Predicting re-involvement for children adopted out of a public child welfare system☆

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ABSTRACT

Some of the approximately 400,000 children currently placed out-of-home in a public child welfare system will not reunify with their family of origin. They may instead be adopted into a new family. Adoption placements can be characterized by poor adjustment for children; some such placements even result in disruption or dissolution. We conducted a stratified Cox regression of 4,016 children from the Colorado public child welfare system. All of the children had a finalized adoption during the years 2002 through 2006. The two outcomes analyzed were new child protection and youth-in-conflict referrals and assessments for these previously adopted children. New child welfare referrals and assessments may be early indicators of poor adjustment for adopted children within the adoptive family. Study results indicate that older children and Hispanic children had higher rates of referral and assessment. Children with a pre-adoption history including longer time out-of-home or a larger number of out-of-home placements also experienced higher referral and assessment rates. Additional factors which predicted subsequent system re-involvement included presence of paid adoption assistance, adoption by a non-relative foster parent and younger adoptive parent age. Several study results were moderated by the presence or absence of an ethnic match between the child and the adoptive parents. We provide an overview of the statistical model used for analysis and we discuss implications of the study results for child welfare practice.

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Introduction

Adoption Outcomes

Many of the over 400,000 children currently living in out-of-home placements in the U.S. (e.g. foster care, kin care or institutional care) will likely achieve reunification with their family of origin at some point in time. However, a significant number of these children will not be able to safely reunify and may instead be adopted into a new family. Several recent studies have begun to explore the connections between placement stability and/or adoption and positive developmental outcomes. Children with a shorter time to establishing placement stability had significantly better behavioral outcomes when observed after 18 months than did children who took longer to achieve stability (Rubin, O'Reilly, Luan, & Localio, 2007). Similarly, a study using the National Survey of Child and Adolescent Well-Being examined developmental outcomes

at time of school entry for children who entered foster care as infants (Lloyd & Barth, 2011). Researchers compared adopted children and those in foster care. Children in adoptive placements displayed better social competence, better language skills and better reading skills than a comparison group of children who remained in foster care. A recent Swedish study noted that children who grew up in foster care showed poorer outcomes on several measures than did adopted children or peers from the general population (Vinnerljung & Hjern, 2011). These measures included school performance and educational achievement, cognitive competence and self-support capability for the young adult years. In addition to positive developmental outcomes, successful adoptions generate a substantial cost savings to the public when compared with the cost of long-term foster care. Barth, Lee, Wildfire, and Guo (2006) estimated this cost savings at anywhere between $4,000 and $127,000 per child (based on single-state data). Johnson sums up the case for adoption by noting: ". . .data collected over the past three decades continue to support adoption as a superior means of promoting normal development in children permanently separated from birth parents" (Johnson, 2002, p. 40).

Adoption Adjustment, Disruption and Dissolution

Even after a child's successful placement for adoption, however, such placement could be characterized by poor adjustment or could even be disrupted (before legal finalization) or dissolved (after legal finalization). Estimates regarding the rate of disruption range from 10% to 25%; estimates regarding the rate of dissolution range from 1% to 5% (Child Welfare Information Gateway, 2012). Adoptions which disrupt or dissolve leave children once again at risk of involvement with the child welfare system and at risk for a somewhat uncertain future.

Adoption Adjustment. Researchers have studied placement stability or adoption adjustment as a precursor of problems that could later lead to disruption or dissolution. Quinton, Rushton, Dance, and Mayes (1998) explored correlates of placement stability in a sample of children in the United Kingdom. They found that lower stability was related to placement of a single child (without siblings), placement into an established family, rejection by birth parents (e.g. where other birth siblings remained in the birth home but one child was removed), a child's emotional or behavioral problems and lower parental responsiveness. McDonald, Propp, and Murphy (2001) studied a composite measure of adoption adjustment (based on parents' responses) in a small one-state sample. They found several characteristics associated with positive adoption adjustment: having fewer special needs, the responding caregiver being married, living in a less rural area, and the presence of other adopted children in the home. However, an increase in the *total* number of children was associated with poorer adoption adjustment, as was greater family income. Finally, the work of Goldman and Ryan (2011) suggests studying externalizing behaviors as a measure of adoption adjustment. They found that several risk factors were associated with increased difficult-to-manage externalizing behaviors as measured by the Child Behavior Checklist (Achenbach & Rescorla, 2001), including prenatal alcohol, tobacco or other drug exposure, being male, prior sexual abuse and multiple out-of-home placements. The authors note that such externalizing behavior has been associated with adoption disruption (Barth, Berry, Yoshikami, Goodfield, & Carson, 1988; Berry & Barth, 1989; Rosenthal, Schmidt, & Conner, 1988; Smith & Howard, 1991, 1999).

Adoption Disruption and Dissolution. Work by Festinger and Maza (2009) using the Adoption and Foster Care Analysis and Reporting System (AFCARS) showed how difficult it is to pinpoint the number of dissolved adoptions. AFCARS data were ambiguous for more than half of the children in a national sample who exited foster care in 2005 and who were classified as previously adopted. For the children with consistent data, about half of these appeared to have experienced a dissolved adoption (although some of these previously adopted children may not have been adopted through the public child welfare system). The authors note that to truly estimate the rate of adoption dissolution, a longitudinal data set is required. Nevertheless, if anywhere close to half of the previously adopted children exiting foster care in a given year were indeed experiencing a dissolved adoption, there is a substantial need to understand the characteristics of these adopted children who re-engage the child welfare system. Prior research on factors influencing adoption disruptions and dissolutions is somewhat scarce and, to date, no published national studies have been conducted in this area (Child Welfare Information Gateway, 2012). However, a few studies shed light on possible factors associated with disruption. These factors can be grouped loosely into six categories: demographics, child characteristics, child history, parent characteristics, placement characteristics and agency characteristics.

Considering demographic factors, male children and older children appear to be at higher risk of disruption (Coakley & Berrick, 2008; Smith, Howard, Garnier, & Ryan, 2006). Smith et al. (2006) also concluded that disruptions were less likely for Caucasian children, but Coakley and Berrick's (2008) review showed mixed results when race was considered as a possible factor related to adoption disruption. Several child characteristics relate to disruption. Barth et al. (1988) found that disruptions were significantly more likely for children with behavioral problems than for those without. Smith and Howard (1991) found that several specific externalizing behaviors were associated with disruptions, including lying, sexual acting out and vandalism. Children with a physical, emotional or behavioral disability were more likely to experience a disruption (Smith et al., 2006). The work of Smith and Howard (1991) suggested that children with a stronger attachment to birth parents may also experience adoption disruption at a higher rate. This could be due to the fact that children in the study who experienced disruption were on average older than those who did not. . .so they would have had more time to bond with and have more memories of birth parents (Coakley & Berrick, 2008). Finally, with regard to a child's history, time in care prior to adoption appears not to be a factor related to later disruption (Coakley & Berrick, 2008). Furthermore, prior residence in a group home or residential care facility was related to lower rates of disruption (Smith et al., 2006). These two results regarding time in care and prior residential care would seem to contradict the conventional wisdom and thus warrant

further study. Nalavany, Ryan, Howard, and Smith (2008) conducted a small study that correlated prior sexual abuse with later moves during foster care and with adoption disruption. However, Smith et al. (2006) found higher hazard of disruption among children who had experienced lack of supervision and neglect as opposed to physical or sexual abuse.

Turning now to the consideration of parent characteristics, research results regarding marriage have been mixed. One study suggested that a longer length of parents' marriages is related to lower rates of disruption (Westhues & Cohen, 1990) while another suggested that status as a single parent was not related to adoption disruption (Berry & Barth, 1990). Mothers with higher levels of education may also have a higher rate of adoption disruption (Berry & Barth, 1990; Rosenthal et al., 1988). Smith and Howard (1991) also suggested that a mother's prior parenting experience may be associated with decreased levels of adoption disruption. With regard to placement characteristics, additional children in the household have been shown to be related to decreased rates of adoption disruption (Rosenthal et al., 1988). Placement with between 1 and 3 siblings was related to a higher rate of disruption while placement with four or more siblings was (perhaps surprisingly) related to lower rates of disruption (Smith et al., 2006). The literature also suggests that foster parent and kin adoptions are less likely to disrupt than are 'stranger' adoptions (Coakley & Berrick, 2008; Rosenthal et al., 1988; Smith et al., 2006). One study compared placements within and outside the Chicago metropolitan area and concluded that placements outside of the metro area were more likely to disrupt (Smith et al., 2006). Finally, concerning agency characteristics, there was a slight but statistically significant relationship between increased caseworker experience (i.e. years on the job) and decreased hazard of disruption (Smith et al., 2006). Smith et al. (2006) also found a decreased hazard of disruption for placement through a private agency as opposed to a public agency.

Despite the literature reviewed above, there remains a need for further research into factors influencing adoption adjustment and adoption disruption and dissolution. Several of the aforementioned studies are more than twenty years old and many rely on one-state samples. And most factors found to correlate with adoption disruption are confirmed by at most two separate studies. In the absence of more complete knowledge about salient factors related to adoption adjustment and adoption disruption, adopted children will continue be at risk for experiencing the consequences of a failed adoption.

Methods

Overview

The present study was commissioned by a group of Colorado county child welfare agencies which sought to better understand the long-term situation of children adopted through public child welfare systems. Representatives from these agencies acted as field advisors to the study. To achieve the study goal, the study examined re-involvement in the child welfare system of previously adopted children. The agency practitioners who advised this study were interested in re-involvement both as an indicator of adoption adjustment and as a possible precursor of dissolution. They understood system re-involvement as an indicator of potential challenges in the adoptive home. Understanding the predictors of re-involvement provides an opportunity for a child welfare agency to design programs which can help facilitate positive adoption adjustment before a child becomes re-involved with the system.

Both post-adoption child welfare referrals and assessments were analyzed, in order to understand the factors which correlated with these early indicators of a challenging situation in an adoptive family. A child welfare referral was defined as an initial call to a county child welfare agency in Colorado for either a concern of child maltreatment or for youth in conflict (i.e. conflict within a family or with the law). A child welfare assessment was defined as a referral where, after initial screening, the country child welfare agency conducted a more in-depth inquiry in to a child's immediate safety and his or her risk for future abuse. Frequencies for both of these outcomes are shown at the top of Table 1. The fact that almost half of the children in the sample were referred back to the child welfare system after adoption finalization and that more than one third were assessed, underscores the importance of understanding predictive factors for these outcomes.

Survival analysis is appropriate for analyzing time-to-event data, such as the time between a finalized adoption and a subsequent referral or assessment. Survival analysis adjusts for different periods of follow-up observation, including possible future referrals or assessments that are not observed because the study period has ended. The following survival analysis explored the relationship between several child and adoptive parent characteristics and post-adoption child welfare system involvement.

Sampling

Data for the study were collected from individual case records entered into Colorado's Statewide Automated Child Welfare Information System (SACWIS). To be included in the survival analysis, a case had to have a finalized adoption between January 1, 2002 and December 31, 2006 in one of nine large Colorado counties. These cases were then observed until either (1) the adopted child's eighteenth birthday or (2) the study censoring date of September 6, 2012, whichever of these dates occurred first. Information available included case characteristics prior to the adoption finalization *and* afterward; therefore pre- and post-finalization records for each child were merged together in the analytic file. These sampling requirements generated a sample of 4,132 cases. However, listwise deletion at the analysis stage (due to missing or invalid values for some variables) resulted in a sample size of 4,016 for both the referral and assessment survival analyses.

Table 1
Distributions of child and family characteristics (*N* = 4,132).

Variable	Percent
Referral outcome	
Child referred to county agency during study	45.3
Child **not** referred to county agency during study	54.7
Assessment outcome	
Child assessed by county agency during study	35.3
Child **not** assessed by county agency during study	64.7
Child age at adoption	
Preschool	51.1
Elementary	36.9
Secondary	12.1
Child ethnicity	
Caucasian	47.3
African American	16.6
Hispanic	34.0
Other	2.1
Ethnic match with adoptive family	
Yes	68.4
No	31.6
Paid assistance	
No	15.8
Yes	84.1
Parent relationship to adoptive child	
Relative	30.6
Foster	57.5
Other	11.9
Adoptive parent age at finalization[a]	
Under 40	37.0
40–50 years	38.3
Over 50	22.9
Missing	1.9
Months out-of-home before adoption finalization	
Less than 18 months	34.2
More than 18 months	65.4
Missing	0.3
Total number of child placements before finalization[a]	
One or fewer placements	25.3
Two placements	30.4
Three to five placements	35.8
Six or more placements	8.6

[a] Adoptive parent age at finalization and number of child placements before finalization were analyzed in the survival models as continuous variables. The categories shown in Table 1 are for descriptive purposes.

Analysis

Post-adoption Outcomes. The two outcome variables used in the survival analyses were years to first post-finalization child welfare referral and years to first post-finalization assessment. Both variables were calculated in a similar fashion; here referrals are used for purposes of explanation. For each case, the censoring date was determined. For children who reached age 18 before September 6, 2012, the censoring date was the date of the child's eighteenth birthday, as by the time they reached eighteen, they could no longer be referred to the child welfare system. If the child had not reached age 18 by September 6, 2012, then this date was the censoring date because it was the last date on which sampled cases were observed for the study. Next, the date of the first referral after finalization of the adoption was recorded. If the date of first referral was *before* the censoring date for the case, then the case experienced that referral; it was not considered to be censored. If no referral was ever recorded, then the case was censored; it did not experience any referral outcome within the timeframe of the study. If the case was not censored, the survival time (in days) was the difference between the adoption finalization date and the referral date. If the case was censored, then the survival time was the difference between the adoption finalization date and the censoring date. Survival days were divided by 365 and rounded to one decimal to calculate survival years. The same calculations were performed for the first assessment after adoption finalization. Separate analytic models were fit for each of these two outcomes.

Predictors. Variables included as predictors in the study were based on the recommendation of the study field advisors from county child welfare agencies and were consistent with categories established from the research literature. Ten predictor variables were chosen for the survival analysis model. These ten predictors were: child age at initial pre-finalization removal, child age at adoption and child ethnicity (demographics), months out-of-home before adoption finalization and total number of child placements before finalization (child history), parent relationship to adoptive child and adoptive parent age at finalization (parent characteristics), ethnic match with adoptive family and paid vs. Medicaid-only assistance (placement

characteristics) and county (agency characteristic). In the final model, the first variable, child age at pre-finalization removal, was not included because it was too highly correlated with the child's age at adoption. Percentage distributions for child and family characteristics are shown in Table 1.

Statistical Model. The analytic model used for the study was a stratified Cox regression model (Kleinbaum & Klein, 2012) which is appropriate for survival time data. Cox regression models the hazard function for an outcome. The hazard function can be interpreted as the instantaneous chance of failure at a specified time. In this study, the instantaneous chance of referral (or assessment) at any specified time after adoption finalization was the modeled 'failure' outcome. The Cox model assumed a proportional hazard relationship for each of the predictor variables. This means that the relationship between hazard functions for two values of a predictor variable remained constant over time. For example, assume that one year after finalization the chance of failure for a still-intact adoption without an ethnic match is twice as great as the chance of failure with a match. The proportional hazard assumption states that at *any* number of years after finalization, the failure hazard for intact adoptions without an ethnic match will be twice as great as for those with an ethnic match. The proportional hazard assumption is equivalent to assuming that there is no interaction between a predictor variable and time, which is often a reasonable simplifying assumption (Allison, 2010). The only predictor variable for which this was not reasonable is the county variable. County was included in the Cox model as a stratification variable, instead of as a predictor variable. This treatment of the county variable is consistent with the assumption that cases are clustered within each county but that the effects of other predictor variables are the same across county clusters (Allison, 2010).

Results from a Cox regression model are often expressed in terms of hazard ratios. A hazard ratio is simply the hazard (i.e. instantaneous chance of failure) for one group compared to the hazard for another group. For these analyses, the failure event was either first post-finalization referral or first post-finalization assessment. A hazard ratio of 1.0 indicates no difference between two groups, while a hazard ratio of 2.0 indicates that the failure hazard for the group of interest is twice as great (at any time) as the hazard for the comparison group. Similarly, a hazard ratio of 0.5 indicates that the failure hazard for the group of interest is half as great as for the comparison group. All analyses were generated using the PHREG procedure contained in the SAS/STAT software package (SAS Institute Inc., 2012).

Model Validation. Several steps were taken to validate the survival models for which results are presented below. First, the proportional hazard assumption was tested for each predictor variable by visually examining a log-log plot (Kleinbaum & Klein, 2012). Based on the plots, it was decided to retain each of the remaining nine predictors (excluding child age at pre-finalization removal), except for county. Instead, as noted above, county was used as a stratification variable. Ethnicity also appeared to substantially violate the proportional hazard assumption. However, it was also reasonable to assume that the relationship of hazard rates between any two ethnic groups would remain constant over time, so the ethnicity predictor was retained in the model. A second step toward ensuring model fit was to appropriately categorize two of the numeric predictors. Categorizing child age at adoption into three groups of (a) under 5 years, (b) 5 through 11 years and (c) 12 or more years resulted in this predictor more closely meeting the proportional hazard assumption (as compared to another potential categorization scheme). Also, the variable measuring number of months in out-of-home care prior to adoption was not statistically significant when used as a numeric variable. This was very counterintuitive from a practice standpoint. Therefore, the variable was tested using several different time categorizations to see if there was a "tipping point" for which number of months in out-of-home care would be associated with the referral or assessment outcome. It was found that when time out-of-home was categorized as more or less than 18 months, there was a significant relationship between (a) prior time out-of-home and (b) post-finalization referrals and assessments. Finally to ensure that the model did not omit any statistically significant interactions, eight pairs of predictor variables were tested for both the referral and assessment models to see if their interactions were significant. For the referral model, only three interactions were statistically significant and for the assessment model, only two interactions were significant. Therefore, these interactions between predictor variables were retained in the two models for which results are reported here.

Results

Introduction

Results for the two survival models are displayed in Tables 2 and 3. As noted above, the predictors tested for inclusion in the model were guided by the recommendations of the advisory group of child welfare professionals and were consistent with categories suggested by the literature. Both models included child age at adoption and child ethnicity (demographic predictors of later referral and assessment); months out-of-home before adoption finalization (child history); parent relationship to adoptive child and adoptive parent age at finalization (parent characteristics); and ethnic match with adoptive family and paid vs. Medicaid-only assistance (placement characteristics). The models also included county (an agency characteristic) as a stratification variable. Statistically significant interactions in both models were parent relationship by ethnic match and child age at adoption by parent age. In addition, the model for referrals included one more interaction – child ethnicity by ethnic match – because it was statistically significant for this outcome. The model for the assessment outcome included total number of child placements before finalization because this predictor was statistically significant for the assessment outcome, but not for referrals. The *p*-values for significant the variables and interactions in each model are summarized in Table 2.

Table 2

Statistical significance of child and family characteristics and interactions (*N* = 4,016).

Predictor variable or interaction	Referral model *p*-values	Assessment model *p*-values
Child age at adoption (preschool, elementary, secondary)	<.001	.001
Child ethnicity (Caucasian, African American, Hispanic, other)	.033	.003
Ethnic match with adoptive family (yes/no)	.005	.018
Interaction: Child ethnicity by ethnic match	<.001	–
Paid assistance (yes/no)	.041	.001
Parent relationship to adoptive child (relative, foster, other)	.008	.003
Interaction: Parent relationship by ethnic match	.004	.001
Adoptive parent age at finalization	.001	<.001
Interaction: Child age at adoption by parent age	.006	.026
Months out-of-home before finalization (greater/less than 18 mos.)	<.001	<.001
Additional child out-of-home placement before finalization	–	.018

Note: the child ethnicity by ethnic match interaction was not statistically significant for the assessment model. Number of child placements before finalization was not significant for the referrals model. County is used as a stratification variable in the Cox regression model, thus no *p*-value is available.

Table 3

Hazard ratios and confidence intervals for selected comparisons (*N* = 4,016).

Comparison	Referrals: Estimated hazard ratio and 95% confidence interval	Assessments: Estimated hazard ratio and 95% confidence interval
Prior ooh (more vs. fewer than 18 months)	1.27[a] (1.13, 1.43)	1.30[a] (1.13, 1.49)
Number of prior placements	–	1.04[a] (1.01, 1.07)
Adoption assistance (paid vs. not paid)	1.17[a] (1.01, 1.36)	1.39[a] (1.16, 1.67)
African Am. child with vs. without match; foster parent	1.08 (0.84, 1.38)	1.23[a] (1.04, 1.45)
Hispanic child with vs. without match; foster parent	1.37[a] (1.15, 1.64)	1.23[a] (1.04, 1.45)
Caucasian child with vs. without match; foster parent	0.64[a] (0.47, 0.89)	1.23[a] (1.04, 1.45)
Af. American (with match) vs. Caucasian (with match)	1.05 (0.88, 1.24)	1.14[b] (0.97, 1.34)
Hispanic (with match) vs. Caucasian (with match)	1.43[a] (1.23, 1.66)	1.28[a,b] (1.10, 1.49)
Relative vs. Foster parent (no match)	1.06 (0.85, 1.31)	1.19 (0.93, 1.50)
Relative vs. Foster parent (with match)	0.75[a] (0.66, 0.86)	0.75[a] (0.65, 0.87)
Other vs. Foster parent (no match)	0.67[a] (0.51, 0.87)	0.63[a] (0.46, 0.86)
Other vs. Foster parent (with match)	0.85 (0.70, 1.03)	0.79[a] (0.63, 0.98)
Elementary vs. preschool at adoption; parent age 30	1.58[a] (1.31, 1.91)	1.50[a] (1.21, 1.87)
Elementary vs. preschool at adoption; parent age 40	1.54[a] (1.37, 1.73)	1.46[a] (1.28, 1.67)
Elementary vs. preschool at adoption; parent age 50	1.51[a] (1.33, 1.71)	1.42[a] (1.24, 1.64)
Secondary vs. preschool at adoption; parent age 30	2.55[a] (1.92, 3.37)	2.29[a] (1.64, 3.18)
Secondary vs. preschool at adoption; parent age 40	2.01[a] (1.67, 2.41)	1.82[a] (1.46, 2.26)
Secondary vs. preschool at adoption; parent age 50	1.58[a] (1.31, 1.91)	1.44[a] (1.16, 1.79)
10-year increase in parent age for preschool aged child	1.16[a] (1.06, 1.26)	1.20[a] (1.08, 1.32)
10-year increase in parent age for elementary aged child	1.13[a] (1.05, 1.22)	1.16[a] (1.07, 1.26)
10-year increase in parent age for secondary aged child	0.91 (0.80, 1.03)	0.95 (0.82, 1.09)

[a] Difference in hazard between groups is statistically significant at *p* = .05.

[b] Comparison also applies in the absence of an ethnic match (i.e. no interaction).

Hazard ratios and confidence intervals for comparisons of interest are displayed in Table 3. The first three comparisons (assistance, time out-of-home before finalization and number of prior placements) display results for variables which do not interact with other variables in the model. Therefore, only one hazard ratio is presented for each model. The remaining comparisons varied based on the interactions present in each model.

Prior System Involvement

Adoptions where the adopted child was in out-of-home care for more than eighteen months prior to finalization had higher post finalization referral and assessment hazards than did adoptions where the child was out-of-home for less than 18 months. On average, adoptions with more than 18 months out of home displayed a 27% greater hazard (HR = 1.27) of referral and 30% greater hazard (HR = 1.30) of assessment. The number of out-of-home placements prior to finalization was not a statistically significant predictor of the rate at which an adopted child would experience a post-finalization referral. It was, however, statistically significant for predicting the hazard of a post-finalization assessment. For each additional out-of-home placement prior to finalization, an adopted child had a 4% greater hazard (HR = 1.04) of post-finalization

assessment. Finally, adoptions for which the family received paid assistance (instead of Medicaid-only assistance) had higher referral and assessment hazard rates after finalization. Adoptions with paid assistance had a 17% greater hazard (HR = 1.17) of experiencing a referral and a 39% greater hazard (HR = 1.39) of experiencing an assessment than did adoptions with Medicaid-only assistance.

Ethnicity

There appeared to be a rather complicated relationship between the (a) child's ethnicity, (b) the presence of an ethnic match with the adoptive parent, (c) the adoptive parent's relationship to the child and (d) post-finalization involvement with the child welfare system. First of all, consider the foster parent relationship. For an African American child adopted by a foster parent, there was no statistically significant difference (HR = 1.08) in the hazard of post-finalization referrals based on whether the parent was also African American or not. But a Hispanic child adopted by a foster parent, had an average 37% *greater* hazard (HR = 1.37) of experiencing a post-finalization referral if that child was adopted by *Hispanic* foster parents rather than by foster parents of a different ethnicity. Finally, a Caucasian child who was adopted by a Caucasian foster parent had a 36% *lower* hazard (HR = 0.64) of experiencing a post-finalization referral than did a Caucasian child adopted by parents of color. For the assessments model, the interaction between child ethnicity and ethnic match was not statistically significant. Children of any ethnicity had a greater average hazard of assessment when adopted by foster parents of the same ethnicity than of a different ethnicity. However, closer examination of the data underlying this outcome suggested that, as with referrals, the experience of Hispanic children being assessed at higher rates when adopted by Hispanic foster parents was an influential factor for the overall result.

Although ethnicity by ethnic match comparisons were also run for relative adoptions and other adoptive parents (in addition to foster parents) they are not shown. Most relatives adopt children with an ethnic match, so to compare cases with and without an ethnic match for relatives would not be very meaningful. In fact, less than 6% of the total sample represented children adopted by relatives without an ethnic match. For children adopted by other types of adoptive parents (i.e. not foster parents and not kin), the results were poorly estimated and often not statistically significant. This suggests that post-finalization experiences for the "other" group are highly variable and that firm conclusions cannot be drawn from these data.

Results are also shown in Table 3 for holding the ethnic match variable constant. First, African American children adopted into African American families (about 10% of the sample) were compared with Caucasian children adopted into Caucasian families. There is no statistically significant difference in the hazard for a post-finalization referral between these two groups when both have an ethnic match. Hispanic children adopted into Hispanic families (about 13% of the sample) were compared to Caucasian children in Caucasian families. Hispanic children in Hispanic families had a 43% greater hazard of experiencing a post-finalization referral than the Caucasian children in Caucasian families. African American children had an estimated average 14% greater likelihood (HR = 1.14) of experiencing a post-finalization assessment than did Caucasian children, although the hazard ratio for this comparison was not statistically significant. Hispanic children had on average a 28% greater hazard of post-finalization assessment than did Caucasian children (with or without an ethnic match).

Adoptive Parents

Comparisons were made between different types of adopting parents. For both models, there was an interaction between adoptive parent relationship and ethnic match. There was no significant difference in the hazard of a post-finalization referral or assessment when comparing adoptions by relatives versus foster parents without an ethnic match. Recall, however, that the number of children adopted by relatives without an ethnic match was small. When comparing relative adoptions versus foster parent adoptions both with an ethnic match, relative adoptions had a 25% *lower* hazard for a referral or an assessment after finalization (referral HR = 0.75; assessment HR = 0.75). When comparing "other" parent adoptions to foster parent adoptions (without an ethnic match) children adopted by other parents had an average 33% lower hazard for a post-finalization referral and 37% lower hazard for a post-finalization assessment than children adopted by foster parents with an ethnic match (referral HR = 0.67; assessment HR = 0.63). With an ethnic match, children adopted by other parents instead of foster parents had an average 15% lower hazard for post-finalization referrals and a 21% lower hazard for post-finalization assessments (referral HR = 0.85; assessment HR = 0.79).

Age: Parents and Children

The relationship of a child's age with post-finalization child welfare system involvement depended on the age of the parent. Children adopted at elementary school age had at least a 50% greater hazard for a post-finalization referral than did children adopted as preschoolers. This relationship was consistent as the age of an adoptive parent increased: 58% greater hazard for 30-year-old parents, 54% greater hazard for 40-year-old parents and 51% greater hazard for 50-year-old parents. The results were very similar for post-finalization assessments, for which elementary-aged adoptions had between a 40% and 50% greater hazard than did preschool-aged adoptions (30-year-old parent, HR = 1.50; 40-year-old parent, HR = 1.46; 50-year-old parent, HR = 1.42). When comparing adoptions of secondary-aged children to preschoolers, however, the comparative hazard decreased substantially with the increased age of the parent. Compared to a preschool adoption, a child adopted in

secondary school had a 155% greater referral hazard when their parent was age 30, a 101% greater hazard when their parent was age 40 and only a 58% greater hazard when their adoptive parent was 50 years old. Thus, although secondary school adoptions always had a greater referral hazard than did preschool adoptions, the comparative hazard between preschool and secondary-aged adoptions *decreased* as the parent's age at adoption increased. Results for post-finalization assessments were similar. Compared to a preschool adoption, a child adopted in secondary school had a 129% greater referral hazard when their parent was 30, an 82% greater hazard when their parent was 40 and only a 44% greater hazard when their adoptive parent was 50 years old.

These age-based patterns in the hazard ratios could be caused either by the results of secondary-aged adoptions *improving* with parent age or they could be caused by preschool-aged adoptions experiencing *worse* outcomes as the age of an adopting parent increases. Therefore, the relationship between an increase in parent age and post-finalization referrals and assessments was examined for all three age categories of children. Indeed, older parents seemed to have relatively less success with adopting either preschool or elementary school children. A ten-year increase in parent age was related to an increased referral hazard of 16% for preschool aged children and 13% for elementary aged children (preschool HR = 1.16, elementary HR = 1.13). For post-finalization assessments, the hazard increases were 20% and 16%, respectively (preschool HR = 1.20; elementary HR = 1.16). However, for secondary aged adoptions, a ten year increase in the parent's age was associated with no significant increase in either the referral or assessment hazard.

The advisory group suggested that results for adoptions of secondary-school-aged children might be driven by the fact that these adoptions are more likely to be relative adoptions than foster parent adoptions. This result was checked by running an additional model (not shown) and looking specifically at results for secondary-aged adoptees and foster parents. In the supplemental model, for secondary students adopted by *foster* parents, a 10-year increase in parent age was correlated with an average 17% *lower* hazard of a post finalization referral. And, there was no difference in the hazard of assessment for secondary-aged children with a 10-year increase in parent age. This suggests that comparatively better results for secondary-aged adoptions by older parents are *not* determined by the fact that only older adoptive parents who are also relatives have better outcomes.

Discussion

Implications

The results of the study which deal with a child's prior history in the child welfare system confirm findings of prior research. Children who spent more time out-of-home or who spent time in a larger number of differing placements were at greater risk for system re-involvement even after achieving a permanent adoptive placement. As other research has concluded, it is beneficial when children achieve permanent placement as quickly as possible and avoid multiple placement moves. The meaning and prevalence of paid adoption assistance varies by county in Colorado. However, in general, such assistance is present for cases where children have more substantial or special needs. Thus, it is not unexpected that re-involvement rates are higher for children whose cases received paid assistance.

The results of the ethnicity and parent relationship analyses are complex and there are several overlapping relationships among these characteristics. However, it appears that two conclusions are warranted. First, there is no clear evidence that children must be adopted into families of the same ethnicity in order to increase the chances of a successful adoption. These data provide examples to the contrary. Second, a major area of focus should be supports for the adoption of Hispanic children into Hispanic families. These data show that such adoptions experience post-finalization referrals and assessments at undesirably high rates.

The interactions among parent age, child age and adoptive parent relationship are also complex. However, the clear implication from these data is that preschool-aged and elementary-aged adoptions experience relatively higher rates of post-finalization referrals and assessments with older parents than with younger parents. Furthermore, adoptions of secondary-aged children by older parents do not experience higher rates of post-finalization involvement with the child welfare system. These results hold both for foster parent and relative adoptions. Thus, when possible, it would seem prudent to place preschool children for adoption with relatively younger parents and secondary-aged children with relatively older parents. There is no negative relationship between adoptive outcomes and placing older children with older parents. Furthermore, in some cases, there may be a positive moderating effect of increased parent age on outcomes for older children.

There are several implications of these results for practice and for research. Many implications were identified when the study results were presented to both the field advisory group and to a group of caseworkers and supervisors in one of the participating counties. First of all, child welfare agencies could follow up with adoptive families after adoption finalization using a more personal process than what is currently common practice. In general, current practice across the counties is to contact adoptive families a year after finalization via letter. This written contact is part of the process of verifying a family's eligibility for continued adoption assistance (paid or Medicaid assistance). However, instead, agencies might contact families via telephone or in-person and, in addition to verifying eligibility for assistance, the agency could also conduct a brief assessment of family needs and/or provide a list of services which are available in the community. The results of the current study identify several characteristics of adopted children at higher risk for re-involvement. These results can provide guidance for prioritizing post-finalization contacts with adoptive families. For example, if resources are limited, then Hispanic adoptive families should perhaps receive priority for a post-adoption contact.

Secondly, several specific practices might support adoptive families. These include pre-adoption parent education for both immediate *and* extended adoptive families. Related to education, another helpful practice could be post-adoption family meetings which also include extended family members. Further, many agencies are currently incorporating trauma awareness into child welfare practice. An awareness specifically of the trauma history of adopted children could be helpful in identifying ways to resolve challenging post-adoptive child behaviors. Understanding cultural connections may also be a fruitful area for revised practice, even for children adopted within their own ethnic group. For such children, understanding family culture differences between a family of origin and an adoptive family could be important for adjustment. The input of children themselves would be helpful in this regard.

Finally, counties acknowledged a need to simply hear from adoptive families about their experiences and to allow these experiences to shape practice. One county has already surveyed adoptive parents and kinship caregivers; another is actively discussing such a survey. Topics have or might include: whether a family is likely to contact the child welfare agency for post-adoption assistance, what health or behavior challenges the adopted child has experienced, a family's preparation or education for adoption and a family's positive adoption experiences. Understanding adoptive family needs and experiences is not only relevant for practice but also for future research. This is a promising area for mixed methods research; after identifying specific family needs and experiences around adoption, families could be interviewed to identify more closely what are the barriers to seeking assistance for their child and what are the services or supports that have been most helpful for successful adoptions. This type of research is vital to developing agency practices and community services which can support adoptive families *before* their children become re-involved with the child welfare system.

Limitations

As with much prior research in the areas of adoption adjustment and disruption/dissolution, this study was limited in its generalizability because it relies on a one-state sample of children involved in the child welfare system. Further study of nationally representative samples of children involved in child welfare systems is clearly needed both to examine factors predictive of the quality of a child's adoption adjustment and to identify possible precursors of adoption disruption or dissolution.

Conclusion

The Children's Bureau notes that further research is needed to identify key factors which predict adoption disruption and dissolution because such research could support the development of services to prevent such occurrences (Child Welfare Information Gateway, 2012). Furthermore, to date, no national studies of adoption disruption and dissolution have been conducted. The results of this study suggest that it is important not only to study actual disruptions and dissolutions, but also to study re-involvement with the child welfare system when there is possible maltreatment of an adopted child or when the child's own behavior is seriously "in conflict" with parents or the law, indicating a poor adjustment situation for the family. Unfortunately, funding for post-adoption services has been decreasing in some states (Council of Family and Child Caring Agencies, 2013) and families have difficulty accessing and using post-adoption services (Festinger, 2002). Adoptive families themselves report that post adoption services were beneficial both to help parents understand a child's behavior and to provide the child and the family with the means to address and change negative behaviors (Zosky, Howard, Smith, Howard, & Shelvin, 2005). This study suggests that it may be beneficial to tailor post-adoption services to specific types of adoptive families which are at high risk for re-involvement in the child welfare system, including Hispanic families and younger parents who adopt older children. Such services are needed so as to improve outcomes for children who cannot reunite with their families of origin but who instead achieve legal permanency via adoption.

Acknowledgements

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