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The Effect of Placement Instability on Adopted Children's Inhibitory Control Abilities and Oppositional Behavior

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This study assessed relations among placement instability, inhibitory control, and caregiver-rated child behavior. The sample included 33 adopted children who had experienced placement instability, 42 adopted children who had experienced 1 stable placement, and 27 children never placed in foster care. Five- and 6-year-old children completed the day–night task, which requires children to inhibit a prepotent response, and a control task that presents similar memory demands but does not require inhibition (C. L. Gerstadt, Y. J. Hong, & A. Diamond, 1994). Adopted children who had experienced placement instability performed worse on the inhibition task than did both other groups of children, when the authors controlled for age, verbal intelligence (as measured with the Wechsler Preschool and Primary Scale of Intelligence—Revised; D. Wechsler, 1989; or the Peabody Picture Vocabulary Test—Third Edition; L. M. Dunn & L. M. Dunn, 1997), and control task performance ($p < .01$). Children who had experienced placement instability were also rated on the Child Behavior Checklist as more oppositional than other children ($p < .01$; T. M. Achenbach & L. A. Rescorla, 2000). Inhibitory control did not mediate the association between placement instability and oppositional behavior ($p > .05$). These results suggest that placement instability may adversely affect the social–emotional development of adopted children.

Keywords: placement instability, inhibitory control, foster care

The gains in inhibitory control that occur between the ages of 2 and 5 are remarkable (Diamond & Taylor, 1996; Gerstadt et al., 1994; Kochanska, Coy, & Murray, 2001; Kochanska, Murray, & Harlan, 2000). These developmental gains are considered to be essential for children's successful school adjustment (Blair, 2002; Lewit & Baker, 1995). Full-day school typically begins when children are between 5 and 6 years of age, timing that is not arbitrary. When children begin school, they are faced with challenges to regulate their own behavior. Most especially, they are expected to engage in inhibitory control or to be able to inhibit a prepotent, or dominant, response. For example, school-age children are expected to do things that they may not want to do (e.g., stay in their seat and complete a worksheet) and to refrain from doing things that they may want to do (e.g., refrain from jumping up and looking out the window when they hear children playing outside). By the time children are 5 or 6 years old, most can handle such demands for inhibitory control at least somewhat successfully. When children cannot handle these demands, they are at risk for a range of problematic outcomes, including academic failure, externalizing behavior problems, and problems in peer relations (e.g., Biederman et al., 2004; Coie, Lochman, Terry, & Hyman, 1992; McBurnett, Lahey, Rathouz, & Loeber, 2000; Schachar & Logan, 1990; Shoal, Giancola, & Kirillova, 2003; Zima et al., 2000).

Studies of rodents, nonhuman primates, and humans suggest that early adverse caregiving experiences, such as abuse, neglect, and separations from caregivers, may be associated with long-term alterations in the ability to regulate behavior and physiology (Kaufman & Charney, 2001; Sanchez, Ladd, & Plotsky, 2001). Thus, it seems plausible that children who have experienced foster care may be particularly at risk for failing to develop adequate self-regulatory skills and that this risk may be heightened for children who have experienced multiple foster care placements. Several studies have shown that placement instability increases children's risk for later problem behaviors (Jonson-Reid & Barth, 2000; Kurtz, Gaudin, & Howing, 1993; Leathers, 2002; Ryan & Testa, 2005). Indeed, whereas a single foster placement does not appear to confer greater risk for behavior problems over and above other risk factors, multiple placements do (Ryan & Testa, 2005). These previous studies have not directly assessed inhibitory control abilities among children who have experienced differing levels of placement instability. As with its effect on behavioral regulation, we expect placement instability to have a similarly potent effect on children's inhibitory control capacities.

In this study, we examined whether placement instability was an important predictor of children's inhibitory control abilities and caregiver-rated behavior. We were interested in the effects of placement instability on child oppositional behavior in particular, given findings from past studies suggesting that placement instability predicts this type of behavior problem (e.g., Brophy, Taylor, & Hughes, 2002; Ryan & Testa, 2005). Included in the present study were children who had never experienced placement in foster care, adopted children who had been in a stable placement

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prior to adoption, and adopted children who had experienced multiple foster placements. We expected that children who had experienced placement instability in infancy and toddlerhood would show poorer inhibitory control abilities and more caregiver-rated oppositional behavior at the age of 5 or 6 compared with other children. We also expected children's inhibitory control abilities to mediate the association between placement instability and child oppositional behavior.

Inhibitory Control and Brain Development

Inhibitory, or effortful, control is defined as the ability to inhibit a prepotent response while keeping two or more rules in mind (Diamond & Taylor, 1996). The Color Stroop Test is a well-known example of an inhibitory control task in which participants are presented with names of colors that are written in colored ink that does not match the words that are written. The task is to say the color of the ink, rather than to read the word. For participants with good reading skills, the prepotent response in this task is to read the spelled-out word rather than to say the color of the ink, with inhibitory control required for correct responding. Participants must have strong reading skills, however, for this to be a task of inhibitory control. Diamond and Taylor (1996) have used several analogous tasks for nonreaders. The day–night task is one such Stroop-like inhibitory control task that is especially useful in differentiating the abilities of children between the ages of 5 and 6 (Gerstadt et al., 1994).

In a number of studies, performance on the day–night task and other similar tasks has been linked with the development of the prefrontal cortex (Diamond, 1989; Diamond & Goldman-Rakic, 1989; Diamond & Taylor, 1996; Gorenstein, Mammato, & James, 1989). Neuroanatomical and imaging studies suggest that inhibitory control capabilities are, at least to some extent, dependent on prefrontal cortex functioning (Casey et al., 1997; Casey, Giedd, & Thomas, 2000; Poggi Davis, Bruce, Snyder, & Nelson, 2003; Schulz et al., 2005). The prefrontal cortex is a slowly developing region of the brain that continues to mature throughout the first 3 decades of life. Although the prefrontal cortex matures slowly, significant development occurs in the preschool years, allowing children to exert increasingly greater inhibitory control as they get older (Blair, 2002; Casey et al., 2000; Gerstadt et al., 1994). Considering that prefrontal cortex functioning is dependent on connections with other structures, this self-regulatory development should not be seen as independent of other brain structures, but rather involving coordination with structures such as the hippocampus and the amygdala (Christ, White, Brunstom, & Abrams, 2003; Luciana, Lindeke, Georgieff, Mills, & Nelson, 1999).

The prefrontal cortex appears to be particularly susceptible to early environmental effects. Conditions such as high levels of stress, maltreatment, and separations from caregivers are associated with deficits in prefrontal cortex development (Graham, Heim, Goodman, Miller, & Nemeroff, 1999; Kaufman & Charney, 2001; Sanchez et al., 2001). A number of studies with rodents, nonhuman primates, and human infants have shown that separations from caregivers are associated with dysregulated neuroendocrine functioning (Dozier, Manni, et al., 2006; Higley, Suomi, & Linnoila, 1992; Rosenfeld, Wetmore, & Levine, 1992; Suomi, 1999). For example, young foster children and children who have experienced maltreatment often show atypically high or low diurnal patterns of cortisol production relative to controls (Cicchetti & Rogosch, 2001; Dozier, Manni, et al., 2006; Hart, Gunnar, & Cicchetti, 1996).

High cortisol levels can compromise normal brain development through processes such as accelerated loss of neurons (Sapolsky, Uno, Rebert, & Finch, 1990), delays in myelination (Dunlap, Archer, Quinlivan, Beazley, & Newnham, 1997), and the inhibition of neurogenesis (Tanapat, Galea, & Gould, 1998). Low cortisol levels can also cause neuronal damage through neuroendangerment and may result in decreased stress reactivity and damaging overactivity of the immune system (Fries, Hesse, Hellhammer, & Hellhammer, 2005; Gunnar & Vazquez, 2001). Effects of high or low cortisol levels on the hippocampus and prefrontal cortex are prominent because of the high density of cortisol receptors in these areas of the brain. Fries et al. (2005) suggested that low levels of cortisol are the result of down-regulation of the hypothalamic-pituitary-adrenal system following extended periods of high levels of cortisol production. Thus, it is possible that even children who show low levels of cortisol production across the day may have experienced very high levels of cortisol production for a period of time. Preliminary evidence for this hypothesis is provided by findings that infants in foster care tend to show high levels of daytime cortisol production, relative to controls (Dozier, Peloso, et al., 2006), whereas preschoolers in foster care show low levels of cortisol more often than high levels, relative to controls (Dozier, Manni, et al., 2006). Regardless of whether high or low levels of cortisol are seen, neuroendocrine dysregulation has been associated with atypical brain development. These connections are somewhat speculative at this point, however, because the longitudinal studies clearly showing such developmental changes have not yet been reported in the literature.

Consistent with findings regarding the effects of early adversity on brain development and neuroendocrine functioning, children's development of executive control abilities, including inhibitory control, also appears to be susceptible to early environmental experience. Studies have suggested that experiencing warm, nurturing care early in life can act as a buffer against later problematic outcomes. For example, parental responsiveness early in life facilitates the development of children's behavioral self-regulation (Stams, Juffer, & van IJzendoorn, 2002; Winsler, Diaz, McCarthy, Atencio, & Chabay, 1999). Warm, maternal responsiveness during play in infancy has been positively associated with children's later inhibitory control abilities (Olson, Bates, Sandy, & Schilling, 2002). Similarly, children of emotionally available and sensitive mothers tend to develop better inhibitory control capacities compared with children of less sensitive mothers (Kochanska et al., 2000). We expect that the lack of a stable caregiving environment undermines the development of the prefrontal cortex and hence the development of both inhibitory control and behavioral self-regulation.

Inhibitory Control and Behavioral Regulation

Deficits in inhibitory control place children at risk for problems in both behavioral and academic domains. Inhibitory control deficits in preschool and school-age children have been associated with hyperactivity, conduct problems, aggression, social incompetence, and diagnoses of attention-deficit/hyperactivity disorder (Berlin, Bohlin, & Rydell, 2003; Brophy et al., 2002; Liew, Eisen-

berg, & Reiser, 2004; Schachar & Logan, 1990; Sonuga-Barke, Dalen, Daley, & Remington, 2002). Attention problems and peer difficulties in early childhood are often associated with later academic problems and the development of psychopathology in adolescence (Biederman et al., 2004; Coie et al., 1992). In contrast, the early emergence of inhibitory control has been associated with important developmental competencies. These include the development of conscience, compliance with caregivers, internalization of rules, social competence, and behavioral regulation (Kochanska et al., 2001; Kochanska, Murray, & Coy, 1997; Kochanska, Murray, Jacques, Koenig, & Vandegeest, 1996; Liew et al., 2004; Murray & Kochanska, 2002).

Children in foster care show higher rates of clinically significant behavior problems and psychological disorders compared with children not in care (e.g., Clausen, Landsverk, Ganger, Chadwick, & Litrownik, 1998; Heflinger, Simpkins, & Combs-Orme, 2000; McIntyre & Keesler, 1986). Moreover, multiple foster placements confer additional risk of developing these problems. For instance, adopted children and adolescents who experience multiple foster placements prior to adoption are more likely than those who have had stable placements to exhibit symptoms of attention-deficit/hyperactivity disorder and oppositional defiant disorder (Simmel, Brooks, Barth, & Hinshaw, 2001).

Placement instability has also been associated with a higher risk of incarceration among adolescents, increased severity of conduct disorder symptoms in both male and female adolescents, and greater child maladjustment (Jonson-Reid & Barth, 2000; Kurtz et al., 1993; Leathers, 2002). In one study of maltreated foster children, placement instability was found to increase the risk of delinquency among boys (Ryan & Testa, 2005). In another study, experiencing a higher number of foster placements predicted later internalizing and externalizing behavior problems, even for children who were not initially rated as evidencing behavioral problems (Newton, Litrownik, & Landsverk, 2000). Foster children who evidence behavioral and emotional problems are subsequently at increased risk for more frequent changes in foster placements than are children without these problems (Fisher, Burraston, & Pears, 2005; Pardeck, 1982). The high incidence of social–emotional problems seen in foster children who have experienced placement instability may reflect deficits in inhibitory control development resulting from their early experiences.

Early Adversity and Self-Regulatory Deficits

Young children in foster care face a unique kind of environmental adversity: the loss of a primary attachment figure. In addition, they often face a number of other risk factors (e.g., genetic risk, prenatal drug exposure, prematurity, exposure to parental substance abuse or psychopathology) that are not unique to children experiencing out-of-home placements but likely contribute to later self-regulatory difficulties. Previous studies have investigated the independent effects of some of these risk factors on children's behavioral and psychological outcomes. For example, low birth weight has been associated with the development of attention problems (Breslau, Chilcoat, DelDotto, & Andreski, 1996; Whitaker et al., 1997), and parental substance abuse and drug exposure have been associated with neuropsychological deficits in children (Day, Richardson, Goldschmidt, & Cornelius, 2000; Wulczyn, 1994).

It is possible that the higher rates of externalizing behavior problems found in foster children are the result of biological, genetic, and prenatal risk factors. However, other studies have found that, compared with children exposed to similar levels of risk, foster children exhibit significantly higher levels of behavioral difficulties (Brooks & Barth, 1998; Coon, Carey, Corley, & Fulker, 1992). These findings have been reported in studies including both clinically referred participants (Kim, Davenport, Joseph, & Zrull, 1988; Rogeness, Hoppe, Macedo, & Fischer, 1988) and nonclinically referred children (Simmel et al., 2001), suggesting that the results do not merely reflect a referral bias. Additionally, in terms of children's cognitive development and school readiness, findings from other studies suggest that the availability of a supportive, predictable caregiving environment acts as a buffer against the adverse effects of parental substance abuse and prenatal drug exposure (Moe & Slinning, 2001; Pulsifer, Radonovich, Belcher, & Butz, 2004). The existence of a stable caregiving relationship may attenuate the risk for negative outcomes among children exposed to multiple pre- and postnatal risk factors.

Among foster children, it is very difficult to isolate the unique contributions of biological and environmental risk factors because these children have typically been exposed to several different risk factors. It is rarely possible to compare groups of foster children who differ from each other on only one, rather than multiple, pre- or postnatal risk factors. Even when foster children are carefully matched with a comparison group on demographic variables, the two groups may differ with regard to some important variables that are not assessed. In addition, researchers typically must rely on case records that are often limited in terms of the level of detail necessary to adequately assess early risk. Despite encountering these difficulties, the present study included two groups of foster children who had both experienced parental separation as well as several other risk factors but who differed in their experience of placement stability. In this way, we attempted to examine the unique effects of placement stability on child development.

The Present Study

In the present study, we examined the inhibitory control skills of 5- and 6-year-old adopted and nonadopted children. Adopted children had experienced at least one disruption in care, with nearly half of the children experiencing multiple foster placements prior to adoption. The nonadopted children had not experienced foster placements. We expected children who had experienced multiple foster placements prior to adoption to perform more poorly on an inhibitory control task compared with children who had experienced more stable caregiving. We also expected children who had experienced multiple placements to be rated more highly on a caregiver-report measure of child oppositional behavior than other children. Thus, we expected placement instability to be associated with developmental deficits specific to children's inhibitory control abilities and oppositional behavior. Secondarily, we assessed whether inhibitory control deficits mediated the association between placement instability and child oppositional behavior.

Method

Participants

Participants in the study were 102 children between the ages of 5 and 6. The sample included three groups: 33 adopted children

who had experienced multiple foster placements prior to adoption, 42 children who had experienced one foster placement prior to adoption, and 27 comparison children who had never been placed in foster or adoptive care. Most of the adopted children had been followed since being placed into foster care as infants or toddlers. Only those children who had been in stable adoptive homes for at least 10 months were included in this study. Children in the comparison group attended a university-run child-care facility. The child-care facility serves a diverse population, with at least 40% of families living within 150% of the poverty line. Within the comparison group, none of the children had ever been placed in foster care and all were living with at least one of their biological parents at the time of assessment.

In the multiple placements group, 62% of the children were female. The majority (58%) of the children in this group were African American, with 27% European American and 15% Hispanic or biracial. Most (94%) of these adoptive parent–child dyads were ethnically matched. Family income for this group ranged from less than $10,000 per year to more than $100,000 per year ($M$ = $44,500; SD = $1,400). Most (64%) of the adopted children in the sample had experienced multiple prenatal and maltreatment risk factors. For some children, this information was not available due to incomplete case records. Case records were complete for all but 2 of the children in the multiple placements group (n = 31). These records indicated that children in the multiple placements group were initially placed into foster care for one or more of the following reasons: neglect (79%), physical abuse (9%), and parental substance abuse (64%). Information regarding additional risk associated with subsequent placements was not available from case records.

In the stable placement group, 55% of the children were female. Within this group, 64% of the children were African American, with 26% European American and 10% Hispanic or biracial. Nearly all (98%) of the dyads were ethnically matched. Family income for the stable placement group ranged from $10,000 annually to more than $100,000 annually ($M$ = $44,900; SD = $1,700). Complete information regarding reasons for initial placement into foster care was available for all but 6 of the children in the stable placement group (n = 36). Reasons for placement into foster care included one or more of the following: neglect (52%), physical abuse (12%), and parental substance abuse (67%).

In the comparison group of children never in foster care, 56% of participants were female. Of these children, 30% were African American, 44% were European American, and 26% were Hispanic or biracial. Mean family income for the comparison group was $45,000 ($SD$ = $2,100), ranging from less than $10,000 to more than $100,000 per year.

Procedure

Children's inhibitory control abilities were assessed during an annual research visit. The day–night task was presented first, followed by the working memory control task. For adopted children, these tasks were administered in a quiet room in children's homes. For comparison children, tasks were administered in a quiet research room in the child-care facility. The tasks took approximately 10 min to administer and were video-recorded for coding purposes. Caregivers also completed a demographics questionnaire and a questionnaire regarding their child's behavior.

Measures

Placement instability. For adopted children, we assessed the number of foster care placements based on a review of children's case records. Any placement with a new caregiver was counted as one placement. For children in the multiple placements group, reasons for subsequent placement changes were not accessible from case records.

Prenatal risk composite. We reviewed adopted children's case records to determine whether each child had experienced prenatal exposure to alcohol or illegal substances, whether the child was born prematurely (at less than 32 weeks gestational age), and whether the biological mother had been diagnosed with a psychiatric disorder. On the basis of these records, we scored each of the prenatal variables as present or absent, and we summed them, as suggested by Burchinal, Roberts, Hooper, and Zeisel (2000). Compared with individual risk factors, cumulative risk indices have been found to more accurately and sensitively predict children's developmental outcomes (Biederman, Milberger, Faraone, & Kiely, 1995; Sameroff & Seifer, 1990). If case records suggested that it was probable but uncertain that a child had experienced one of the prenatal risk variables, the risk factor was scored as present. If prenatal risk information was unknown, children were not assigned a prenatal risk composite score. These data were not available for the comparison group.

Maltreatment risk composite. We also reviewed adopted children's case records to assess whether children had experienced neglect, physical abuse, or exposure to parental substance abuse. As suggested by Burchinal et al. (2000), to obtain a more accurate predictor of later developmental outcomes, we scored each of the maltreatment variables as present or absent and we summed them on the basis of the children's case records. As with the prenatal risk composite, we scored maltreatment risk factors as present if case records suggested that it was probable but uncertain that a child had experienced the risk variable. If maltreatment risk information was unknown, we did not assign children a maltreatment risk composite score. These data were not available for the comparison group. For children in the multiple placements group, information regarding children's experience of subsequent risk factors associated with each additional placement was not accessible from case files for inclusion in the present study.

Inhibitory control task. Participants were tested individually on the day–night task and on the working memory control task (Gerstadt et al., 1994). The day–night task is a Stroop-like assessment of inhibitory control. To perform well, children need to hold two rules in mind and inhibit a prepotent response. Gerstadt et al. (1994) have used this task to study the development of the prefrontal cortex and executive function skills in young children. The task is very difficult for children younger than 4.5 years, but it is typically quite easy for children older than 6 years (Gerstadt et al., 1994).

During administration of the day–night task, we showed children a series of two types of cards: black cards with a white moon and stars and white cards with a yellow sun. Following the administration guidelines of Gerstadt et al. (1994), the experimenter gave each child the following directions, "When you see this card [sun], I want you to say 'night.' And when you see this card [moon and stars], I want you to say 'day.'" The experimenter then practiced with the child for up to three trials, praising the child for

every correct response. After the child answered each rule correctly or practiced for three trials, the experimenter showed the child nine sun cards and nine moon cards one at a time. Children were not given performance feedback during the 18 trials. We reviewed the video-recorded sessions to determine children's number of correct responses on the day–night task. Interrater reliability was 100%.

Working memory control task. As a control for the day–night task, children also completed a working memory task (the squiggle/checkerboard task) modeled after tasks used by Gerstadt et al. (1994). Like the day–night task, the working memory task requires that children hold two rules in mind. However, unlike the day–night task, the working memory task does not require the inhibition of a prepotent response. This task was used to control for differences in children's ability to hold two rules in mind.

The same procedure was used in the working memory task as in the day–night task, but different stimulus cards were presented to children. Nine of the cards had two red squiggles that formed an *X* on a blue background, and nine of the cards had a red and blue checkerboard pattern. Children were asked to say "white" when shown a squiggle card and to say "black" when shown a checkerboard card. We reviewed the video-recorded sessions to determine children's number of correct responses on the control task. Interrater reliability was 100%.

Standardized estimate of child verbal intelligence. To estimate children's verbal intelligence, we administered either the Vocabulary subtest of the Wechsler Preschool and Primary Scales of Intelligence—Revised (WPPSI-R; Wechsler, 1989) or the Peabody Picture Vocabulary Test—Third Edition (PPVT-III; Dunn & Dunn, 1997) to children. Adopted children completed the WPPSI-R Vocabulary subtest when they were 5 or 6 years old. Children who had never been in child care completed the PPVT-III at the age of 5 or 7. The WPPSI-R Vocabulary subtest has been shown to be a good measure of general intelligence and to correlate moderately with the Verbal scale ($r = .68$) and the Full scale ($r = .61$) of the WPPSI-R (Sattler, 2001). The PPVT-III is a measure of receptive vocabulary that has been found to correlate moderately with tests of cognitive abilities (rs = .43–.74; Sattler, 2001). Studies examining the performance of preschoolers and school-age children on the PPVT—Revised (Dunn & Dunn, 1981) and the WPPSI-R indicate that the PPVT—Revised is significantly positively correlated with children's Verbal Scale and Full Scale WPPSI-R scores (Carvajal, Parks, Logan, & Page, 1992; Kutsick, Vance, Schwarting, & West, 1988). To obtain a standardized estimate of children's verbal intelligence, we utilized standard scores rather than raw scores in all analyses.

Caregiver-rated child behavior. We measured child behavior with the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000). The CBCL was completed by caregivers when children were approximately 5 or 6 years old. The CBCL consists of 113 items that describe children's behavior. Parents report on a 3-point scale ranging from 0 (*not true*) to 3 (*very often true*) regarding observations of their child's behavior during the past 2 months. The reliability and validity of the CBCL have been demonstrated in a number of studies (e.g., Bingham, Loukas, Fitzgerald, & Zucker, 2003; Mattison & Spitznagel, 1999).

The CBCL generates a total sum score (i.e., Total Problems), two broad band scores (i.e., Internalizing Behavior and Externalizing Behavior), and six narrow band scores. The current study examined children's *T* scores on the Total Problems, Internalizing Behavior, Externalizing Behavior, Oppositional Behavior, Attention Problems, and Aggressive Behavior scales of the CBCL in relation to placement instability and children's inhibitory control abilities. We were particularly interested in children's oppositional behavior outcomes, although the other externalizing subscales were also included due to past findings suggesting associations among placement instability, inhibitory control deficits, and externalizing behaviors. The Oppositional Behavior subscale of the CBCL includes 13 items that assess behaviors such as arguing, refusing to follow directions, and failing to show remorse after getting in trouble. The Attention Problems subscale is composed of 11 items that assess immaturity, inability to concentrate, and impulsivity. The Aggressive Behavior subscale includes 20 items that measure bullying, cruelty toward others, fighting, and hitting.

Results

Preliminary Analyses

Table 1 presents descriptive statistics for placement variables of the two groups of adopted children, including number of placements prior to adoption, age of first placement, age at placement with the current caregiver, and duration of the current placement at the time of assessment. A one-way analysis of variance (ANOVA) indicated that the two groups of adopted children did not differ significantly with regard to age of first placement ($p > .05$). To

Table 1
Descriptive Statistics for Placement Variables Among Adopted Children

Variable	Range	*M*	*SD*	*n*
Number of placements	1.0–5.0	1.7	1.0	75
Age at first placement (months)				
Stable placement	0–30	4.6_a	8.2	42
Multiple placements	0–48	7.8_a	9.5	33
Age placed with current caregiver (months)				
Stable placement	0.0–40.0	7.6_a	10.0	42
Multiple placements	0.5–50.0	17.4_b	12.2	33
Duration of current placement (months)				
Stable placement	31.3–82.0	56.9_a	10.2	42
Multiple placements	10.1–64.0	47.2_b	12.7	33

Note. Means in the same column that do not share subscripts differ at $p < .05$ based on pairwise comparisons.

examine this more closely, we conducted a one-way ANOVA comparing children placed into foster care within the first month of birth ($n = 34$) and children placed at an older age ($n = 41$) in terms of the dependent variables of interest (inhibitory control task performance and caregiver-rated child behavior). Results indicated that children placed within 1 month of birth and children placed later did not differ significantly in terms of inhibitory control abilities or behavior ($ps > .05$). However, as would be expected, there were significant differences between the two groups of adopted children on the other placement variables. Children in the stable placement group had been placed with their current caregiver at a younger age, $F(1, 73) = 14.6$, $p < .01$, and had spent a longer amount of time with their current caregiver, $F(1, 73) = 13.4$, $p < .01$, compared with children in the multiple placements group. Therefore, we conducted further analyses involving the two groups of adopted children, controlling for child age at placement with the current caregiver and duration of the current placement.

Table 2 presents descriptive statistics for adopted children's history of prenatal risk (premature birth, prenatal exposure to drugs, and maternal psychopathology) and maltreatment (physical abuse, neglect, and parental substance abuse). Differences between the two groups of adopted children were examined for individual prenatal and maltreatment risk factors as well as composited prenatal and maltreatment indices. Adopted children in the two groups did not differ significantly on any of these variables including the prenatal and maltreatment risk composite scores ($ps > .05$), with the exception of children's experience of neglect. Not surprisingly, a one-way ANOVA indicated that children in the multiple placements group were more likely to have experienced neglect than children in the stable placement group, $F(1, 65) = 9.0$, $p < .05$. We therefore conducted analyses involving the two groups of adopted children, controlling for neglect.

Missing data. One of the children in the stable placement group and 4 of the children in the never-placed group were missing verbal intelligence standard scores. We imputed group means for these five data points because none of the children were missing more than a single data point. For the child in the stable placement group, we imputed the stable placement group mean verbal intelligence standard score ($M = 96.0$). For the 4 children in the never placed group, we imputed the mean verbal intelligence score of the never-placed group ($M = 106.4$). One-way ANOVAs among the full sample and within each of the three groups revealed that children who were missing a verbal intelligence standard score did not differ significantly from other children in terms of age, ethnicity, family income, inhibitory control task number correct, working memory task number correct, or any of the CBCL scales ($ps > .05$).

Several children across the three groups had incomplete data in terms of their CBCL scales or caregiver-rated oppositional behavior. More specifically, 1 child in the never-placed group, 5 children in the stable placement group, and 6 children in the multiple placements group were missing caregiver reports on their behavior. In order to avoid excluding children for only one missing data point, we imputed mean CBCL Oppositional Behavior scale scores from each of the three groups for these missing data points ($M = 52.6$ for the never-placed group; $M = 52.8$ for the stable placement group; $M = 58.7$ for the multiple placements group). One-way ANOVAs among the full sample and within each of the three groups revealed that children who were missing a CBCL did not differ significantly from other children in terms of age, ethnicity, family income, inhibitory control task number correct, working memory control task number correct, or verbal intelligence ($ps > .05$).

In order to examine the effects of age at current placement, duration of current placement, and neglect on children's inhibitory control abilities and on caregiver-rated child behavior, we conducted preliminary analyses including only the two groups of adopted children. These questions were addressed using two analyses of covariance (ANCOVAs) models. The never-placed group of comparison children was not included in these analyses because placement and history of risk variables were not available for these children.

Adopted children's history of risk, placement instability, and inhibitory control. First, an ANCOVA model predicting children's inhibitory control abilities from their experience of placement instability and history of risk was tested. The first model included child age, verbal intelligence, working memory task performance, age at placement with the current caregiver, duration of placement with the current caregiver, and experience of neglect as covariates, and placement instability as the independent variable. The full model explained approximately 32.9% of the variance in children's inhibitory control abilities. Among the covariates, only children's working memory task performance was significantly and positively associated with children's inhibitory control abilities, $F(1, 59) = 6.7$, $p < .05$. However, the effect size of working memory task performance on inhibitory control was

Table 2
Descriptive Statistics for History of Risk Among Adopted Children

	Stable placement				Multiple placements			
Variable	Range	*M*	*SD*	*n*	Range	*M*	*SD*	*n*
Premature birth	0–2	0.9_a	1.0	32	0–2	0.9_a	0.8	25
Prenatal drug exposure	0–2	1.1_a	0.9	29	0–2	0.9_a	0.8	25
Maternal psychiatric disorder	0–2	0.9_a	0.8	31	0–2	1.0_a	0.6	26
Prenatal risk composite	1–3	2.0_a	0.7	28	0–3	2.0_a	1.0	25
Physical abuse	0–2	0.2_a	0.5	36	0–2	0.2_a	0.5	31
Neglect	0–2	1.0_a	0.9	36	0–2	1.7_b	0.8	31
Parental substance abuse	0–2	0.9_a	0.5	33	0–2	0.8_a	0.6	28
Maltreatment risk composite	0–2	0.9_a	0.5	32	0–2	0.8_a	0.6	28

Note. Means in the same row that do not share subscripts differ at $p < .05$ based on pairwise comparisons.

fairly small ($\eta^2 = .08$). After we covaried the effects of the control and risk variables listed above, a significant main effect of placement instability on children's inhibitory control emerged, $F(1, 59) = 17.5$, $p < .01$. Children in the multiple placements group showed significantly poorer inhibitory control abilities compared with children in the stable placement group. In terms of effect size, there was a moderate difference in inhibitory control between the two groups ($\eta^2 = .20$).

Adopted children's history of risk, placement instability, and oppositional behavior. A second ANCOVA model was then tested for the effect of placement instability on caregiver-rated child oppositional behavior, when controlling for placement and maltreatment variables. We were interested in examining associations among placement instability, inhibitory control, and child oppositional behavior, in particular, due to past findings in the literature indicating that foster children exposed to placement instability are at increased risk of exhibiting oppositional/delinquent behavior compared with other children (Leathers, 2002; Ryan & Testa, 2005).

The second model included child age, verbal intelligence, age at current placement, duration of current placement, and neglect entered as covariates, and placement instability as the independent variable. The full model explained approximately 35.3% of the variance in the dependent variable. None of the covariates were significantly associated with caregiver-rated child oppositional behavior (ps $< .05$). After we covaried the effects of the control and risk variables, a significant effect of placement instability was obtained, $F(1, 60) = 14.9$, $p < .01$. Children in the multiple placements group were rated by caregivers as exhibiting significantly greater oppositional behavior than were children in the stable placement group. Calculation of effect size indicated that this was a moderate difference between the two groups ($\eta^2 = .16$).

Preliminary analyses including all three groups. Further analyses were conducted including the never-placed group of children. One-way ANOVAs indicated that the composition of the three groups of children did not differ significantly with regard to caregiver demographics (caregiver age, education, and income) or child age, gender, or ethnicity (ps $> .05$). Table 3 presents descriptive statistics and summarizes group differences for study control variables. Bivariate correlations were conducted among study variables and are presented in Table 4. Regarding correlations between placement instability and child behavior, considering that analyses examining child behavior were somewhat exploratory and that several comparisons were made, we used Bonferroni adjustment for alpha level. The only significant association to emerge, when using this more conservative criterion ($p < .001$), occurred between placement instability and child oppositional behavior ($r = -.25$, $p < .00$).

Table 3
Descriptive Statistics for Study Control Variables

Variable	Range	*M*	*SD*	*n*
Child age				
Never placed	4.8–6.4	5.3_a	0.4	27
Stable placement	4.7–6.8	5.4_a	0.6	42
Multiple placements	5.0–6.5	5.5_a	0.5	33
Verbal IQ standard score				
Never placed	84–134	106.4_b	13.7	23
Stable placement	70–120	96.0_a	11.8	41
Multiple placements	60–130	95.9_a	16.6	33
Working memory performance				
Never placed	5–16	14.1_a	3.0	27
Stable placement	5–16	11.7_b	3.3	42
Multiple placements	3–16	13.2_a	3.0	33

Note. Means in the same column that do not share subscripts differ at $p < .05$ based on pairwise comparisons.

Given the significant correlations among children's inhibitory control task performance, working memory task performance, and child age, we conducted the main analysis examining children's inhibitory control skills, controlling for both child age and working memory task performance. Children's verbal intelligence scores were also controlled for in the main analyses, given the significant negative correlation between child verbal intelligence and placement instability. In examining the effects of placement instability on caregiver-rated child oppositional behavior, we conducted analyses controlling for child age and verbal intelligence, given significant correlations among these variables, placement instability, and child oppositional behavior.

In our preliminary analyses, adopted children's placement, prenatal, and maltreatment risk factors were not significantly associated with their inhibitory control abilities or with caregiver reports of their oppositional behavior. In addition, these variables were not available for children in the never-placed group. Therefore, placement and risk variables were not included in our main analyses, which included all three groups of children and examined both children's inhibitory control abilities and oppositional behavior.

Main Analyses

Table 5 presents descriptive statistics and summarizes group differences for children's inhibitory control task performance and caregiver-rated child behavior scores. Three predictions were tested in the main analyses. First, we predicted that foster children who had experienced multiple placements during infancy and toddlerhood would perform worse on an inhibitory control task at age 5 or 6 than would children who had experienced more stable caregiving. Second, we predicted that children who had experienced placement instability would demonstrate elevated rates of caregiver-reported oppositional behavioral at age 5 or 6 compared with children whose experience of caregiving had been more stable. Lastly, we predicted that inhibitory control task performance would mediate the relationship between placement instability and oppositional behavior.

Inhibitory control. An ANCOVA model predicting children's inhibitory control abilities was conducted. The model included child age, verbal intelligence, and working memory task performance as covariates, and placement instability as the independent variable. The results indicated that the full model explained approximately 24.7% of the variance in children's inhibitory control abilities. Among the covariates, child age at assessment was significantly and positively associated with children's inhibitory control abilities, $F(1, 96) = 6.3$, $p < .05$. Children's working memory task performance was also significantly and positively associated with children's inhibitory control abilities, $F(1, 96) = 8.6$, $p < .01$. However, effects of both child age and working memory task performance were relatively small in magnitude ($\eta^2 = .05$ and $\eta^2 = .07$, respectively). After we covaried the effects of the control

Table 4
Bivariate Correlations Among Study Control Variables and Variables of Interest (N = 102)

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Child age	—										
2. Verbal IQ standard score	−.06	—									
3. Working memory task performance	.03	.04	—								
4. Placement instability	.14	−.25*	−.09	—							
5. Inhibitory control task performance	.19*	.17	.22*	−.27**	—						
6. CBCL Total Problems *T* score	.22*	−.20*	−.06	.21*	−.20*	—					
7. CBCL Internalizing Behavior *T* score	.12	−.14	.07	−.01	−.15	.79**	—				
8. CBCL Externalizing Behavior *T* score	.21*	−.16	−.08	.28**	−.21*	.93**	.56**	—			
9. CBCL Attention Problems *T* score	.26**	−.09	−.11	.11	−.03	.71**	.43**	.69**	—		
10. CBCL Oppositional Behavior *T* score	.24*	.05	.02	.36**	−.17	.56**	.34**	.63**	.49**	—	
11. CBCL Aggressive Behavior *T* score	.26**	−.08	−.06	.25*	−.17	.79**	.47**	.86**	.70**	.70**	—

Note. CBCL = Child Behavior Checklist.
* $p < .05$. ** $p < .01$.

variables, a significant main effect of placement instability on children's inhibitory control emerged, $F(2, 96) = 8.7$, $p < .01$. Planned comparisons were used based on an a priori hypothesis. Children in the multiple placements group showed significantly poorer inhibitory control abilities compared with both children in the never-placed and the stable placement groups. In terms of effect size, there was a moderate difference among the three groups ($\eta^2 = .14$).

Oppositional behavior. An ANCOVA model examining caregiver-rated child oppositional behavior was conducted. The model included child age and verbal intelligence as covariates, and placement instability was included as the independent variable. The full model explained approximately 22.9% of the variance in the dependent variable. Only child age was significantly associated with caregiver-rated child oppositional behavior, $F(1, 97) = 5.0$, $p < .05$. However, this effect size was relatively small ($\eta^2 = .04$). After covarying the effects of the control variables, we obtained a significant effect of placement instability, $F(2, 97) = 10.3$, $p < .01$. Planned comparisons revealed that children in the multiple placements group were rated by their caregivers as showing significantly more oppositional behavior than were children in the never-placed and the stable placement groups. Effect size calculation indicated a moderate difference among the three groups ($\eta^2 = .16$).

Mediation model. Bivariate correlations revealed that placement instability was positively associated with child oppositional behavior and negatively associated with children's inhibitory control task performance. However, children's inhibitory control task performance was not significantly associated with ratings of children's oppositional behavior, although this association was in the expected direction ($p > .05$). Thus, we did not find support for our third prediction that children's inhibitory control abilities would mediate the negative association between placement instability and child oppositional behavior.

Discussion

This study investigated the effect of placement instability on the development of inhibitory control abilities and caregiver-rated oppositional behavior among 5- and 6-year-old adopted and nonadopted children. Consistent with our hypotheses, children who had experienced placement instability showed poorer inhibitory control abilities and higher levels of caregiver-rated oppositional behavior compared with both nonadopted and adopted children who had experienced more stable caregiving. Our results regarding child oppositional behavior are consistent with the findings of previous studies (Berlin et al., 2003; Brophy et al., 2002; Liew et al., 2004; Schachar & Logan, 1990; Sonuga-Barke et al., 2002). These findings suggest that children experiencing multiple foster placements are particularly at risk for failing to develop adequate inhibitory and behavioral control, self-regulatory deficits that are predictive of numerous problematic outcomes, including malad-

Table 5
Means and Standard Deviations for Study Dependent Variables

	Never placed		Stable placement		Multiple placements	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*
Inhibitory control task performance	11.8_a	3.4	11.9_a	3.0	9.3_b	3.9
CBCL Total Problems *T* score	45.9_a	11.5	47.2_a	9.6	51.5_b	12.8
CBCL Internalizing Behavior *T* score	47.4_a	12.5	44.8_a	9.0	47.0_a	8.0
CBCL Externalizing Behavior *T* score	45.7_a	11.8	48.0_a	10.0	54.0_b	12.5
CBCL Oppositional Behavior *T* score	52.6_a	5.3	52.8_a	5.9	58.7_b	8.3
CBCL Attention Problems *T* score	54.5_a	6.9	55.0_a	6.3	56.5_a	10.5
CBCL Aggressive Behavior *T* score	53.0_a	5.8	53.3_a	5.8	57.7_b	9.6

Note. Means in the same row that do not share subscripts differ at $p < .01$ based on pairwise comparisons. CBCL = Child Behavior Checklist.

justment to the demands faced at school (Biederman et al., 2004; Coie et al., 1992; McBurnett et al., 2000; Schachar & Logan, 1990; Shoal et al., 2003; Zima et al., 2000).

Results of the present study showed that associations among placement instability, inhibitory control, and oppositional behavior remained significant when we controlled for child age, child verbal intelligence, and child performance on the working memory control task. This finding suggests that children who do not experience a consistent caregiving relationship after being placed into foster care are at greater risk for failing to develop adequate inhibitory control skills and are at greater risk of showing oppositional behavior compared with other children. These deficits appear to be specific to children's inhibitory control abilities and behavioral regulation rather than to working memory problems or cognitive deficits more generally.

We were able to compare the inhibitory control skills and oppositional behavior ratings of children who had experienced multiple foster placements not only with children who had never been placed in out-of-home care but also with children who had entered the foster care system and had experienced stable placement into adoptive homes. This allowed for the comparison of children who had been exposed to similar levels of prenatal and maltreatment risk but who differed in the placement instability that they had experienced. We found that placement instability remained associated with children's inhibitory control abilities and oppositional behavior after we controlled for group differences in children's history of pre- and postnatal risk. These findings suggest that caregiving stability is an important protective factor for children who have experienced multiple types of early adversity.

In a secondary analysis, we investigated inhibitory control as a mediator of the association between placement instability and child oppositional behavior. It is unclear why we did not find support for this third hypothesis. It is plausible that our measure of inhibitory control is more relevant to children's behavior at school rather than at home, because at school children face more stringent demands on their attention and self-regulation. A stronger relation between inhibitory control and oppositional behavior may have emerged if teacher reports of child behavior were used in the present study rather than parent reports. On the other hand, it is possible that placement instability has independent effects on inhibitory control and oppositional behavior.

How do we account for these differences in inhibitory control and oppositional behavior among children who had experienced greater placement instability versus those who had experienced relatively stable caregiving? There are a number of possibilities to consider, some of which we can address with the data collected here and some with the results of other published studies. The first possibility that is not supported by these data is that children who experience greater prenatal risk are also subject to greater placement instability. Prenatal risk, as assessed here, was not associated with placement instability or with differences in children's inhibitory control abilities or ratings of their oppositional behavior. This is consistent with other research that has found that supportive subsequent care can override the effects of prenatal risk (Moe & Slinning, 2001; Pulsifer et al., 2004). We expect, therefore, that our findings regarding inhibitory control relate primarily to some aspect of postnatal, rather than prenatal, risk. Potential postnatal risk factors include duration of exposure to the inadequacy of birth parents' care, children's experience of maltreatment, children's preexisting behavioral problems, and/or the experience of multiple caregiving disruptions. These possibilities are each considered in turn below.

The two groups of adopted children included in our study were not significantly different in terms of the age at which they were first placed into foster care. We also found that there were no differences in inhibitory control and behavior between adopted children who had been placed into foster care within 1 month of birth and children first placed into foster care between the ages of 1 and 48 months. Thus, it is not likely that differences in duration of exposure to inadequate caregiving account for our results.

The two groups of foster children were also similar in terms of their experience of abuse and exposure to parental substance abuse, suggesting that neither of these risk factors is driving the observed differences in inhibitory control and behavior. However, children in the multiple placements group were more likely to have experienced neglect than were children in the stable placements group, suggesting that this type of maltreatment could contribute to children's inhibitory control deficits. In our preliminary analyses, we controlled for neglect and found that placement instability was still a significant predictor of children's inhibitory control abilities. This finding indicates that the significant group difference in children's experience of early neglect was not as important a predictor of children's inhibitory control abilities and behavior as was their later experience of placement instability. This finding suggests that having a stable relationship with a caregiver at some point in early development can attenuate the negative effects of early inadequate caregiving on the development of self-regulation.

Limitations

There are several limitations of the present study. First, it is never possible to have an ideal comparison group for foster or adopted children. The never-placed group may be different from the adopted groups in important ways that we did not measure. We have dealt with this issue by essentially using two comparison groups, one that had experienced stable adoptive care and one that had never been placed outside the home. We are reassured in finding that the never-placed group performed similarly to the stable adopted group.

Second, two different measures of child verbal intelligence were used due to the inclusion of children recruited from two different populations (adopted children and nonadopted children). Although the use of two measures was not ideal, both are widely used and well-validated measures of vocabulary. In addition, both tests have been found to correlate moderately with tests of cognitive ability, and they have been found to correlate significantly with each other. We suggest that both measures yielded valid assessments of child verbal abilities, although it is possible that group differences on the measure were the result of using two separate vocabulary tests. Regardless, children's performance on the verbal intelligence measure was controlled for in our main analysis and is therefore not likely to have influenced our results.

Third, detailed accounts of specific maltreatment incidents experienced by adopted children were not accessible from case files. This precluded our use of continuous variables for the number of maltreatment incidents and maltreatment severity experienced by each child. We acknowledge that continuous maltreatment variables are likely to be stronger predictors of child outcomes com-

pared with dichotomous variables. Thus, it is possible that our risk variables were not sensitive enough to predict child outcomes. Our results regarding history of risk should therefore be interpreted cautiously. Additionally, for the multiple placements group, maltreatment risk associated with subsequent foster placements could not be assessed from children's case records. It is likely that children in the multiple placements group experienced additional exposure to low-quality care, compared with other children, due to being placed back with their biological parents in attempts at reunification or with foster caregivers who neglected or abused them. It is therefore possible, and likely, that placement instability is confounded with children's additional experience of maltreatment and that this cumulative experience of maltreatment contributes to inhibitory control and behavioral outcomes. We cannot rule out these additional interpretations from the present data, but these are questions that are exceptionally difficult to answer given how quickly children are placed and replaced in the system. Future case studies should more precisely examine associations between various maltreatment experiences and later outcomes. Despite this difficulty, the current findings suggest that the risks associated with early exposure to maltreatment in general can be diminished if children are subsequently placed into a stable caregiving relationship.

As another limitation, our data are cross-sectional, not allowing us to infer direction of causality. Although it would have been ideal to assess children's inhibitory control abilities and oppositional behavior prior to their experience of placement instability, this was not possible given that the majority of adopted children in the sample entered foster care as infants or toddlers. Therefore, the alternate direction of association, with child inhibitory control predicting placement instability, cannot be ruled out. It has been found elsewhere, for example, that children initially showing more severe emotional and behavioral problems are more likely than other children to experience repeated placement disruptions (e.g., Fisher et al., 2005; James, 2004; James, Landsverk, & Slymen, 2004; Newton et al., 2000; Pardeck, 1982; Pardeck, Murphy, & Fitzwater, 1985). Nonetheless, findings of James et al. (2004) and Newton et al. (2000) suggest that changes in caregivers bring about increases in behavior problems. Multiple foster placements increase the likelihood that children who initially show few behavior problems will exhibit behavior problems in the future and that behavior problems will worsen for those children who initially show high levels of behavior problems.

In addition, only one measure of child inhibitory control was utilized. Convergent data across several different inhibitory control measures would strengthen our results. This was not possible due to the necessity of limiting the burden of participating in research for families in our study. However, the day–night task has been validated against other measures of inhibitory control and has demonstrated good psychometric properties (Archibald & Kern, 1999; Diamond & Taylor, 1996). Finally, a few children included in the study were missing either a verbal intelligence standard score or an oppositional behavior *T* score. None of these children were missing more than a single data point and all had inhibitory control and working memory task data. Thus, we imputed means for these missing values, which is not an ideal strategy given our relatively small sample size. However, we found that children who were missing data did not differ significantly from other children on our main study variables. We therefore do not think that a selection effect due to missing data is driving our results.

Conclusions

Children who have experienced foster care are a vulnerable group, often having been exposed to multiple pre- and postnatal risk factors, as well as separations from their primary caregivers. Along with facing these early adverse experiences, foster children are also frequently exposed to disruptions in their relationships with surrogate caregivers. Early caregiving relationships play a critical role in helping children develop self-regulatory abilities, including inhibitory control (Kochanska et al., 2000). Effective caregivers modulate stimulation and arousal for their children and provide a predictable environment that is contingent on children's needs (Barnard, 1999; Tronick, 1995). Young children rely on their caregivers to act as external regulators of emotion and behavior until they develop their own self-regulatory abilities (Field, 1994; Tronick, 1995). Our findings suggest that this development is likely to be compromised when children experience placement instability.

Poor inhibitory control, in turn, places children at a significant disadvantage in trying to regulate their behavior in social contexts. Children with inhibitory control deficits are more likely than other children to exhibit externalizing behavior problems and, as a result, often get into trouble with teachers and have difficulties interacting with peers (Berlin & Bohlin, 2002; Hughes, White, Sharpen, & Dunn, 2000; Riggs, Blair, & Greenberg, 2003). A number of studies have found a high incidence of externalizing disorders among foster children (e.g., Clausen et al., 1998; Leathers, 2002; Simmel et al., 2001), and some studies have found, even more specifically, that placement instability is associated with higher levels of externalizing disorders (Jonson-Reid & Barth, 2000; Kurtz et al., 1993; Leathers, 2002; Ryan & Testa, 2005). Externalizing behavior problems predispose children to academic failure, peer rejection, and consequent social and emotional problems (Biederman et al., 2004; Blair, 2002; Coie et al., 1992). Furthermore, Lengua (2002) has suggested that children who are low in self-regulation are especially susceptible to the effects of multiple risk. Additionally, externalizing behavior problems jeopardize foster children's relationships with their foster caregivers, placing them at greater risk for repeated placement disruptions (James et al., 2004; Newton et al., 2000).

The present study adds to the existing literature by examining the effects of placement instability on the development of inhibitory control abilities among a sample of children with histories of foster placement. Inhibitory control deficits were not observed for children who had experienced placement into foster care, as well as similar levels of pre- and postnatal risk, but who had been placed initially into adoptive homes. These findings suggest that placement instability impedes the development of children's self-regulatory abilities, placing children at great risk for future problematic outcomes. As others have suggested (e.g., James et al., 2004), these results point toward the importance of placing children into preadoptive homes when possible and limiting the number of placement disruptions that children experience.

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