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Living in Non-Parental Care Moderates Effects of Prekindergarten Experiences
on Externalizing Behavior Problems in School

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Abstract

The current study examines the effects of prekindergarten quality and quantity on externalizing behavior problems for children living in non-parental care, compared to other children from socioeconomically at-risk backgrounds. Data were obtained from the Head Start Impact Study. Non-parental care was defined as a primary caregiver other than a biological, adoptive, or step-parent. The sample included 3029 children who attended center-based prekindergarten. Teacher-child conflict and more hours of prekindergarten predicted increased externalizing behavior problems for the full sample. Teacher-child closeness and overall process quality were only associated with externalizing behavior for children in non-parental care. Findings are discussed within a goodness-of-fit perspective in which the vulnerabilities of children in non-parental care explain how they respond to their prekindergarten experiences.

Keywords: prekindergarten, non-parental care, externalizing behavior problems, school readiness, teacher-child relationships, early care and education quality

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Externalizing behavior problems, including hyperactivity, inattention, and aggressive or oppositional behaviors, impede children's abilities to succeed in school (e.g., Keith & Roisman, 2010; Ladd, Birch, & Buhs, 1999). Children with early externalizing behaviors tend to show less motivation, persistence, and positive attitudes toward learning in preschool, which are in turn linked with lower achievement in elementary school (e.g., McWayne & Cheung, 2009). A national survey of kindergarten teachers revealed that more children face problems managing their behavior (e.g., following directions) than grasping early academics (Rimm-Kaufman, Pianta, & Cox, 2000). A particularly vulnerable group of children at-risk for behavioral problems during the transition to school are those living in non-parental care (e.g., formal foster care, kinship care) due to concerns such as abuse, neglect, domestic violence, illness, substance abuse, or legal problems (Billing, Ehrle, & Kortenkamp, 2002; Pears, Kim, & Fisher, 2008).

The federal government recently established memorandums between Child Welfare and the offices of both Head Start and Child Care to increase access to quality early care and education programs (ECE) for children involved in the Child Welfare System, including those living in non-parental care (U.S. Department of Health and Human Services, 2011a, 2011b). In order for ECE programs to be successful at improving school readiness outcomes for children from high-risk backgrounds, such as those living in non-parental care, they must meet children's specific and diverse needs. Children who have had early adverse experiences (e.g., maltreatment) may respond to ECE programs differently than others. Yet very little is known about how children's risk factors play a role in the effects of ECE experiences on school readiness outcomes. The current study takes an important step in this line of work by examining

the role of ECE quality and quantity during the prekindergarten year for children living in non-parental care compared to other children from socioeconomically at-risk backgrounds. We focus on externalizing behavior problems as an index of school readiness because children living in non-parental care are particularly vulnerable in this domain (e.g., Billing et al., 2002; Stahmer et al., 2005).

Children Living in Non-Parental Care

In the current study, *non-parental care* is defined as a primary caregiver who self-identifies as someone other than a biological, adoptive, or step-parent. Almost 80% of children in the United States who are not living with a parent live with other relatives (often called kinship care), and most of these children are not in a formal foster care arrangement (Denby, 2011). Children living in non-parental care face risks that may compromise their development in nearly every domain, making it difficult for them to enter kindergarten ready to succeed. Children in non-parental care often experience prenatal exposure to alcohol (Astley, Stachowak, Clarren, & Clausen, 2002), poverty (Ehrle & Geen, 2002; Sousa & Sorensen, 2006), caregiver mental health problems (Ehrle & Geen, 2002; Minkler, Fuller-Thomson, Miller, & Driver, 2000), maltreatment (Chernoff, Combs-Orme, Risley-Curtiss, & Heisler, 1994; Pears, Kim, & Fisher, 2008), and instability of home environments (Rubin, O'Reilly, Hafner, Luan, & Localio, 2007). Consequently, children living in non-parental care often face developmental challenges; they particularly struggle with behavioral and mental health (Billing et al., 2002; Ehrle & Geen, 2002; Rubin et al., 2007; Stahmer et al., 2005), as well as academic achievement and school engagement (Billing et al., 2002; Pears, Heywood, Kim, & Fisher, 2011; Scherr, 2007).

Impaired self-regulation may be at the root of many of these negative outcomes. Stressful experiences early in life can disrupt the development of neurobiological systems that

are important to self-regulation and related behavioral outcomes (e.g., Bruce, Gunnar, Pears, & Fisher, 2013; Gunnar & Quevedo, 2007; Twardosz & Lutzker, 2010). Children living in non-parental care show heightened vulnerabilities in self-regulation (Lewis, Dozier, Ackerman, & Sepulveda-Kozakowski, 2007; Pears, Bruce, Fisher, & Kim, 2010) and may therefore need additional *external* regulation (through supportive relationships and structure from adults) in order to avoid externalizing behavior problems. Research on parenting practices of substitute parental figures for children who have experienced maltreatment suggests that structured yet responsive and warm adult-child interactions help children who have poor self-regulation learn to manage their behavior more appropriately (Kim-Spoon, Haskett, Longo & Nice, 2012). Unfortunately, many non-parental families utilize negative or harsh, rather than supportive, parenting (e.g., Erhle, Geen, & Clark, 2001; Orme & Buehler, 2001). In sum, children living in non-parental care often experience adversity that threatens self-regulation and heightens the need for supportive relationships with adult caregivers.

High quality ECE programs may provide an avenue for helping young children living in non-parental care learn skills for managing their behavior in group settings, and increase their chances for success in school. Over 50% of 3-5 year old children living in out-of-home child welfare placements attend center-based ECE programs (Ward et al., 2009). However, given the specific vulnerabilities and needs of children living in non-parental care, ECE experiences may affect these children's development differently than that of children in the general population.

Early Care and Education (ECE)

Evidence from studies of children who live with their parents consistently shows that ECE experiences play a significant role in development across a wide variety of areas relevant to school readiness, including behavior and early academics (Belsky et al., 2007; Magnuson &

Waldfogel, 2005; National Institute of Child Health and Human Development Early Child Care Research Network [NICHD ECCRN], 2005). Although the size of these ECE effects on development tends to be modest, some studies indicate that ECE effects may be greater for children from at-risk families (e.g., Magnuson, Ruhm, & Waldfogel, 2007; Peisner-Feinberg et al., 2001). This line of work, however, has been limited by a nearly exclusive focus on socioeconomic risks. A few recent studies have found that factors associated with children's underlying neurobiology, also moderate effects of ECE on social and behavioral indicators of school readiness (Belsky & Pluess, 2013; Lipscomb, et al., 2013; Phillips, Fox, & Gunnar, 2011; Pluess & Belsky, 2009). Given that vulnerabilities associated with non-parental care (e.g., prenatal exposure to drugs and alcohol, maltreatment, etc.) affect children's neurobiology (e.g., Bruce et al., 2013) they may also affect the way children respond to ECE experiences.

An emerging line of research is beginning to document the role of ECE experiences in the development of children living in non-parental care. For example, Dinehart and colleagues (2012) have shown that attending accredited child care (a marker for high quality), compared to non-accredited child care, is associated with better developmental and early academic outcomes for preschool-aged children receiving Child Protective Services (CPS). Similarly, higher quality ECE has been linked to better scores on developmental assessments for infants and toddlers receiving CPS (Kaiser et al., 2011). Additionally, analysis of data from the national Head Start Impact Study, a randomized control trial, found that Head Start has a positive impact on school readiness for children living in non-parental care, including early academic skills, behavior, and relationships with teachers (Lipscomb, Pratt, Schmitt, Pears & Kim, 2013). Collectively these findings suggest that quality ECE experiences can have a meaningful role in the development of children involved in child welfare. The current study extends this work by examining how

specific features of ECE quality and quantity relate to behavioral outcomes for children living in a range of types of non-parental care, and by comparing these ECE effects to those for other children from socioeconomically disadvantaged households.

Little is known about how different groups of children respond to various ECE experiences. Prior work has focused on whether children from specific subgroups (e.g., low-income, difficult temperament) evince a greater magnitude of the same types of associations between ECE and child outcomes as children from the general population. For example, differential susceptibility, a model in which factors such as temperament or genetics enhance children's sensitivity to both positive and negative environmental inputs (e.g., Belsky, Bakermans-Kranenburg, & van Ijzendoorn, 2007), is receiving increasing empirical attention in the field of ECE (e.g., Belsky & Pluess, 2012, 2013; Phillips et al., 2012; Pluess & Belsky, 2009). In contrast, the current study takes a goodness-of-fit perspective, in which the degree of congruence or "fit" between individuals and their environmental contexts impacts how experiences contribute to outcomes (e.g., Lerner, 1983; Thomas & Chess, 1977). Although the goodness of fit perspective has primarily been discussed in relation to parenting, it also has relevance for the ECE context (Vitiello, Moas, Henderson, Greenfield, & Munis, 2012). In this study we consider how specific features of ECE might provide a "match" or "mismatch" for the needs and vulnerabilities of children who live in non-parental care. This study focuses on ECE quality and quantity during the prekindergarten year. By examining only center-based pre-kindergarten programs this study holds type of care constant.

Quality of ECE. The current study examines two key components of the quality of children's ECE experiences: classroom process quality and teacher-child relationships. Both have been identified as important predictors of school readiness outcomes for the general

population of young children as well as for those living in poverty (e.g., Peisner-Feinberg et al., 2001). Yet they have rarely been studied simultaneously, and their importance for children living in non-parental care has not yet been investigated.

Classroom process quality. Classroom process quality is defined as the quality of instruction and the nature of teacher-child interactions (Cassidy, Hestenes, Hansen, Hegde, Shim, & Hestenesl., 2005; La Paro, Pianta, & Stuhlman, 2004). Prior research consistently links process quality with social, behavioral, and cognitive outcomes in preschool and beyond (Burchinal et al., 2008; La Paro et al., 2004; Mashburn et al., 2008; Vandell, 2004). For example, in a study of 240 publicly funded prekindergarten programs, responsive and stimulating teacher interactions predicted greater social competence and fewer behavior problems when children transitioned into kindergarten the following year (Burchinal et al., 2008). Although no prior evidence of the effect of classroom process quality on behavior problems for children living in non-parental care is available to guide the current study, evidence suggests that children at risk for school problems (due in part to externalizing problems) benefit more from high classroom process quality than children at low risk for school problems (Downer, Rimm-Kaufman, & Pianta, 2007). Because children living in non-parental care are also at increased risk for school failure and struggle specifically with self-regulation and behavior, we anticipate a stronger effect of classroom process quality on behavior problems for children living in non-parental care.

Teacher-child relationships. In addition to the overall quality of teacher instruction and interaction in the classroom, individual relationships between children and their teachers are also important in promoting children's learning and development (Hamre & Pianta, 2001). When early teacher-child relationships are characterized by a combination of warmth, closeness, and a lack of conflict, they appear to have a lasting positive impact on children's behavioral and

academic outcomes in kindergarten and first grade (Birch & Ladd, 1997; Birch & Ladd, 1998; Hamre & Pianta, 2001; Palermo et al., 2007). When specifically considering children's externalizing behavior outcomes, the degree of conflict within teacher-child relationships seems to be most important. Relationships characterized by teacher-child conflict have been associated with increases in aggression and other externalizing behaviors (Birch & Ladd, 1998; Doumen, Buyse, Colpin, & Verschueren, 2011), as well as with related negative outcomes such as more school avoidance, negative attitudes toward school, low self-directedness, and low cooperation in the classroom (Birch & Ladd, 1997).

In contrast, the closeness aspect of teacher-child relationships does not typically appear to be associated with externalizing behavior (e.g., O'Connor, Collins, & Supplee, 2012; Xiao & Jin, 2011). However, because children living in non-parental care have a heightened need for supportive relationships with trusting adults, coupled with vulnerabilities in self-regulation (Lewis et al., 2007; Pears, Fisher, Bruce, Kim, & Yoerger, 2010), we expect teacher-child closeness to be an important predictor of behavioral problems among children living in non-parental care compared to other children. For this same reason, we also anticipate that teacher-child conflict may be a stronger predictor of behavior problems for children living in non-parental care.

When considering both the overall process quality of ECE classrooms and individual teacher-child relationships in the same analysis, relationships between individual children and teachers appear to predict socio-emotional outcomes, including behavior problems, whereas classroom process quality is a better predictor of children's language and academic skills (Howes et al., 2008; Peisner Feinberg et al., 2001). Thus, for most children, it seems that their personal relationships with the teacher, rather than the overall way that the teacher interacts with

children in the classroom, is what helps children learn to manage their behavior. However, we anticipate that because children living in non-parental care tend to have less well developed self-regulatory systems due to neurobiological vulnerabilities (e.g., Twardosz & Lutzker, 2010), their behavioral outcomes may be sensitive to both the overall process quality of the classroom as well as their individual relationships with teachers.

Quantity of ECE. Higher *quantities* of ECE (more hours per week and/or more hours over time) have been linked to increased problem behavior (e.g., McCartney et al, 2010; NICHD ECCRN, 2005, 2006; Vandell, Belsky, Burchinal, Steinberg, & Vandergrift, 2010). These effects are relatively small in size but endure throughout childhood and into adolescence, and persist when controlling for family demographics, as well as the type and quality of ECE. Long hours spent with large peer groups appear to be responsible for at least part of these associations (McCartney et al., 2010), which often include heightened social interaction and competition (Fabes, Harnish, & Martin, 2003) and can be stressful for young children (e.g., Donzella, Gunnar, Krueger, & Alwin, 2000). Indeed, long hours of center-based ECE have also been associated with elevated cortisol levels (Watamura, Donzella, Alwin, & Gunnar, 2003).

Recent evidence suggests that children at-risk for dysregulation are more likely than other children to respond to center-based ECE with increasing behavioral problems (Lipscomb et al., 2013). Similarly, we anticipate that the problem behavior of children living in non-parental care, who often have under-developed self-regulation skills, may be more strongly affected by longer hours of ECE than that of other children.

Current Study

The current study examined data from the Head Start Impact Study (U.S. DHHS, 2010a). The focus of the current analysis was to estimate the effects of children's experiences of ECE

quality and quantity during the prekindergarten year, rather than testing the impact of Head Start, and to compare these effects for children living in non-parental care to other children from socioeconomically at-risk backgrounds (eligible for Head Start) living with their parents. We expected that the main effects of ECE experiences for the overall sample would mirror those evidenced in prior research. For the full sample, it was hypothesized that more hours of ECE would be associated with increased behavioral problems. We also expected that more conflictual teacher-child relationships would be associated with increased behavior problems, controlling for classroom process quality and children's externalizing behavior problems in prekindergarten. Considering their vulnerabilities in self-regulation and behavior, and heightened need for positive, consistent relationships with adult caregivers, we anticipated that children living in non-parental care would exhibit stronger effects of both hours of ECE and teacher-child conflict on changes in problem behavior from prekindergarten to kindergarten. We also anticipated teacher-child closeness and overall process quality to predict fewer behavior problems for children living in non-parental care; these associations were not expected for children living with their parents.

Method

Participants

This study uses data from the Head Start Impact Study, but investigates effects of ECE quality and quantity across all center-based ECE programs in the prekindergarten year rather than examining the impact of Head Start. The HSIS is a national study that randomly assigned two cohorts of 3- and 4- year old children to a Head Start ($n = 2,783$) or community comparison group ($n = 1,884$) to evaluate the effectiveness of Head Start on school readiness outcomes (U.S. DHHS, 2010a). Unequal sample sizes for Head Start and control groups were purposeful (U.S. DHHS, 2010a). The community comparison group could access other non-Head Start ECE

programs, and many control group parents (60%) did enroll their children in center-based ECE programs. During the fall of the second year of the study, if children in the comparison group remained eligible for Head Start, and did not go into kindergarten, they could enroll in Head Start.

Analyses were limited to children who attended center-based ECE (either Head Start or community-based center care) during their prekindergarten year, which resulted in the exclusion of 1028 children. Additionally, because of our interest in comparing children living in non-parental care to the larger sample, we excluded 385 children because parents/caregivers did not report who the primary caregiver was, and therefore, it was impossible to determine whether children lived in non-parental care. Comparison tests indicated that children whose parents/caregivers did not report the primary caregiver had lower scores on a household risk index than children who remained in the study, and thus, comparisons between those in non-parental care versus parental care may underestimate differences between the two groups.

This study analyzed a sample of 3029 children (50% female) during their prekindergarten and kindergarten years. At study entry (2002), children were on average a little over 4-years-old ($M = 49.37$ months, $SD = 6.85$, $range = 33.60 - 71.67$). The sample was ethnically/racially diverse: Hispanic (37%), Black (32%), and White (32%). Within the current sample of 3029 children, this study also focused on a specific subsample of 215 children (50% female) who lived in non-parental care during at least one wave of data collection between study entry and kindergarten. A grouping variable was created such that 1 = child lived in non-parental care ($n = 215$) and 0 = child lived with his/her parent(s) ($n = 2814$). The non-parental subsample differed slightly from the overall sample on ethnicity/race: Hispanic (16%), Black (44%), and White (40%).

For the current sample, the most common non-parental primary caregiver (at 2002) was the child's grandmother (63%), followed by a formal foster parent (15%), other female non-relative (12%), sister/step-sister (4%), great grandmother (3%), other male non-relative (2%), and the child's great grandfather (2%). Rates of primary caregiver relationship were similar across time. Children in non-parental care tend to experience primary caregiver transitions. In this sample (spanning waves 2002-2006), children living in non-parental care experienced an average of 1.27 transitions ($SD = 1.14$). On average, the subsample lived in non-parental care settings a little less than three out of five waves, from 2002-2006 ($M = 2.77$, $SD = 1.52$). Children living in non-parental care demonstrated elevated rates of special needs (19% vs. 14% for larger sample) and externalizing behavior problems in prekindergarten ($M = 2.41$ vs. 1.69 for larger sample).

Procedure

This study analyzed data gathered during children's prekindergarten and kindergarten years. Identical data were collected for children assigned to Head Start and children who attended other center-based ECE settings. Because the current study's sample came from both cohorts of the HSIS, children's prekindergarten experiences were measured during two different years, depending on the child's age. The 4-year-old cohort's prekindergarten experiences were measured during the 2002-2003 year, and the 3-year-old cohort's prekindergarten experiences were measured during the 2003-2004 year. The data were merged so that ECE experiences and baseline behavior problems represented the prekindergarten year (regardless of the year of data collection), and behavior problem outcome data represented the spring of the kindergarten year.

Participating parents/primary caregivers completed an interview to obtain information about child and family characteristics. In the spring of the prekindergarten year, teachers

completed questionnaires, including reports of teacher-child relationships and children's externalizing behavior problems in the classroom. Trained observers conducted direct observations of classroom process quality, also in the spring of prekindergarten year.

Measures

Non-parental care. During both the fall and spring prekindergarten interviews, children's primary parents/caregivers were asked to report their relationship with the child. If reports indicated relationships with children were non-parental (e.g., grandparent, foster parent) during at least one wave of data collection between study entry and kindergarten, the non-parental care variable was coded as 1 (*non-parental care*), and if relationships were reported as parental (biological, adoptive, or step-parent) during all waves the variable was coded as 0 (*parental care*).

Classroom process quality. A composite variable was used to assess classroom process quality, including positive interaction, cognitive support/language reasoning, classroom organization, and behavior management. Items were obtained from the Early Childhood Environment Rating Scale-Revised Edition (ECERS-R; Harms, Clifford, & Cryer, 1998) and the Arnett Scale of Teacher Behavior (Arnett, 1989). In the spring of the prekindergarten year, trained observers rated classroom quality on a scale from 1 (*inadequate*) to 7 (*excellent*) for the ECERS-R, and rated classroom interactions on a scale from 1 (*not at all*) to 4 (*very much*) for the Arnett. Based on the findings of Cassidy and colleagues (2005), we utilized specific items from the ECERS-R that measured process aspects of quality in the following areas: interactions (supervision of gross motor activities, supervision of children other than gross motor, staff-child interactions, and interactions among children), behavior management (discipline), cognitive support/language reasoning (books and pictures, encouraging children to communicate, using

language to develop reasoning skills, and informal use of language), and classroom organization/program structure (schedule, free play, and group time). In addition, the following subscales from the Arnett were included: detachment, independence, sensitivity, harshness, and punitiveness. Negative subscales from the Arnett (detachment, harshness, and punitiveness) were reverse coded. Items were then standardized and aggregated to create an overall composite score of classroom process quality during the prekindergarten year (Chronbach's $\alpha = .84$).

Teacher-child relationship. Individual teacher-child relationships were measured using the closeness and conflict subscales of the Student-Teacher Relationship Scale (short form; Pianta, 2001). Teachers rated their relationships with individual study children from 1 (*definitely does not apply*) to 5 (*definitely applies*). The closeness subscale was comprised of seven items (total scores ranging from 7-35), and included items like, "If upset, this child will seek comfort from me" and "I share an affectionate, warm relationship with this child." The conflict subscale consisted of eight items (total scores ranging from 7-40), and sample items included, "This child becomes easily angry at me." These subscales have demonstrated strong reliability in the HSIS (Chronbach's $\alpha = .80-.87$; U.S. DHHS, 2010b). This measure was collected in the spring of the prekindergarten year.

ECE quantity during prekindergarten. In the fall of the prekindergarten year parents were asked to report on how many hours their child typically spends per week in their primary ECE (Head Start or non-Head Start) center. The average reported total hours was 25.84 ($SD = 10.68$).

Externalizing behavior problems. Teachers rated children's behavior problems in the spring of the prekindergarten and kindergarten years using the Adjustment Scales for Preschool Intervention (ASPI; Lutz, Fantuzzo, & McDermott, 2002). Three behavioral dimensions were

measured: aggressive (22 items), oppositional (11 items), and inattentive/hyperactive (10 items). The ASPI consists of 24 classroom situations with 144 descriptors of typical and problem classroom behaviors. Teachers are asked to match descriptors to children's behaviors in the classroom over the last 2 months. Example descriptors for the aggressive dimension include: "Overly rough with other children in games" and "Answers back aggressively, makes threats or creates a disturbance when corrected." Example descriptors for the oppositional dimension include: "Answers questions except when in a bad mood" and "Tells on others to gain teacher's favor." Example descriptors for the inattentive/hyperactive dimension include: "Answers questions without taking time to think" and "Constantly restless (changes position, etc.)." This measure has demonstrated reliability and validity in previous studies (Lutz et al., 2002). Items were aggregated to create a composite score for total behavior problems in prekindergarten and kindergarten (reliabilities for composite scores: Chronbach's $\alpha = .77$ and $.82$, respectively).

Covariates

Child covariates. Child covariates were reported by parents/caregivers during the fall of 2002 and included sex, age, and special needs status. To obtain special needs status, primary caregivers were asked to respond "yes" or "no" to the question: "Did a doctor or other health or education professional ever tell you that [CHILD] has any special needs or disabilities—for example, physical, emotional, language, hearing, learning difficulty, or other special needs?" Fourteen percent of parents reported that their children had special needs.

Family covariates. Family covariates were reported in the fall of 2002 and included household income, caregiver instability, and parenting/caregiving style. Parents/caregivers selected their total gross family income for the last month from one of the following categories: 1 (*less than \$250*), 2 (*between \$251 and \$500*), 3 (*between \$501 and \$1,000*), 4 (*between \$1,001*

and \$1,500), 5 (between \$1,501 and \$2,000), 6 (between \$2,001 and \$2,500), or 7 (over \$2,500).

A family income-to-needs ratio was then computed by dividing the ordinal monthly household income variable by the number of people living in the household.

Caregiver instability was defined as whether the child experienced one or more transitions between primary caregivers during the prekindergarten or kindergarten year, coded as 0 (*no*) and 1 (*yes*).

Parents reported children's ethnicity. The variable was categorized into non-white (0) and white (1).

Parent /caregiving style was assessed using the Child-Rearing Practices Report (CRPR; Block, 1965). Parents responded to 13 items on a scale from 1 (*exactly like you*) to 7 (*not at all like you*). Example items include: "I teach my child that misbehavior or breaking the rules will always be punished one way or another" and "I believe physical punishment to be the best way of disciplining". Four scales emerged from the survey according to Baumrind's typology (1971): authoritarian (Chronbach's $\alpha = .74$), authoritative (Chronbach's $\alpha = .74$), permissive (Chronbach's $\alpha = .75$), and neglectful (Chronbach's $\alpha = .73$; see U.S. DHHS, 2010b). A dichotomous variable was then created identifying whether parenting/caregiving style was authoritarian (defined as high control, low warmth; coded as 1) or not (coded as 0).

Analytic Strategy

Data analyses were conducted using Stata 12.1 (StataCorp., 2011). Due to the nested structure of the data (children nested in prekindergarten programs), multilevel modeling was utilized to answer all research questions. The ICC for the unconditional model was .02. All models control for children's behavior problems in prekindergarten as well as other child and family demographic characteristics. Head Start status was also entered as a covariate in initial

models, however, because it never reached significance, it was trimmed from our final models. For ease of interpretation, predictor variables were mean centered. The effects of prekindergarten quality and quantity on externalizing behavior problems in kindergarten were modeled as:

$$Y_{ij} = \beta_{0j} + \beta_{1ij} (\text{externalizing behavior problems in spring of prekindergarten}) + \beta_{2ij} (\text{gender}) + \beta_{3ij} (\text{non-parental care}) + \beta_{4ij} (\text{special needs}) + \beta_{5ij} (\text{child age}) + \beta_{6ij} (\text{parenting style}) + \beta_{7ij} (\text{income}) + \beta_{8ij} (\text{caregiver transitions}) + \beta_{9ij} (\text{ethnicity}) + \beta_{10ij} (\text{ECE quantity}) + \beta_{11ij} (\text{classroom process quality}) + \beta_{12ij} (\text{teacher-child closeness}) + \beta_{13ij} (\text{teacher-child conflict}) + r_{ij}$$

Y_{ij} represents the average externalizing behavior outcome in kindergarten for child i in classroom j , accounting for externalizing behavior problems in prekindergarten, gender, non-parental care status, special needs, child age, parenting style, income-to-needs ratio, caregiver transitions, ethnicity, total hours in child care, classroom process quality, teacher-child closeness, teacher-child conflict, and error all at the child level. Standardized effect sizes were calculated using the following equation: $\beta_{y,x} = (b_{y,x} \times s_x) / s_y$

Missing Data. The following variables had > 15% missing: externalizing behavior problems in prekindergarten and in kindergarten, child age, sex, special needs status, parenting/caregiving style, family income, ECE quantity, caregiver transitions, and classroom process quality. To handle missing data, multiple imputation using a multivariate normal model was employed for the entire sample. Data were assumed to be missing at random (MAR), which requires that all variables associated with missingness are included in the imputation model and that all other patterns of missingness are random (Acock, 2012; Schafer & Graham, 2002).

There is no definitive test of the MAR assumption; however, tests were conducted to determine

whether auxiliary variables not included in original models were related to missingness. Logistic regressions were conducted using dummy variables that were created for all variables with > 5% missingness (0 = present; 1 = missing). Variables already in the models and demographic variables theoretically related to missingness (e.g., maternal education) were included as predictors in the logistic regressions. None of the possible auxiliary variables predicted missingness, which suggests that it is reasonable to assume that data are missing at random. In order to reduce potential bias that could result from using listwise deletion and to maintain statistical power that could be lost (Acock, 2012), multiple imputation was used to create 15 datasets in Stata. These datasets were used for all hypothesis testing. Following recommendations by von Hippel (2007) and Acock (2012), the observations with missing values on the outcome variable, although included in the imputation model, were dropped before estimating the analysis models. This modification of the traditional imputation method, called multiple imputation, then delete (MID), is thought to remove unnecessary “noise” and uncertainty that imputed outcome variables can bring, and thus, improve the quality of the standard errors (Acock, 2012).

Results

Preliminary Results

Comparison tests revealed no significant differences between the full sample and the non-parental care sample on process quality, quantity, or teacher-child closeness. Significant group differences did emerge for teacher-child conflict, $t(2577) = -2.27, p = .02$ ($M = 13.65$ for full sample, $M = 14.75$ for non-parental care sample). Descriptive statistics and bivariate correlations can be found in Tables 1 and 2. Teacher-child closeness, teacher-child conflict, and prekindergarten quantity were significantly correlated with kindergarten behavior problems.

Hypothesis Testing

A summary of results regarding the effects of the quantity and quality of prekindergarten experiences on children's externalizing behavior problems in kindergarten can be found in Table 3. Two models were estimated. Model 1 examined the main effects of quantity (hours in ECE per week) and quality (classroom process quality and teacher-child closeness and conflict) on externalizing behavior problems in kindergarten, controlling for children's externalizing behavior problems during prekindergarten and other covariates (Table 3). Findings showed that more hours in ECE during prekindergarten were related to increases in externalizing behavior problems ($\beta = .04, p = .049$). Results supported our hypothesis that more conflictual teacher-child relationships would predict increases in externalizing behavior problems ($\beta = .11, p < .001$) between prekindergarten and kindergarten. Neither classroom process quality nor teacher-child closeness predicted externalizing behavior problems in kindergarten, controlling for teacher-child conflict, hours of ECE, earlier externalizing behavior problems and other covariates.

Model 2 added four interaction terms to test for differential effects of these same ECE experiences (hours in ECE per week, classroom process quality, and teacher-child closeness and conflict) on externalizing behavior problems in kindergarten for children living in non-parental care versus those living in parental care (Table 3). Two of these four interaction effects were significant: teacher-child closeness*non-parental care and classroom process quality*non-parental care. As shown in Figure 1, teacher-child closeness predicted fewer externalizing behavior problems in kindergarten for children living in non-parental care but not for other children from similar socioeconomic backgrounds (i.e., eligible for Head Start). In contrast and unexpectedly, higher classroom process quality led to *more* externalizing behavior problems for children living in non-parental care (see Figure 2). We did not detect a larger impact of

prekindergarten quantity or teacher-child conflict on externalizing behavior problems for children living in non-parental care than for other children (Table 3). The change in χ^2 from model 1 to model 2 was statistically significant ($\Delta\chi^2(4) = 26.92, p < .001$), indicating a significant improvement in model fit by allowing the effects of prekindergarten experiences to differ for children in non-parental versus parental care.

Discussion

The current study offers a first look at the effects of prekindergarten quantity and quality on the development of externalizing behavior problems for children who live in non-parental care (the primary caregiver for the child was not a biological, adoptive, or step-parent). In the current study, most of these children lived with relatives (primarily grandmothers) and experienced at least one transition between primary caregivers from 2002 to 2006. Consistent with evidence from prior research, results indicate that children living in non-parental care exhibit elevated levels of externalizing behavior problems, including inattention, hyperactivity, aggression, and oppositional behavior. These behavioral problems may represent the effects of early adversity on self-regulatory systems (e.g., unstable home environments, maltreatment, prenatal exposure to drugs, parent mental illness and/or substance abuse; Astley et al., 2002; Chernoff et al., 1994; Ehrle & Geen, 2002; Minkler et al., 2000; Rubin et al., 2007).

We statistically compared the effects of prekindergarten for children living in non-parental care to those for other children who were eligible for Head Start and lived with their parents. As hypothesized, the main effects of prekindergarten experiences for the entire sample mirrored those evidenced in prior research. Children who had higher amounts of conflict with their teachers during prekindergarten, as well as those who attended more hours of prekindergarten showed more externalizing behavioral problems in kindergarten, controlling for

their earlier externalizing behavior problems in prekindergarten. Findings were also partially consistent with a goodness-of-fit perspective in which the vulnerabilities (e.g., low self-regulation) and needs (e.g., trusting and supportive relationships with adults) common among children living in non-parental care helped to explain how they responded to their prekindergarten experiences. Children living in non-parental care appeared to be more sensitive to the effects of both teacher-child closeness and overall classroom process quality, but not to teacher-child conflict or hours of ECE, on the development of externalizing behavior problems than Head Start-eligible children living with their parents.

Effects of Teacher-Child Relationships

Findings from the current study supported our expectations that the behavior of children living in non-parental care would be particularly sensitive to experiences in prekindergarten. When examining the entire sample of children, teacher-child conflict predicted increases in children's behavior problems over time; teacher-child closeness was not associated with changes in behavior problems. However, as hypothesized, teacher-child closeness was important for children living in non-parental care. This finding of heightened sensitivity to close, warm relationships with teachers is consistent with prior evidence of beneficial effects of interventions that improve warmth and responsivity in relationships between foster parents and children with poor self-regulation skills (Kim-Spoon et al., 2012). The current study suggests that close relationships with prekindergarten teachers may also help to prevent increasing behavior problems among children living in non-parental care during the transition to kindergarten.

Overall Classroom Process Quality

As anticipated, children living in non-parental care were more sensitive than children living with their parents to overall classroom process quality, at both the high and low end of

process quality (Figure 2). The behavior of children who lived with their parents was relatively unaffected by overall process quality, when accounting for the quality of the teacher-child relationship. This type of interaction effect is similar to those specified in the differential susceptibility framework (e.g., Belsky et al., 2007) suggesting that some children are more sensitive to both the positive and the negative aspects of their environments. Yet the direction of the effect is opposite than expected. Children living in non-parental care who attended prekindergarten classrooms with *higher* process quality exhibited *more* externalizing behavioral problems in kindergarten, controlling for their earlier levels of externalizing behavior problems. Conversely, these children exhibited *fewer* externalizing behavioral problems when they attended classrooms that were rated *lower* in process quality. It is important to reiterate that the outcome measure of externalizing behavior problems was rated by kindergarten teachers, not by the prekindergarten teachers whose process quality was observed.

In order to interpret these effects, we examined the measure of process quality used in this study and its relevance to the needs of children living in non-parental care. The measure of overall process quality employed in the present study (process items from the ECERS-R and the Arnett Scale of Caregiver Behavior) is oriented toward “child-centered” practices, such as redirection and autonomy support, which are developmentally appropriate for young children overall (e.g., Copple & Bredekamp, 2009). Quality ratings based on ECERS-R and Arnett assessments have been linked to fewer behavior problems in early and middle childhood for general and low-income samples (Votruba-Drzal, Coley, & Chase-Lonsdale, 2004; Votruba-Drzal, Coley, Maldonado-Carreno, Li-Grining, & Chase-Lonsdale, 2010). The current study’s use of the process quality items from the ECERS differs from the traditional use of the ECERS total score. Yet our approach is consistent with recent evidence that the process and structural

components of the ECERS can be differentiated (Cassidy, Hestenes, Hansen et al., 2005; Cassidy, Hestenes, Hegde, Hestenes, & Mims, 2005) and that process quality is linked with children's development (e.g., Burchinal et al., 2008).

However, children in non-parental care face considerable risks for behavioral dysregulation and as such may need structured and adult-guided interactions with individualized feedback in order to help them to manage and regulate their behavior and emotions. This concept has not yet been well-researched; however, it is not unprecedented in the literature. A study of children adopted at birth who have a genetic risk for dysregulation showed fewer behavioral problems when they experience *more* structured parenting (e.g., making specific requests for changes in children's behavior), whereas children without genetic risk show greater benefits from *less* structured parenting (Leve et al., 2009). Children who are at risk for dysregulation due to vulnerabilities associated with living in non-parental care may exhibit a similar need for structured guidance from their adult caregivers, including prekindergarten teachers.

Alternative interpretations are also possible. For example, children attending prekindergarten programs with lower process quality may also have had kindergarten teachers the next year who were not as skilled at handling behaviors and thus rated the children higher on externalizing behavior. Future research could examine these possibilities.

Strengths, Limitations, and Conclusions

The current study built on the strengths of a large national dataset on Head-Start eligible children and families living in poverty who often face multiple risk factors. Thus, children in this sample living with their parents represented an appropriate comparison group for children living in non-parental care. Because the parent interview asked for identification of the child's

primary caregiver at each measurement occasion we were able to control for caregiver instability in the analyses, as well as for a variety of other child and family characteristics. The prekindergarten programs children attended also include a mixture of Head Start and non-Head Start programs and measures of prekindergarten quality were available both for individual teacher-child relationships and overall classroom process quality. This proved important in understanding the ways in which children living in non-parental care responded to their prekindergarten experiences. Additionally, the outcome measure of children's behavior was reported by kindergarten teachers who were independent from children's prekindergarten experiences.

Several limitations must also be noted. First, due to the way in which we structured the data for analysis to address our specific research questions, this study was observational rather than experimental. However, we tested intervention status (Head Start vs. control) as a potential covariate but removed it due to lack of any detectable effect. Additionally, specific risk factors typical of children living in non-parental care were not assessed (e.g., maltreatment, pre- and postnatal exposure to drugs, formal involvement in the child welfare system, etc.). Finally, our measure of income-to-needs ratio was limited in that just one reporter (parent/caregiver) provided total gross family income for the previous month based on a number of income categories (e.g., *between \$251 and \$500*). A measure including more sources of income information and more precise monthly dollar amounts may have been a more accurate representation of true family income.

Nonetheless, the current study contributes in important ways to a very small but emerging body of research on the ECE experiences of children living in non-parental care (Dinehart et al., 2012; Lipscomb & Pears, 2012; Lipscomb, Pratt, Schmitt, Pears, & Kim, 2013; Meloy & Philips,

2012). The current study is the first to examine the role of ECE quantity and quality on the behavioral development of children living in non-parental care and suggests that, on the one hand, children living in non-parental care appear to respond in similar ways as other children to teacher-child conflict and quantity of ECE. On the other hand, results suggest that children living in non-parental care are particularly vulnerable to a lack of closeness in relationships with their teachers. Additionally, classroom processes that have traditionally been regarded as “high quality” (autonomy support and child-centered interactions) may not provide a good fit for these children. There was some indication that children living in non-parental care responded positively to the classroom process quality that was rated as “poor quality,” which may be indicative of more structured or adult-guided interactions. However, due to the rather unexpected nature of this finding, future research will be needed to replicate and further explore these associations. The current study was limited by lack of an explicit measure of structured or adult-guided teaching (e.g., giving clear expectations and requests for behavior). Developing such a measure, or adapting a measure of structured parenting for use in ECE settings, may be a fruitful pursuit for future research. For now, the current findings indicate that it may be most important to prioritize strengthening relationships between children living in non-parental care and their prekindergarten teachers, and to avoid long hours in ECE.

Findings from the present study also have broader implications for the field of ECE. They are consistent with an emerging line of research documenting differential impacts of ECE experiences on social and behavioral outcomes for children with risks for dysregulation (Belsky et al., 2013; Crockenberg & Leerkes, 2005; Lipscomb et al., 2013; Pluess & Belsky, 2009).

Much more research is necessary. In addition to better understanding the linkages identified in the current study, research should also work to identify effective ways of promoting

positive teacher-child relationships for children such as those living in non-parental care, with whom it may be challenging to forge positive relationships due to behavioral problems, mobility, and other risk factors. Future research is also needed in order to replicate current findings, and, if they replicate, to help explain why certain aspects of process quality may not optimally support the behavioral development of children living in non-parental care. Identifying underlying mechanisms would be important in helping early childhood teachers find effective ways of meeting the apparently divergent needs of children from varying backgrounds in their classrooms.

This work is increasingly important in light of current policies that aim to increase access to ECE for children with particularly high needs, including those involved in foster care and child welfare services more broadly (e.g., U.S. Department of Education, 2011; U.S. Department of Health and Human Services, 2011a, 2011b). Current findings suggest that in order for policies such as these to be effective in improving school readiness outcomes for children living in non-parental care they must not only increase access but must also improve relationships between teachers and children. This may necessitate targeted training and mentoring opportunities. Future research is needed to develop and evaluate professional development programs that can help teachers to better understand how early adverse experiences, such as exposure to trauma and home instability, affect children's behaviors, and to establish close relationships with children facing such risks in order to help them learn to manage their behaviors more effectively.

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Table 1

Descriptive Statistics for all Study Variables (N = 3029)

Categorical covariates and predictor variables	% Yes	% No		
Non-parental care	7.10	92.90		
Child sex (male =no, female=yes)	49.92	50.08		
Child with special needs	13.88	86.12		
Authoritarian parenting/caregiving	7.20	92.80		
Caregiver instability 2002-2003	11.90	88.01		
Ethnicity (non-white=no, white=yes)	32.81	67.19		
Continuous variables	<i>M</i>	<i>SD</i>	Min	Max
Covariates and baseline measures				
Child age (in months)	49.37	6.85	33.60	71.67
Income-to-needs ratio	1.36	0.81	0.08	7.00
Child behavior problems in prekindergarten	1.74	2.25	0.00	13.33
Predictor variables				
Quality composite	8.16	1.33	1.50	13.11
Teacher-child closeness	30.95	4.03	7	35
Teacher-child conflict	13.73	6.34	7	40
Hours per week in ECE	26.20	10.92	0.00	72.00
Outcome variables				
Child behavior problems in kindergarten	1.68	2.25	0.00	13.33

Table 2

Correlations for all Predictors, Outcomes, and Covariates

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Classroom process quality	—												
2. Teacher-child closeness	-.00	—											
3. Teacher-child conflict	-.04 [†]	-.31**	—										
4. Hours in ECE	-.16**	.09**	.02	—									
5. Child sex ^a	-.01	.17**	-.21**	.03	—								
6. Child age (in months)	.08**	-.07**	-.04 [†]	-.10**	-.02	—							
7. Child with special needs ^b	.03	-.08**	.10**	-.09**	-.11**	.03	—						
8. Income-to-needs ratio	-.02	.07**	.01	.01**	.05*	-.01	.00	—					
9. Ethnicity ^c	.16**	-.03	.04**	-.20**	-.01	.02	.12**	.07**	—				
10. Authoritarian parenting/ caregiving	.01	-.00	.02	-.02	-.03	.03	.03	-.01	-.04*	—			
11. Non-parental care ^d	-.02	-.02	.05*	.04 [†]	-.00	-.03	.04*	-.01	.06**	.01	—		
12. Caregiver instability	-.03	-.03	.05*	.01	-.04 [†]	.00	.02	-.01	.05**	-.00	.57**	—	
13. Behavior problems in prekindergarten	-.02	-.19**	.65**	.05*	-.21**	-.05*	.11**	.06**	.03	.02	.08**	.04 [†]	—
14. Behavior problems in Kindergarten	.00	-.09**	.39*	.06*	-.21**	-.03	.09**	.04 [†]	.06*	.00	.08**	.03	.49**

^a0 = male, 1 = female; ^b0 = no, 1 = yes; ^c0 = non-white, 1 = white; ^d0 = parental care, 1 = non-parental care.

[†] $p < .10$. * $p < .05$. ** $p < .01$, * $p < .001$.

Table 3

Effects of Preschool Experiences on Externalizing Behavior Problems in Kindergarten (N= 1835)

	Model 1			Model 2		
	B	SE B	β	B	SE B	β
Externalizing behavior problems in prekindergarten	.39	.03	.39**	.39	.03	.39**
Parental group ^a	.54	.21	.06**	.51	.22	.06*
Sex ^b	-.47	.10	-.10**	-.45	.09	-.10**
Prekindergarten Experiences						
Classroom quality	.05	.07	.01	.01	.08	.01
Teacher-child closeness	.02	.01	.03	.03	.01	.05*
Teacher-child conflict	.04	.01	.11**	.04	.01	.10**
Hours of preschool/week	.01	.005	.04*	.01	.005	.05*
Interaction Effects						
Classroom quality x group	—	—	—	.71	.33	.05*
Teacher-child closeness x group	—	—	—	-.14	.05	-.07**
Teacher-child conflict x group	—	—	—	.01	.03	.01
Hours of preschool/week x group	—	—	—	-.02	.02	-.03
R²	$\chi^2(13) = 582.36, p < .001$.26			$\chi^2(17) = 598.24, p < .001$.27		

^aNon-parental care = 1; Parental care = 0; ^b0 = male, 1=female; ^c0 = no, 1 = yes.

Note. Only covariates that were significant predictors of outcomes are shown above. Estimates not shown included: child age, special needs status, authoritarian parenting style, income-to-needs ratio, and whether or not the child experienced changes in primary caregivers at home during the study.

* $p < .05$, ** $p < .01$

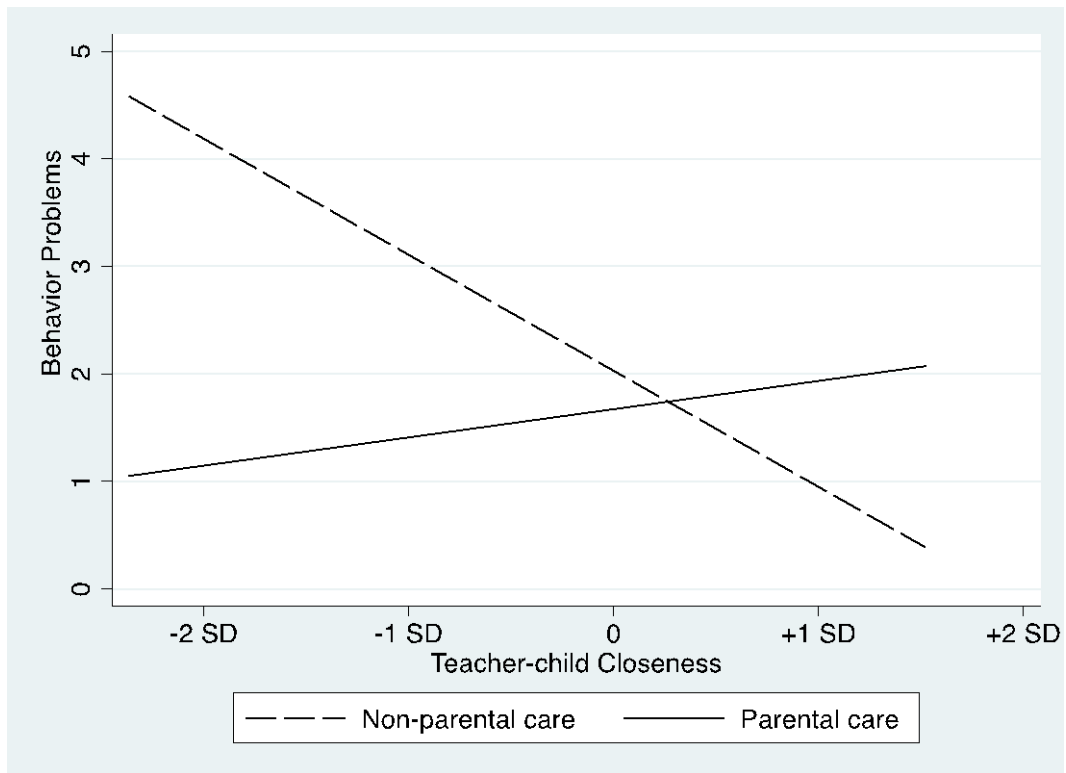


Figure 1. Interaction Between Teacher-Child Closeness and Non-Parental Care on Externalizing Behavior Problems in Kindergarten.

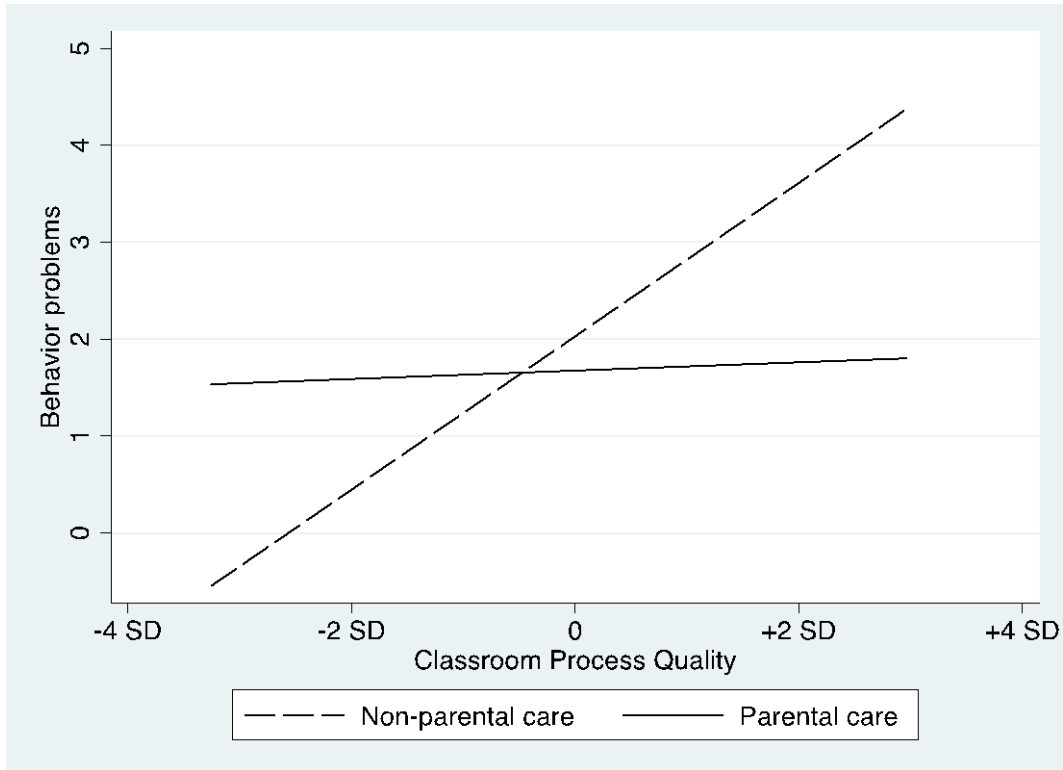


Figure 2. Interaction Between Classroom Process Quality and Non-Parental Care on Externalizing Behavior Problems in Kindergarten.