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Factors associated with caregiver stability in permanent placements: A Classification Tree approach

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Abstract

Objective—Identify individual and environmental variables associated with caregiver stability and instability for children in diverse permanent placement types (i.e., reunification, adoption, and long-term foster care/guardianship with relatives or non-relatives), following 5 or more months in out-of-home care prior to age 4 due to substantiated maltreatment.

Methods—Participants were 285 children from the Southwestern site of Longitudinal Studies of Child Abuse and Neglect (LONGSCAN). Caregiver instability was defined as a change in primary caregiver between ages 6 and 8 years. Classification and regression tree (CART) analysis was used to identify the strongest predictors of instability from multiple variables assessed at age 6 with caregiver and child reports within the domains of neighborhood/community characteristics, caregiving environment, caregiver characteristics, and child characteristics.

Results—One out of 7, or 14% of the 285 children experienced caregiver instability in their permanent placement between ages 6 and 8. The strongest predictor of stability was whether the child had been placed in adoptive care. However, for children who were not adopted, a number of contextual factors (e.g., father involvement, expressiveness within the family) and child characteristics (e.g., intellectual functioning, externalizing problem behaviors) predicted stability and instability of permanent placements.

Conclusions—Current findings suggest that a number of factors should be considered, in addition to placement type, if we are to understand what predicts caregiver stability and find stable permanent placements for children who have entered foster care. These factors include involvement of a father figure, family functioning, and child functioning.

Practice Implications—Adoption was supported as a desired permanent placement in terms of stability, but results suggest that other placement types can also lead to stability. In fact, with attention to providing biological parents, relative, and non-relative caregivers with support and resources (e.g., emotional, financial, and optimizing father involvement or providing a stable adult figure) the likelihood that a child will have a stable caregiver may be increased.

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Introduction

In 2008 an estimated 273,000 children in the United States were removed from their homes by child protective agencies and placed in temporary care due to substantiated maltreatment (US Department of Health and Human Services, 2009). While the primary goal of such action is the protection of children, it is recognized that out-of-home placements can have iatrogenic effects (see Newton, Litrownik, & Landsverk, 2000; F. Wulczyn, Kogan, & Harden, 2003). As a result of these potential effects, federal legislation (i.e., Adoption Assistance and Child Welfare Act of 1980, Adoption & Safe Families Act of 1997) has expanded the goals of temporary out-of-home placements in the US to include permanence and child well-being, in addition to safety.

Permanence emerged as a goal in the 1970s as a result of what was called foster care drift, that is, children entering out-of-home care and remaining in temporary custody while bouncing from foster home to foster home until they were emancipated (Hegar, 1993). With the new laws, temporary placements are to provide the courts with the opportunity to make decisions, usually within 12 months, about permanent living arrangements (e.g., reunification, adoption, long-term foster care/guardianship with relatives or non-relatives).

Although stability remains a central goal of child welfare practice when making decisions about permanent placements (for exceptions, see Hegar, 1993), recent research indicates that, similar to temporary placements, so-called “permanent” placements are subject to disruption and instability. One follow-up of former foster children indicated that the majority were doing poorly, due in part to an experienced lack of stability in their “permanent” placement (Pecora, et al., 2006).

Research on factors related to stability in permanent placements is essential in order to provide clear guidelines for child welfare decisions and promote positive child outcomes. However, research on stability across permanent placement type (i.e., reunification, adoption, or long-term foster care/guardianship with relatives or non-relatives) is scarce (for an exception, see Fisher, Burraston, & Pears, 2005). Most studies have examined either non-permanent foster care placement instability, or specific types of permanent placement failures, such as re-entry following reunification and failed adoption. These categories of studies have differed somewhat in their conceptualization of potential predictors.

Research on predictors of foster placement changes has tended to focus on the role of child behavior (Aarons et al., 2010; Barber, Delfabbro, & Cooper, 2001; Chamberlain et al., 2006; Leathers, 2006), though older child age, longer stays in care, and placement in nonkinship care have also been supported as predictors (Barth et al., 2007; Chamberlain et al., 2006; Connell et al., 2006; James, 2004; Webster, Barth, & Needell, 2000). In contrast, research on re-entry following reunification has tended to focus more on caregiver mental health, family stressors such as poverty, and case variables such as type of maltreatment (e.g., neglect), substantiation status, and prior Child Protective Services (CPS) involvement (Connell, Bergeron, Katz, Saunders, & Tebes, 2007; Connell et al., 2009; Drake, Jonson-Reid, & Sapokaite, 2006; Hindley, Ramchandani, & Jones, 2006; Sledjeski, Dierker, Brigham, & Breslin, 2008). Adoption research, on the other hand, has found evidence that older child age, behavioral problems, and placement with a nonrelative predict disruption (Coakley & Berrick, 2008; Rushton & Dance, 2006; Smith, Howard, Garnier, & Ryan, 2006).

We would agree with Connell and his colleagues (2006), who asserted that research is needed to generalize findings from previous studies on placement stability to children with a broader range of foster care experiences, and would go a step further in arguing that stability

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across all permanent placement options (e.g., reunification, adoption, long-term foster care/guardianship with relatives or non-relatives) should be examined.

In addition to the lack of research across permanent placement type, a number of methodological issues also limit the application of extant research to the problem of permanent placement stability (Hindley et al., 2006; Holland, Faulkner, & Perez-del-Aguila, 2005; Minty, 1999). Much of the empirical work has utilized administrative data, and though this research has the advantage of examining larger sample sizes over longer periods of time than those found in most prospective studies, the type of data available is oftentimes limited (English, Brandford, & Coghlan, 2000). This is necessarily the case, even when investigators make the extra effort to expand the sources of administrative data beyond Child Welfare Agencies (see Drake et al., 2006), since the perspective and characteristics of the children and caregivers are not considered.

The few studies that did obtain foster parent or child reports (e.g., Dozier & Lindhiem, 2006; Leathers, 2006) typically collect individual data at a single point in time and follow the targeted children to see if they remain with the same caregiver (utilizing administrative records or direct observation). In a unique study by Fisher and colleagues (2005), differential stability of permanent placements (reunification, relative, and non-relative adoption) following exposure to an intervention was examined over 24 months with a variety of child and parent measures obtained at 3-month intervals. While providing additional information about the individuals and contextual factors, the authors of this study recognized the limitations of small sample size and the lack of power to examine variables of potential interest.

Despite these conceptual and methodological limitations, the results of prior work suggest that predictors of permanent placement stability likely operate at multiple levels of a child's environment (Kimberlin, Anthony, & Austin, 2009). Thus, an ecological approach is needed, one that considers factors at the levels of neighborhood/community, caregiving environment, caregiver, and child (see Drake et al., 2006; Fisher et al., 2005; Hindley et al., 2006; Kimberlin et al., 2009).

Examination of a large number of predictors at different levels of children's environments can be statistically impractical, especially when prior research has not narrowed the scope of potential predictors. In predicting permanent placement stability as a binary outcome, discriminant function analysis or logistic regression analysis represent reasonable strategies. However, they are impractical when 1) the potential number of predictor variables is quite large, 2) the distributions of these variables are non-normal, and 3) there are few cues regarding which variables are essential (e.g., which are likely candidates for non-linear relationships, and which combinations might be selected for interaction terms).

The purpose of the present study was to identify, from a large initial set of variables, those that best predict the stability of permanent placement between the ages of 6 and 8 for children in a number of different living situations (e.g., reunification, adoption, foster care/guardianship with relatives and non-relatives). To do so, we chose a data mining approach known as classification and regression tree (CART) analysis (Breiman, Friedman, Olshen, & Stone, 1984).

CART analysis and related approaches have long been used in the areas of medical and marketing decision-making research, and have gained increasing popularity within the human services field, including child welfare and mental health (Alegria et al., 2004; Dean et al., 2009; Frisman, Prendergast, Lin, Rodis, & Greenwell, 2008; Johnson, Brown, & Wells, 2002; Kerby, 2003; Kriston, Berner, Ruf, Mundle, & Härter, 2008; Mann et al., 2008; Montoya, 2008; Müller, Weijers, Böning, & Wiesbeck, 2008; Neuner, Schmid, Wolfersdorf,

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& Spiessl, 2008; Seroczynski, Cole, & Maxwell, 1997; Sledjeski et al., 2008; Stice, Presnell, & Spangler, 2002; Swan, Jack, Javitz, McAfee, & McClure, 2008).

CART belongs to a family of decision tree methodologies sometimes referred to as recursive partitioning methods. It is a non-parametric technique that can select from among a large set of categorical and continuous variables, regardless of their distributional characteristics, those that individually, or in combination, best predict the outcome variable of interest. Because collinearity does not affect CART analysis, multiple variables of similar constructs may be included in order to determine which emerges as the most efficient predictor. This approach is particularly useful because of its high predictive accuracy and its ability to delineate clear cutpoints for identifying high- and low-risk groups (Strobl, Malley, & Tutz, 2009). In a recent parallel analysis, CART demonstrated greater sensitivity and parsimony than logistic regression methods in the prediction of maltreatment recurrence (Sledjeski et al., 2008).

The current study examines caregiver stability between ages 6 and 8 in a sample of children who were placed in out-of-home care before the age of 3.5 years and who by age 6 were living in a number of different permanent placements (e.g., reunification, adoption, and long-term foster care/guardianship with relatives or non-relatives). Because of limited extant research, this first attempt to identify predictors of stability across the full range of permanent placements should be considered exploratory. Therefore, a broad net was cast when identifying potential predictor variables (Table 1). Following an ecological framework (see Fisher et al., 2005), we included four classes of potential predictor variables, all of which were assessed when children were 6 years old: neighborhood/community characteristics, caregiving environment, caregiver characteristics, and child characteristics.

Method

Sample and procedures

Participants (n = 285; 46.3% boys) were drawn from the Southwestern site of the Longitudinal Studies of Child Abuse and Neglect (LONGSCAN) consortium (Runyan et al., 1998). All children at this site (n = 330) were placed in out-of-home care by the age of 3 1/2 years as a result of substantiated maltreatment during an 18-month period (May 1990 through October 1991), and remained in out-of-home foster care for at least 5 months. The analyses reported here were limited to participants with completed interviews at age 6 (n = 299) and who were living with an individual caregiver (3 participants who were living in group facilities were excluded) and for whom we knew caregiver status between age 6 and 8 (285 LONGSCAN children remained in the sample). The sample was diverse with regard to race/ethnicity (29% White, 38% African American, 17% Hispanic, 17% Mixed or Other).

Data for the present study were collected through face-to-face interviews with children and their caregivers (including biological, adopted, and foster/guardian caregivers) at ages 6 and 8 and CPS chart abstraction and administrative database review. All predictor variables were based on data collected at age 6. At age 8, only caregiver status was used for the present study (to create the outcome variable, caregiver stability/instability in permanent placements).

Measures

Caregiver stability/instability in permanent placements

Because all children in the present study had been removed from their homes when they were less than 3.5 years of age due to substantiated maltreatment, a state-mandated permanency plan should have been in place for these children by age 6. Caregiver stability

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was defined as a change in primary caregiver between the ages of 6 and 8 years of age, based on CPS chart abstraction and administrative databases and confirmed during caregiver interviews. Fourteen percent of the children (n = 40) changed caregivers between ages 6 and 8, and 86% (n = 245) remained in a stable placement.

Neighborhood environment

Neighborhood quality—Caregivers completed the Neighborhood Risk Assessment (Hunter et al., 2003), a measure designed to assess potential neighborhood risk factors for family stress or child maltreatment. Items were chosen based on the work of Garbarino and Sherman (1980) and an earlier measure developed at the LONGSCAN Eastern study site, and were rated on a 5-point scale from 1 (never true) to 5 (always true). The measure contains 4 subscales reflecting neighborhood quality: tangible support from neighbors, child-friendliness, safety, and attachment to the neighborhood (α's ranging from, .73 to .86) as well as a total sum of the 25 items comprising the 4 subscales, which indicates overall neighborhood quality.

Interviewer's perception of neighborhood safety—Interviewers rated their perception of the safety of the child's neighborhood (Hunter et al., 2003). High scores represent positive ratings; the range of scores is from 1 to 5.

Caregiving environment

Caregiver's social support—Caregivers completed a version of the Duke-UNC Functional Social Support Scale (Broadhead, Gehlbach, de Gruy, & Kaplan, 1988) that was modified by LONGSCAN investigators (Hunter et al., 2003). The measure has 3 subscales: Confidant Support, Affective Support, and Instrumental Support. Item responses are on a 5-point scale ranging from 1 (much less than I would like) to 5 (as much as I would like). The 10 items from these subscales were summed to produce the index of social support used here. There is substantial evidence for the reliability and validity of this scale (Broadhead et al., 1988; Hunter et al., 2003), α= .88 in current study.

Domestic violence exposure—Children completed “Things I've Seen and Heard” (Richters & Martinez, 1992), a measure that assesses exposure to violence. Prior work with LONGSCAN samples suggests that the measure distinguishes well between domestic and community violence exposure (Thompson et al., 2007). Item responses range from 0 (never) to 4 (many times). Two individual items were used in the present study: *heard grownups in home yell at each other,* and *seen grownups in home hit each other*.

Permanent placement type—Placement information and reunification status were obtained from CPS chart abstraction and administrative databases review, and confirmed by the child and caregiver at subsequent interviews. Children were classified into 1 of 4 categories for age 6: reunified, adopted, long-term foster care/guardianship with relatives, or long-term foster care/guardianship with non-relatives.

Harsh parenting—Caregivers completed the psychological aggression and minor assault subscales of the Parent-to-Child Conflict Tactics Scale (CTS-PC; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). The validity of this measure as a measure of violent and nonviolent ways of dealing with conflict is well established. For the current study, the 9 items from these scales were summed into a single index of harsh parenting.

Positive family characteristics—Caregivers responded to the Self-Report Family Inventory (Beavers, Hampson, & Hulgus, 1990), which assesses an individual's perception of his/her family's functioning. Items are on a 5-point scale ranging from 1 (fits our

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household very well) to 5 (doesn't fit our household at all). For the present study, the 5 subscales were scored in a direction such that higher scores indicate the presence of each scale construct: Family Health/Competence (19 items), Conflict (12 items), Cohesion (5 items), Expressiveness (5 items), and Directive Leadership (3 items).

Per-person household income—Income data were collected in a grouped format for each household (Hunter et al., 2003). The categories began with “Under $5,000” and rose in increments of $5,000, ending in “$50,000 or more.” Income was adjusted based on household composition by dividing income by the number of people in the household using the mid-points of the income range categories.

Negative family events—Caregivers completed the Child Life Events Scale (Hunter et al., 2003), based on Coddington's (1972) Life Event Records. Respondents indicated whether each event occurred in the past year. Three scales of family problems constructed by Lau, Litrownik, Newton and Landsverk (2003) were used in this study: the 10-item Family Harm scale (events such as illnesses, accidents, being victim or witness of crimes), 5-item Family Dysfunction scale (e.g., separations, divorces, family members going to jail), and 5-item Family Instability scale (e.g., family evicted, people moving in and out); items related to change in caregiver were dropped as these overlap with the dependent variable.

Interviewer's positive perception of home environment—Interviewers provided ratings of the home environment in terms of child-centered enrichment (5 yes/no items) and overall home environment (4 items on a 1-to-5 scale; Hunter, et al., 2003). High scores for each of these variables represent positive ratings.

Caregiver characteristics

Caregiver depression—Caregiver depression was measured using the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a 20-item self-report questionnaire of depressive symptomatology in the past week reflecting 6 major dimensions of depression: Depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disturbance. Responses to items such as “I was bothered by things that usually don't bother me” and “I felt people disliked me” were made on a 4-point scale from 0 (rarely or none of the time) to 3 (most or all of the time), resulting in a range of scores between 0-60. The CES-D has been shown to be a reliable measure for assessing the number, types, and duration of depressive symptoms across racial, gender, and age categories (Knight, Williams, McGee, & Olaman, 1997; Radloff, 1977).

Father figure involvement scale—The Father Figure Involvement Scale (Hunter et al., 2003) is a LONGSCAN developed 6-item measure designed to obtain the primary caregiver's perception of the extent and quality of a father figure's involvement with the child. The first 2 items identify if there is a father figure in the child's life, and if there is, the exact relationship of the father figure to the subject child. The next 4 items ask caregivers to rate the nature and extent of the father figure's involvement in terms of companionship, emotional support, physical care, and financial support on a 4-point scale ranging from 0 (none) to 3 (a lot). The resulting continuous father involvement score ranged from 0 (no father figure, or father figure who was not at all involved) to 12 (father figure who was maximally involved).

Demographics—Caregiver's ethnicity and employment status were obtained via self report.

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Interviewer's positive perception of caregiver—Interviewers provided ratings of caregiver's neatness, restedness, cooperativeness, truthfulness, openness, and comprehension (Hunter et al., 2003). High scores represent positive ratings; the range of scores is from 1 to 5, and the summary variable is a mean of the 6 items.

Child characteristics

Internalizing and externalizing behaviors—Caregivers reported the frequency of 113 child behavior problems during the prior 6 months using the Child Behavior Checklist (CBCL/ages 4-18; Achenbach, 1991), using a 3-point Likert scale (0 = not true, 1 = sometimes true, 2 = often true). The CBCL is an empirically validated measure of child and adolescent behavior problems with acceptable reliability and validity (Achenbach, 1991). T scores on CBCL broadband scales (internalizing and externalizing) were used in analyses.

Child cognitive ability—Children completed the Wechsler Preschool and Primary Scale of Intelligence -Revised (WPPSI-R): Short Form Vocabulary and Block Design (Wechsler, 1989). The purpose of this instrument is to briefly assess the general intellectual functioning of children aged 3 to 7 years and 3 months. LONGSCAN chose to use a 2-subtest short form because of time constraints. The Vocabulary and Block Design combination is 1 of the recommended dyads that can be used for screening purposes. Vocabulary measures language development, learning ability, and fund of information, and is an excellent measure of general intelligence (Sattler, 1992). Block design measures visual-motor coordination and perceptual organization, and is considered the best measure of general intelligence from among the Performance Scale subtests (Sattler, 1992). For each subtest, scaled scores were entered into the analysis.

Child health assessment—The LONGSCAN-developed Child Health Form (Hunter et al., 2003) consists of 3 items inquiring about general health, any diseases or conditions the child might have, and any other illness or condition not contained in the list of specific conditions. Item 2 contained 8 conditions, each scored separately as present or not present. Four separate indexes of physical, emotional, cognitive, and communication problems were constructed by summing the items within those categories.

Interviewer's positive perception of child—Interviewers provided ratings of the child's appearance (3 items), and how well the child understood directions and remained on task during the interview (2 items). High scores represent positive ratings; the range of scores is from 1 to 5, and the summary variable is a mean of the 5 items (Hunter et al., 2003).

Ethnicity—Child ethnicity was obtained via caregiver report.

Analytic plan

CART uses binary recursive partitioning to identify the most efficient predictors for splitting the study sample into successively smaller and “purer” high- and low- risk groups (Breiman et al., 1984). Predictor variables can be any combination of categorical or continuous variables. In the present study, the outcome variable was a dichotomous indicator of caregiver stability or instability in each child's permanent placement between ages 6 and 8 years. A total of 45 predictor variables from 4 domains (neighborhood/community characteristics, caregiving environment, caregiver characteristics, and child characteristics) were entered into the CART analysis.

For the first split of what is termed the parent node (containing the entire sample), CART selects the predictor that best splits the sample into high- and low-risk groups for the

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outcome variable, as well as the separation (for categorical predictors) or cutpoint (for continuous predictors) that best discriminates the two groups. For each successive split of what are termed child nodes, CART repeats this process. Results are typically displayed in an inverted tree shaped diagram referred to as a *classification tree*. In general terms, the split at each node will be found that will generate the greatest improvement in predictive accuracy. When greater purity, or predictive accuracy, cannot be obtained by further splits, CART stops splitting and produces terminal nodes.

In addition to primary predictors (known as *splitters*), CART analyses identify other types of potentially useful predictor variables known as *surrogates* and *competitors*. Surrogates create splits that are similar to those produced by the primary predictors; they are substituted for the primary predictors in the case of missing data. Competitors are variables that might purify nodes at almost the level of the selected primary predictors, but are not entered into the model because the selected variables were at least slightly stronger. Thus a CART approach has the advantage of not only identifying the most efficient predictors, but also other potentially important predictors.

The CART software allows several methods of cross-validation to provide a realistic estimate of the sample-specific effects in the tree. The method used in the present study is one that derives the main model from the whole sample (the *learning sample*), but generates predictive stability rates on test samples of successive withholdings of one-tenth segments of the sample. Ultimately 10 trees are generated on different sets of 9/10 of the sample, and are the basis of reported accuracy rates for the test sample that can be compared to those from the learning sample.

Results

Primary predictors and corresponding splits

The optimal classification tree produced by CART analyses, presented in Figure 1, consisted of 6 forks and 7 terminal notes. The parent node indicates that in the overall sample of 285 children, 14% experienced caregiver instability in their permanent placement between ages 6 and 8 years. The first predictor that emerged was child's placement status at age 6. This predictor distinguished children who were adopted by age 6 from those who were in some other type of placement (i.e., reunification, long-term foster care/guardianship with relatives or non-relatives). Of 87 children who were adopted, only 2 children (2.3%) changed caregivers between ages 6 and 8.

Of the children who were not adopted by age 6 (n = 198), 19.2% experienced instability in their permanent placement. However, this rate was substantially reduced by the presence of a highly involved father figure. Among children who were not adopted but whose father figure received the highest possible involvement score of 12 (range=0-12), none experienced instability in their permanent placement (n = 25, Terminal Node). Of those whose father figure received a lower involvement score, 22.0% experienced instability (n = 173).

For children who were neither adopted nor had a highly involved father, the instability rate was reduced from 22.0% to 14.4% by being in a family with lower expressiveness (scores less than 3.9, range=1-5; n = 125). In contrast, the instability rate increased from 22.0% to 41.7% for children with greater family expressiveness (n = 48, Terminal Node).

Among those with lower family expressiveness scores, the caregiver instability rate was reduced from 14.4% to 0% if the child's WPSSI Block Design scaled score was over 9.5 (where 9 is the normative mean; n = 29, Terminal Node). On the other hand, those with

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lower scores experienced an increased chance of instability, going from 14.4% to 18.8% (n = 96).

For children who were not adopted, didn't have extremely involved father figures, had lower expressiveness in their families, and had WPPSI scores lower than 9.5, the caregiver instability rate was reduced from 18.8% to 3.7% if the interviewer rated the respondent greater than 3.1 on a scale of 1 to 5 based on cooperation, openness, truthfulness, and appearance (n = 27, Terminal Node). In contrast, the instability rate increased from 18.8% to 26.6% for children whose caregivers received lower interviewer ratings (n = 69). The final predictor for those with lower interviewer ratings was the externalizing score from the CBCL. Those who had standardized scores above 57.5 had a 41.2% chance of changing caregivers (n = 34, Terminal Node), compared to 8.6% among those who had lower externalizing scores (n = 35, Terminal Node). This T-Score point is a little over half a standard deviation below the clinical cutpoint of 63 for the externalizing scale, and .75 standard deviation above the normative mean.

Description of terminal nodes

Another way to think of the tree results is to describe the composition of the terminal nodes with very high or very low instability rates. There are seven terminal nodes in this tree. The first terminal node contained all 87 adopted children. They have the very low instability rate of 2.3% compared to an overall rate of 14%.

Another low-instability terminal node contains children who were not adopted, had fathers who were not extremely involved, had lower expressiveness in their families, and had higher WPPSI Block Design scale scores (greater than 9.5). This group of 29 experienced an instability rate of 0.

A final low-instability terminal node of 27 consists of children who were not adopted, didn't have extremely involved father figures, had low family expressiveness, scored less than 9.5 on the WPPSI Block Design, but had caregivers that were rated very highly by the interviewer (over 3.1 on a 1-4 scale). This combination resulted in a 3.7% instability rate.

There were 2 terminal nodes with very high instability rates. One contained 48 children who were not adopted, didn't have highly involved father figures, and had highly expressive families (41.7% instability).

A very similar instability rate (41.2%) was experienced by children in the terminal node who were not adopted, didn't have highly involved father figures, lived in families with fairly low expressiveness scores, had WPPSI Block Design scaled scores less than 9.5, didn't have caregivers with very high ratings, and who had externalizing scores of 58 or higher. This terminal node contains 34 children.

Importance weights, competitor variables, and cross-validation analysis

Table 2 shows the importance weights for predictor and surrogate variables with weights of at least 10 (i.e., the most important predictor receives a weight of 100, so those variables whose relative predictive power is one-tenth or more than that of the most predictive variable in the model were included). The variables in the model as primary predictors encompass 3 of the 4 levels of the ecological model: caregiving environment (Placement Type, and Family Expressiveness), caregiver characteristics (Father Figure Involvement and Interviewer Ratings of Respondent), and child characteristics (WPPSI and CBCL Externalizing Behavior).

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Because the current study is exploratory, we also list the surrogate and competitor variables that could enter future models based on different populations. Knowing that these variables remain potential predictors could be helpful to future researchers in planning similar studies. These variables are shown in Table 3.

Based on the learning sample (the actual study sample), the tree accurately classified 85% of children experiencing instability in the covered time period and 80% of children experiencing stability. Cross-validation analyses with test samples indicated reasonable validity (Breiman et al., 1984; Strobl et al., 2009), albeit with somewhat lower accuracy rates (accurately classifying 69% of children experiencing instability and 60% of those experiencing stability).

Discussion

The present study examined predictors of caregiver stability and instability following permanent placement for children who had been removed from their homes because of maltreatment when they were less than 3.5 years of age. The results can be summarized as follows: (1) 1 out of 7, or 14% of the 285 children experienced caregiver instability in their permanent placement between the ages of 6 and 8, (2) the best predictor of caregiver stability over this period of time was whether the child had been placed in adoptive care, (3) though there was no evidence of differential stability for children who were reunified versus living with relatives or non-relatives (i.e., long-term foster care or guardianship), other contextual factors (e.g., father involvement, expressiveness within the family), and child characteristics (e.g., intellectual functioning, externalizing problem behaviors) did appear to be associated with permanence for children who were not adopted, and (4) the CART analytic strategy was useful in helping to identify potentially important factors from amongst a number that may be critical when trying to promote permanence.

The percentage of children in the current study who experienced caregiver (or permanent placement) instability (14% for the whole sample, 19% for children who were not adopted) is somewhat lower than the proportions reported in previous studies of placement stability. For example, Webster and colleagues (2000) found that 51.7% of foster children in long-term non-kin placements and 29.4% of those in kinship care experienced instability (i.e., at least 3 moves) over an 8 year period in California, while Connell and colleagues (2006) reported that approximately half of all children who entered out-of-home care in Rhode Island during a 5 year period changed placement at least once. Fisher and colleagues (2005) reported a 22% failure rate for 54 3- to 6-year olds who were followed for a maximum of 2 years from the time they were reunified or adopted. When attempting to put the present findings into context it is important to recognize that studies have used different samples (e.g., ages, regional systems), starting points (entry into foster care, at the time of reunification or adoption, and 3-6 years following entry into foster care), follow-up periods (5- and 8-year windows, follow-up of assumed permanent placements for 2 years), and definitions of stability and instability. In addition, all permanent placement options (i.e., reunification, adoption, long-term foster care/guardianship with relatives or non-relatives) are considered in the current study, while other studies, except for Fisher et al. (2005), examined stability within a single type of permanent placement (e.g., reunified only, adopted only).

A number of factors that could potentially influence caregiver stability have been identified in studies examining short- and long-term foster care disruptions, adoption failures, and re-entry and re-reports for reunified children. Our longitudinal sample provided data from multiple sources (child, caregiver) on many of these factors. The current study identified potentially important predictors (e.g., risk and protective factors) of caregiver stability or

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long-term permanence. Specifically, those children who were in adoptive settings were more likely to have a stable caregiver than those children who were in one of the other permanent settings (reunified, relative, and non-relative foster care or guardianship).

Finding adoption to be related to caregiver stability is not surprising. It confirms the appropriateness of policy and practice that encourages adoption as the most desired permanent placement if reunification is not possible. What is surprising is the failure to find that placement type subsequently predicted caregiver stability in the children who were in the remaining group of reunification, long-term foster care/guardianship with relatives or non-relatives. Though previous studies have not examined all three of these groups simultaneously, there is some suggestion that relative placements are more stable (Testa, 2001; Webster et al., 2000).

In fact, subsequent splits suggest that there are a number of other factors that are likely to facilitate caregiver stability (e.g., involved father figure, high functioning primary caregiver, child having above average intelligence) or serve as risks for instability (e.g., families that are highly expressive, children with more externalizing problem behaviors). All of these predictors interact with placement setting. That is, they are used to differentiate outcomes within the group of children who are reunified or in guardianship/long-term foster care with relatives and non-relatives.

The most important predictor for this remaining group of children was reported father figure involvement by the primary caregiver. Children who were not adopted but had a highly involved father figure (i.e., the primary caregiver rated them as maximally involved on each of the 4 dimensions) all experienced stability of their primary caregiver over the 2-year period.

This finding is particularly interesting in the context of prior findings by Perloff and Buckner, (1996) which suggested that 1) there is a substantial discrepancy between mother and child reports of the presence of the father in their lives, 2) it is important to consider the child's perspective even when the father is minimally involved, and 3) there is a declining involvement of fathers over the years of the child's life, with almost half being involved before age 6 and about a third after that. The implication here is that who does the reporting makes a difference, and that part of the context in which to assess father impact includes the age of the child. Our findings fall into the later age range of the Perloff and Buckner (1996) study, possibly implying that the father influence is less at this age than it might have been at earlier ages. Nevertheless, we do see a substantial impact on caregiver stability even at this later age, and the fact that it is the caregiver reporting involvement could suggest that it is the caregiver's perception of help or support from a father figure that is critical in determining whether a primary caregiver will continue to serve in that role.

In summarizing recent research on father figure involvement, Marsiglio and colleagues (2000) pointed out a growing recognition of the need to view father-child relationships in the context of mutually interdependent family relationships, the reciprocal father-child interaction, and the social ecologies fathers and their children share. The current findings suggest, together with those summarized by Marsiglio and colleagues (2000), that future efforts to examine the relationship between father figure involvement and caregiver stability in long-term placements need to consider multiple potential moderators. Some of these potentially important moderators are identified in the current study. For example, characteristics of the child (intellectual functioning) and caregiver (overall rating of functioning) can serve a protective function increasing the likelihood of caregiver stability, while other family (expressiveness) and child (externalizing problem behaviors) characteristics can result in the child being more vulnerable to a change in caregiver. It is

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possible that expressiveness may bring attention to areas where conflicts exist within the family, while the latter finding is consistent with prior reports (Newton et al., 2000), and confirms the importance of efforts directed at developing more prosocial behaviors in foster children as they prepare for a permanent placement (Chamberlain et al., 2006; Fisher et al., 2005). It is also interesting to note that some of the same child, caregiver, and family protective/vulnerability factors identified as potentially important for the outcome of caregiver stability have also been related to mental and physical health outcomes in at-risk children and youth (Luthar, 2006).

Though the present study had the advantage of utilizing prospective data obtained from multiple sources, examined caregiver stability in a variety of permanent placements, and applied an analytic strategy that can (a) handle large numbers of predictors without losing power, (b) accommodate missing data, and (c) examine complex interactions, limitations should be noted. While the regression tree analysis identified factors and circumstances that were related to a change of caregiver in this study sample, it did not inform about the reason(s) for such change or whether the change was likely to become a positive or negative influence upon the child's life. As a result, the findings reported in the current study may be limited in terms of their external validity, or applicability to samples other than the one studied. It is the case that the cohort of children studied entered out-of-home care at a young age (< 3.5 years) and thus the resultant number who were adopted (almost a third) is relatively high in relationship to studies examining the entire age range of children entering foster care (F. Wulczyn, Barth, Yuan, Harden, & Landsverk, 2005).

In addition, it is also possible that the findings are specific to the cohort of children who were removed from their home and placed in out-of-home care within this jurisdiction, for instance, specific region of the country, and specific Child Protective Agency.

It is also worth noting some methodological limitations of CART. First, the method is purely descriptive and non-probabilistic; thus, the typical tests of significance or confidence intervals accompanying more commonly used parametric techniques are absent. Second, the technique may “over fit” the data. The software we utilized attempts to address this weakness by drawing successive samples from the data and reassessing the overall fit which was found to be reasonable. Third, large samples are desirable as these are likely to result in more reliable and consistent splits of the data.

Three other cautions need to be noted when interpreting the findings. First, it was assumed that since all of the children had entered substitute care prior to 3.5 years of age, by age 6, or at a minimum of 2.5 years later, they all should have been in a permanent placement. We did not review official records to insure that this was the case, but would still argue that in practice, these children should have found themselves with a stable caregiver for a 2-year period after having entered substitute care at least 2.5 years previously. Second, the variable of father-figure involvement shows itself to be important in stability, and it is important to be reminded that this was measured from the primary caregiver's perspective which may have assessed a different construct (e.g., support for the primary caregiver) than would have been obtained from the children directly (Perloff & Buckner, 1996). Finally, we do note that caregiver stability was only sampled over a 2-year period. While it is possible that this sample may not represent the actual experiences of children who have multiple primary caregivers during the entire interval, we would suggest that the sample and design are sensitive enough to yield meaningful results.

Even with these cautions and potential limitations, the current study and its findings are informative. Evidence that one in seven young children who have been removed from their home continue to experience changes in their primary caregiver when they should be in a

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stable caregiving environment suggests that our policies and practices are at best, not optimal, and at worst, not working as intended. While it appears that children who are placed in adoptive settings are more likely to experience caregiver stability, the increasing numbers of children who are now being adopted along with the possible lowering of standards or relaxation of selection criteria may be a harbinger of more disrupted adoptions (Fox & Berrick, 2007; F. H. Wulczyn, Chen, & Hislop, 2006).

The current findings suggest that there are a number of factors beyond placement type that should be considered in attempts to both further understand what predicts caregiver stability, as well as find stable permanent placements for children who have entered foster care. These include involvement of a father figure, family functioning, and child functioning (cognitive and problem behavior). In terms of policy and practice, it is clear that adoption is a desired permanent placement in terms of stability, but other options need not be assumed to lead to instability. In fact, with attention to providing biological parents, relative and non-relative caregivers with support and resources (e.g., emotional, financial, and optimizing father involvement or providing a stable adult figure) the likelihood that a child would have a stable caregiver might be increased. Finally, the results of this exploratory analysis suggest that a number of additional predictors at multiple levels of children's environments deserve future attention, both individually and in combination.

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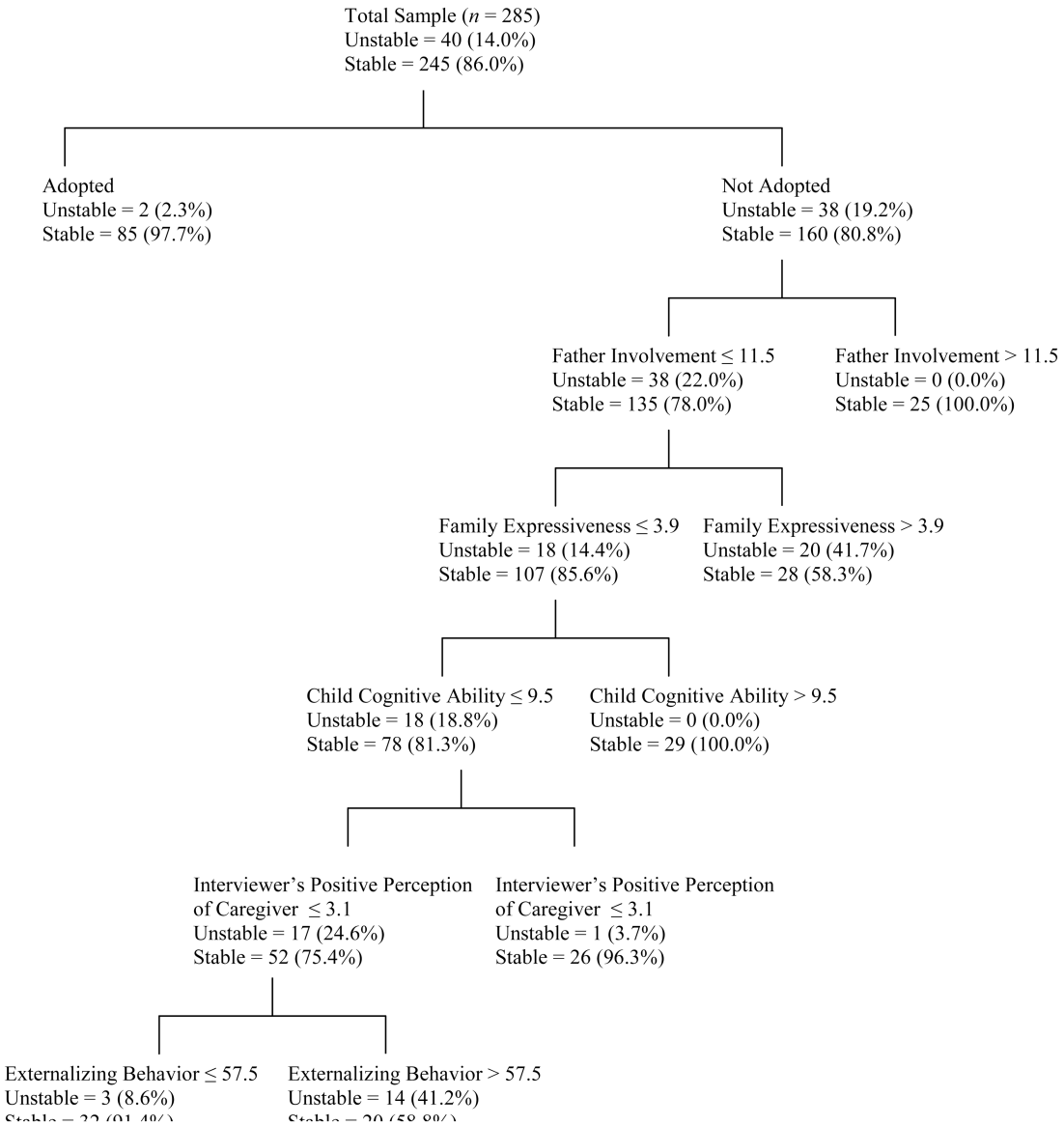

Figure 1. Classification Tree Predicting Caregiver Stability in Permanent Placements

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Table 1
Predictor Variables Entered into CART Analysis

Neighborhood/Community
Overall neighborhood quality
Neighborhood safety
Attachment to neighborhood
Child friendliness of neighborhood
Tangible support from neighbors
Interviewer positive perception of neighborhood quality
Caregiving Environment
Caregiver's social support
Heard grownups in home yell at each other
Seen grownups in home hit each other
Permanent placement type (adopted, reunified, relative, nonrelative)
Harsh parenting
Family cohesion
Family conflict
Family health/competence
Family leadership
Family expressiveness
Annual household income per person
Family instability
Family harm
Family dysfunction
Interviewer positive perception of enrichment
Interviewer positive perception of home environment
Caregiver Characteristics
Depression
Father figure involvement
Ethnicity
Employment status
Interviewer positive perception of caregiver
Child Characteristics
Internalizing behavior
Cognitive health problem
Communication-related health problem
Emotional health problem
Physical health problem
Ethnicity
Interviewer positive perception of child
WPPSI Block Design

WPPSI Vocabulary

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Table 2
Importance Weights of Predictor and Surrogate Variables

Domain	Predictor	Importance Weight
Variables Appearing as Predictors		
Caregiving Environment	Placement type	100.00
Caregiver Characteristics	Father figure involvement	60.93
Child Characteristics	WPPSI Block Design	52.47
Caregiving Environment	Family expressiveness	47.00
Child Characteristics	Externalizing behavior	40.00
Caregiver Characteristics	Interviewer rating of respondent	35.60
Variables Appearing Only as Surrogates		
Neighborhood/Community	Overall neighborhood quality	32.75
Child Characteristics	WPPSI Vocabulary	31.62
Caregiver Characteristics	Depression	18.08
Caregiving Environment	Social support	17.13
Caregiving Environment	Family health/competence	15.81

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Table 3
Competitor Variables that May Also be Important as Predictor Variables

Source	Variable
Caregiving Environment	Family dysfunction
Neighborhood/Community	Neighborhood safety
Caregiving Environment	Family harm
Child Characteristics	Interviewer rating of child
Caregiving Environment	Family cohesion
Caregiving Environment	Family dysfunction
Caregiving Environment	Interviewer rating of home condition