



Published in final edited form as:

Child Abuse Negl. 2009 September ; 33(9): 598–611. doi:10.1016/j.chiabu.2008.07.008.

Associations Between Intensity of Child Welfare Involvement and Child Development Among Young Children in Child Welfare

Aubyn C Stahmer, Ph.D.^{1,2}, Michael Hurlburt, Ph.D.¹, Sarah McCue Horwitz, Ph.D.⁴, John Landsverk, Ph.D.^{1,3}, Jinjin Zhang, MsC, M.A.¹, and Laurel K Leslie, M.D., M.P.H.^{1,5}

¹ San Diego, CA-based Child and Adolescent Services Research Center at Rady Children's Hospital

² University of California, San Diego, Department of Psychology

³ San Diego State University, School of Social Work

⁴ Department of Pediatrics, Stanford University in Palo Alto, CA

⁵ Tufts Medical Center, Department of Pediatrics in Boston, MA

Abstract

Objective—To examine developmental and behavioral status of children in child welfare (CW) over time, by intensity of CW involvement using a national probability sample.

Methods—As part of the National Survey of Child and Adolescent Well-Being (NSCAW), data were collected on 1,049 children 12–47 months old investigated by CW agencies for possible abuse or neglect. Analyses used descriptive statistics to characterize developmental and behavioral status across four domains (developmental/cognitive, language, adaptive functioning, and behavior) by intensity of CW involvement (in-home with CW services, in-home with no CW services or out-of-home care) over time. Multivariate analyses were used to examine the relationship between independent variables (age, gender, home environment, race/ethnicity, maltreatment history, intensity of CW involvement) and follow-up domain scores.

Results—On average, children improved in developmental/cognitive, communication/language status over time, but these improvements did not differ by intensity of CW involvement. Analyses revealed a positive relationship between the home environment and change in language and adaptive behavior standard scores over time, and few predictors of change in behavioral status. An interaction between intensity of CW involvement and initial developmental/cognitive status was present.

Conclusions—Across domains, intensity of CW involvement does not appear to have a significant effect on change in developmental and behavioral status, although out-of-home care does have differential relationships with children's developmental/cognitive status for those with very low initial cognitive/developmental status. Facilitating development in children in CW may require supportive, enriched care environments both for children remaining at home and those in foster care.

Practice Implications—Toddler and preschool age children known to child welfare are likely to have difficulties with development whether they are removed from their homes or not. It would be helpful if child welfare workers were trained to screen for developmental, language, adaptive behavior and behavioral difficulties in children in foster care, and those remaining at home.

Address all correspondence to: Aubyn C. Stahmer, Ph.D., Child and Adolescent Services Research Center, 3020 Children's Way, MC, 5033, San Diego, CA 92123, Phone: (858) 966-7703 x3223, Fax: (858) 966-7704, astahmer@casrc.org.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Additional support for biological, foster, and kinship caregivers in encouraging development is important for the attainment of critical developmental skills, especially for children with developmental difficulties.

Keywords

Child Welfare; Foster Care; Child Development

Over 3.5 million children are referred to child welfare (CW) each year in the United States, with approximately 25% of those substantiated as victims of child abuse or neglect (Administration for Children and Families, 2006). The highest rates of abuse and neglect occur in children under the age of 6. In 2006 over 40% (approximately 350,000) of children in CW were between the ages of 1 and 4 (Administration for Children and Families, 2006). Of those, approximately 80% remained at home with varying levels of CW services while the rest of the children were in out-of-home care.

Understanding the needs of young children with CW contacts is especially important given that during the period from infancy through preschool, children rapidly learn to develop communication skills, cognitive skills, behavioral regulation strategies, and social interaction skills that provide a foundation for later learning and participation in society (Shonkoff & Phillips, 2000). The importance of early relationships in the development of these skills was emphasized in a recent report by the National Research Council's Institute of Medicine (Shonkoff & Phillips, 2000): "The scientific evidence on the significant developmental impacts of early experiences, caregiving relationships, and environmental threats is incontrovertible." Not surprisingly, recent data indicate that a large proportion (as high as 61%) of young children in CW exhibit developmental and behavioral deficits (Reams, 1999), in sharp contrast to the much smaller proportion (10–12%) of children in the general population who exhibit such deficits (First & Palfrey, 1994). Delays in toddlers and preschoolers in CW appear in a variety of domains including developmental and cognitive skills (Egeland & Sroufe, 1981; Kinard, 1999; Klee, Kronstadt, & Zlotnick, 1997; Landsverk, Davis, Ganger, & Newton, 1996; Zimmer & Panko, 2006), language skills (Allen & Oliver, 1982; Coster, Gersten, Beeghly, & Cicchetti, 1989; Simms, 1989), behavior problems (Leslie, Gordon, Ganger, & Gist, 2002; Reams, 1999; Simms, 1989; Stahmer et al., 2005; Urquiza, Wirtz, Peterson, & Singer, 1994), and adaptive skills (Stahmer et al., 2005; Horwitz, Balestracci, & Simms, 2001). Although most studies have addressed children residing in out-of-home care, recent data suggest that similar levels of need are seen in young children who remain at home (Leslie et al., 2002; Stahmer et al., 2005).

With increasing attention being given to the development and well-being of children in contact with CW, a significant issue is the degree to which foster care itself facilitates or hinders the development of young children removed from their homes. Residing in a different home environment may be every bit as significant for children's development and well-being as services that they might receive from formal care providers. However, very little is known about the development of young children in CW, or about how intensity of CW involvement (remaining at home or being placed outside the home of origin) relates to developmental changes over time (Horwitz et al., 2001). What is known is that very young children are more likely to be placed outside the home than school age children, and children with disabilities are two times as likely as children without disabilities to be placed in foster care (U.S. Department of Health and Human Services, 2002).

Given the lack of a comparison group in many of the studies, the paucity of longitudinal studies, use of regional samples and the inconsistency of results, available data are difficult to interpret. Early cohort studies indicated that older children in long-term foster care showed

improvements in overall well-being (Benedict, Zuravin, Somerfield, & Brandt, 1996; Blatt, 1992; Fanshel & Shinn, 1978). In general, studies of children in out-of-home care without a comparison group have suggested that children's academic, developmental and behavioral scores do not improve or decline, but rather remain stable while the children are in out-of-home care (Maluccio & Fein, 1986; Minty, 1999a).

Some studies of older children suggest that foster care is not detrimental to children in terms of educational attainment or social adjustment, but also that there are few protective factors associated with foster care (Heath, Colton, & Aldgate, 1989; Maluccio & Fein, 1989). In contrast, several studies suggest that difficult behavior, grades and risk behaviors may improve for school-age children in foster care (Taussig, Clyman, & Landsverk, 2001). These studies, however, are difficult to generalize to preschool children.

Horwitz and colleagues (Horwitz et al., 2001) conducted a longitudinal cohort study of preschool children entering foster care in two Connecticut counties. Scores from a standardized caregiver report measure of adaptive behavior indicated that functioning for these children improved from borderline delays to the normed average range over a 12 month time period, however, no comparison group was measured. Recent studies examining intensive early intervention foster care for preschool children also report reductions in behavior problems for the treatment group in comparison to a general foster care group (Fisher, Gunnar, Chamberlain, & Reid, 2000). These latter two studies were conducted in communities with high quality intervention services and highly developed linkages between CW and early intervention services, a situation which may be relatively uncommon.

Variables that were associated with improved outcomes in these local studies included initial developmental level, adaptive behavior, academic achievement, social adjustment and behavior problems. Although it is difficult to measure social adjustment or academic skills in young children, communication, cognitive and social interaction skills as well as behavioral regulation strategies are important for later functioning and important outcomes to measure in the early years (Shonkoff & Phillips, 2000). Additionally, communication and language delays in toddlers and preschoolers are associated with a range of future linguistic, educational and social difficulties (Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998). Previous studies of infants and toddlers at risk for developmental problems or delays have also found an association between the quality of the family environment and developmental improvement (Hauser-Cram, Warfield, Shonkoff, & Krauss, 2001; Kelly & Booth, 2002). Thus, when examining outcomes for young children in contact with CW, it is important to examine correlates identified in prior studies of children with CW involvement as well as those identified in the literature on child development.

The current study uses data from a nationally representative sample of children in contact with US CW agencies due to allegations of abuse or neglect to compare changes in developmental (developmental/cognitive; language and communication; adaptive behavior) and behavioral status for young children in both in-home and out-of-home care. The objectives of this study are to (1) examine whether there are changes in developmental and behavioral status for children in CW over time; (2) examine differences in these changes based on intensity of CW involvement; and (3) examine other predictors of change in status over time. Understanding how the developmental and behavioral needs of young children in CW relate to the intensity of CW involvement may assist with the development of appropriate training for caregivers, understanding the role of out-of-home placement as an intervention services for this population. A longitudinal examination of a nationally representative sample of children, including both children in foster care and those remaining at home, will provide a broader perspective on the relationship between intensity of CW involvement and developmental change over time than has been possible in prior studies.

METHOD

The National Survey of Child and Adolescent Well-being (NSCAW), the first national longitudinal study of its kind, was designed to examine the experiences of children and families involved with CW. The NSCAW used a two stage national probability sampling strategy to select a total of 100 primary sampling units (PSUs) representing CW agencies, and then eligible children within those PSUs. PSUs were typically defined as geographic areas that encompass the population served by a single CW agency (usually one county and hereafter referred to as “counties”). Of the 100 counties sampled for the study, the NSCAW ultimately collected child-level data in 92 counties. Within participating counties, children coming into contact with CW were identified and the child and his/her caregiver were invited to participate in the study. The final sample of children was representative of the national population of children coming into contact with CW as a result of allegations of abuse or neglect (U.S. Department of Health and Human Services, 2002).

Approval for secondary analyses of these data was given by Rady Children’s Hospital, San Diego Institutional Review Board.

Sample

The target population for the NSCAW child protective service sample was all children, aged birth to 14 years, who were subjects of child abuse and neglect investigations conducted by CW during a 15-month period beginning in October 1999. Only one child from each home was selected to participate. The final sample included 5,501 children, resulting in an overall weighted response rate of 64%. Extensive analyses concluded that non-response bias was minimal (less than 10% for all variables) and unlikely to be consequential for most analyses (see Dowd, Kinsey, Wheelless, & NSCAW Research Group, 2002 for a complete description of the analyses). This report focuses specifically on the 1,049 children ages 12 to 47 months from the study sample. All children in this age range were included in the analyses. A complete description of the sampling plan can be found in the NSCAW Research Group Report (Dowd et al., 2002).

PROCEDURES

After sampling, study representatives contacted caregivers and asked permission to interview them about the children in their care and to assess the child directly. Baseline (BL; Wave 1 of NSCAW) interviews were conducted an average of 5.9 months (90% of interviews in the range of 2.5 to 10 months) after onset of the CW investigation to help assure that the immediate upheaval of changing placements or taking part in the investigation would be less likely to affect scores on the standardized measures (Hochstadt, Jaudes, Zimo, & Schachter, 1987; Leslie et al., 2002; Stahmer et al., 2005). Follow-up (FU; Wave 3 of NSCAW) interviews were conducted an average of 21.3 months (90% of interviews in the range of 17 to 25 months) after onset of the CW investigation. Of the children included, 369 (65.9% weighted) were living at home at BL with no CW services delivered to the family, 419 (23.4% weighted) were living at home with CW services delivered to the family and 261 (10.7% weighted) were living in out-of-home care.

Measures

Sociodemographics—Children’s age, gender, prior CW involvement, and race/ethnicity were obtained from CW agency workers and confirmed with field representatives and caregivers. Caregiver education and income were obtained through caregiver interviews.

Intensity of CW Involvement (in-home with CW services, in-home with no CW services, or placed in out-of-home care) was obtained from the CW agency worker interview and was defined as the level of services provided to the family (child or caregiver) at the BL interview. Children remaining in their home of origin, living with a permanent caregiver, who did not receive any services at the time of the baseline assessment were included in the *In-home, no CW services* group. Children remaining in their home of origin, living with a permanent caregiver receiving any type of services funded by CW, were placed in the *In-home, with CW services* group. Services included, but were not limited to counseling (for caregiver and/or child); assistance in obtaining food, clothing, or other necessities; income support; substance abuse treatment (for caregiver and/or child); mental health treatment (for caregiver and/or child); parenting classes; family support services; domestic violence services; and legal services. Information regarding specific type and duration of services provided will not be presented in these analyses. CW workers were asked if “any services have been provided to or arranged for the family.” This item referred to services provided or arranged prior to the baseline interview, regardless of the outcome of the investigation. For each service indicated to have been provided to or arranged for the family, the CW worker was then asked if the services had been “provided by the agency, arranged, or referred.” We considered the CW worker’s response affirmative if they indicated that a service had been provided or arranged and paid for by the agency (i.e., a service that was referred out to another provider but not paid for by CWS did not qualify for a CW service received by the child or his or her family). The out-of-home group included children in foster care, kinship foster care, group homes or other programs such as treatment centers. Kinship foster care was included in the out-of-home category to ensure a large enough sample of children in out-of-home care for the analyses. Approximately half of the children in the out-of-home group were in kinship care (47%) and half were in non-kin foster care (48%). A few children were in group homes (n=5, 2%) or other care arrangements (n=8; 3%). Intensity of CW involvement was chosen as the variable of interest for the sample because when making decisions regarding intensity of CW involvement, social workers do not know how long a child will be in specific living arrangements or whether reunification will occur, and for many children intensity of CW involvement will occur for an extended period. The groups were not matched on service use.

Maltreatment History—The type of alleged maltreatment children experienced that led to the episode triggering current involvement with the CW system was also obtained from CW agency workers. Workers were asked to identify the types of maltreatment that had been alleged using a Modified Maltreatment Classification Scale (MMCS; English, & the LONGSCAN Investigators, 1997 as modified from the Maltreatment Classification Scale outlined in Barnett, Manly, & Cicchetti, 1993). As described in English, Bangdiwala and Runyan (2005), LONGSCAN’s modification of the MCS system (MMCS) includes greater specificity about severity and subtype of maltreatment. Although the original MCS was designed for agency record review, NSCAW maltreatment data were collected in an interview with the CW worker who knew the most about the investigation and had immediate access to case record materials. Data were collected about all the types of maltreatment that had been recorded in the allegation. CW workers chose types of maltreatment for each case from a list of possible maltreatment types. More than one type of maltreatment could be identified. Interrater reliability for the modified MCS is not available. Six indicator variables regarding maltreatment history were created: (1) physical abuse, (2) sexual abuse, (3) emotional abuse, (4) supervisory neglect, (5) physical neglect, and (6) abandonment. Complete definitions of each maltreatment category can be found at <http://www.iprc.unc.edu/longscan/>.

Living Environment—The Home Observation for Measurement of the Environment-Short Form (HOME-SF; Baker, Keck, Mott, & Quinlan, 1993) was used to assess the quality of the caregiving environment in which the child resided at the time of data collection. The HOME-

SF is a modification of the HOME Inventory (Bradley & Caldwell, 1984) which has been used in over 200 published studies, including studies of intellectual and academic attainment, SES and cognitive development. The HOME-SF has been normed on young children of varying races and socioeconomic levels, has good reliability and validity for families of different racial/ethnic backgrounds and those living in impoverished urban environments (Mott, 2004). However, some researchers have raised concern regarding the applicability of the original HOME Scale (developed and standardized in the 1970s) to inner-city families, and the sensitivity of this measure for detecting change over time (Ertem, Forsyth, Avni-Singer, Damour, & Cicchetti, 1997). The HOME-SF provides a total score and two scale scores, cognitive/verbal stimulation, emotional support/nurturing. Half of the items are caregiver reports and half are observational. Scores are calculated by summing the number of questions answered yes. A higher score indicates the presence of more positive characteristics in the home environment. Total HOME-SF scores were computed separately for children under 3 years of age (18 total items) and 36–47 months (26 total items). Because of the differing number of items in the scales depending on the age group, scores with a comparable range were created for the purpose of making comparisons. These scores were calculated by dividing the total score by the number of questions answered and multiplying by 10. This yielded scores for both age groups with values ranging from 0 to 10. HOME-SF scores for children placed out-of-home referred to the child's out-of-home environment.

Measures of Child Development—Measures of child development were obtained at BL and FU in four domains: (1) developmental/cognitive status, (2) language and communication level, (3) adaptive behavior, and (4) behavioral symptoms. Standardized scores for each assessment were used in the analyses, thus controlling for the age of the child at each assessment period.

Developmental/Cognitive Status: The measurement of developmental/cognitive status was conducted using comprehensive screening assessments that varied with the age of the child. Children who were less than 4 years old (or had passed their 4th birthday and received a score of 0 on the Kaufman Brief Intelligence Test) received the Battelle Developmental Inventory (BDI; Newborg, Stock, Whek, Guidubaldi, & Svinicki, 1984). The BDI was normed on 800 children and has good construct validity as well as concurrent validity. Test-retest reliability for this assessment ranges from .76–.99, with most of the component domains above .90. The cognitive domain of the assessment was administered to children in this study via interview with the child's caregiver, observation in the natural environment, or structured assessments according to the standardized procedures specified in the manual. This domain is grouped into four subdomains including perceptual discrimination, memory, reasoning and academic skills and conceptual development. A developmental quotient with a mean of 100 and a standard deviation of 15 is obtained.

Children who were 4 years of age or older received the Kaufman Brief Intelligence Test (K-BIT; Kaufman & Kaufman, 1990), a standardized assessment tool consisting of two subtests: Vocabulary (expressive vocabulary and definitions) and Matrices (ability to perceive relationships and complete analogies). This test was normed on over 2,000 individuals and has good internal reliability (.94 overall), test-retest reliability (.80 to .96 for various component domains) and concurrent validity. The domains correlate well with measures of full scale IQ. The standard score on this assessment has a mean of 100 and a standard deviation of 15.

Although all children were under age 4 at BL, some were over age 4 at FU. Therefore, some children were measured only by the BDI and some were first assessed using the BDI at BL and then by the K-BIT at FU. Other longitudinal studies have used varying assessments of development as children age (e.g., Campbell & Ramey, 1994). On conceptual grounds, the two tests target the same general constructs (Grigorenko & Sternberg, 1999). However, as part of

multivariate analyses (see analysis section), we evaluated whether it seemed reasonable to consider scores on both measures compatible. Within a multivariate framework, we found that differences between BL and FU for the group of children who crossed from one test to another did not differ from the pattern observed in the reference group of children who were assessed at both points with the BDI. Furthermore, the pattern did not differ materially from that observed in the language domain. Therefore, we felt some confidence in using these two measures together as indicators of developmental/cognitive status for those children who transitioned from one measure to the other.

Language and Communication Level: To assess language development, the Preschool Language Scales-3 (PLS-3; Zimmerman, Steiner, & Pond, 1992) was used. This standardized assessment comprises two scales, expressive communication and auditory comprehension, and yields a total language score from those scales. Areas evaluated include sensory discrimination, logical thinking, grammar and vocabulary, memory and attention span, temporal/spatial relations, and self-image. Auditory comprehension items include knowledge of body parts, following directions, comparing sizes, prepositions, and colors. As specified in the assessment manual, the field representative could use direct testing as well as observation to obtain item scores. Test-retest reliability ranges from .82–.94 depending upon the component domain. The scales correlate well with other measures of communication skills. The standard score on this assessment has a mean of 100 and a standard deviation of 15. Due to the applicable age range for this measure, information about child language was available only for children under 60 months of age.

Adaptive Behavior Level: Adaptive behavior was measured using the Vineland Adaptive Behavior Scale – Screener (Sparrow, Balla, & Cichetti, 1984), a standardized measure used to assess the child’s competence and independence in his/her daily living environment. This measure involves a semi-structured interview, with the child’s caregiver providing examples of specific behavior to the interviewer. The daily living skills scale, which measures self-help skills and ability to complete activities of daily living in the natural environment, was used in the NSCAW. Examples of questions include the ability to brush one’s teeth, turn on the water faucet, remove a spoon from mouth, and so forth. This measure was normed on a sample of 563 children, representative of the gender, ethnicity, geographic region, and parent education level of children in the United States. Test-retest reliability has been high, between .87 and .98, and the scales correlate well with other measures of adaptive behavior. The standard score on this assessment has a mean of 100 and a standard deviation of 15.

Behavioral Symptoms: The behavior problem components of the Child Behavior Checklist (CBCL; Achenbach, 1991; Achenbach, Edelbrock, & Howell, 1987) were used to quantify emotional and behavioral symptoms. The CBCL is a widely used measure of behavior problems and social competence with established reliability and validity that has been standardized by age and gender on large populations from different socioeconomic backgrounds. Test-retest reliability ranges from .73–.93. The CBCL has good discriminative validity in that the scores do not correlate with cognitive test scores, and the problem items cluster into meaningful scales and correlate well with similar scales from other checklists. Two forms of the CBCL were used; one for children ages 2–3 years and another for children ages 4–18 years. Each behavior in the CBCL was rated by the child’s caregiver, using a 3-point scale. We used the total problems standard score for the CBCL with a mean of 50 and a standard deviation of 10. Due to the applicable age range for this measure, information about child behavior was not available for children under 24 months of age. The social competence dimension of the CBCL was not used in this study.

Analyses: Examination of differences in baseline characteristics by intensity of CW involvement, and differences in each domain by intensity of CW involvement were examined using Chi Square analyses.

Analyses focused primarily on the relationship of group changes in developmental status over time and as a function of different intensity of CW involvement. Specifically, controlling for other variables, we were interested in whether intensity of CW involvement was related to, on average, change in developmental and behavioral status. Due to the potential for changes in caregiver relationships to have a more pronounced or different kind of effect on children with more significant developmental delays, our analyses also considered interactions that might occur between BL developmental status and intensity of CW involvement.

Analyses were pursued individually within each developmental domain. Descriptive statistics were used to understand similarities and differences between groups with different levels of intensity of CW involvement at the time of the BL assessment and the changes over time between the BL and FU assessments.

Multivariate linear regression was employed to understand the unique relationship between intensity of CW involvement and change in each developmental domain, controlling for other important variables, including BL domain scores, age, gender, race/ethnicity, home environment, and maltreatment history. Analysis of covariance (ANCOVA) and analysis of raw change scores are frequently used approaches to analyzing predictors of change over time. Potential for omitted variable bias in model parameters always exists in analysis of change in observational studies (Senn, 2006). Senn (2006) suggests, however, that ANCOVA is more likely to yield valid estimates of model parameters than analysis of change scores under most conditions. We opted to utilize ANCOVA in multivariate models and discuss conclusions in light of limitations in analyses of non-randomized designs.

Multivariate models followed a structured approach to incorporation of variables. Initial models included intensity of CW involvement and relevant independent variables. Subsequent to an initial model, another model was tested including an interaction between the BL domain score and intensity of CW involvement. Interactions were retained if significant and dropped if not statistically significant. All bivariate variables were included in each model. Analyses presented represent the best model fit following this sequenced analysis in each domain; important changes from one step to the next are presented in text.

Secondary analyses were conducted to assess whether including number of different placements during the time period, prior involvement with CW, time to baseline assessment, time between baseline and follow-up assessment, change of reporter, change of instrument or caregiver income or education affected model results. However, these variables did not add any new information to the models and were therefore not included in the final models. Additionally, models were run with Kinship care separated from non-relative out-of-home care. The two out-of-home groups patterned in the same way and therefore were included as one group in the model.

All analyses took into account the complex sampling design of the NSCAW (case weights and clustering of observations) to obtain appropriate statistical estimates. Weighted analyses were performed using the statistical software SUDAAN (version 9.0), which corrects standard error estimates for weighted and clustered data. Additional detailed information about the NSCAW sample design and weight derivation is available at Cornell University, where the public use data set is archived (<http://www.ndacan.cornell.edu>).

RESULTS

Sample Characteristics

Table 1 presents information regarding children's age, gender, race/ethnicity, maltreatment history, caregiver education, prior CW involvement, HOME-SF scores and caregiver income stratified by intensity of CW involvement. For all tables standard deviations are used for standardized assessments to facilitate understanding of effect sizes. Standard deviations are also utilized for other continuously distributed variables utilized in multivariate models. Standard errors are presented for all other variables, in which comparison of population estimates was more meaningful. Accounting for the sample design, all estimates reported in this paper are generalizable to the population of children 12–47 months of age for which a report of abuse or neglect is investigated, which was roughly 400,000 children in the year that children were enrolled in NSCAW. Children in the sample were distributed relatively evenly across age groups and roughly half of children were of each gender. The mean age of the children overall was 28 months. Most of the children were White (42.2%), Black (30.4%) or Hispanic (20.6%). The majority of children experienced either supervisory (49.1%) or physical neglect (28.5%), or physical abuse (33.3%). Across all of these variables, few differences appeared as a function of intensity of CW involvement. No differences were seen by age, gender, race/ethnicity, or caregiver education. Significant differences were noted by maltreatment history when stratified by intensity of CW involvement (Table 1). Further examination of significant areas indicated several interesting findings. Children initially placed in out-of-home care were more likely to have been referred to CW due to accusations of physical neglect ($X^2=4.11$, $p<.05$), supervisory neglect ($X^2=6.87$, $p<.01$) and abandonment ($X^2=11.72$, $p<.001$) than those remaining at home with no CW services and more concerns regarding supervisory neglect than those remaining at home with CW services ($X^2= 5.02$, $p<.05$). Children remaining at home with CW services were more likely than children at home with no services to have been referred for accusations of physical neglect ($X^2= 8.62$, $p<.01$) and abandonment ($X^2= 4.97$, $p<.05$). Finally, children who remained at home with no CW services were more likely to have been referred due to accusations of sexual abuse ($X^2= 6.09$, $p<.05$) than children in the out-of-home group. Children who remained at home with no CW services were less likely to have prior CW involvement than children remaining at home with CW services ($X^2= 6.75$, $p<.05$) or children placed out-of-home ($X^2=12.38$, $p<.001$). Out-of-home care providers were more likely to have higher HOME-SF scores than in-home with CW services caregivers ($t=-3.78$, $p<.001$). Out-of-home caregivers had higher mean incomes than in-home caregivers ($t=-5.67$, -5.90 , $p<.001$). Although not depicted in the table, no significant differences were found between the groups for either length of time to BL assessments or length of time between BL and FU assessments.

Developmental and Behavioral Status and CW Service Level

Table 2 displays average developmental and behavioral scores in each domain by intensity of CW involvement and time period. Children remaining at home, with no CW services differed significantly from children initially placed OOH in three distinct ways. Children remaining at home with no CW services had higher development/cognitive scores at FU ($t=2.12$, $p<.05$), higher adaptive behavior scores at BL ($t= 2.90$, $p<.01$) and lower CBCL scores at BL than children initially placed OOH ($t=-2.30$, $p<.05$). No differences were found by intensity of CW involvement for language at either time period.

Changes over time in standard scores were examined for each domain. When examined for all children, significant changes were observed between the BL and FU assessment periods in the developmental/cognitive ($t=-2.99$, $p<.01$), and language ($t= -3.01$, $p<.001$) domains (see Table 2). Children remaining at home with no CW services ($t=-2.95$, $p<.01$) and with CW services ($t= -2.11$, $p<.05$) had significantly improved developmental/cognitive scores, and

language/communication scores ($t=-2.14$, $p<.05$ and $t=-3.29$, $p<.01$ respectively). Children remaining at home with no CW services had significantly higher behavior scores ($t=2.21$, $p<.05$) at FU.

Predictors of FU Domain Scores in Multivariate Analyses

Multivariate analyses were conducted to examine predictors of change over time in each developmental domain (see Table 3). Separate analyses were conducted for each domain. In all analyses, a categorical age variable was used to control for the possibility that changes in domain scores might differ by developmental stage.

Developmental/Cognitive Domain—The multivariate model of developmental/cognitive status identified a number of variables that were related to improvement over time. Age was positively related to status over time, with children over 24 months showing greater change in developmental/cognitive status than the toddler reference group (12–23 mos). The HOME-SF was not related to improvement over time in developmental/cognitive status. Gender was associated with change in this domain, with boys making significantly less improvement than girls. Race/ethnicity was not related to improvement in this domain. Children reported to have experienced sexual abuse experienced relatively less change over time in this domain compared to children not reported to have experienced sexual abuse.

After controlling for these variables, intensity of CW involvement was not significantly related to change over time in developmental/cognitive status. An interaction was evident between initial developmental/cognitive status and intensity of CW involvement. Specifically, children with lower BL developmental/cognitive scores (below about 85–90) placed in out-of-home care were found to experience relatively less positive change than children with comparable BL scores who remained at home with no services. Although not statistically significant, the pattern for children remaining at home with services was similar to that of children placed out-of-home. An example of the net effect of this interaction is summarized in Figure 1. In this example, FU developmental/cognitive scores are estimated based on the entire model for hypothetical children meeting all of the criteria for the reference groups. For instance, a white male, between 12 and 23 mos of age with a BL developmental/cognitive score of 60 would have a predicted FU developmental/cognitive score of approximately 80 if he remained at home with no services. A child with the same characteristics and BL score who was placed out-of-home would have an estimated FU score of approximately 60.

Language and Communication Domain—Several variables were related to positive change over time in language status. The HOME-SF was positively associated with change in this domain. Relative to females, males experienced less positive change over time. Hispanic children experienced substantially less positive change than White children, even after entering the study with lower PLS scores on average. Children reported to have been physically abused or physically neglected also experienced less positive change. No significant differences were found based on intensity of CW involvement.

Adaptive Behavior—In the Adaptive Behavior domain, age was related to FU scores, with children in the 24–25 month group making greater positive change than those in the toddler reference group. The HOME-SF was also positively related to change in adaptive behavior status. Male gender was associated with lower scores in this domain. Children from Black and Hispanic racial/ethnic backgrounds experienced less positive change than White children. Children reported to have experienced sexual abuse and supervisory neglect experienced relatively more positive change in this domain than children not reported to have experienced these types of abuse.

The main effect of intensity of CW involvement on change in adaptive behavior was modified by an interaction with BL adaptive behavior scores. The effect was opposite in character to those in the developmental/cognitive domain. Namely, children with higher BL adaptive behavior scores placed out-of-home tended to experience deterioration relative to those remaining in-home with similar BL status, and those with lower BL adaptive behavior scores placed out-of-home tended to experience more positive change relative to children with similar BL scores remaining at home.

Due to the nature of the assessment administration methods for young children, which often rely on questions asked of a caregiver rather than direct observation or interaction with the child, there was concern that this interaction might have to do with the higher likelihood of changes in informants among children placed out-of-home than among children remaining at home. Therefore, analyses were re-run, including an interaction of BL assessment score with a dummy variable indicating whether the informant from the BL assessment remained the same, changed, or was ambiguous at FU. Inclusion of this interaction term in the Vineland model eliminated the interaction between intensity of CW involvement and BL adaptive behavior scores. The interaction between informant and BL intensity of CW involvement, indicated that when the informant changes on the Vineland, children with more extreme scores (high or low) at the BL assessment tend to have greater change toward the mean than children who do not have a change in informant.

Behavioral Domain—The final multivariate model in the behavioral domain had few significant findings. Being Hispanic was associated with improved CBCL scores over time. Additionally children with abandonment as an abuse type had poorer CBCL scores over time. None of the additional variables in the model were associated with change over time, including intensity of CW involvement.

DISCUSSION

As children come into contact with CW, important decisions are made regarding appropriate intensity of CW involvement. Developmental issues are an increasing policy concern in this population. Results from this nationally representative sample provide information regarding the relationship between intensity of CW involvement and patterns of developmental change in young children (ages 12–47 months) referred to CW. Main findings include: (1) few differences between intensity of CW involvement and changes in overall child developmental and behavioral status over time, (2) overall improvement in developmental/cognitive and language scores over time, but not as a function of intensity of CW involvement, (3) few changes in adaptive behavior or behavior problems over time, and (4) a positive relationship between the home environment and change in language/communication and adaptive behavior standard scores over time.

In general, children in the CW system showed improvement in developmental/cognitive, and language domain scores over the 15-month time period, but these gains were not consistently related to any specific intensity of CW involvement. Multivariate models indicated no differences in developmental change as a function of intensity of CW involvement. These data are observational in nature, and therefore causal relationships cannot be determined. However, there were many similarities between the three groups at baseline, and limited differences in change over time by intensity of CW involvement even when controlling for baseline developmental level, age, maltreatment type, gender, and the home environment. Therefore, some suggestions regarding the general relationship between intensity of CW involvement and change in development over time will be discussed.

These findings are consistent with previous studies reporting that foster care does not have a negative effect on child functioning, but does not facilitate development either (Maluccio & Fein, 1989; Minty, 1999b). However, our results contrast with other findings that do show improvements for young children in foster care; most notably improved adaptive functioning (Horwitz et al., 2001). There are several possible explanations for the differences between the present study and the results of Horwitz and colleagues. First, only the daily living skills subscale of the Vineland Adaptive Behavior Scales was employed in NSCAW, while children in the Horwitz study also received the communicative and social skills subscales. Second, our sample included a slightly younger subset of children. It is possible that older children show greater improvement in adaptive skills when in foster care due to more consistent service provision in schools (e.g., better attendance) or some other factor. Third, the NSCAW sample represents a national, rather than a local, target population and there may be different patterns of development in some communities than others. In particular, the foster care environment provided in Connecticut may have facilitated development of children in out-of-home care. These improvements would be consistent with research examining specialized foster care, which indicates improvements in development for young children in specialized care in comparison with children in typical foster care environments (Fisher et al., 2000; Fisher, Ellis, & Chamberlain, 1999). In the NSCAW sample, all types of foster care providers were included. Perhaps something about the home environment provided a rationale for the provision of services. Recent research has documented that CW programs vary widely in the amount of training and support provided to out-of-home caregivers (Hurlburt et al., 2007). The specific services received by children in this study were not examined as service use was not the focus of this paper. However, a detailed examination of the relationship between specific services and the development of young children known to CW would be an important future research emphasis.

The HOME-SF scores were positively related to change in both language and adaptive behavior status, and therefore may play a role in improving developmental status for children in CW. These data are consistent with previous studies finding an association between family environment and outcome (Hauser-Cram et al., 2001; Kelly & Booth, 2002) and lend support to the idea that studies examining high quality foster care may find improvements in child developmental functioning whereas a national sample of usual foster care may not. Children in out-of-home care did have higher HOME-SF scores than children remaining at home with services. Scores for children at home with no services were similar to scores for children placed out-of-home. The quality of the home environment may be especially important for children entering CW with more considerable delays. If improved quality of care is a major factor in development, greater attention must be paid to the training and support given to caregivers in all home situations in order to ensure appropriate environments for at-risk children.

There was a key exception to these main findings in the developmental/cognitive domain. Models indicated a significant interaction between intensity of CW involvement and BL scores. In comparison with children remaining at home with comparably low scores, children in out-of-home care who had low scores at BL exhibited less positive change over time. The difference was most dramatic for children with very low BL scores. Possibly children with fewer cognitive/developmental abilities have greater difficulty with changing environments, while children with higher skills are less affected and perhaps even stimulated by a new or improved environment. We cannot rule out other factors such as living arrangement changes, service use, and prior involvement in CW that may play some role in this interaction. The patterns were very similar for children placed out-of-home, and those remaining at home with services. This may indicate that the children at home with services are similar to those placed in out-of-home care, and those remaining at home with no services may have additional differences in their environment that make their developmental change during this time period differ.

Although the children's developmental/cognitive and language scores improved over time, scores remained lower than normative levels on the assessments. We do not think that the increase in developmental/cognitive and language scores can be interpreted as regression to the mean. If there had been regression to the mean we would have expected to see children with scores at either extreme at BL have less extreme scores at FU. Regression to the mean cannot explain overall group changes, either decrements (e.g., adaptive behavior for toddlers) or improvements (such as language changes for preschoolers), nor can it explain interactions between baseline scores and intensity of CW involvement (Bland & Altman, 1994; Pomerleau et al., 2005).

These same improvements were not seen for adaptive behavior, nor was a reduction in behavior problems evident. This could be due to the relative strength seen in adaptive behavior. That is, children, on average, were scoring in the average range in this area (except BL scores for children in out-of-home care) and continued to score in the average range at FU. Similarly, on average, behavior problem scores were in the typical range. It may be that behavioral difficulties commonly found in children with CW involvement manifest themselves as children reach school age.

Limitations

As with all research, these analyses have their limitations. It can reasonably be questioned whether it is possible, or advisable, to compare the developmental outcomes of children placed out-of-home with those of children remaining in their homes with or without supportive CW services. It is likely that there are important differences in level of maltreatment, caregiver competence and overall safety of the environment between the homes of origin for children remaining at home and those placed in out-of-home care. In fact, these data indicate increased levels of abandonment and neglect in children in out-of-home care, especially when compared to children remaining at home with no services. However, developmental/cognitive levels were quite similar to children remaining at home with CW services. Given that our research questions focused on change in development over time, not absolute differences, and that we were specifically interested in the potential impact of out-of-home care, comparing children across intensity of CW involvement is appropriate. Interestingly, the results of this study do not reveal any differential changes as a function of intensity of CW involvement, despite the fact that children removed from their homes are also known to have much higher probability of receiving developmental services than children remaining at home (Stahmer et al., 2005). As a comparison group, the children remaining at home can be seen as a conservative comparison group, in the sense that one might have expected greater improvements over time for children in out-of-home care. Another limitation is the lack of examination of service use in this specific sample. Inclusion of the amount of services provided may have affected the model and should be examined in future research. This study suggests that the developmental status of children in contact with CW does tend to improve over time, but not differentially for children placed in out-of-home care. Our interests are not in suggesting that children should remain in their homes, but to understand whether, on average, intensity of CW involvement seems to be contributing positively to child development.

Conclusions

Overall, younger children in contact with CW show deficits in functioning during the toddler years, with some recovery in development and communication skills during preschool years. Therefore, when examining the progress of very young children in CW, it is important to utilize a comparison group to account for changes over time that occur in measurement of developmental abilities across home situations. Further examination of changes as children reach school age will be important in understanding how early development may affect later functioning in this at-risk group.

Children with limited cognitive capacity may need special attention upon transition to foster care. Children with developmental delay are more likely to be placed out-of-home, therefore foster care providers may need additional support to facilitate development in this population. Additional training for biological parents and foster care providers (including those providing kinship care) in encouraging development in children with delays is important for attainment of critical developmental skills (Fisher et al., 1999).

Data indicate intensity of CW involvement, on average, is not likely to differentially affect developmental and behavioral progress although the home environment does. Facilitating development in children in out-of-home care may require supportive, enriched care environments (Minty, 1999a). Given that a majority of children known to CW remain at home, improving both in-home and out-of-home care environments may have the greatest effect on improving the well-being of children known to CW. Future research might focus on specific support and parent training programs that facilitate child well-being and can be implemented in CW environments.

Acknowledgments

The Caring for Children in Child Welfare project (CCCW) is a collaborative effort between the Child and Adolescent Services Research Center (CASRC) at Children's Hospital San Diego, the Department of Psychiatry at the University of Pittsburgh (Pittsburgh), the Columbus Children's Hospital, the Services Effectiveness Research Program at Duke University (Duke), and the Research Triangle Institute (RTI). The study is jointly funded by the National Institute of Mental Health (MH59672) and by the Administration on Children and Families (90PH0006). A complete description of the study and a list of key personnel are available at www.casrc.org/projects/CCCW/index.htm.

It should be noted that this document also includes data from the National Survey of Child and Adolescent Well-Being (NSCAW), which was developed under contract to RTI from the Administration on Children, Youth, and Families, U.S. Department of Health and Human Services (ACYF/DHHS). The CCCW also maintains ongoing collaboration with the NSCAW Research Group.

The information and opinions expressed herein reflect solely the position of the author(s). Nothing herein should be construed to indicate the support or endorsement of its content by ACYF/DHHS.

References

- Achenbach, T. Manual for the Child Behavior Checklist/4–18 and 1991 Profile. Burlington, VT: University of Vermont, Department of Psychiatry; 1991.
- Achenbach TM, Edelbrock C, Howell CT. Empirically based assessment of the behavioral/emotional problems of 2- and 3- year-old children. *Journal of Abnormal Child Psychology* 1987;15(4):629–650. [PubMed: 3437096]
- Administration for Children and Families, C. B. Child Maltreatment 2006: Reports from the States to the National Child Abuse and Neglect Data Systems - National statistics on child abuse and neglect. [Web Page]. 2006. URL [http://www.acf.hhs.gov/programs/cb/stats_research/index.htm#can\[2008, April 16\]](http://www.acf.hhs.gov/programs/cb/stats_research/index.htm#can[2008, April 16]).
- Allen RE, Oliver JM. The effects of child maltreatment on language development. *Child Abuse & Neglect* 1982;6(3):299–305. [PubMed: 6892313]
- Baker, PC.; Keck, CK.; Mott, FL.; Quinlan, SV. NLSY Child Handbook: Revised Edition: A Guide to the 1986–1990 NLSY Child Data. Columbus, OH: The Ohio State University, Center for Human Resource Research; 1993.
- Barnett, D.; Manly, JT.; Cicchetti, D. Defining child maltreatment: The interface between policy and research. In: Cicchetti, D.; Toth, SL., editors. *Advances in applied developmental psychology: Child abuse, child development and social policy*. Vol. Chapter 2. Norwood, NJ: Ablex Publishing Corp; 1993. p. 7-73.
- Benedict MI, Zuravin S, Somerfield M, Brandt D. The reported health and functioning of children maltreated while in family foster care. *Child Abuse & Neglect* 1996;20(7):561–571. [PubMed: 8832113]

- Bland JM, Altman DG. Regression towards the mean. *British Medical Journal* 1994;308(6942):1499. [PubMed: 8019287]
- Blatt ER. Factors associated with child abuse and neglect in residential care settings. *Children and Youth Services Review* 1992;14(6):493–517.
- Bradley RH, Caldwell BM. The relation of infants' home environments to achievement test performance in first grade: a follow-up study. *Child Development* 1984;55(3):803–809. [PubMed: 6734319]
- Campbell FA, Ramey CT. Effects of early intervention on intellectual and academic achievement: A follow-up study of children from low-income families. *Child Development* 1994;65(2):684–698. [PubMed: 8013248]
- Coster WJ, Gersten MS, Beehly M, Cicchetti D. Communicative functioning in maltreated toddlers. *Developmental Psychology* 1989;25(6):1020–1029.
- Dowd, K.; Kinsey, S.; Wheelless, S. NSCAW Research Group. National Survey of Child and Adolescent Well-Being (NSCAW): Wave 1 Data File Users Manual. Research Triangle Park, NC: Research Triangle Institute; 2002.
- Egeland B, Sroufe LA. Attachment and early maltreatment. *Child Development* 1981;52(1):44–52. [PubMed: 7238152]
- English, DJ, the LONGSCAN Investigators. Modified Maltreatment Classification System (MMCS). For more information visit the LONGSCAN. 1997. website at <http://www.iprc.unc.edu/longscan/>
- English DJ, Bangdiwala SI, Runyan DK. The dimensions of maltreatment: Introduction. *Child Abuse & Neglect* 2005;29(5):441–460. [PubMed: 15970319]
- Ertem IO, Forsyth BW, Avni-Singer AJ, Damour LK, Cicchetti DV. Development of a supplement to the HOME Scale for children living in impoverished urban environments. *Journal of Developmental & Behavioral Pediatrics* 1997;18(5):322–328. [PubMed: 9349975]discussion 329–330.
- Fanshel, D.; Shinn, EB. Children in foster care: A longitudinal investigation. New York: Columbia University Press; 1978.
- First LR, Palfrey JS. The infant or young child with developmental delay. *New England Journal of Medicine* 1994;330:478–483. [PubMed: 7507219]
- Fisher PA, Ellis BH, Chamberlain P. Early intervention foster care: A model for preventing risk in young children who have been maltreated. *Children's Services: Social Policy, Research, & Practice* 1999;2(3):159–182.
- Fisher PA, Gunnar MR, Chamberlain P, Reid JB. Preventive intervention for maltreated preschool children: Impact on children's behavior, neuroendocrine activity, and foster parent functioning. *Journal of the American Academy of Child & Adolescent Psychiatry* 2000;39(11):1356–1364. [PubMed: 11068890]
- Grigorenko, EL.; Sternberg, RJ. Assessing cognitive development in early childhood. Washington, DC: The World Bank; 1999.
- Hauser-Cram P, Warfield ME, Shonkoff JP, Krauss MW. Children with disabilities: A longitudinal study of child development and parent well-being. *Monographs of the Society for Research in Child Development* 2001;66(3):1–131.
- Heath A, Colton M, Aldgate J. The educational progress of children in and out of care. *British Journal of Social Work* 1989;19(6):447–460.
- Hochstadt NJ, Jaudes PK, Zimo DA, Schachter J. The medical and psychosocial needs of children entering foster care. *Child Abuse & Neglect* 1987;11(1):53–62. [PubMed: 3828875]
- Horwitz SM, Balestracci KMB, Simms MD. Foster care placement improves children's functioning. *Archives of Pediatric and Adolescent Medicine* 2001;155:1255–1259.
- Hurlburt MS, Leslie LK, Barth R, Landsverk J, Kolko D, Rolls J. National variation in efforts to train child welfare workers and foster caregivers on children's mental health and development. Technical Report. 2007
- Kaufman, AS.; Kaufman, NL. Kaufman Brief Intelligence Test (K-BIT). Circle Pines, MN: American Guidance Service, Inc; 1990.
- Kelly, JF.; Booth, CL. The early child care study of children with special needs. In: Glidden, LM., editor. International review of research in mental retardation. Vol. 25. San Diego, CA: Academic Press; 2002. p. 71-106.

- Kinard EM. Psychosocial resources and academic performance in abused children. *Children and Youth Services Review* 1999;21(5):351–376.
- Klee L, Kronstadt D, Zlotnick C. Foster care's youngest: A preliminary report. *American Journal of Orthopsychiatry* 1997;67(2):290–299. [PubMed: 9142362]
- Landsverk J, Davis I, Ganger W, Newton R. Impact of child psychosocial functioning on reunification from out-of-home placement. *Children and Youth Services Review* 1996;18(4–5):447–462.
- Leslie L, Gordon J, Ganger W, Gist K. Developmental delay in young children in child welfare by initial placement type. *Infant Mental Health Journal* 2002;23(5):496–516.
- Maluccio, AN.; Fein, E. An examination of long term foster family care for children and youth. In: Hudson, J.; Galaway, B., editors. *The state as parent: International research perspectives on interventions with young persons*. Vol. 53. New York, NY: Kluwer Academic/Plenum Publishers; 1989. p. 387-400.
- Maluccio AN, Fein E. Growing up in foster care: Response to Festinger. *Children and Youth Services Review* 1986;8(2):104–105.
- Minty B. Annotation: Outcomes in long-term foster family care. *Journal of Child Psychology & Psychiatry* 1999a;40(7):991–999. [PubMed: 10576530]
- Minty B. Outcomes in long-term foster family care. *Journal of Child Psychology and Psychiatry* 1999b; 40(7):991–999. [PubMed: 10576530]
- Mott FL. The utility of the Home-SF scale for child development research in a large national longitudinal survey: The national longitudinal survey of youth 1979 cohort. *Parenting: Science and Practice* 2004;4(2–3):259–270.
- Newborg, J.; Stock, JR.; Wherk, L.; Guidubaldi, J.; Svinicki, J. *Battelle Developmental Inventory*. Itasca, IL: Riverside Publishing; 1984.
- Pomerleau A, Malcuit G, Chicoine J, Séguin R, Belhumeur C, Germain P, Amyot I, Jéliu G. Health status, cognitive and motor development of young children adopted from China, East Asia, and Russia across the first 6 months after adoption. *International Journal of Behavioral Development* 2005;29:445–457.
- Reams R. Children birth to three entering the state's custody. *Infant Mental Health Journal* 1999;20(2): 166–174.
- Senn S. Change from baseline and analysis of covariance revisited. *Statistics in Medicine* 2006;25:4334–4344. [PubMed: 16921578]
- Shonkoff, J.; Phillips, P. *From neurons to neighborhoods: The science of early childhood development*. Washington DC: National Academy Press; 2000.
- Simms MD. The foster care clinic: A community program to identify treatment needs of children in foster care. *Journal of Developmental & Behavioral Pediatrics* 1989;10(3):121–128. [PubMed: 2473095]
- Sparrow, S.; Balla, D.; Cichetti, D. *Vineland Adaptive Behavior Scales: Interview edition, survey form manual*. Circle Pines, MN: American Guidance Service; 1984.
- Stahmer AC, Leslie LK, Hurlburt M, Barth RP, Webb MB, Landsverk J, Zhang J. Developmental and behavioral needs and service use for young children in child welfare. *Pediatrics* 2005;116(4):891–900. [PubMed: 16199698]
- Stothard SE, Snowling MJ, Bishop DV, Chipchase BB, Kaplan CA. Language-impaired preschoolers: A follow-up into adolescence. *Journal of Speech Language and Hearing Research* 1998;41:407–418.
- Taussig HN, Clyman RB, Landsverk J. Children who return home from foster care: a 6-year prospective study of behavioral health outcomes in adolescence. *Pediatrics* 2001;108(1):E10. [PubMed: 11433089]
- U.S. Department of Health and Human Services. *The AFCARS report: Current estimates as of August 2002* [Web Page]. 2003. URL <http://www.acf.hhs.gov/programs/cb/publications/report7.htm> [2006, January].
- Urquiza AJ, Wirtz SJ, Peterson MD, Singer VA. Screening and evaluating abused and neglected children entering protective custody. *Child Welfare* 1994;73(2):155–171. [PubMed: 8149776]
- Zimmer MH, Panko LM. Developmental status and service use among children in the child welfare system: A national survey. *Archives of Pediatric and Adolescent Medicine* 2006;160(2):183–188.

Zimmerman, IL.; Steiner, VG.; Pond, RE. *Preschool Language Scale-3*. San Antonio, TX: Psychological Corporation; 1992.

Predicted W3 Developmental/Cognitive Scores by Intensity of CW Involvement: Reference Category Example

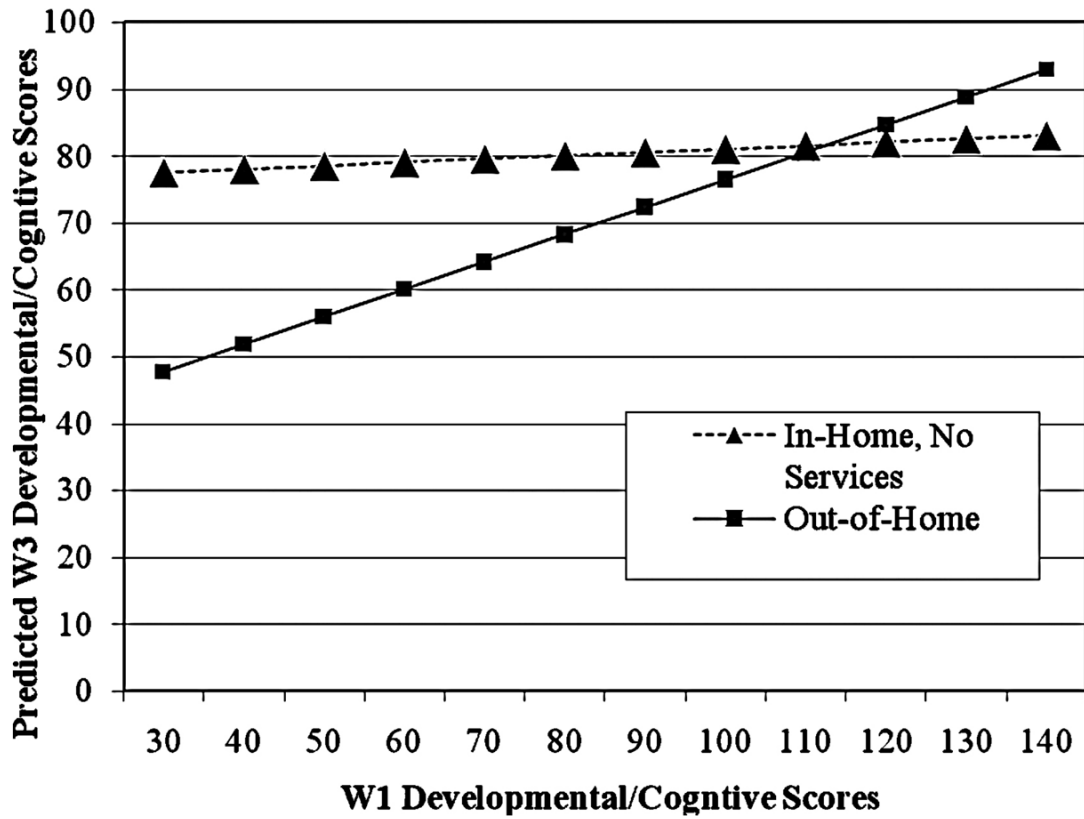


Figure 1. The figure illustrates the interaction between BL developmental/cognitive scores and intensity of CW involvement. The figure depicts predicted FU standard scores for hypothetical children meeting all of the reference categories remaining at home with services, and those in out-of-home care.

Table 1
Sociodemographic Characteristics and Maltreatment History of Children in Child Welfare by Intensity of CW Involvement for Children ages 12–47 months in NSCAW ¹

	Intensity of CW Involvement				Total (N=1049)	p-value
	In-home, No Services (N=369, 65.9%)	In-home, Services (N=419, 23.36%)	Out-of-home (N=261, 10.74%)			
Age in Months (% , SE)						
12–23	40.13(5.33)	34.56(3.07)	41.76(8.28)	39.01(3.74)	Overall	
24–35	23.89(3.50)	31.15(3.89)	36.39(9.52)	26.93(2.76)	X ² =5.28	
36–47	35.98(4.40)	34.28(4.68)	21.85(5.59)	34.07(2.86)	P=0.2697	
Gender (% male, SE)	51.2(4.25)	56.43(4.08)	53.56(7.18)	52.67(3.46)	X ² =1.21	
					P=0.5475	
Race/Ethnicity (% , SE)					Overall	
Black	27.66(3.91)	38.49(4.99)	29.85(6.39)	30.44(3.35)	X ² =13.38	
White	41.18(5.00)	47.08(4.83)	38.13(7.95)	42.24(4.12)	P=.0483	
Hispanic	23.79(4.79)	8.79(1.78)	26.60(10.56)	20.58(3.71)		
Other	7.36(2.27)	5.64(2.14)	5.41(2.48)	6.75(1.62)		
Maltreatment History (% , SE)					X ² =2.48	
Physical abuse	34.10(3.20)	35.47(4.26)	24.07(5.38)	33.32(2.42)	P=0.2942	
Sexual abuse ^c	11.81(2.84)	5.84(1.92)	3.57(1.56)	9.55(1.99)	X ² =6.28	
Emotional abuse	9.92(3.65)	11.05(3.45)	16.11(5.23)	10.85(2.97)	P=0.0485	
Physical neglect ^{a,b}	21.82(3.18)	41.66(6.34)	42.00(9.40)	28.54(2.98)	X ² =1.82	
Supervise neglect ^{b,d}	45.55(4.92)	49.14(6.05)	70.59(5.76)	49.09(3.24)	P=0.4074	
Abandonment ^{a,b}	0.28(0.19)	3.19(1.36)	8.28(2.62)	1.82(0.43)	X ² =12.68	
					P=0.0028	
					X ² =7.21	
					P=0.0316	
					X ² =17.58	
					P=0.0003	
Caregiver education (% , SE)					Overall	
<HS	26.56(3.54)	35.80(4.02)	26.50(9.74)	28.72(2.91)	X ² =4.56	
HS diploma	53.78(4.04)	49.25(4.50)	51.55(9.13)	52.48(2.72)	P=0.3439	
>HS	19.65(3.90)	14.95(2.44)	21.95(5.04)	18.80(2.76)		
Prior CW Involvement (% , SE)^{a,b}					X ² =18.51	
Yes	18.02(3.57)	36.11(5.79)	51.20(9.14)	25.57(3.15)	P=0.0002	
No	81.98(3.57)	63.89(5.79)	48.80(9.14)	74.43(3.15)		
Mean HOME-SF Score (SD)					P=0.0024	
Standardized Score ^d	7.69(1.47)	7.34(1.52)	8.01(1.57)	7.65(1.53)	P=0.3754	
Raw Scores	16.03(3.77)	15.07(3.77)	15.73(3.77)	15.77(3.77)		
Caregiver income (Mean, SD)^{b,d}	20087 (17471)	18525 (14144)	35149 (22883)	21405 (21175)	P=0.0000	
Number of U.S. Children Represented by the Sample	275929	97811	44949	418689		

¹ All percentages are weighted percentages

^a In-home, no services < In-home with services

^b In-home, no services < Out-of-home

^c In-home, no services > Out-of-home

^d In-home, with services < Out-of-home

Table 2

Mean Scores for Developmental and Behavioral Domains by Intensity of CW Involvement and Time Period for Children ages 12–47 months in NSCAW

Domain	Intensity of CW Involvement			Comparisons by Intensity of CW Involvement p-value
	In-home, no Services Mean (SD)	In-home, Services Mean (SD)	Out-of-home Mean (SD)	
Developmental/Cognitive				
Baseline	84.54 (18.76)	85.88 (18.55)	87.32 (19.79)	t=2.12; p=.037 In-home, no services > Out-of-home at Follow-up
Follow-up	92.51 (18.42)	90.01 (17.63)	86.10 (16.15)	
Comparisons by Time	t=-2.95; p=.004	t= -2.11; p=.038.	n.s.	t=-2.99; p=.004
Language and Communication				
Baseline	85.32 (18.31)	82.99 (17.16)	83.27 (16.41)	t=2.90; p=.0048 In-home, no services > Out-of-home at Baseline
Follow-up	89.01 (18.20)	88.29 (19.60)	87.98(19.00)	
Comparisons by Time	t=-2.14; p=.035	t=-3.29; p=.002	n.s.	t= -3.01; p=.004
Adaptive Behavior				
Baseline	93.07 (16.95)	90.78 (16.52)	85.96 (15.41)	t=-2.30; p=0.0242 In-home, no services < Out-of-home at Baseline
Follow-up	92.18 (16.81)	90.95 (17.16)	90.63 (18.41)	
Comparisons by Time	n.s.	n.s.	n.s.	n.s.
Behavior²				
Baseline	51.63 (10.28)	53.99 (10.39)	56.77 (11.25)	t=-2.30; p=0.0242 In-home, no services < Out-of-home at Baseline
Follow-up	53.66 (10.42)	55.46 (11.12)	51.60 (11.94)	
Comparisons by Time Period	t=-2.21; p=.03	n.s.	n.s.	n.s.

¹ All estimates are weighted. Standard deviations are unweighted.

²The CBCL is normed for children ages two and above, therefore children under the age of two were not included in these analyses.

Multivariate Linear Modeling Predicting Follow-up (FU) Scores for Children ages 12–47 months in NSCAW¹

	Developmental/Cognitive				Language & Commun.				Adaptive Behavior				Behavior			
	R ² =0.208		R ² =0.268		R ² =0.313		R ² =0.390		R ² =0.268		R ² =0.313		R ² =0.390		R ² =0.390	
	β	SE	P-value	β	SE	P-value	β	SE	P-value	β	SE	P-value	β	SE	P-value	P-value
Intercept	75.99	11.15	.0000	52.69	7.39	.0000	24.96	7.50	.0013	21.24	6.14	.0009	21.24	6.14	.0009	.0009
Baseline score	0.05	0.06	.4240	0.33	0.05	.0000	0.47	0.06	.0000	0.63	0.05	.0000	0.63	0.05	.0000	.0000
Age in month																
12–23																
24–35	12.06	3.34	.0005	1.99	2.37	.4038	5.04	2.03	.0150	--	--	--	--	--	--	--
36–47	8.92	3.10	.0051	3.37	2.59	.1969	-1.30	2.03	.523	2.23	1.33	.0972	2.23	1.33	.0972	.0972
HOME-SF	1.61	0.99	.1087	2.19	0.72	.0031	2.30	0.55	.0001	-0.08	0.48	.8731	-0.08	0.48	.8731	.8731
Gender																
Male	-5.60	2.40	.0222	-5.16	2.00	.0118	-5.25	1.73	.0032	0.32	1.31	.8060	0.32	1.31	.8060	.8060
Female	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Race/Ethnicity																
Black	-1.55	3.16	.6251	-0.00	2.49	1.0000	4.69	2.17	.0334	0.02	1.22	.9867	0.02	1.22	.9867	.9867
White	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hispanic	-1.02	4.00	.7993	-10.42	3.05	.0010	8.72	3.22	.0084	-5.91	2.48	.0195	-5.91	2.48	.0195	.0195
Other	0.52	3.48	.8823	1.45	3.08	.6396	2.25	2.76	.4169	-3.85	5.16	.4577	-3.85	5.16	.4577	.4577
Maltreatment history																
Physical abuse	-1.99	2.08	.3422	-5.28	1.78	.0039	3.25	1.89	.0888	1.87	1.40	.1855	1.87	1.40	.1855	.1855
Sexual abuse	-4.75	2.10	.0264	-8.39	4.42	.0614	7.13	3.21	.0291	-2.13	2.44	.3869	-2.13	2.44	.3869	.3869
Emotional abuse	-3.36	2.49	.1812	-7.92	4.34	.0718	0.22	2.45	.9299	2.39	2.71	.3810	2.39	2.71	.3810	.3810
Physical neglect	-2.92	3.06	.3428	-5.38	2.42	.0293	-0.52	2.07	.8003	-0.96	1.79	.5931	-0.96	1.79	.5931	.5931
Supervise neglect	-1.35	2.34	.5648	-1.36	2.24	.5470	4.46	1.59	.0062	-0.70	1.53	.6480	-0.70	1.53	.6480	.6480
Abandonment	7.31	3.85	.0614	-0.47	3.37	.8894	4.91	2.98	.1028	6.45	2.58	.0144	6.45	2.58	.0144	.0144
BL CW Involvement																
In-home, No CW Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
In-home, CW Services	-34.27	9.61	.0006	-0.47	1.94	.8098	1.66	2.11	.4332	-0.44	1.32	.7425	-0.44	1.32	.7425	.7425
Out-of-home	-40.53	13.21	.0029	0.05	2.29	.9828	-2.30	3.40	.5013	-5.36	3.62	.1427	-5.36	3.62	.1427	.1427
In-home, CW services*BL score	0.36	0.11	.0013													
Out-of-home * BL score	0.36	0.13	.0079													
Caregiver Interviewed																
Same Both Time Periods																
Different																
Ambiguous																
Different * BL Adaptive																
Ambiguous * BL Adaptive																

----- scores not available for this age group due to floor or ceiling limit