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A Translational Neuroscience Perspective on the Importance of Reducing Placement Instability among Foster Children

Philip A. Fisher,
Oregon Social Learning Center, University of Oregon

Anne M. Mannering,
Oregon State University

Amanda Van Scoyoc, and
University of Oregon

Alice M. Graham
University of Oregon

Abstract

Placement instability is a common occurrence among foster children and others involved with child welfare system services, and is associated with negative psychiatric and mental health outcomes. The purpose of this paper is to review and synthesize research in this area and to consider this information in terms of child welfare practice and policy. Evidence from 59 sources is reviewed, including research on (a) the connection between placement instability and poor outcomes; (b) sources of information that can be employed to reliably predict risk for placement instability; and (c) interventions designed to mitigate the effects of placement instability. The available empirical evidence suggests that placement instability and other family chaos is associated with disrupted development of the brain's prefrontal cortex, which is involved in executive functioning. Poor executive functioning is implicated in elevated risk for ADHD, disruptive behavior disorders, substance abuse, and other forms of disinhibitory psychopathology. This might help to explain the high rates of psychiatric medication prescriptions for foster children. Notably, however, recent research findings have shown that placement instability is both predictable and preventable and that interventions to address placement instability have the potential to mitigate neurobiological and psychiatric effects of prior adversity.

Placement instability is a prevalent problem among child welfare system children. Broadly defined, placement instability comprises any change of household and caregiver that does not result in a permanent placement with a child's biological family or an adoptive family. Moves to a nonpermanent placement include foster care entry, moves between foster homes, failed reunifications with biological parents, and failed adoptive placements. Having more than one placement within the first year of being placed in foster care predicts further instability for children who remain in care (Webster, Barth, & Needell, 2000). The risk for placement instability also increases markedly as time in foster care increases. According to the U.S. Department of Health and Human Services, 85.1% of children in foster care for less than 1 year experience two or fewer foster care placements (U.S. Department of Health and Human Services, 2010). However, only 62.2% of children in foster care for 1–2 years and

33.0% of children in foster care for 2 years or longer experience two or fewer placements. Thus, despite the national policy mandate in the United States for foster children to achieve placement permanency by age 15 (Child Welfare Act and Adoption and Safe Families Act of 1997, Public Law 105-89), placement instability remains a serious concern.

An important opportunity exists to address the problem of placement instability. Recent research findings indicate that risk for placement failure can be reliably predicted using inexpensive and readily employed methods (Chamberlain et al., 2006; James, 2004). Moreover, emerging evidence indicates that specific, family-based interventions can effectively mitigate the risk for placement disruption (Fisher, Stoolmiller, Mannering, Takahaski, & Chamberlain, 2011). Thus, the potential exists through policy and programming to significantly reduce placement instability in the child welfare system. This paper synthesizes the information in this area.

The growing scientific knowledge base documenting the myriad deleterious effects of instability on foster children's development and psychosocial functioning underscores the imperative to address this issue. Most foster children have had a diverse range of early maltreatment experiences. Research findings indicate that there are unique cognitive and behavioral consequences of different profiles of maltreatment (e.g. neglect, physical abuse, sexual abuse, or maltreatment in multiple domains; Pears, Kim, & Fisher, 2008). As such, some children enter foster care with more risk factors and disruptive behavior than other children, and might fail to perceive that the environment has improved in foster care (Dozier, Higley, Albus, & Nutter, 2002). These difficulties can negatively impact caregiver-child interactions, thereby increasing risk for placement disruptions. Research findings also indicate that, regardless of early experiences and child-specific difficulties, there are negative consequences to placement instability. Whereas a single foster placement does not significantly increase the risk for behavior problems, multiple placements increase the risk for internalizing and externalizing symptoms among children, regardless of whether they exhibit behavior problems prior to foster care entry (Ryan & Testa, 2005). For example, Rubin, O'Reilly, Luan, and Localio (2007) found that foster children who had experienced placement instability had up to 63% higher risk for behavior problems compared to foster children who had not experienced placement instability. Placement instability also contributes to foster children's disproportionately high risk for poor outcomes across developmental, social, emotional, behavioral, cognitive, and mental health domains (Harden, 2004). Child behavior problems, in turn, predict increased risk for disruption from subsequent foster placements (Fisher, Burraston, & Pears, 2005).

Developing more adequate explanatory models of the factors that contribute to or reduce risk for poor outcomes among foster children is an issue of significant public health and policy concern, and is a topic of importance for fields including social work, psychology, psychiatry and education. Numerous researchers have found elevated rates of psychiatric disorders, including internalizing and externalizing disorders, in this population (McMillen et al., 2005). Moreover, there is recent evidence of a very high and increasing use of psychotropic medications in foster children. These rates far exceed those in the general population for all medications (Zito et al., 2003; 2008), for multiple medications (McMillen et al., 2005), and for antipsychotic medications to treat children (not necessarily diagnosed

with a psychotic disorder) who are not responsive to other medications and are difficult to maintain in community settings due to sever behavior problems (dosReis et al., 2011).

Despite growing public awareness of the need to reduce foster children's placement instability, progress in this area has been limited by a lack of adequate science-based explanatory models, methods for the early detection of risk, and effective prevention and intervention strategies. In this article, we present a perspective grounded in the principles, methodologies, and knowledge from the burgeoning field of developmental translational neuroscience that has the potential to increase understanding of the general risk profiles of children entering foster care and the potential consequences of placement instability for these children while in care. This perspective emphasizes the sensitivity of key underlying neural regulatory systems to early environmental stress, including experiences preceding foster care entry and subsequent placement instability. The functioning of such systems appears to play a key role in determining risk and resiliency regarding psychosocial outcomes and, therefore, warrants attention in intervention and prevention efforts. After presenting this neurodevelopmental model, we describe a practical and reliable approach for detecting children at risk for placement instability, summarize evidence for the efficacy of specific interventions that reduce risk for placement instability, and discuss the implications of this emerging knowledge base for child welfare system policy and programs.

Early Life Adversity and Neuroplasticity

There is growing public and scientific interest in human brain development, particularly in regard to critically important experiences (prenatal and in infancy) that shape the architecture of the developing brain (Shonkoff, Boyce, & McEwen, 2009; Lefmann & Combs-Orme, 2013). Responsive, nurturing, and low-stress early environments set the stage for healthy development, whereas chronically adverse experiences early in life—including neglect and maltreatment (Bruce, Fisher, Pears, & Levine, 2009) and family chaos and a lack of predictability (Lengua, Honorado, & Bush, 2007)—fundamentally and permanently alter the functioning of key neural systems involved in learning, memory, and self-regulation and the complex networks of neuronal connectivity among these systems (Behen et al., 2009; DeBellis, Hooper, Spratt, & Woolley, 2009; Debillis, Spratt, & Hooper, 2011; Miskovic, Schmidt, Georgiades, Boyle, & Macmillan, 2010). Further, there is emerging evidence that severe early adversity is associated with alterations in the expression of genes (Choi, Jeong, Rohan, Polcari, & Teicher, 2009; Danese, Pariante, Caspi, Taylor, & Poulton, 2007; Roth, Levenson, Sullivan, & Sweatt, 2006; Roth, Lubin, Funk, & Sweatt, 2009; Roth & Sweatt, 2010) and produces genetic changes associated with premature aging (Drury et al., 2012a & b; Kiecolt-Glaser et al., 2011; Tyrka et al., 2010). As such, the neurodevelopmental effects of adversity appear to play a key role in determining risk and resiliency regarding foster children's psychosocial outcomes and warrant attention in intervention and prevention efforts.

One way that the research in this area has been characterized, which is particularly germane to the content of this paper, is with respect to the brain's plasticity. Essentially, the concept of neuroplasticity involves the extent to which the development of regions of the brain and the circuitry connecting those regions are affected by an individual's experiences in the

environment (Perry, 2009). These experiences begin during the prenatal period, as there is extensive evidence from both animal (Barr et al., 2005; Coulon et al., 2013; Darnaudery & Maccari, 2008; Grigoryan & Segal, 2013; Kim et al., 2009) and human studies (Austin et al., 2005; Kuroda, 2011; Sandman et al., 2012; Urban et al., 2013) that prenatal stressors—including terratogenic agents such as alcohol, illicit and prescription drugs, and nicotine, as well as psychogenic influences such as maternal depression—impact the developing brain. Specifically, changes in the morphology of the brain (e.g., Weinstock, 2011) and in the formation of neurons in specific focal regions (e.g., Coulon et al., 2013) have been shown to be affected by prenatal stress.

In additional to the prenatal period, experiences in the early years of life, particularly within infancy and toddlerhood, also exert a substantial impact on brain development. One of the most powerful sources of evidence for these early life effects is research conducted on children reared in institutional settings in developing countries (often referred to as “orphanages”). This research has found that children reared in these settings exhibit deficits across many domains of development (Roeber et al., 2012; Wiik et al., 2011; Wilbarger et al., 2010). In addition, research has shown that these children have significant alterations in brain development (Lupien et al., 2011; Sheriden et al., 2012; Telzer et al., 2013; Tottenham et al., 2010). Similarly, research on maltreated children has provided clear documentation of the effects of abuse and neglect on the developing brain. For example, research has shown differences in the amount of both gray and white matter in maltreated children (De Brito et al., 2013; Liao et al., 2013). In addition, research on both institutionally reared and maltreated children has shown disregulation in hypothalamic-pituitary-adrenal (HPA) axis following early adversity (Bruce et al., 2009; Dozier et al., 2008; Kertes et al., 2008; Kroupina et al., 2012). The HPA axis produces the hormone cortisol, which plays a critical role in energy metabolism and stimulation of the immune system in response to stress, and helps maintain homeostatic balance in the body following exposure to stressors. Studies of individuals exposed to early adversity have found changes in both the diurnal rhythmicity of the HPA axis, possibly indicative of changes in set point (i.e. upregulation or downregulation) of the system (see Gunnar & Vazquez, 2001), as well as changes in the responsivity of the HPA to a stressor (Fisher et al., 2012).

Notably, just as the development of neurobiological systems can be negatively impacted by early stress, the concept of neural plasticity also applies to the potential for positive changes in brain and associated behavioral functioning under improved conditions. Some of the early work in this area was conducted by animal researchers, who found that in rodents who had been exposed to early life stress and subsequently placed in “enriched environments” (which, in the rodent context, involves increased opportunities for activity and exploration), performance on learning and other tasks was significantly better than for those exposed to stress and not placed in enriched environments (Greenough et al., 1970; Greenough, Madden, & Fleischmann, 1972; Volkmar & Greenough, 1972). There area several parallel lines of research in this area in humans. This includes studies of children adopted or placed in foster care following institutional rearing in developing countries and children placed in therapeutic foster care in the United States following early maltreatment. Research in both of these areas has documented the reversibility of early stress effects on children’s brain development (Almas et al., 2012; Smyke et al., 2012). For example, studies of children in

foster care have shown greater regulation of the diurnal pattern of cortisol production in children who receive therapeutic interventions and increased *dysregulation* of diurnal cortisol among foster children who remain in stressful environments (Fisher et al., 2007; Fisher & Stoolmiller, 2008).

A topic of considerable importance with respect to both the effects of, and the reversibility of, early life stress on the brain is whether there are specific "sensitive periods" in which the developing brain is more likely to be impacted (for better or for worse) by experiences in the environment. Just as the early research involving animal models showed that basic sensory functions like vision cannot develop properly with environmental input at specific points in development, subsequent research has shown that the early years of life (between birth and about 24 months in particular) appear to be extremely important to many domains of physical, cognitive, and motor development. As such, children adopted from institutional care in infancy are much more likely to catch up to their same-aged peers, whereas those adopted later are more likely to show continued delays in their development (see Bakermans-Kranenburg et al., 2011). Other potential "sensitive periods" are currently being explored, with a particular emphasis on whether the massive amount of growth and reorganization during adolescence in the brain's prefrontal cortex represents another window for interventions to be maximally effective (Dahl, 2002). Other developmental and life-course transitions (e.g., early adulthood, birth of a child) may also be important times to consider the possibility of sensitive periods.

One question that often arises when considering the neurodevelopmental effects of early adversity is whether all children who experience adversity can be expected to show the same deficits, and at the same levels, as those who are not exposed to early stress. The answer, of course, is that (as is true with behavioral outcomes), there is considerable population variance in the effects of stress on neurodevelopment. The concept of resilience is often invoked to characterize those children who exhibit fewer vulnerabilities following stress (see Masten, 2013). Although resilience is an intuitively appealing construct, it introduces some methodologically complex issues into the research. For example, resilience may indeed be a result of certain constitutional or genetic factors within the individual; however, it may also be the result of high levels of resiliency promoting aspects of the environment (e.g., a responsive caregiver, the presence of a cohesive community) that counterbalance the effects of adversity, or of low levels of adverse experiences among individuals assigned to a specific risk group (for example, a child in foster care may have experienced a single episode of domestic violence but been exposed to little neglect and direct abuse). Thus, research in this area needs to go beyond the invocation of the resilience framework to precisely operationalize the risk and protective factors that impact resilience.

An area of developmental research that has implications for the research on resilience and that has received considerable attention in recent years is whether all individuals are equally sensitive to environmental influences. Historically, there has been recognition that some individuals may be more negatively impacted by stress than others; however, more recent conceptualizations suggest that certain individuals may be less susceptible to all environmental influences, both positive and negative. Research in this area, characterized as either variations in "biological sensitivity to context" or "differential susceptibility to

environment," suggests that some highly sensitive individuals are more likely to thrive in positive environments and struggle in poor environments, whereas other less sensitive individuals are less likely to be affected for better or worse regardless of the environment (Beslky, Schlomer, & Ellis, 2012; Ellis et al., 2011). Notably, although there is a growing scientific knowledge base in this area, much of the work has been conducted on individuals exposed to low-to-moderate levels of stress, and the applicability to populations such as children in the child welfare system remains uncertain.

The Effects of Early Adverse Experiences on the Development of Executive Functioning

One neural regulatory system that has been implicated consistently as being particularly vulnerable to adverse early experiences is executive functioning (EF), which includes mental cognitive flexibility, working memory, and the capacity to exert inhibitory control. EF has been likened to an *air traffic control system* in the brain (Center on the Developing Child at Harvard University, 2011). Substantial data indicate that EF is essential to the development of self-regulation and adaptive functioning across cognitive, social, and emotional domains (Blair, 2002). Key brain regions involved in EF, especially in the prefrontal cortex, show a protracted developmental course (Bourgeois, Goldman-Rakic, & Rakic, 1994; Chugani, Phelps, & Mazziota, 1987; Diamond, 2002) with critical periods for the development of EF continuing well beyond infancy; as such, they are particularly vulnerable to adverse childhood experiences (Anderson, 2002). Robust evidence that responsive caregiving supports the development of self-regulation and associated positive outcomes (Kochanska, Murray, & Harlan, 2000) underscores the importance of environmental factors early in life, when these critical brain regions show the greatest plasticity. Conversely, the adverse early experiences that typically precede foster care entry have been shown to demonstrate associations with EF deficits (Beers, & De Bellis, 2002; DeBellis, et al., 2009; Nolin, & Ethier, 2007).

It is important to recognize that not all children exhibit EF deficits at foster care entry (Fisher, Gunnar, Dozier, Bruce, & Pears, 2006). Variations in a child's EF level at foster care entry could provide information about their genetic makeup, their experiences prior to out-of-home care, and the interaction of genes and environment on a child's neurodevelopment. This might, in turn, provide information about a child's sensitivity to future caregiving environments and placement disruptions. Notably, researchers examining cumulative risk have found that a child's capacity for self-regulation differentiates between resilient and nonresilient responses to chronic, disruptive risk factors such as poverty and household instability (Buckner, Mezzacappa, & Beardslee, 2003). Similarly, children with low initial levels of self-regulation are more vulnerable to the negative psychosocial outcomes associated with exposure to cumulative risk; however, consistent and sensitive caregiving appears to mediate this relationship. Thus, efforts to develop effective strategies to improve outcomes for foster children could be enhanced by understanding the associations between adverse early experiences, placement instability, and EF.

Placement instability, EF, and psychopathology

Recent evidence from studies of foster preschoolers provides support for the hypothesized association between placement instability and EF deficits. Lewis, Dozier, Ackerman, and Sepulveda (2007) examined inhibitory control, a key component of EF supported by the prefrontal cortex and other neural regions involved in regulatory functioning. Among adopted foster children, those with histories of placement instability performed significantly worse on a day–night Stroop task than children without histories of placement instability. Placement instability was also positively associated with caregiver reports of child oppositional behavior. Similarly, Pears, Bruce, Fisher, and Kim (2010) found that, as the number of unique foster care placements increases, child scores on a composite measure of inhibitory control decreases. Moreover, inhibitory control mediates the association between number of previous foster placements and indiscriminate friendliness, a problematic behavior associated with safety risks and inattention, poor impulse control, and peer rejection (Roy, Rutter, & Pickles, 2004).

These findings are consistent with previous findings showing that EF deficits increase risk for subsequent psychopathology. EF deficits have been implicated in a broad range of disorders in children and adolescents, including ADHD (Miller & Hinshaw, 2010), disruptive behavior disorders (Hughes & Ensor, 2008), substance abuse (Hester, Lubman, & Yücel, 2010), and PTSD (DePrince, Weinzierl, & Combs, 2009). With respect to foster children, the evidence for inhibitory control deficits in preschool-aged children who experienced previous placement instability dovetails with evidence from psychiatric studies that children and adolescents with histories of placement instability prior to adoption are more likely to exhibit symptoms of ADHD and ODD (Simmel, Brooks, Barth, & Hinshaw, 2001). It is important to note that the aforementioned findings show a correlational rather than a causal association between placement instability, EF deficits, and psychopathology. Further research is needed to identify causal relations and the extent to which the relations are unidirectional or recursive.

Predicting risk for placement instability

Given the associations between placement instability, EF deficits, and psychopathology, a relevant question for public policy involving foster children is whether placement instability is predictable. The results from a number of recent studies suggest that there are at least two readily available or easily acquired sources of data.

The first source of data is the child's history of prior placement disruptions. Researchers have demonstrated a functional relationship between placement instability and the probability of future placement disruptions (Fisher, et al., 2005; Price, et al., 2008; Rubin, et al, 2007). For example, in one study of foster preschoolers, the children who experienced more than 4 placement transitions had over a 70% risk of additional placement disruptions (Chamberlain, et al., 2008; Fisher, Kim, & Pears, 2009). Put simply, increased placement failures increase the likelihood of future placement failures. Thus, ongoing surveillance of placement transitions within the child welfare system is a reliable and extremely inexpensive way to predict the children most in need of targeted intervention.

The second source of data is the child's level of problem behavior. Chamberlain and colleagues (2006) conducted a study of 246 elementary school-aged foster children between 5 and 12 years of age in San Diego County. They found that child behavior problems are a robust predictor of placement failure. Specifically, caregivers are able to tolerate a certain amount of problem behavior on a daily basis without much risk for placement failure (a total of 6 or fewer problem behaviors resulted in a risk for disruption of 8.5%). After 6 problem behaviors per day, however, disruption risk increases dramatically (25% with each additional problem behavior reported). Fisher and colleagues (2011) replicated this *threshold effect* in a sample of foster preschoolers: In this age range, exhibiting 5 problem behaviors per day is associated with low disruption rates and a substantial increase in disruption risk with each additional problem behavior.

What is particularly noteworthy about the above studies is the fact that the data collection tool employed—the Parent Daily Report (Chamberlain & Reid, 1987)—is a simple checklist, consisting of 30 commonly occurring behavior problems that can be administered via a 5- to 10-minute telephone interview. Foster caregivers are simply asked to report whether or not their foster child engaged in the 30 problematic behaviors in the past 24 hours. In other words, information that reliably predicts the likelihood of whether a placement will fail can be readily and quickly obtained from caregivers. In a subsequent study (Hurlburt, Chamberlain, DeGarmo, Zhang, & Price, in press), the data obtained from the Parent Daily Report remained equally reliable when obtained from caregivers via automated telephone calls, E-mail, or Internet direct-entry websites.

The ease with which statistically reliable information about placement disruptions can be gathered via either of the above methods—monitoring child placement instability or using the Parent Daily Report—has at least one very important implication: It creates the potential for the child welfare system to create data-driven systems to assess child risk for placement disruptions on an ongoing basis. Of course, even a statistically reliable system based on known probabilities is not a fail-safe solution for assessing children who will or will not experience placement disruptions. However, we know of no systematic, empirically based policies or programs in place at federal, state, or county levels to identify and intervene with foster children at risk for placement disruptions. Thus, progress toward a more data-driven, proactive approach for identifying placement instability should prove to be beneficial.

Preventing Placement Disruptions

To have the greatest impact, implementing systems for identifying foster children at high risk for placement instability would need to be tied to supportive interventions for children and caregivers to mitigate risk. Evidence-based interventions in this area exist and have been validated in randomized clinical trials. One such intervention is Multidimensional Treatment Foster Care for Preschoolers (MTFC-P), which was designed to reduce child behavior problems and increase self-regulation. MTFC-P has been designed to utilize a multi-pronged approach with the foster family at the forefront of the intervention. The foster caregivers are trained to provide a consistent, contingent home environment through behavioral management techniques, including immediate encouragement for positive behavior and setting limits when necessary. They also receive ongoing support through weekly parent

support groups, daily check-ins and 24-hour crisis intervention. To address developmental, behavioral, and socioemotional issues, the foster preschoolers attend weekly therapeutic playgroups (Fisher, Ellis, & Chamberlain, 1999). Through these program components, the foster children and their caregiver receive individualized support that is readily available. The results from a randomized clinical trial show that MTFC-P effectively mitigates the risk of disruption from prior placement history and from child problem behavior. Placement stability was examined specifically in a subsample of children from the larger randomized trial of 112 foster preschoolers (including 52 older children who had experienced four or more prior placements). After 24 months of services, the children in the MTFC-P condition and the services-as-usual comparison condition had the same rates of attempted permanent placement; however, the MTFC-P children were more than twice as likely to have achieved placement permanency. To understand whether the heterogeneity of early maltreatment experience impacts permanent placement, a logistic regression analysis was conducted regarding the type of maltreatment, severity of maltreatment, and number of maltreatment incidences as the predictors. These findings indicate that past experiences of maltreatment do not predict placement permanency and that the type of maltreatment experienced does not strongly impact placement instability (Fisher, Kim, & Pears, 2009).

The findings from an additional study indicate that the threshold effect can be eliminated effectively for MTFC-P children. In this study, the services-as-usual comparison group was increasingly likely to disrupt once the number of daily problem behaviors exceeded 5, with each additional problematic behavior increasing the risk of disruption by about 10%, and the MTFC-P children showed lower levels of problem behavior and no increased risk for disruption even in instances of higher problem behavior. In fact, the disruption rates were significantly lower overall for the MTFC-P children. A likely mechanism for the reduced disruption rates in both of the above studies is the high level of support and instruction in effective parenting techniques provided to the caregivers.

Another intervention that has been found to reduce risk for placement disruptions associated with problem behavior is the Keeping Foster and Kin Parents Skilled and Supported Program (KEEP), which provides foster caregivers with training in behavior management methods, supervision, and support (Price, et al, 2008). In this intervention, the KEEP caregivers receive 16 weeks of group training focused on the increased use of positive reinforcement, the consistent use of nonharsh discipline methods, and parental monitoring of child activities and peer associations. Strategies for avoiding power struggles, managing peer relationships, and increasing success in school are also discussed during the group meetings. If any caregiver misses a group session, an interventionist comes to the home to deliver the material in person. The results from a randomized clinical trial provide further evidence that interventions can decrease placement disruptions. Seven hundred families with foster children between the ages of 5 and 12 years old participated in this study. The foster caregivers were randomly assigned to KEEP or to a control condition, and child placement disruptions were considered within 200 days of the beginning of the intervention. As with MTFC-P, the results from this study indicated that the KEEP children had fewer placement disruptions; moreover, the number of prior placements predicted increased risk for placement disruptions in the control group but not in the KEEP group. It is noteworthy that, in addition to mitigating placement disruption risk, similar outcome effects from the MTFC-

P and KEEP interventions have been observed, including reductions in caregiver stress and child behavior problems (Chamberlain et al., 2008; Fisher et al., 2009).

Is Preventing Placement Disruptions Associated With Improved EF?

One implication of the neurodevelopmental perspective invoked above is an extension of the well-established link between caregiving and EF development in low- and high-risk contexts. Specifically, responsive and consistent caregiving (skills emphasized in MTFC-P and KEEP) appear to facilitate EF development and provide a buffer between poor EF and negative psychosocial outcomes (Kochanska et al., 2000; Lengua et al., 2007). Determining the extent to which placement stability is bolstered by the link between supportive parenting and EF development is crucial: It could provide a set of common mechanisms through which interventions might lead to improved outcomes while making the most efficient use of scarce resources. The previously noted decreases in placement instability, child problem behavior, and caregiver stress associated with these interventions point toward potential increases in EF development. Additional, and somewhat more direct, support for this contention can be found in electrophysiological evidence from a subsample of MTFC-P children (Bruce, McDermott, Fisher, & Fox, 2009). Postintervention EEG recordings were obtained while each child completed a measure of cognitive control and response monitoring (i.e. a flanker task). Compared to the services-as-usual children, the MTFC-P children showed greater electrophysiological responses to external feedback about task errors and resembled a comparison group of nonmaltreated children. These results suggest that MTFC-P children are better equipped to absorb environmental feedback and learn from their mistakes. Thus, although foster children might be less sensitive to environmental feedback, targeted interventions such as MTFC-P hold the potential to ameliorate these deficits (Bruce et al., 2009).

Implications for Public Policy

The evidence presented in this paper suggests that knowledge about a child's prior placement history and amount of disruptive behavior might be useful in determining the likelihood that a placement may fail, and this might influence decisions about services and support available to children. Clearly, in cases of a child with many placement failures, immediate treatment could be warranted. Foster children experience disparities in many areas of cognitive, emotional, and behavioral development. These children have been found consistently to have high rates of psychiatric disorders, and recent evidence has raised public awareness and concern about the prevalence of psychotropic medication use in this population. Given that children entering foster care have experienced maltreatment and have been removed from their home, these children enter foster care at risk for behavioral disturbances and often have difficulties fitting in with the new family environment. Once a child is in foster care, research findings show that placement instability is a common phenomenon, putting these children at even greater risk for poor outcomes. Moreover, among foster children, placement instability might greatly enhance risk for negative outcomes and be associated (perhaps bidirectionally, though this is not yet understood) with poor EF.

Variables that are associated with poor outcomes for high-risk children are useful in forming explanatory models. Within such explanatory models, the most useful predictors of outcomes are those that are malleable. For example, poverty is associated with delayed cognitive development, but it is difficult to intervene to eliminate poverty; in contrast, parenting (i.e. a highly malleable variable for which there are many evidence-based interventions) plays a central role in predicting child outcomes. Similar issues exist in the area of placement instability. Even though child-specific factors might increase the likelihood that a foster placement will fail, prior placement instability is a useful predictor of future placement failure that is malleable to intervention effects.

To synopsize, evidence suggests that placement instability is a strong predictor of poor outcomes and that a possible mechanism underlying these poor outcomes is the manner in which placement disruptions manifest in altering the development and/or maturation of prefrontal cortex regions involved in EF. Evidence also suggests that a number of sources of readily available or easily gathered information could allow us to predict risk for placement instability, that empirically validated interventions exist to mitigate this risk, and that such interventions might help to remediate some of the neurobiological effects of prior instability on EF. Thus, although definitive studies targeting EF through interventions to increase placement stability have yet to be conducted, the evidence presented in this paper strongly suggests that we should be concerned about EF deficits in the child welfare population. Finally, we can predict which children are at the greatest risk based on placement instability. Given converging evidence that children who move placements frequently are at particularly high risk for poor outcomes, identifying and directing resources to these children is a worthwhile endeavor. Moreover, the evidence presented in this paper suggests that screening and early intervention for EF deficits at entry into a new foster placement could help to improve outcomes for foster preschoolers. Thus, the current knowledge base supports the implementation of measures that will allow the child welfare system to systematically monitor foster children and intervene proactively to prevent disruptions.

In some areas of science-based policy and practice, the predictors of negative outcomes (and ways to prevent these outcomes) are known, but significant challenges remain as to implementing change on a wide-scale basis because of the costs and complexities of doing so. For example, the effects of exercise on childhood obesity prevention are well understood, but there has been limited progress in this area. In contrast, there has been considerable progress in other areas (e.g. home visitation for high-risk infants and their parents).

Despite the emerging knowledge base in the area of foster children's placement instability, the typical response to reducing placement instability (at the county, state, and federal levels) remains reactive, with services being provided after disruptions have occurred. It is not clear what barriers prevent progress in this area. Some resistance might result from an assumption that a more proactive approach would be too costly. Although we are not aware of any economic analyses comparing the relative costs and benefits of a reactive versus proactive approach to placement disruptions, it is likely that the reactive approach is extremely costly in terms of casework time spent identifying new placements, foster parent attrition, and the increasing services needed as placement disruptions accrue and problems

escalate. It is also important to recognize that, over and above the direct costs of disruptions, other negative outcomes involve monetary (e.g. emergency room visits) and nonmonetary (e.g. development of a psychiatric disorder and need for medication) costs. Moreover, although the current evidence base for preventing placement instability involves moderate- to high-dose programs that might be perceived as overly costly, it is possible that many disruptions could be prevented with a much lower dose and supportive approach (e.g. access to a parent help line). Further research could help to identify such low-cost measures. In sum, the impetus for moving forward in this area is strong, and the justification for not doing so is diminishing as new findings emerge.

Conclusions and Future Directions

The widespread dissemination of cost-effective methods for the early identification of children at risk for placement instability, bolstered by evidence-based intervention data, has the potential to improve child welfare system outcomes at a national level. However, it is important to address outcomes and treatment goals for children who do not benefit from the existing intervention approaches. Indeed, preventive intervention efforts might need to differ depending upon the severity of the specific early adversity experienced and associated EF deficits. Developing more precise conceptual models of how early environmental stress impacts psychosocial functioning (using the developmental translation neuroscience perspective) might help to address this issue. Such models might include topics such as considering how prenatal substance exposure and postnatal maltreatment influence neurodevelopment. Prenatal substance exposure has been shown to alter the functioning of stress-sensitive neural systems (Lester & Padbury, 2009), but few researchers have examined the combined effects of prenatal substance exposure and postnatal maltreatment, despite evidence of a high prevalence of prenatal exposure among foster children (Smith, Johnson, Pears, & DeGarmo, 2007; Young, Boles, & Otero, 2007). Research and policy efforts guided by a neurodevelopmental perspective carry the promise of enhanced early identification of risk, greater precision for intervention targets, monitoring of intervention effects, and improved well-being in this highly vulnerable population.

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