

6-10-2013

Classroom Level Effects of Children's Prior Participation in Child Care

K. Alison Clarke-Stewart
University of California - Irvine

Rachel Lucas-Thompson
Colorado State University

Jennifer M. Weaver
Boise State University

Andrea Karsh
University of California - Irvine



This document was originally published by Academic Journals in *Educational Research and Reviews*. This work is provided under a Creative Commons Attribution 4.0 International License. Details regarding the use of this work can be found at: <http://creativecommons.org/licenses/by/4.0/>.

Full Length Research Paper

Classroom level effects of children's prior participation in child care

K. Alison Clarke-Stewart^{1*}, Rachel Lucas-Thompson², Jennifer M. Weaver³ and Andrea Karsh⁴

¹Psychology and Social Behavior, University of California-Irvine, U.S.A.

²Department of Human Development and Family Studies, Colorado State University, U.S.A.

³Department of Psychology, Boise State University, U.S.A.

⁴School of Education, University of California-Irvine, U.S.A.

Accepted 7 May, 2013

Previous research indicates that children who spend many hours in early child care exhibit more externalizing behavior problems than children who spend less time in child care. Concern has been expressed regarding the cumulative effect of these problem behaviors on elementary school classes. We collected information about children's child-care histories from parents of first through fourth graders ($N = 429$) and about classroom functioning from their teachers ($N = 31$). We analyzed associations between the proportion of children in the class who had spent many hours in care prior to school entry and teachers' reports of the time they spent in instruction and management, the difficulty they had in teaching and managing the class and the frequency of students' positive and negative behavior in the classroom. No significant associations were found to support the contention that prior child-care participation negatively affects classroom functioning.

Key words: Child-care participation, classroom management, behavior problems, externalizing behavior.

INTRODUCTION

Effects of classroom level of children's prior participation in child care

Over the past quarter century, a dramatic change has taken place in children's early experiences. The proportion of young children attending child-care arrangements before they enter elementary school has risen markedly. In the United States, for example, the number of children in child care has increased from below 25% to over 80% (West et al., 2000). This increase has provoked questions about the effects of early child care on children's development. One issue of particular concern has been whether children who spend many

hours in child care before they enter school have more social and emotional behavior problems than children who spend more time at home. This concern arises out of traditional theories of psychological development. For example, attachment theory suggests that children will have emotional problems if they fail to develop and maintain close ties with their mothers, ties that require frequent physical proximity and responsive interactions and could be impaired if children spend many hours in child care. Social learning theory suggests that children will exhibit more aggressive behavior if they spend many hours with peers who act aggressively. Frustration-aggression theory suggests that the frustration of

*Corresponding author. E-mail: acstewar@uci.edu. Tel: 949 824-5574.

spending many hours in a child-care arrangement competing with other children for limited resources will increase children's aggression. Impelled by such theoretical concerns, researchers have conducted empirical studies to investigate the effects of child care on children's social and emotional behavior problems. "Externalizing" behavior problems reflected in aggressive, defiant, noncompliant, disruptive, and disobedient behavior have been of particular interest.

Time in child care and children's externalizing behavior

Confirming theoretical concerns, researchers have found evidence in their empirical studies that children who spend many hours in early child care are more likely to exhibit externalizing behavior problems, both contemporaneously and in kindergarten and elementary school than children who spend less (or no) time in care (Averdijk et al., 2011; Bates et al., 1994; Baydar and Brooks-Gunn, 1991; Belsky, 1999; Borge and Melhuish, 1995; Dmitrieva et al., 2007; Haskins, 1985; Hausfather et al., 1997; Jacob, 2009; NICHD (National Institute of Child Health and Human Development) Early Child Care Research Network, 2005a,b; Rodkin and Roisman, 2010). The NICHD Study of Early Child Care and Youth Development is the most comprehensive study to demonstrate the link. This longitudinal investigation followed 1300 randomly selected infants in ten regions around the United States from birth to adolescence (NICHD Early Child Care Research Network, 2005a, b). When the children were 2 years old, the investigators found that those who had spent more hours in care in their first two years were rated by their caregivers as having more externalizing behavior problems. When they were 4½ years old, the children who had spent more time in care up to that age were again rated by their caregivers as having more externalizing problems. When the children were in kindergarten, their mothers and teachers reported that those who had attended more child care before starting school displayed more externalizing problems than those who had attended fewer hours of care. These relations between quantity of care and externalizing behavior problems persisted even when the researchers controlled for family variation (income, ethnicity, parents' education) and the quality of child care. Although statistically significant, the associations between child care and children's behavior problems were quite modest in size (NICHD Early Child Care Research Network, 2006). For the strongest association, observed at age 4½, the effect size across the entire sample was only $d = 0.1$ (Belsky et al., 2007). This association was reduced as children got older. No significant relation was observed between quantity of child care before school entry and externalizing problems in third and sixth grades. However, children who had spent more hours in center, child care, in particular,

manifested significantly more teacher-reported behavior problems in these grades. Children who spent more time in care with small or medium sized groups of peers were also rated as more aggressive by their third grade teachers (NICHD Early Child Care Research Network, 2008).

Concern about societal effects

Despite the modest size of the association between child-care attendance and children's externalizing behavior, concern has been expressed regarding the *cumulative* societal impact of child-care participation because of the large numbers of children involved. In most industrialized nations today, substantial numbers of children are cared for by non-parental figures for many hours every week. In the United States, just over two thirds of mothers are in the labor force and approximately 80% of their children under 6 years old are in a child-care arrangement for an average of almost 40 h a week (Smolensky et al., 2003). Having large numbers of children who have spent many hours in non-parental child care may show up as a problem when these children get together in elementary school. Belsky (2009) has suggested that having even a few more children with elevated levels of problem behavior could encourage other children to imitate these undesirable behaviors and thereby serve as a catalyst for increasing levels of classroom disruptiveness. Even a small association between child care and externalizing behavior problems is "noteworthy and meaningful because of the large number of children who experience extensive child care prior to school entry.... This contemporary situation raises questions about the potential collective consequences—across classrooms, schools, communities, and society at large—of small enduring developmental differences among children who vary in their early child-care experience" (Belsky et al., 2007).

Usually, concerns about societal level effects involve major public policies, such as affirmative action (Beer, 1992), or disturbing social trends such as media violence (Linz et al., 1992), cocaine use (Bruno, 1991), or wife battering (Archer, 1989). The answer to the question of whether child care has a collective impact on society may be equally important; it is certainly an issue that demands investigation and analysis. If child-care participation does have a lasting and pervasive negative impact on elementary school functioning, for example, teachers and principals should be prepared, parents should be encouraged to reduce their children's hours of care, and policymakers should work harder to provide alternative arrangements for children with employed parents.

As we discuss below, there are three lines of research that suggest that there could be negative consequences when children with extensive prior child-care experience come together in the elementary school classroom: first, there is research showing that externalizing behavior in

schools can be “contagious” among the children in a classroom; second, there are studies showing that children’s progress in the classroom is affected by characteristics of their classmates; and third, there are studies demonstrating that children’s externalizing behavior in the classroom can affect teachers’ moods and behavior.

The spread of externalizing behavior

A number of studies have shown that children are more likely to behave aggressively if they are exposed to other aggressive children. Goldstein et al. (2001) observed that in the preschool years, children in child-care centers were more likely to behave aggressively if another child had just performed an act of aggression than if no aggression had occurred. Snyder et al. (2005) found that in kindergarten and first grade children who associated with more aggressive peers increased their own externalizing behavior in the classroom. Bennett et al. (2005) discovered that children in kindergarten classes that misbehaved more were less likely to decrease their externalizing behavior over the year of kindergarten than children in better behaved classes. Similarly, Kellam et al. (1998) found that boys who were placed in first grade classes in which the overall level of aggressive and disruptive acts was higher were more aggressive in sixth grade than boys whose first grade classmates were more docile; and Thomas et al. (2006) found that children exposed to more aggressive classes in grades 1 to 3 were significantly more aggressive and disruptive in grade 3 than children without this exposure—even after children’s initial levels of aggression were taken into account. In other group settings, too, when highly aggressive children are grouped together, levels of aggression rise (Dishion et al., 1996, 1999; Dodge et al., 2006). The findings from all these studies, then, clearly demonstrate that there are links between individual and classroom levels of externalizing behavior and support the argument that the presence of children with externalizing behavior problems in the classroom could affect the aggressive and disruptive behavior of the entire class. The question of whether child-care participation encourages a level of externalizing behavior high enough to set in motion a chain of aggressive interactions, contributing to an aggressive classroom climate and increasing behavior problems in other children is not answered by this research.

The only study that has addressed the effects of child-care on classroom aggression was conducted by Dmitrieva et al. (2007). These researchers found that kindergarten children in the Early Childhood Longitudinal Study exhibited more teacher-reported externalizing behavior in classes where there were more peers with extensive child-care histories (a higher proportion had been in any child care or in center care for more than 30

h/week or from an early age). Although statistically significant, the effects were small in magnitude, and the study was limited to kindergarten classes, leaving open the issue of whether child-care effects continue in the elementary grades.

The influence of classmates on academic progress

A second basis for concern about negative consequences of having large numbers of children with extensive child-care experience in the classroom is research showing that classmates’ behavior affects children’s academic progress. Economists have shown that having more disruptive children in the classroom interferes with classmates’ learning. In a study of third to sixth grade, for example, Hoxby (2000) found that students did worse on reading and math tests if the class contained more members from two groups of disruptive students—boys and African American children. Figlio (2005) identified another group of disruptive children—boys with girls’ names. In sixth grade, these boys were more prone to misbehavior, presumably because of being teased about their names. When the class contained more of these boys, their classmates had lower mathematics scores (as well as exhibiting more misbehavior). These studies suggest that children affect their classmates’ achievement directly through peer interactions, less directly through creation of a positive or negative classroom climate, or indirectly through effects on teachers’ time. The question of whether children with extensive child-care histories constitute a disruptive group that negatively affects their classmates’ academic progress in these ways is not answered by this research. Dmitrieva et al.’s study (2007) did offer some relevant information, but it was not supportive of this position. Children’s achievement in kindergarten was not related to the proportion of students in the kindergarten class who had extensive child care of any type, and children with more classmates who had spent long hours in center care exhibited higher academic achievement, not lower achievement.

Effects of disruptive behavior on teachers

The third reason to be concerned about the classroom consequences of children’s prior child-care participation comes from research showing that teachers are affected by the behavior of students with externalizing behavior problems. Interactions between teachers and children with externalizing behavior disorders have been described as a negative spiral of disobedience, coercion, correction, and punishment (Reid, 1993). Observers have noted the following: “Disruptive behavior in the classroom requires inordinate amounts of educators’ time and effort, reduces time available for instruction, and may result in a

more restrictive educational setting” (Wilkinson, 2005). “Students with confrontational and disruptive behavior patterns interfere with classroom instruction” (Gresham et al., 2005). And most dramatically, “Aggressive, disruptive, and defiant behavior wastes teaching time, disrupts the learning of all students, threatens safety, overwhelms teachers—and ruins the student’s own chances for successful schooling and a successful life (Walker et al., 2003-2004). In the national Schools and Staffing Surveys, nearly half of all teachers surveyed reported that students’ misbehavior in their school interfered with their ability to teach effectively (US Department of Education, 1999-2000). Teachers find students’ misbehavior stressful (Boyle et al., 1995; Punch and Tuettemann, 1990) and rate students with externalizing problems as significantly more stressful to teach than their classmates (Greene et al., 2002). Those teachers whose students exhibit more externalizing behavior in the classroom claim that they suffer more emotional exhaustion (Hastings and Bham, 2003). It is still an open question whether teachers find that a class full of children who have had extensive child-care experience is more stressful, emotionally exhausting, and difficult to manage than a class in which fewer children participated in early child care.

Questions about collective consequences of child care

Thus, although research suggests that individual children who have spent more time in child care are likely to exhibit more externalizing problem behavior, we do not know what the collective consequences of this are in elementary school classrooms. There are reasons to expect negative consequences—because research suggests that aggression can be contagious, children’s learning can be affected by their classmates’ behavior, and students’ behavior can affect their teacher’s mood and behavior. But we do not know whether early child-care participants are so aggressive and disruptive that this interferes with elementary teachers’ ability to manage and instruct their classes. To answer this question, it is necessary to study the classroom-level consequences of prior child-care experience and investigate whether classes containing a higher proportion of children with extensive child-care experience exhibit more disruptive behavior, have more behavior problems, display poorer work habits or lag behind academically. It is necessary to examine whether these classes are more difficult for teachers to manage and teach and to inquire whether teachers in these classes spend more time disciplining children and less time instructing them. We conducted the present study to explore these issues. Dmitrieva et al. (2007), who studied classroom-level effects of early child-care participation on children’s externalizing behavior in kindergarten, acknowledged that future researchers should examine whether such effects are seen at later

grade levels and are evident in student-teacher interactions. Other developmental psychologists agree that Dmitrieva et al.’s findings are only suggestive and further research with longer-term follow-up is necessary (Linting and Van IJzendoorn, 2009; Thompson, 2009).

The current study

In this study, we collected information from parents of elementary school students about their children’s history of child care and from teachers about their experiences in their current classrooms. We then analyzed associations between the proportion of children in the class who had spent many hours in child care before they entered school and the teachers’ reports of students’ behavior in the classroom, the amount of time the teacher spent in class instruction and management, and the difficulty the teacher had teaching and managing the class. We looked for positive associations between higher proportions of children with extensive child-care histories and higher levels of students’ misbehavior and teaching difficulty as evidence of cumulative negative effects of child care.

METHOD

Sample and procedure

School principals and teachers who had participated in the NICHD Study of Early Child Care and Youth Development at the California site were contacted in the spring of the school year and asked to participate in this study. First- through fourth-grade teachers ($N = 31$) in 14 schools completed the study procedures (3 principals and 4 teachers who were contacted declined; 3 teachers agreed to participate but did not complete the procedures before the end of the school year). With a conventional level of significance ($p < .05$) and the desired power level of .80, this sample size was large enough to detect a medium effect size of .26. Teachers were asked to complete a questionnaire evaluating the characteristics of their current classes and were given questionnaires to distribute and collect from the parents of children in their class. A total of 429 parents returned completed questionnaires (mean return rate = 62%). The number of classes in each grade was as follows: 6 classes in first grade; 8 in second grade; 6 in third grade; and 11 in fourth grade.

Questionnaires for parents

The questionnaire for parents indicated that this was a study of how prior child-care participation affects elementary school classes. “Child care” was defined to mean “any kind of care provided by someone other than parents. This includes care provided by a sitter, a nanny, a neighbor, or a relative, in your home or a daycare home, in a daycare center or a preschool. It means a regular arrangement, not something that happened only on occasion or in an emergency.”

To find out how much child care their child had experienced prior to school entry, parents were asked the following multiple-choice question: When your child was 6 months old, how many hours was he/she in child care? (1) 0-10 h/week, (2) 11-20 h/week, (3) 21-30 h/week, (4) More than 30 h/week. This question was repeated for the child at 1, 2, 3 and 4 years of age. Because research has

indicated that participation in center care is of particular interest, parents were also asked whether the child had been in care in a center or preschool for (1) 0-10 h/week, (2) 11-20 h/week, (3) 21-30 h/week, (4) More than 30 h/week, at 6 months, 1, 2, 3 and 4 years.

To determine whether parents could reliably recall their children's child-care histories using this questionnaire, we enlisted the help of 45 parents who had participated in the NICHD Study of Early Child Care and Youth Development at the same site as these study participants. The NICHD Study parents had been asked about their contemporaneous child-care arrangements every 3 to 4 months beginning when the children were 3 months old. At the time we sent them the questionnaires we used in this study, their children were 14-15 years old. Parents' responses on this questionnaire were strongly correlated with information they had provided earlier (hours of child care at 6 months, $r = .85$; at 1 year, $r = .91$; at 2 years, $r = .91$; at 3 years, $r = .77$; and at 4 years, $r = .76$). These correlations provide clear evidence that parents are able to recall reliably their children's child-care histories.

Measures of children's participation in child care were computed from parents' questionnaire responses. Because the association between hours of child-care participation and levels of externalizing has been found in previous research to be linear and no threshold for how many hours are "too many" has appeared, we defined a high level of care as being more than 30 h per week. This cut-off point was selected because it represents a substantial number of hours of care each week and reflects the amount of care necessitated by full-time maternal employment. We applied this definition of extensive care across different ages to create five child-care participation variables: care exceeding 30 h per week at (a) 0-4 years, (b) 1-4 years, (c) 2-4 years, (d) 3-4 years, and (e) 4 years of age. Because of the link between externalizing and center care, in particular, we computed the same five variables for center care. The independent variables used in analyses were the percentages of children in each classroom who were in care more than 30 h per week at ages 0-4 years, 1-4 years, 2-4 years, 3-4 years, and 4 years, and the percentage of children who were in center care for more than 30 h per week across these age intervals.

Questionnaires for teachers

The questionnaire for teachers used a multiple choice format to elicit information about the class, the teacher and the teacher's experience with the particular class. Descriptive information included the grade, class size, and percentage of children who were boys, Asian American, African American, Latino, and from very low-income families, and the number of years the teacher had been teaching. To determine how classes were functioning, teachers were asked to estimate how many children in the class (a) were below grade level in academic achievement, (b) had poor work habits, (c) had problems interacting with other students and (d) had behavior problems that disrupted the class or required the teacher's individual attention. They were asked to estimate what percentage of time in an average day they spent (a) teaching the whole class in an academic subject, (b) managing or disciplining the class, and (c) managing or disciplining children with behavior problems. They were asked to rate the following characteristics of the class using 7-point scales from 1 = extremely low to 7 = extremely high: (a) world knowledge, (b) academic achievement, (c) motivation to learn, (d) good work habits, (e) social skills with peers, (f) noisiness, (g) rudeness, (h) aggressiveness, and (i) defiance/disobedience. They also were asked to use 7-point scales, from 1 = extremely difficult to 7 = extremely easy, to rate the difficulty of the following aspects of teaching the class because of the students' (mis)behavior: (a) teaching language arts, (b) teaching mathematics, (c) teaching science, (d) teaching current events, (e) managing transitions, and (f) keeping order in the class. Because this was an exploratory study, we were not able to validate these

teachers' ratings and estimates with independent observations in the classrooms; therefore, the data must be considered as representing teachers' perceptions rather than objective facts.

Through a process of clustering and combining conceptually and empirically related teacher responses, we created the following variables to reflect classroom functioning. For each variable, the high end of the scale represents a negative aspect of teaching (poor class behavior, low class achievement, greater difficulty teaching, more time disciplining, less time teaching).

Poor class behavior: this is the sum of teachers' ratings of students' good work habits and motivation to learn (inversed), teachers' ratings of class noisiness, rudeness, aggressiveness, and defiance/disobedience, and the percentages of children in the class who had poor work habits, problems interacting with peers and disruptive behavior problems; $\alpha = .81$.

Low class achievement: this is the sum of teachers' ratings of high academic achievement in the class (inversed) plus the percentage of children in the class who were below grade level; $\alpha = .77$.

Difficulty in managing/teaching: this is the sum of teachers' ratings of difficulty in managing transitions, keeping order in the class, and teaching language arts, mathematics, science, and current events; $\alpha = .93$.

Time managing/disciplining: this is the percentage of time the teacher spent managing or disciplining the class, and managing children with behavior problems; $\alpha = .90$.

Less time teaching: this is the percentage of time the teacher spent teaching the class in an academic subject (inversed).

Analyses

Descriptive analyses were conducted to determine the following: (a) the distribution of children with different child-care histories (number of children in care for more than 30 h/week at different ages); (b) demographic characteristics of the sample (children's ethnicities, families' income levels, class sizes, and teachers' experience); and (c) mean levels and ranges of classroom functioning: poor class behavior (noisy, rude, defiant, disruptive); low class achievement; difficulty in managing or teaching the class; time spent by teacher in managing or disciplining the class; time spent teaching the class in an academic subject. To examine the validity of the classroom functioning variables, we computed Pearson correlations between these variables and the classroom demographic variables. Multiple regression and correlational analyses were conducted to look for associations between child-care participation and classroom functioning, specifically between the percentage of children in the classroom who had participated in child care for many hours and poor classroom functioning. To rule out the possibility that classroom demographics were suppressing or enhancing associations between child-care participation and classroom functioning, multiple regression analyses and partial correlations were computed statistically controlling for the demographic characteristics that were significantly related to classroom functioning. To investigate whether prior child-care participation effects were present in the earlier grades of elementary school but disappeared in later ones, regression analyses were conducted to see if school grade moderated (interacted with) associations between child-care participation and classroom functioning.

RESULTS

Numbers and proportions of children in child care

The distribution of children with different child-care histories is presented in Table 1. Of the 429 children in the sample, 119 (28%) were in care for more than 30 h

Table 1. Numbers and Percentages of Children in Child Care.

Child care	Number of children	Mean percentage in class	SD %	Min %	Max %
Any type of non-parental care					
> 30 hrs/wk at age 0-4 yrs	70	17.41	10.61	0	33.33
> 30 hrs/wk at age 1-4 yrs	83	20.21	11.04	0	42.86
> 30 hrs/wk at age 2-4 yrs	95	22.82	10.40	0	42.86
> 30 hrs/wk at age 3-4 yrs	107	25.41	10.13	0	42.86
> 30 hrs/wk at age 4 yrs	119	29.72	12.44	0	55.56
Center care					
> 30 hrs/wk at age 0-4 yrs	27	6.21	6.39	0	17.65
> 30 hrs /wk at age 1-4 yrs	38	8.46	7.13	0	22.22
> 30 hrs /wk at age 2-4 yrs	54	12.40	8.32	0	28.57
> 30 hrs /wk at age 3-4 yrs	71	15.80	9.66	0	28.57
> 30 hrs /wk at age 4 yrs	84	19.07	10.99	0	36.36

per week when they were 4 years of age (84 in center care); 70 (16%) were in more than 30 h of care from their first year of life (age 6 months) to age 4. The average proportion of children in the class who had been in more than 30 h of care per week at age 4 was 30% (0-56%), and the average proportion of children who had received this amount of care across the entire period from 6 months to 4 years was 17% (0-33%).

Demographic characteristics of classrooms

Class sizes in the sample ranged from fewer than 20 students to more than 35; the median class size was 20-25. The percentage of children from low-income families ranged from less than 10% to more than 80% (median = 0-10%), as did the percentage of Asian American children. The percentage of Latino students ranged from less than 10% to more than 90% (median = 11-20%). Only four classes contained more than 10% African American children. Teachers' experience ranged from less than 5 years to more than 20 years (median = 11-15 years).

Classroom functioning

Mean levels for teachers' ratings and estimates reflecting classroom functioning are presented in Table 2. A wide range of variation was obtained for each response. Correlational analyses of classroom functioning variables revealed a positive association between low class achievement and poor class behavior ($r = .624, p < .01$), and teachers reported having more difficulty managing and teaching classes that had lower achievement ($r = .690, p < .01$) and poorer classroom behavior ($r = .613, p < .01$). There were no other significant associations among the classroom functioning variables.

Associations between classroom demographics and classroom functioning

Pearson correlations between classroom functioning variables and classroom demographics (class size, grade, ethnicity and income level of students, and number of years teacher had been teaching) confirmed the validity of the classroom functioning variables: teachers who had been teaching longer reported that they had less difficulty managing and teaching their classes than did teachers with less experience ($r = -.393, p < .05$); classes containing more low-income children and classes with more Latino children were reported by teachers to have lower class achievement ($r = .738, p < .001; r = .474, p < .01$), poorer class behavior ($r = .560, p < .01, r = .392, p < .05$), and to be more difficult to manage and teach ($r = .526, p < .01, r = .482, p < .05$).¹

Associations between Child-care participation and classroom functioning

Results of multiple regression and correlational analyses conducted to look for associations between the percentage of children in the classroom who had participated in many hours of child care and poor classroom functioning are summarized in Tables 3 and 4. None of the multiple F 's was statistically significant. In fact, none was even close to significance. Moreover, none of the beta coefficients for specific classroom functioning variables was significant. Only two significant bivariate correlations were found: when classes contained a higher percentage of children who had been in any care or center care for more than 30 h per week at age 4, teachers reported less difficulty managing and teaching the class.

Multiple regression analyses and partial correlations controlling for the demographic characteristics that were

Table 2. Classroom functioning variables.

Classroom functioning	Mean	SD	Min.	Max.
Percentages				
Percent children below grade level achievement	15	1.62	0-10	81-90
Percent children with poor work habits	15	1.36	0-10	71-80
Percent children with peer problems	10	.96	0-10	41-60
Percent children with disruptive behavior problems	10	1.11	0-10	31-40
Percent time teaching class	60	1.88	11-20	91-100
Percent time managing class	15	2.06	0-10	91-100
Percent time managing problem children	20	1.69	0-10	91-100
Ratings				
Rating of class achievement	4.53	1.28	2.5	7
Rating of class motivation	5.10	1.19	3	7
Rating of class work habits	4.73	1.11	3	7
Rating of class externalizing behavior (noisiness, rudeness, aggressiveness, defiance/disobedience)	2.99	1.28	1	5.5
Rating of difficulty teaching class (in language arts, mathematics, science, and current events)	5.22	1.30	2.75	7
Rating of difficulty managing class (managing transitions, keeping order in the class)	4.74	1.48	2	7

Table 3. Regression analyses of associations between child-care participation and classroom functioning (N = 31).

Child-care participation	Multiple regression coefficients and tests of significance			Beta coefficients / significance levels for poor classroom functioning variables				
	<i>R</i>	<i>F</i>	<i>Sig.</i>	Low class achievement	Poor class behavior	Difficulty managing/teaching	Time managing/disciplining	Less time teaching
Percent of children in any type of nonparental care								
> 30 h/wk 0-4 yrs	.394	.446	.859	.068/.895	-.059/.897	-.420/.400	.177/.753	.333/.194
> 30 h/wk 1-4 yrs	.401	.466	.845	-.342/.506	.332/.465	-.507/.311	-.142/.800	.273/.282
> 30 h/wk 2-4 yrs	.506	.837	.572	-.603/.221	.421/.329	-.670/.161	.290/.582	.276/.249
> 30 h/wk 3-4 yrs	.494	.785	.609	-.686/.169	.467/.284	-.475/.317	-.042/.735	.148/.535
> 30 h/wk at 4 yrs	.410	.490	.829	-.431/.402	.387/.394	-.412/.406	-.053/.726	.054/.826
Percent of children in center care								
> 30 h/wk 0-4 yrs	.422	.525	.804	.401/.433	.034/.940	-.259/.597	.210/.704	.291/.247
> 30 h/wk 1-4 yrs	.371	.387	.897	.227/.662	.025/.956	-.406/.420	-.196/.729	.112/.659
> 30 h/wk 2-4 yrs	.577	1.211	.349	-.025/.955	.037/.927	-.694/.140	-.172/.730	.162/.470
> 30 h/wk 3-4 yrs	.437	.574	.768	-.451/.375	.416/.355	-.418/.393	.370/.465	.009/.971
> 30 h/wk at 4 yrs	.486	.753	.633	-.356/.469	.299/.490	-.448/.340	.474/.338	.036/.881

significantly related to classroom functioning (percentage of low-income children and Latino children and teachers' years of experience) revealed no significant associations between child-care participation and classroom functioning.

No significant interactions were found in regression analyses performed to see if school grade moderated associations between child-care participation and classroom functioning.

DISCUSSION

This exploratory study provided no evidence that child-care participation has cumulative negative consequences in elementary school classrooms. Belsky (2009) had suggested that even though the child-care effects Dmitrieva et al. had observed in kindergarten classes were small, they could accumulate to larger collective or cumulative effects in later years. In fact, he suggested,

Table 4. Correlations between child-care participation and poor classroom functioning (N = 31).

Child-care participation	Poor classroom functioning				
	Low class achievement	Poor class behavior	Difficulty managing/teaching	Time managing/disciplining	Less time teaching
Percent of children in any type of non-parental care					
> 30 h/wk 0-4 yrs	-.026	.017	-.111	.079	.112
> 30 h/wk 1-4 yrs	-.149	.046	-.195	.076	.074
> 30 h/wk 2-4 yrs	-.189	.013	-.176	.005	.119
> 30 h/wk 3-4 yrs	-.193	-.051	-.247	-.022	-.059
> 30 h/wk at 4 yrs	-.075	-.232	-.363*	-.207	-.153
Percent of children in center care					
> 30 h/wk 0-4 yrs	-.090	.077	-.184	-.018	.159
> 30 h/wk 1-4 yrs	-.178	.024	-.253	-.043	.070
> 30 h/wk 2-4 yrs	-.124	-.059	-.179	-.103	.175
> 30 h/wk 3-4 yrs	-.254	-.097	-.235	-.073	.013
> 30 h/wk at 4 yrs	-.239	-.194	-.386*	.128	-.157

* $p < .05$.

these effects, especially across multiple grade levels, could actually mask the effects of children's own child-care experiences. In our study of later elementary grades (1st through 4th), however, no associations were found between poorer classroom functioning and having a higher percentage of children in the class who experienced full-time child care from infancy through age 4, or for shorter lengths of time within this period. The only significant associations we found were two correlations in the opposite direction: classes containing more children who participated in over 30 h of any care or center care each week when they were 4 years old were reported by their teachers to be less difficult to manage and teach.

Classes containing more children with extensive child-care experience were not reported by their teachers to exhibit poorer behavior in the classroom compared with classes with fewer child-care participants. Although research—including research conducted in these classrooms, with these teachers—has suggested that individual children who have been in child care for many hours exhibit more externalizing behaviors at school than children with fewer hours of child care, in the present study the behavior of children with extensive child-care experience did not cumulate to create classes that were less polite, noisier, more disobedient, disruptive, defiant, or aggressive. Classes with higher concentrations of child-care participants did not have lower achievement levels, according to their teachers, were not more difficult to teach or manage, and did not require the teacher to spend more time managing and disciplining them or less time providing academic instruction.

Although this was an exploratory study, our sample was large enough to detect medium size child-care

effects, and our search for effects was quite extensive. We examined a number of measures of extensive child care—care for more than 30 h per week for a period of at least 1, 2, 3 or 4 years, and beginning in infancy and extending through age 4. We examined time in center care as well as time in any form of child care because center care has been found to have stronger and more persistent effects on externalizing behavior (Belsky et al., 2007). We controlled demographic characteristics of classrooms and looked to see whether there were stronger effects in earlier grades. Despite these efforts, we found no evidence of negative effects of prior child-care participation on elementary school classes.

Our findings provide no support for concern about societal effects of child-care participation. Of course because this was an exploratory study it is too early to dismiss this concern. However, we found no evidence that the level of externalizing behavior problems associated with child-care attendance has negative consequences for other children in the class or for teachers. Research showing that children's aggressive behavior increases when they are exposed to more aggressive children in the class (Bennett et al., 2005; Kellam et al., 1998; Snyder, 2005; Thomas et al., 2006), that children's academic progress is impaired when they attend classes containing more disruptive children (Figlio, 2005; Hoxby, 2000), and that teachers find students' misbehavior stressful and emotionally exhausting (Boyle et al., 1995; Hastings and Bham, 2003; Punch and Tuettemann, 1990) does not seem to apply to the small increment in externalizing behavior associated with long hours of child care. Moreover, a closer look at the aforementioned studies documenting links between classroom and individual levels of aggression, between classroom characteristics and students' achievement, and

between students' misbehavior and teachers' distress indicate that these effects, too, are quite small (Betts et al., 2003; Punch and Tuettemann, 1990) and do not appear for every class or outcome (Angrist and Lang, 2002; Betts et al., 2003) or in every study (Henry et al., 2000; Hoglund and Leadbeater, 2004). Even when children with severe disabilities are included in a class, this has been found to have no effect on the quantity of time teachers use for instruction, and observations indicate that when these disabled children behave in ways that might disrupt the class, such as talking loudly, classmates typically continue to attend to their schoolwork (Hollowood et al., 1994). For all these reasons, it is not surprising that we did not find classroom level effects of prior child-care participation.

LIMITATIONS AND FUTURE RESEARCH

This study had a number of limitations. For one, reports of child-care participation were retrospective. Although our validation analysis suggested that parents could answer our questions about children's child-care histories reliably, in future research investigators should study this issue prospectively. In addition, in the present study, measures of classroom functioning were limited to teachers' reports and ratings. In future research investigators should conduct classroom observations using quantitative measures of classroom dynamics. It would also be valuable in future research to have teachers or observers rate the externalizing behaviors of individual children in the class and relate these ratings to prior child-care experience as well as classroom level functioning. Another way to assess the effect of prior child-care participation in future research would be to assess the effectiveness of teachers' instruction in terms of students' progress toward educational goals. Finally, the present study should be expanded to evaluate effects in a variety of geographical regions and a diversity of ethnic and income communities.

If more extensive studies in the future do reveal problems in elementary school classrooms related to children's prior participation in child care, solutions might include implementing programs to reduce hours of child care or programs to combat children's problem behavior. Aggressiveness and disruption in classrooms have been reduced in a variety of interventions, particularly in programs that target all children in the class rather than just troublemakers (Conduct Problems Prevention Research Group, 1999; Hunter, 2003). Continued monitoring of the effects of child care on children's school-related behavior is important. We hope that this report stimulates such efforts.

ACKNOWLEDGEMENTS

We express our appreciation to the teachers and parents

who completed the questionnaires for this study and to the students who collected them (Lauren Bloom, Lauren Nestler, Vista Kushesh, Iracel Navarro, and Jenna Tanaka). We also appreciate the financial support of the National Institute of Child Health and Human Development (NICHD) through the Study of Early Child Care and Youth Development (HD-25456).

REFERENCES

- Angrist J, Lang K (2002). How important are classroom peer effects: Evidence from Boston's METCO Program. National Bureau of Economic Research Working Paper 9263. <http://www.nber.org/papers/w9263.pdf>.
- Archer NH (1989). Battered women and the legal system: Past, present and future. *Law Psychol. Rev.* 13: 145-163.
- Averdijk M, Besemer S, Eisner M, Bijleveld, C, Ribeaud D (2011). The relationship between quantity, type, and timing of external childcare and child problem behaviour in Switzerland. *Eur. J. Dev. Psychol.* 8: 637-660.
- Bates J, Marvinney D, Kelly T, Dodge K, Bennett R, Pettit G (1994). Child care history and kindergarten adjustment. *Dev. Psychol.* 30: 690-700.
- Baydar N, Brooks-Gunn J (1991). Effects of maternal employment and child-care arrangements on preschoolers' cognitive and behavioral outcomes: Evidence from the children in the National Longitudinal Survey of Youth. *Dev. Psychol.* 27: 932-945
- Beer WR (1992). Affirmative action: Social policy as shibboleth. In: Suedfeld P, Tetlock PE (eds) *Psychology and social policy*. Washington DC: Hemisphere, pp 137-147.
- Belsky J (1999). Quantity of nonmaternal care and boys' problem behavior/adjustment. *Psychiatry.* 62: 1-20.
- Belsky J (2009). Classroom composition, childcare history and social development: Are childcare effects disappearing or spreading? *Soc. Dev.* 18: 230-238.
- Belsky J, Vandell DL, Burchinal M, Clarke-Stewart KA, McCartney K, Owen MT, NICHD Early Childcare Research Network (2007). Are there long-term effects of early child care? *Child Dev.* 78: 681-701.
- Bennett P, Elliott M, Peters D (2005). Classroom and family effects on children's social and behavioral problems. *Elem. Sch. J.* 105: 461-480.
- Betts JR, Zau AC, Rice LA (2003). Determinants of student achievement: New evidence from San Diego. San Francisco Public Policy Institute of California. <http://www.asu.edu/educ/eps/EPUR/articles/EPUR-0309-39-OWI.pdf>
- Borge A, Melhuish E (1995). A longitudinal study of childhood behavior problems, maternal employment, and day care in a rural Norwegian community. *Int. J. Behav. Dev.* 18: 23-42.
- Boyle GJ, Borg MG, Falzon JM, Baglioni AJ (1995). A structural model of the dimensions of teacher stress. *Br. J. Educ. Psychol.* 65: 49-67.
- Bruno F (ed) (1991). *Cocaine today: Its effects on the individual and society*. Oxford: Unicri.
- Conduct Problems Prevention Research Group (1999). Initial impact of the Fast Track prevention trial for conduct problems: II. Classroom effects. *J. Consult. Clin. Psychol.* 67: 648-657.
- Dishion TJ, McCord J, Poulin F (1999). When interventions harm: Peer groups and problem behavior. *Am. Psychol.* 54: 755-764.
- Dishion TJ, Spracklen KM, Patterson GR (1996). Deviancy training in male adolescent friendships. *Behav. Ther.* 27: 373-390.
- Dmitrieva J, Steinberg L, Belsky J. (2007). Child-care history, classroom composition, and children's functioning in kindergarten. *Psychol. Sci.* 18: 1032-1039.
- Dodge KA, Dishion TJ, Lansford JE (2006). Deviant peer influences in intervention and public policy for youth. *Soc. Policy Rep.* 20: No. 1.
- Figlio DN (2005). Boys named Sue: Disruptive children and their peers. NBER Working Papers 11277, National Bureau of Economic Research.

- http://www.aeaweb.org/annual_mtg_papers/2005/0107_1430_1102.pdf.
- Goldstein NE, Arnold DH, Rosenberg JL, Stowe RM, Ortiz C (2001). Contagion of aggression in day care classrooms as a function of peer and teacher responses. *J. Educ. Psychol.* 93: 708-719.
- Greene RW, Beszterczey SK, Katzenstein T, Park K, Goring J (2002). Are students with ADHD more stressful to teach? Patterns of teacher stress in an elementary school sample. *J. Emot. Behav. Disord.* 10(2): 79-89.
- Gresham FM, Lane KL, Beebe-Frankenberger M (2005). Predictors of hyperactive-impulsive-inattention and conduct problems: A comparative follow-back investigation. *Psychol. Sch.* 42: 721-736.
- Haskins R (1985). Public school aggression among children with varying day-care experience. *Child Dev.* 56: 689-703.
- Hastings RP, Bham MS (2003). The relationship between student behaviour patterns and teacher burnout. *Sch. Psychol. Int.* 24: 115-127.
- Hausfather A, Toharia A, LaRoche C, Engelsmann F (1997). Effects of age of entry, day-care quality, and family characteristics on preschool behavior. *J. Child Psychol. Psychiatry.* 38: 441-448.
- Henry D, Guerra N, Huesmann R, Tolan P, VanAcker R, Eron L (2000). Normative influences on aggression in urban elementary school classrooms. *Am. J. Community Psychol.* 28: 59-81.
- Hoglund W, Leadbeater B (2004). The effects of family, school, and classroom ecologies on changes in children's social competence and emotional and behavioral problems in first grade. *Dev. Psychol.* 40: 533-544.
- Hollowood TM, Salisbury CL, Rainforth B, Palombaro MM (1994). Use of instructional time in classrooms serving students with and without severe disabilities. *Except. Child.* 61: 242-253.
- Hoxby C (2000). Peer effects in the classroom: Learning from gender and race variation. National Bureau of Economic Research working paper 7866. <http://ideas.repec.org/p/nbr/nberwo/7867.html>.
- Hunter L (2003). School psychology: A public health framework III. Managing disruptive behavior in schools: The value of a public health and evidence-based perspective. *J. Sch. Psychol.* 41: 39-59.
- Jacob JI (2009). The socio-emotional effects of non-maternal childcare on children in the USA: A critical review of recent studies. *Early Child Dev. Care.* 179: 559-570.
- Kellam SG, Ling X, Mersica R, Brown CH, Ialongo N (1998). The effect of level of aggression in the first grade classroom on the course and malleability of aggressive behavior into middle school. *Dev. Psychopathol.* 10: 165-185.
- Linting M, Van IJzendoorn MH (2009). Dissipating or diffusing aggression after non-maternal childcare? Commentary on a novel hypothesis. *Soc. Dev.* 18: 239-246.
- Linz D, Wilson BJ, Donnerstein E (1992). Sexual violence in the mass media: Legal solutions, warnings, and mitigation through education. *J. Soc. Issues.* 48: 145-171.
- NICHD Early Child Care Research Network (2005a). Child care and child development: Results from the NICHD Study of Early Child Care and Youth Development. New York: Guilford.
- NICHD Early Child Care Research Network (2005b). Early child care and children's development in the primary grades: Results from the NICHD Study of Early Child Care. *Am. Educ. Res. J.* 43: 537-570.
- NICHD Early Child Care Research Network (2006). Child care effect sizes for the NICHD Study of Early Child Care and Youth Development. *Am. Psychol.* 61: 99-116.
- NICHD Early Child Care Research Network (2008). Social competence with peers in third grade: Associations with earlier peer experiences in childcare. *Soc. Dev.* 17: 419-453.
- Punch KF, Tuettemann E (1990). Correlates of psychological distress among secondary school teachers. *Br. Educ. Res. J.* 16: 369-382.
- Reid JB (1993). Prevention of conduct disorder before and after school entry: Relating interventions to developmental findings. *Dev. Psychopathol.* 5: 243-262.
- Rodkin PC, Roisman GI (2010). Antecedents and correlates of the popular-aggressive phenomenon in elementary school. *Child Dev.* 81: 837-850.
- Smolensky E, Gootman JA (eds), Committee on Family and Work Policies, National Research Council (2003). Working families and growing kids: Caring for children and adolescents. Washington DC: The National Academies Press.
- Snyder J, Schrepferman L, Oeser J, Patterson G, Stoolmiller M, Johnson K, Snyder A (2005). Deviancy training and association with deviant peers in young children: Occurrence and contribution to early-onset conduct problems. *Dev. Psychopathol.* 17: 397-413.
- Thomas DE, Bierman KL, Conduct Problems Prevention Research Group (2006). The impact of classroom aggression on the development of aggressive behavior problems in children. *Dev. Psychopathol.* 18: 471-487.
- Thompson RA (2009). Making the most of small effects. *Soc. Dev.* 18: 247-251.
- US Department of Education (1999-2000). Schools and Staffing Surveys. <http://165.224.221.98/pubsearch/pubsinfo.asp?pubid=2005335>.
- Walker HM, Ramsey E, Gresham FM (2003-2004). Heading off disruptive behavior: How early intervention can reduce defiant behavior--and win back teaching time. *Am. Educ.* (online). http://www.aft.org/pubs-reports/american_educator/winter03-04/early_intervention.html.
- West J, Denton K, Germino-Hausken E (2000). America's Kindergartners. Washington DC: National Center for Education Statistics.
- Wilkinson LA. (2005). Supporting the inclusion of students with emotional and behavioural disorders: Examples using conjoint behavioural consultation and self-management. *Int. J. Spec. Educ.* 20: 73-84.

Endnotes

¹ Because percentages of low-income children were not normally distributed, a dichotomous variable reflecting low ($\leq 10\%$) and higher proportions ($>10\%$) of low-income children in the class were used in correlational and regression analyses.