status as indicated by the presence of an IEP per teacher report. As part of the consent process, caregivers completed a short initial questionnaire that contained basic information of the child and his/her family. They also completed a family background questionnaire in the spring, providing information on demographics, household characteristics, and the home environment. In both the fall and spring questionnaires, caregivers were asked whether their child attended preschool during the year prior to kindergarten. If the caregiver indicated that the child attended Head Start, public school pre-kindergarten, or a private preschool (including "an early education center, child care center, parochial child care center, or nursery school other than Head Start"), the child was classified as an attender. On the other hand, if the child was in a home-based care, in an extended-day program, or in the care of a parent or relative, he or she was considered a non-attender.

2.4. Analyses

To investigate the prevalence of kindergarten-transition challenges, we ran descriptive statistics to examine both the *number* of areas in which children had challenges transitioning (0–5 areas), as well as the *level* of teacher-rated transition difficulties based on the 5-point scale (0 = no difficulties, 4 = great difficulties). We then examined nine child-level characteristics as potential predictors of transition challenges: preschool attendance, gender, race, ethnicity, disability status, family income, maternal education, number of children in the household, and home language. Three sets of analyses were employed: (1) univariate analyses of variance (ANOVA), which tested whether the extent and levels of transition difficulty varied by categories of individual correlates (e.g., boys vs. girls); (2) multilevel multinomial regression, which simultaneously tested all potential predictors and identified variables that differentiated between children with no difficulty, some difficulty, or extensive difficulty transitioning after controlling for teacher effects; and (3) multilevel linear regression, which tested whether the nine correlates predicted the level of transition challenges after controlling for the number of areas with reported difficulty.

In the multinomial regression, model coefficients (in the unit of Logit) describe how likely the changes of categories occur (i.e., from the reference category to the target category) with one unit of change in the predictors. For ease of interpretation, the coefficients were converted to odds ratios (O.R., exponential of the Logit). Effect sizes (E.S.) were calculated using techniques proposed by Chinn (2000) and can be interpreted using the thresholds 0.2 (small), 0.5 (medium) and 0.8 (large) (Cohen, 1988).

2.4.1. Missing data

In the analytical sample, the outcome variables measuring kindergarten-transition difficulties were fully observed, and eight of the nine child-level correlates had low amounts of missing data (0% to 3%). On the other hand, 23% of the data were missing for the variable "number of children in household." Instead of using listwise deletion, which has been shown to produce biased results

Table 1
Descriptive statistics of the full and analytical sample.

	Full sample (801 children, 64 classrooms)			Analytical sample(688 children,45 classrooms)		
	Mean or %	*SD*	Range	Mean or %	*SD*	Range
Teacher and classroom characteristics						
Teacher race: White	95.3%			95.3%		
Black	2.3%			2.3%		
Other or multiracial	2.3%			2.3%		
Teacher ethnicity: Hispanic	2.3%			2.3%		
Teaching certification: Yes	97.2%			97.2%		
Teacher degree: Bachelor's	26.8%			26.8%		
Master's	73.2%			73.2%		
Teacher's years of experience teaching	12.62	8.15	2∼35	12.62	8.15	2∼35
Class size	25.49	0.86	23∼27	25.49	0.86	23∼27
Classroom composition: Percent of boys	52.13	5.85	42∼64	52.13	5.85	42∼64
Percent of ELL	20.94	18.03	0∼58	20.94	18.03	0∼58
Percent of IEP	7.95	5.66	0∼23	7.95	5.66	0∼23
Child and family characteristics						
Gender: Male	51.4%			50.9%		
Race: White	68.3%			70.5%		
Black	8.8%			8.2%		
Other	12.2%			10.7%		
Multiracial	10.7%			10.6%		
Ethnicity: Hispanic	15.7%			14.3%		
IEP	8.1%			8.3%		
Annual income: 1st Quartile ($20,000 or less)	22.6%			21.5%		
2nd Quartile ($20,001∼$40,000)	24.3%			25.1%		
3rd Quartile ($40,001∼$80,000)	27.5%			27.9%		
4th Quartile ($80,001 or more)	25.6%			25.5%		
Maternal education: No high school diploma	14.0%			14.2%		
High school diploma/GED	45.2%			44.9%		
Associate's degree	16.9%			17.2%		
Bachelor's degree	23.9%			23.6%		
Preschool attendance	74.3%			73.0%		
English as a primary home language	87.8%			89.1%		
Age in months	67.25	4.45	52∼92	67.22	4.48	52∼92
Number of people in the household	4.51	1.32	2∼9+	4.50	1.29	2∼9+
Number of children in the household	2.48	1.15	1∼9+	2.45	1.12	1∼9+

Note. The full sample and the analytical sample had identical descriptive statistics at the classroom-level, because teachers from the excluded sample did not provide any classroom-level information due to attrition or survey non-response.

and low power (Graham, 2012), we used multiple imputation (MI) (R. J. Little & Rubin, 1987) to treat missing data. We conducted inclusive imputation (Schafer & Olsen, 1998), where the imputation model included all analyses variables as well as variables theoretically or empirically related to missingness (e.g., children's cognitive and socio-behavioral skills). To account for the fact that data were nested within classrooms, a multilevel imputation model was applied by treating teacher effect as a random component using Blimp 1.0.3 (Enders, Du, & Keller, 2019). Twenty datasets were imputed and analyzed to generate the final estimates.

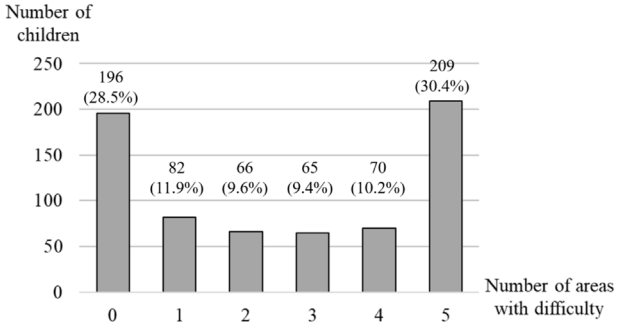

Fig. 1. Number of areas (out of five total areas) in which kindergarten-transition challenges were reported by the teachers.

3. Results

3.1. Prevalence of kindergarten-transition difficulties

Prevalence of kindergarten-transition difficulties among our sample of 688 kindergarteners was based on teacher ratings provided in the fall of the year on five potential problem areas: making friends, following schedules, meeting academic demands, working in groups, and being organized. Recall that these ratings used a 5-point scale (0 = no difficulties, 4 = great difficulties), where zero indicates an absence of problems, and a value larger than zero implies that transition challenges existed to some extent. Out of the 688 valid responses, 72% of the children were reported as having transition problems based on ratings of 1 or higher in at least one area. Moreover, more than 30% of children were reported to have challenges in all five areas, as shown in Fig. 1. The average number of transition difficulties was 2.5 (out of five).

Across the five areas of potential difficulty, more than one-half of children had at least some difficulties in being organized (56%), working in groups (53%), meeting academic demands (54%), and making friends (50%), whereas only 37% had challenges following schedules (see Fig. 2). For those who had transition difficulties, the average levels of challenges were 1.8 for making friends, 1.9 for following schedules, 2.1 for meeting academic demands, 1.9 for working in groups, and 2.0 for being organized. Correlation among the five areas of transitional difficulties was moderate to high, ranging from 0.59 to 0.76 as measured by Spearman's rho coefficients (see Table 2).

Across the five areas of potential transition difficulties, the percentage of children rated as having great difficulties varied from a low of 3.2% (following schedules) to more than 7% having great diffi-

Table 2
Correlation among five items measuring transition difficulties (Spearman's rho).

	1	2	3	4	5
1. Making friends and interacting with classmates	–	0.645*	0.604*	0.757*	0.586*
2. Following schedule and routine		–	0.700*	0.723*	0.699*
3. Adjusting to academic demands			–	0.726*	0.746*
4. Working within groups in the classroom				–	0.728*
5. Being organized					–

* $p < .001$.

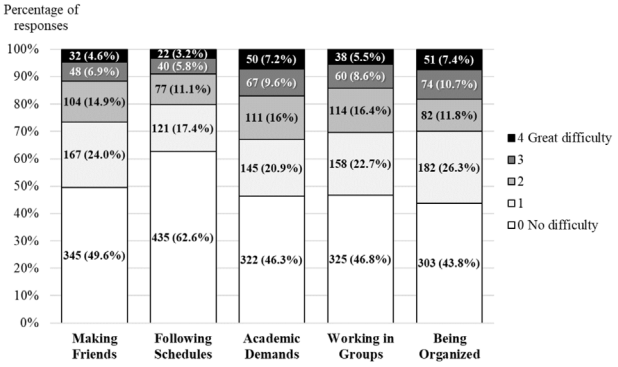

Fig. 2. Teacher-reported challenges in transitioning to kindergarten: frequency and percentage.

culties being organized (7.4%) and dealing with academic demands (7.2%).

3.2. Predictors of kindergarten-transition difficulties

3.2.1. Univariate correlates of transition difficulty

To predict children's kindergarten-transition difficulties, we first examined potential correlates (child demographics, family characteristics, and preschool attendance status) individually via univariate tests (see Table 3). Notably, two child characteristics were significantly related to both the number of areas in which children displayed transition difficulty as well as the level of difficulty: child gender and IEP status ($p < .001$). Specifically, boys had more difficulty (2.9 areas, mean level = 1.2) than girls (2.2 areas, mean level = 0.8), and children with IEPs struggled more (3.5 areas, mean level = 1.6) than those without IEPs (2.4 areas, mean level = 0.9). Moreover, household characteristics including family income ($p = .027$), number of children in the household ($p = .023$), and home language ($p = .010$) were also significantly linked to the level of transition difficulty, in that children from poorer families, single-child households, or English-speaking homes tended to have significantly greater difficulty transitioning to kindergarten than their peers from higher-income families, multiple-child households, and non English-speaking homes.

3.2.2. Predictors of the number of areas with transition difficulty

Second, we used multilevel regression models to examine all covariates simultaneously so that significant predictors of transition difficulties could be identified. Given the bimodal distribution of the number of areas in which children had challenges (see Fig. 1), we used a three-category outcome variable to measure the extent of transition problems: no difficulty (29% of the sample), some difficulty (difficulty in one to four areas, 41% of the sample), and extensive difficulty (difficulty in all five areas, 30% of the sample).

Results of multinomial regression are summarized in Table 4. Notably, children who had attended preschool were less likely to experience transition challenges in one or more areas ($p = .027$, O.R. = 0.6, E.S. = -0.3). Moreover, gender, IEP status, and home language consistently predicted the existence of transitioning difficulty. In particular, the odds for boys to experience transition challenges were 2.0∼2.8 times as great as the odds for girls ($p < .01$, E.S. = 0.4∼0.6); children from English-speaking households were 2.4 times as likely to have some difficulty ($p = .033$, E.S. = 0.5) and 4.1 times as likely to have extensive difficulty ($p = .022$, E.S. = 0.8) as those from non English-speaking homes; and IEP status was associated with substantially increased odds of having some (O.R. = 5.9, $p = .001$, E.S. = 1.0) or extensive transition difficulties (O.R. = 11.6, $p < .001$, E.S. = 1.4). Ethnicity also served to predict transition challenges, in that Hispanic children were 2.1 times as likely as non-Hispanic children to have some rather than no challenges ($p = .049$, E.S. = 0.4). Finally, unique predictors of extensive transition difficulty included income and household size: Being in a higher-income quartile was related to a 30% decrease in the odds of having difficulties in all areas ($p < .05$, E.S. = 0.2), whereas an additional child in the household was associated with a 50% increase in the odds of having no difficulty ($p = .016$, E.S. = 0.2) rather than extensive difficulty.

3.2.3. Predictors of the level of transition difficulty

We also investigated the predictors of the *level* of transition challenges (0∼4) after controlling for the number of areas where challenges were reported as well as all potential correlates (see Table 5). Again, boys received higher ratings in the level of transition difficulties than girls ($b = 0.09$ points, $p = .025$), and children with IEPs had higher levels of difficulty than their peers (b = 0.20, $p = .056$). In terms of family characteristics, higher income ($b = -0.05$, $p = .050$) predicted lower levels of transition challenges.

4. Discussion

Evidence suggests that kindergarten has become increasingly academic in nature, as shown by analyses of kindergarten teachers' reported expectations towards their children over the last two decades (Bassok et al., 2016). For instance, kindergarten teachers in 2010 reported having higher expectations for children's reading and math achievement as compared to teachers in 1998. Correspondingly, kindergarten teachers now spend more time providing explicit reading and math instruction than in years prior. Given that the kindergarten milieu may therefore differ in key ways from children's earlier caregiving contexts, and thus present some challenges to children as they matriculate into this new 'academized' setting, research and policy efforts highlight the importance of providing supports to families and children as they navigate this transitional period (Cook & Coley, 2017). To contribute to the literature concerning children's kindergarten-transition difficulties, the present study examined the extent to which children entering kindergarten experience transition difficulties in five salient areas: making friends and interacting with classmates, following schedules and routines, adjusting to the classroom's academic demands, working within groups in the classroom, and being organized.

Results of the present study clearly show that challenges in the transition to kindergarten are common, and potentially are more prevalent than previous estimates have suggested. For the five areas investigated in which difficulties may manifest themselves,

Table 3
Correlates of transition difficulties: Univariate tests.

Variables		Number of areas with difficulty		Level of difficulty	
		Mean (*SD*)	*p*-value	Mean (*SD*)	*p*-value
Preschool attender	Yes	2.50 (*2.09*)	.684	0.97 (*1.06*)	.770
	No	2.57 (*1.98*)		1.00 (*1.05*)	
Gender	Male	2.88 (*2.01*)	<.001	1.18 (*1.13*)	<.001
	Female	2.15 (*2.04*)		0.77 (*0.93*)	
Race	White	2.48 (*2.07*)	.192	0.98 (*1.07*)	.098
	Black	2.66 (*2.11*)		1.08 (*1.14*)	
	Other	2.27 (*1.94*)		0.75 (*0.82*)	
	Multiracial	2.95 (*2.02*)		1.15 (*1.06*)	
Hispanic	Yes	2.61 (*1.93*)	.625	0.93 (*0.93*)	.601
	No	2.50 (*2.08*)		0.99 (*1.07*)	
IEP	Yes	3.51 (*1.78*)	<.001	1.62 (*1.20*)	<.001
	No	2.43 (*2.06*)		0.92 (*1.02*)	
Income	Q1 (< = 20 K)	2.76 (*2.08*)	.073	1.13 (*1.14*)	.027
	Q2 (20∼40 K)	2.72 (*1.99*)		1.09 (*1.10*)	
	Q3 (40∼80 K)	2.35 (*2.06*)		0.88 (*0.95*)	
	Q4 (>80 K)	2.30 (*2.07*)		0.86 (*1.02*)	
Maternal education	No HS	2.65 (*2.07*)	.265	1.01 (*1.02*)	.342
	High school	2.52 (*2.01*)		0.99 (*1.05*)	
	Associate's	2.74 (*2.14*)		1.10 (*1.11*)	
	Bachelor's+	2.28 (2.07)		0.87 (*1.03*)	
# children in house	1	2.85 (*2.14*)	.088	1.21 (*1.16*)	.023
	2	2.51 (*2.02*)		0.98 (*1.06*)	
	3+	2.36 (*2.03*)		0.87 (*0.97*)	
Home language	English	2.57 (*2.07*)	.105	1.02 (*1.08*)	.010
	Other	2.16 (*1.94*)		0.69 (*0.74*)	

Note. Univariate ANOVA results were pooled using moment-based statistics (Grund, Lüdtke, & Robitzsch, 2016; Li, Raghunathan, & Rubin, 1991; Reiter, 2007) with 20 imputed datasets.

Table 4
Predicting the extent of kindergarten-transition difficulty: Multilevel multinomial regression.

Variables	Some difficulty vs. No difficulty (reference)				Extensive difficulty vs. No difficulty (reference)				Extensive difficulty vs. Some difficulty (reference)			
	Est.	*p*	O.R.	E.S.	Est.	*p*	O.R.	E.S.	Est.	*p*	O.R.	E.S.
Level-1: child and family characteristics												
Child attended preschool	**−0.50**	**.027**	**0.60**	**−0.28**	−0.45	.060	0.64	−0.25	0.06	0.73	1.06	0.03
Child is a boy	**0.67**	**.002**	**1.96**	**0.37**	**1.02**	**<.001**	**2.77**	**0.56**	0.34	0.12	1.40	0.19
Child race: Black vs. white	0.49	.263	1.62	0.27	0.80	.057	2.22	0.44	0.26	0.42	1.30	0.15
Other vs. white	0.26	.520	1.29	0.14	0.10	.806	1.11	0.06	−0.17	0.66	0.84	−0.09
Multiracial vs. white	0.15	.636	1.16	0.08	0.13	.757	1.14	0.07	−0.02	0.97	0.99	−0.01
Child is Hispanic/Latino(a)	**0.76**	**.049**	**2.13**	**0.42**	0.54	.189	1.72	0.30	−0.19	0.56	0.83	−0.11
Child have an IEP	**1.77**	**.001**	**5.87**	**0.98**	**2.45**	**<.001**	**11.61**	**1.35**	0.62	0.14	1.86	0.34
Income quartiles	−0.05	.673	0.95	−0.03	**−0.36**	**.024**	**0.70**	**−0.20**	**−0.30**	**0.03**	**0.74**	**−0.16**
Maternal ed: HS diploma vs. no HS	0.10	.778	1.11	0.06	−0.30	.427	0.74	−0.16	−0.41	0.28	0.66	−0.23
Associate's vs. no HS	−0.29	.509	0.75	−0.16	−0.27	.583	0.76	−0.15	0.01	0.98	1.01	0.01
Bachelor's vs. no HS	−0.28	.509	0.75	−0.16	−0.77	.112	0.47	−0.42	−0.45	0.31	0.64	−0.25
Number of children in household	−0.14	.152	0.87	−0.08	**−0.38**	**.016**	**0.68**	**−0.21**	−0.23	0.06	0.79	−0.13
English is a primary home language	**0.86**	**.033**	**2.37**	**0.48**	**1.42**	**.022**	**4.13**	**0.78**	0.57	0.27	1.77	0.31
Level-2: classroom and teacher												
Teacher effect (random)	0.61	.009			2.76	.005			1.50	.024		

Note. Est. = Coefficient estimates (Logit for fixed effects). O.R. = odds ratio (exponential of the Logit). E.S. = effect size. HS = high school.
Coefficient estimates were pooled with 20 imputed datasets. E.S. was calculated based on the pooled estimates using formula proposed by Chinn (2000).

at least one-half of the sample experienced some challenges, and one-third of our sample reportedly experienced difficulties across all five areas. Given that the present study used teacher report on each child's experience, and directly asked teachers about each individual student's difficulties in the transition, the present study offers more precision than prior evaluations of the prevalence of kindergarten-transition issues (Rimm-Kaufman & Pianta, 2000).

One potential cause for the relatively high prevalence of transition difficulties may be the lack of alignment between children's experiences prior to kindergarten and their experiences in the kindergarten classroom. Although the majority of the sample had attended preschool, recent research has highlighted the stark differences in classroom expectations and experiences across these two settings (Purtell, Jiang, Justice, Lin, & Logan, 2019; Rimm-Kaufman & Pianta, 2000). Furthermore, work by Bassok and colleagues (2016) revealed that kindergarten has become much more academically focused in recent years, while preschool settings continue to offer large volumes of time in which academic learning is not the focus (Early et al., 2010). Thus, it is not surprising that difficulty meeting academic demands and being organized were two of the most common challenges kindergarten students experienced, as these may not be demands required of children in preschool settings.

It is also clear that transition difficulties are interrelated. More directly, children who experience one difficulty are likely to experience all five difficulties, and these difficulties transcend *both* the academic and social-behavioral demands of kindergarten. To this end, it is important to highlight that the transition difficulties of

Table 5
Predicting the levels of kindergarten-transition difficulty: Multilevel linear regression.

Effects	Having difficulty		
	Est.	*p*	Beta
Level-1: child and family characteristics			
Number of areas with difficulty	0.43	<.001	0.84
Child attended preschool	0.02	.795	0.01
Child is a boy	0.09	.025	0.04
Child race: Black vs. white	0.00	.990	0.00
Other vs. white	−0.08	.289	−0.02
Multiracial vs. white	−0.06	.469	−0.02
Child is Hispanic/Latino(a)	−0.04	.494	−0.02
Child has an IEP	0.20	.056	0.05
Income quartiles	−0.05	.050	−0.05
Maternal ed: HS diploma vs. non-HS	−0.02	.798	−0.01
Associate's vs. non-HS	−0.00	.992	−0.00
Bachelor's vs. non-HS	−0.01	.948	−0.00
Number of children in household	−0.04	.065	−0.04
English is a primary home language	0.10	.200	0.03
Level-2: classroom and teacher			
Teacher effect (random)	0.02	.007	

Note. Est. = Coefficient estimates. Beta = standardized coefficient estimates. HS = high school.
Coefficient estimates were pooled with 20 imputed datasets.

children who struggle greatly are not an either/or proposition, as may be inferred from some writing on this topic (Blair & Razza, 2007). Rather, interventions designed to support kindergarten-transition problems for those particularly vulnerable need to attend to both academics and social-behavioral development. This finding coalesces in part with Hair and colleagues' (2006) work identifying a salient profile of entering kindergartens corresponding to low levels of academic, social, and behavioral competences (Hair et al., 2006). The tendency for children to struggle in multiple domains suggests that there are some children for whom kindergarten is overwhelmingly challenging. Children who experience these multiple challenges may be particularly important to identify and intervene, as other research has found that children who experience both academic and behavioral problems early in elementary school are at the greatest risk of problematic outcomes at the end of elementary school, including academic failure and conduct disorder diagnosis (Reinke, Herman, Petras, & Ialongo, 2008).

Lastly, an important contribution of the present study is that it demonstrates that transition problems are predictable. First, boys were much more likely to experience transition difficulties than girls, suggesting that providing additional supports to boys during the early months of kindergarten may be beneficial. Alternatively, modifying the classroom climate that all children experience may particularly benefit boys, as prior work has shown them to be more sensitive to the classroom environment around them (Ponitz, Rimm-Kaufman, Brock, & Nathanson, 2009). Second, children who lived with more children in the household were less likely to have extensive transition difficulties. This may signal that families who have already had a child transition into schooling are better prepared to help later children transition successfully. However, our data does not allow us to directly address this. Lastly, we found that children from non-English speaking homes had fewer transition difficulties than children from English speaking homes. Although we did not hypothesize this finding, it is inline with other work that has found the Dual Language Learners and children from immigrant families have higher average mental health and social-emotional functioning than children from non-immigrant families (De Feyter & Winsler, 2009; Crosnoe, 2006; Halle et al., 2014). These assets may have helped these children navigate the transition more smoothly.

Lastly, children with disabilities (on the basis of IEP provision) were also consistently more likely to experience transition difficulties. Most types of disabilities for which young children receive educational services involve language and learning impairments (2020), which can have significant negative effects on most types of transition difficulties we assessed. For instance, children with language impairments have difficulty making friends and interacting with classmates (Chen, Lin, Justice, & Sawyer, 2017) as well as academics (Justice et al., 2009), representing two of the five areas of difficulty we assessed. Thus, it is not unexpected that children with disabilities would be significantly more likely than other children to have extensive difficulties. However, it is also of note that it is common practice that transition planning is required for children with disabilities across all major transitions in schooling, including preschool to kindergarten (Purtell et al., 2020). For example, in Ohio, when a child has an IEP, there is at least one meeting with the family, preschool teacher, and elementary school personnel to make plans to support the child through the transition and make sure any needs they have are met (Ohio Department of Education, 2019). The present evidence suggests that children with IEPs would benefit from more supports from teachers and the school in the transition to kindergarten. However, qualitative research has also noted that the transition process for children with IEPs is stressful and burdensome, particularly in terms of paperwork (Purtell et al., 2020). It is important to work to identify ways to provide these students with the supports they need in ways that support, not stress, families.

Overall, this work highlights the need to support children during the transition to kindergarten. Children's struggles in the transition likely reflect, in part, the challenges of entering a drastically new environment. Reducing the discontinuity between children's experiences prior to and after kindergarten entry is a viable option for easing the transition. This may include increasing access to preschool, as well as ensuring that children's experiences in kindergarten are built upon, and are similar to, their experiences in their preschool settings. For example, Boston Public Schools is working towards their alignment, but has also encountered significant challenges in coordinating children's experiences across transitions (McCormick et al., 2020). Another potential route to reducing challenges is to provide more supports to children and families during the transition. Although elementary schools commonly offer basic supports, including open houses and staggered starts for kindergarteners (M. H. Little, Cohen-Vogel, & Curran, 2016), numerous challenges, including the fragmented preschool landscape in many states, prevents more intensive transition supports from being provided (Purtell et al., 2020). Future work should continue to identify supports that improve children's transition experiences and the consequences of both transition difficulties and supports to children's long-term development.

An alternative perspective on these findings is that these transition challenges may be a sign that we need to reconsider the activities and goals of kindergarten, especially given the high proportion of students that experienced at least one challenge. For example, qualitative research suggests that as we have honed in on kindergarten as time for early intervention, we have actually made kindergarten less developmentally appropriate (Graue, 2011). Indeed, quantitative work clearly supports the notion that kindergarten has become more academically-focused in recent decades (Bassok et al., 2016). Future research should consider aspects of the kindergarten context and how they are associated with children's likelihood of experiencing transition difficulties.

It is important to note a few limitations of the current work. First, the measure of kindergarten transition difficulty is teacher-reported and may be influenced by teachers' own perceptions of what is or is not challenging behavior. Additionally, any other biases that teachers may have may play a role in their reporting. However, given the proximity of teachers to their students in the classroom, they are likely to be the most knowledgeable reporter of transition challenges. Second, our study took place in only one

school district. Although the district is large and diverse in terms of socioeconomic status and geography, future research should incorporate this measure into other studies, particularly ones that work with more racially and linguistically diverse populations. Third, the present study did not explore the contribution of transition difficulties to future academic or social-behavioral outcomes. This would be an important means to assess the validity of our transition-difficulty measure as well as the relevance of transition difficulties to children's future achievement. To this end, a particularly salient direction for future research is to determine the extent to which difficulties in the transition to kindergarten may have lasting consequences for children's academic and social-behavioral outcomes.

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CRediT authorship contribution statement

Hui Jiang: Methodology, Formal analysis, Data curation, Writing - original draft, Writing - review & editing. **Laura Justice:** Conceptualization, Investigation, Writing - original draft, Writing - review & editing, Supervision, Funding acquisition. **Kelly M. Purtell:** Conceptualization, Investigation, Writing - original draft, Writing - review & editing. **Tzu-Jung Lin:** Investigation, Writing - review & editing. **Jessica Logan:** Investigation, Writing - review & editing.

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