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Characteristics and Behavioral Outcomes for Youth in Group Care and Family-Based Care: A Propensity Score Matching Approach Using National Data

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Abstract

This study aimed to answer two questions: (a) Given expected differences in children who are placed in group care compared to those in family-based settings, is it possible to match children on baseline characteristics? (b) Are there differences in behavioral outcomes for youth with episodes in group care versus those in family-based care? Using data from the National Survey of Child and Adolescent Well-Being, the study sample included 1,191 children with episodes in out-of-home care (n = 254 youth with group care episodes; n = 937 youth with episodes in family-based care and no group care). Conditioning variables were identified, which distinguished between the two groups of youth. Using propensity score matching, all youth placed into group care were matched on the propensity score with family-based care youth. Behavioral outcomes at 36 months, as measured by the Child Behavior Checklist, were compared for the matched sample. Of the total 254 youth with group care episodes, 157 could be matched to youth with episodes in family-based care. No significant differences remained between the two groups in the matched sample, and findings revealed no significant differences in longitudinal behavioral outcomes.

Keywords

residential treatment; residential care; group care; family-based care; propensity score matching

The list of evidence-based treatments for youth with serious emotional and behavioral problems has grown considerably during the last decade (National Registry of Evidence-Based Programs and Practices [NREPP], 2010). Notably absent from any list is residential care or group home treatment, referred to as group care in this article. In fact, group care has been cited as a treatment that may potentially have adverse effects (Barth, 2005; Overcamp-Martini & Nutton, 2009).

Concerns about group care are based on its cost, a weak evidence base for effectiveness, and a service delivery mode, which ideologically departs from system of care emphasis on community-based care in the least restrictive setting (Stroul & Friedman, 1986). Concerns

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further revolve around reliance on shift staff with often inadequate training and high turnover rates, issues of safety and potential for abuse, as well as negative peer processes (e.g., Burns, Hoagwood, & Mrazek, 1999; Dishion, McCord, & Poulin, 1999). Child-serving systems, policy makers, and consumers tend to view placement into group care as an adverse outcome (Dodge, 2006) that is only defensible as a "last-resort-placement" for youth for whom all other placement options have been exhausted (Barth, 2002). In light of these concerns and with the emergence of a growing number of home- and community-based interventions, many service systems have begun to reduce utilization of group care through implementation of alternative less restrictive approaches in the treatment of youth with emotional and behavioral disorders (Pumariega, 2006). While cross- sectional federal data indicate reductions in group care utilization rates in recent years from 20% to about 16% of the foster care population (U.S. Department of Health and Human Services, Administration for Children, Youth and Families, 2009), group care remains an integral part of the continuum of services for a sizable proportion of children in out-of-home care (Butler & McPherson, 2007; Leichtman, 2006). As such, questions about the placement of children into group care and related outcomes remain highly relevant.

Behavior Problems and Other Predictors of Group Care

Behavioral outcomes are of particular interest to group care settings. A majority of studies have identified elevated behavior problems as a primary characteristic of youth placed into group care (e.g., Handwerk, Friman, Mott, & Stairs, 1998; James et al., 2006; Wulczyn, Barth, Yuan, Jones Harden, & Landsverk, 2005), alongside a range of other factors such as older age and longer and unstable placement histories (e.g., Baker, Wulczyn, & Dale, 2005; Wulczyn, Kogan, & Harden, 2003). Yet there is also countervailing evidence that a substantial number of children placed into group care have needs that are no more severe than those of children in lower level family-based care (Breland-Noble, Farmer, Dubs, Potter, & Burns, 2005; Farmer, Mustillo, Burns, & Holden, 2008; Lyons, Libman-Mintzer, Kieiel, & Shallcross, 1998). Such similarities may in part be explained by the multitude of reasons, including policy mandates, administrative reasons, and contextual factors (e.g., resource availability or region), which have been identified as important determinants of access to services (Barth, Wildfire, & Green, 2006; Hurlburt et al., 2004; James, 2004). As such, placement assignment may not always be intentional or reflect the logic on which the continuum of services is based. Regardless of these confounding factors, behavior problems are, at least in theory, viewed as an important factor that should affect both initial placement into group care as well as eventual stepping down from group care placement to less restrictive settings (Huefner, James, Ringle, Thompson, & Daly, 2010).

Outcomes of Group Care

The outcome literature on group care remains scant. Current knowledge about its effect on targeted outcomes is mostly based on regional studies with small nonrepresentative samples and weak study designs (Bean, White, & Lake, 2005; Bettmann & Jasperson, 2009; Hair, 2005). Existing studies, relying primarily on pre-experimental designs, have measured outcomes in terms of symptom reduction (Lyons, Terry, Martinovich, Peterson, & Bouska, 2001; Weis, Wilson, & Whitemarsh, 2005), behavioral and socioemotional functioning (Larzelere et al., 2001; Leichtman, Leichtman, Barber, & Neese, 2001; Lyons & Schaefer, 2000; Mann-Feder, 1996; Weis et al., 2005), and academic success (Hooper, Murphy, Devaney, & Hultman, 2000; Thompson et al., 1996). In general, youths who have less severe dysfunction, greater capacity for interpersonal relationships, and acute rather than chronic onset of problems tend to have better outcomes (Landsman, Groza, Tyler, & Malone, 2001; Wilmshurst, 2002). Involvement of families in treatment during group care placement, availability of after-care services, as well as shorter lengths of stay in group care

further mitigate outcome and have been associated with a better prognosis or outcome (Hoagwood & Cunningham, 1993; Larzelere et al., 2001). Predictors of poor outcome include comorbid substance use disorders, a history of physical or sexual abuse, and early onset of persistent conduct problems and delinquency (e.g., Peterson & Scanlan, 2002).

Although findings from pre-post or nonequivalent comparison group studies point to improvements in functioning following group care placement, a final verdict on the outcomes associated with group care placement cannot be rendered without carefully selected comparison groups to address threats to internal validity. Only a handful of studies have compared the outcomes of group care to those associated with home- or community-based interventions (Barth, Greeson, Guo, Green, & Hurley, 2007; Breland-Noble et al., 2004; Breland-Noble et al., 2005; Chamberlain & Reid, 1998; Lee & Thompson, 2008). One of the main challenges is to address the baseline differences that are inherent to the placement of children along the continuum of services and may not be random. Findings from these studies are mixed. In a randomized trial, Chamberlain and Reid (1998) examined the effectiveness of Multidimensional Treatment Foster Care (MTFC), randomly assigning 79 male adolescents with histories of delinquency to MTFC and group care. They found that participation in MTFC produced more favorable outcomes (e.g., fewer criminal referrals, more frequent return to live with relatives) than participation in the group care program. Breland-Noble et al. (2004, 2005) reported on a study of treatment foster homes and group homes in North Carolina. They found considerable similarities between the two groups in terms of demographic and clinical characteristics. However, the two groups differed significantly in their service use patterns, with youth in treatment foster homes receiving more community-based services. Youth in group homes were also almost twice as likely to receive psychotropic medication. Barth et al. (2007) compared outcomes for youth receiving intensive in-home therapy or group care. As would be expected, youth differed at baseline along many different dimensions. Using propensity score matching (PSM), which eliminated most baseline differences, the authors reported that youth receiving intensive in-home therapy had a greater tendency toward living with family, making progress in school, not experiencing trouble with the law, and placement stability, although findings were not statistically significant. Given the high cost associated with group care, along with the restrictive nature of this setting, the study recommended intensive in-home services as the preferred treatment. Using the same statistical method, Lee and Thompson (2008) compared outcomes for youth in treatment foster care and group care at Boys Town. Contrary to prior work, the study found that group care youth were more likely to be favorably discharged, more likely to return home, and less likely to experience subsequent placement in the first 6 months following discharge. Authors cautioned not to generalize results to other group care settings given the unique characteristics of BoysTown. However, findings suggested that family-style group care can be effective.

PSM

The Barth et al. (2007) and Lee and Thompson (2008) studies were observational but used PSM to address baseline differences between the two comparison groups. Due to valid ethical, policy, and practical concerns, randomizing children to group care is usually not possible or may simply not be permitted in real-world service systems. However, inferring causality in the absence of an experiment is difficult. PSM is a method to reduce bias and improve efficiency of parameters in observational studies (Rubin, 2006). The primary advantage of PSM is its effective control of covariates or conditioning factors threatening internal validity through predicting propensity scores, matching on propensity scores, and multivariate analysis based on a matched sample or resample (Rosenbaum & Rubin, 1983). This is considered to be a more rigorous approach than merely controlling for covariates in observational studies, since simple comparison of individuals receiving different treatment

approaches (e.g., group care versus lower level out-of-home care) is potentially misleading or biased in that the effect of treatment is not estimated per se (Guo & Fraser, 2009).

PSM is not without limitations or critics, however (e.g., Pearl, 2009; Shadish, Cook, & Campell, 2002). For example, covert bias might still exist as PSM only controls for observed variables or confounds. In addition, the matching methodology can result in inexact and incomplete matching, particularly when the two groups being compared do not have substantial overlap on the covariates used to derive the propensity scores. This can greatly reduce sample size and power of the target analyses. Despite these concerns, PSM is an appropriate analytic approach to be considered in the area of foster and group care research where random assignment is difficult at best and where baseline differences across placements with varying levels of restrictiveness can be expected.

Purpose of Current Study

There are two questions that guide the current analysis: (a) Given expected differences in children who are placed in group care compared to those in lower level family-based settings (e.g., foster care, kinship care), is it possible to match children on baseline characteristics? (b) Are there differences in behavioral outcomes for youth with episodes in group care versus those in lower level family-based care? In other words, are behavioral outcomes for youth in group care significantly worse if we adjust for baseline characteristics?

Our study uses data from the National Survey of Child and Adolescent Well-Being (NSCAW), the first national probability study of children and families referred for child welfare services. While children from all service systems (mental health, child welfare, juvenile justice) enter group care settings, this study specifically focuses on children placed by the child welfare system. This group of children makes up a large proportion of the population of youth in group care settings (National Center for Juvenile Justice [NCJJ], 2008; Pottick, Warner, & Yoder, 2005; U.S. Department of Health and Human Services, Administration for Children, Youth and Families, 2009). The availability of national data offers the opportunity to provide national estimates about characteristics and outcomes relevant to youth in group care placements.

Method

The National Survey of Child and Adolescent Well-Being was authorized under the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 (P.L. 104-193). It is the first national longitudinal study of its kind and examines the characteristics, needs, experiences, and outcomes of children and families referred to child welfare services (National Survey of Child and Adolescent Well-Being Research Group, 2002).

Survey Design and Sample

NSCAW used a stratified two-stage cluster sampling strategy to select 100 primary sampling units (PSU) from a national sampling frame, with the probability of PSU selection proportional to the size of the PSU's service population. Of the 100 PSUs identified by the sampling strategy, the NSCAW study ultimately collected child-level data in 92 PSUs representing 96 counties in 36 states. In participating counties, children were randomly selected from among the population of children, ages birth to 14, for whom an investigation of abuse or neglect had been opened by the child welfare system during a 15-month period beginning in October 1999. The final NSCAW sample included 5,501 children. The NSCAW sampling strategy generates national estimates for the full population of children

and families referred for child welfare services (NSCAW Research Group, 2002). Approval for this study was given by the U.S. Office of Management and the Budget and the Institutional Review Boards (IRB) of the Research Triangle Institute, University of California at Berkeley, Children's Hospital in San Diego, and numerous state or county IRBs representing PSUs involved with the study.

Survey Procedures

Field representatives conducted face-to-face interviews with youth, biological parents and/or foster caregivers, and caseworkers over five waves (baseline, 12 months, 18 months, 36 months, and 59 to 97 months). All data were directly entered into laptop computers. Field representatives participated in 12 days of training, including specific interview content and procedures for conducting effective interviews with diverse study respondents. They also completed certification exercises with regard to mastery of data collection procedures at the end of training.

Current Analysis

The current analysis is limited to the 36-month period that encompasses Waves 1 through 4. It reports on youth, 2 and older, who spent time in out-of-home care and for whom Waves 1 and 4 behavioral data were available. The final study sample included 1,191 children, 254 of whom had spent time in group homes and/or residential treatment and 937 who had been placed in family-based settings of care and had not experienced any stays in group care or other restrictive settings, such as inpatient psychiatric care.

Variables and Measures

Grouping variable—Our study compared behavioral outcomes for two groups: (a) children who experienced any episodes in group care (this included smaller group homes as well as larger residential treatment facilities) and (b) children who experienced episodes in lower level family-based care (kinship care and foster care) but had not experienced stays in group care or other higher level care, such as inpatient psychiatric care.

Outcome variables—Level of behavioral problems was the targeted outcome of the analysis. The Child Behavior Checklist (CBCL), a widely used and psychometrically established measure (Achenbach, 1991), was used to estimate if emotional and behavioral problems were in the clinical range. Two caregiver report forms of the CBCL were used—one for children ages 2 to 3 years and another for children ages 4 to 18 years. Children whose scores fell at or above the clinical cut-point ($t \geq 64$) on internalizing, externalizing, or total behavior problems were categorized as having clinically significant levels of need. In the current study, a dichotomous variable was used for each scale score (1 = clinical level, 0 = nonclinical level). Wave 4 data were used to estimate total, internalizing, and externalizing behavioral outcomes at 36 months. The average number of months at the time of Wave 4 follow-up interviews was 37 months ($M = 37.2$, $SD = 3.0$).

Conditioning variables—To develop the propensity score and identify our matched sample, predictor or conditioning variables associated with stays in group care were identified from the conceptual and empirical literature (e.g., Baker et al., 2005; James et al., 2006; Wulzcyn et al., 2003). These included sociodemographic characteristics (gender, age, race/ethnicity), placement-related variables (primary maltreatment type, family risk score), clinical characteristics (baseline behavior problems, developmental functioning, health status), placement history (number of placements), and resource factors (urbanicity and insurance type) (see Note 1).

Child sociodemographics—Children's age, gender, and race/ethnicity were collected as part of the initial case identification procedure and were confirmed through caregiver and child welfare worker interviews. In the current study, age was used as a continuous variable while gender was treated as a dichotomous variable and race/ethnicity was treated as a categorical variable.

Maltreatment history—Child welfare workers identified the types of suspected maltreatment using a modified *Maltreatment Classification Scale* (Manly, Cicchetti, & Barnett, 1994). Out of this variable, NSCAW constructed a variable that identified the primary type of maltreatment identified. Categories included (a) physical abuse, (b) sexual abuse, (c) physical neglect, (d) emotional neglect, and (e) other abuse. In the current study, this variable was treated as a categorical variable.

Family risk assessment—This variable is a composite score of the initial assessment of 21 risk items, used in the determination of case decisions, including prior history of abuse or neglect, caregiver substance abuse, domestic violence in the home, caregiver mental health problems, poor parenting skills, excessive discipline, and so forth. A family risk rate was developed to capture the proportion of total risks present during the investigation for each family. The variable was continuous and ranged from 0.48 to 2.

Baseline behavioral functioning—Behavior problems were measured through the CBCL as described above, and for the current study, scores were categorized as within the clinical range or not for the total, externalizing, and internalizing scale scores.

Developmental functioning—Risk for developmental problems was assessed using several standardized measures for different age groups. The *Preschool Language Scale* (PLS-3; Zimmerman, Steiner, & Pond, 1992) was used to assess language delay; cognitive delays were assessed by the *Battelle Developmental Inventory* (BDI; Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984) for children younger than 4 years and by the *Kaufman Brief Intelligence Test* (K-BIT; Kaufman & Kaufman, 1990) for children 4 years of age or older; adaptive functioning delays were determined by the *Vineland Adaptive Behavior Scale-Screener* (Sparrow, Balla, & Cicchetti, 1984), a standardized measure that assesses the child's competence and independence in his or her daily living environment. Children were classified as "delayed" if they scored 2.0 standard deviations or more below the mean on at least one standardized measure in any of the three developmental domains measured: language, cognition, and/or adaptive behavior. We chose the cut-off point of 2.0 standard deviations below the mean as this level of delay would warrant further evaluation of a child's developmental status in a number of states with early intervention or special education services. For the current study, this variable was treated as dichotomous (1 = evidence of developmental delay, 0 = no evidence of developmental delay).

Health status—Information about chronicity of children's health problems was obtained from caregivers. They were asked the following question: "Does the child have any health problems that last a long time or come back again and again?" The answer to this question was dichotomized (1 = yes, 0 = no).

Number of placements—In the NSCAW study, placement into out-of-home care was defined as any removal from home with at least one overnight stay. To be counted as a

[1]Length of stay in out-of-home care and onset of mental health service use were not included in the analysis given concerns about multicollinearity. Length of stay was highly correlated with number of placements ($p < .00001$) and onset of mental health service use was highly correlated with behavior problems ($p < .00001$).

placement change, the child's physical location of residence needed to have changed. Hence, if the child fled placement for several days but was returned to the same residence, no placement change would have been recorded. By contrast, if the child was placed into a shelter or detention, then a placement change would have occurred. This variable was treated as a continuous variable and could range from 0 to 19.

Urbanicity—This dichotomous variable indicates a child's place of residency within a PSU based on a classification of a geographic area by population size and density. Consistent with Census Bureau definitions, urban was defined as greater than 50% of the population living in an urban area. This variable was dichotomized (1 = urban, 0 = rural).

Insurance type—Insurance information was obtained from caregiver interviews. Our variable was collapsed into three categories (2 = Medicaid coverage, 1 = private insurance, 0 = no insurance).

Data Analysis

We used PSM to compare behavioral functioning for youth who experienced episodes in group care versus youth who were placed in out-of-home care but remained in family-based settings. Specifically, this approach involves four steps (Guo, Barth, & Gibbons, 2006).

First, using prior research, theory, and experience, case characteristics that are likely to be associated with the assignment to conditions are identified so that they can be addressed in the PSM process. Second, these predictor or conditioning variables are then used in a logistic regression in which the DV is a dichotomous variable indicating placement into group care versus placement into lower level settings. This helps to ascertain whether the hypothesized case characteristics do indeed distinguish between the groups. Third, the probability of being placed into group care is calculated based on the estimated logistic regression. The predicted logit (p/(1−p)) is defined as the propensity score for placement into group care (D'Agostino, 1998). All youth placed into group care are then matched on the propensity score with family-based care youth to create a matched sample or resample. Matches must be the nearest case in the family-based care group to the "group care" group and must all fall within a predetermined caliper (range). The latter step is intended to prevent cases that are nearest neighbors, but do not have very similar propensity scores, from being included in the final matched data set. Finally, based on the matched sample, outcomes for the two groups are compared.

Results

Sample Description and Bivariate Findings

Of the 1,191 children and youth who experienced out-of-home care during the course of the 36-month study period, 254 (19.9%) experienced episodes in group care (see Table 1). Youth in group care were almost 3 years older ($M = 10.4$, $SE = 0.7$) than youth without such placements ($M = 7.5$, $SE = 0.3$, $p < .001$). The group of youth with group care histories had a greater number of youth with total behavior problems ($p < .05$) and externalizing problems ($p < .01$) in the clinical range. No significant differences were found between the groups in terms of internalizing behaviors. Youth with group care episodes experienced an average of 2.5 more placements than youth without such episodes ($p < .0001$). Group care youth also had a higher percentage of private insurance and a lower percentage of no insurance ($p < .05$). Children and adolescents with group care episodes were not significantly different from those who did not experience such episodes with regard to characteristics of gender, race/ethnicity, family risk, developmental problems, health problems, and urbanicity.

Deriving the Propensity Score

Characteristics that significantly distinguish between children and youth who did and did not experience group care episodes help to identify conditioning variables, which may contribute to selection bias, and would therefore influence the likelihood of an individual youth experiencing an episode in group care. Logistic regression was used to derive a propensity score to help account and control for this selection bias. While different methods have been proposed to estimate the propensity score (e.g., Dehejia & Wahba, 1999; Hirano & Imbens, 2001; Rosenbaum & Rubin, 1984), data-driven approaches include or exclude conditioning variables based on the Wald or t statistic and its associated p value (Guo & Fraser, 2009); that is, variables are chosen based on a predetermined level of these parameters. The current study relied on Rosenbaum's (2002) approach, which recommended including all pretreatment differences at a low threshold for significance, such as $|t| > 1.5$.

Three separate models that tested the likelihood of group care using logistic regression were developed: Model 1 included all conditioning variables plus level of total behavior problems; Model 2 included level of externalizing behavior problems; and Model 3 included level of internalizing behavior problems (see Note 2). Findings show that being older, male, experiencing physical neglect or other maltreatment as the primary type of maltreatment, having a higher number of placements, as well as private insurance predicted episodes in group care (see Table 2). With regard to level of behavior problems, both presence of total behavior problems and externalizing behavior problems in the clinical range significantly predicted the odds of group care episodes. Level of internalizing behavior problems did not present a statistically significant source of selection bias.

Using the $|t| > 1.5$ cut-off, four variables—race/ethnicity, family risk score, developmental problems, and urbanicity—were excluded from the first two models to derive the matched sample. For the final model, we additionally excluded baseline internalizing behavior problems as this variable fell below the preset cut-off.

PSM

We conducted PSM using the propensity score obtained from the logistic regression models. We used one-to-one nearest neighbor matching, where for each case that experienced an episode in group care, a non-group-care case was selected for the closest propensity score within a specified caliper. For sensitivity analysis purposes (Guo et al., 2006), we used different caliper widths to create the newly matched sample (0.3, 0.5, 0.8). We also ran the models with all conditioning variables (shown in Table 1), which reduced the size of the matched sample by 6 cases. Because of the relative consistency of results after testing different models and calipers, we present results for the final and most efficient models, using the narrowest caliper width of 0.3 (see Table 3). The resulting matched sample size was 314. Of the 254 youths with episodes in group care, 157 youths were identified who were similar on the identified conditioning variables to 157 youth with episodes in lower level care. Findings from the logistic regression models indicate that no significant differences remain between the two groups in the matched sample. This indicates that selection bias with regard to the conditioning variables was significantly reduced as an explanation for episodes in group care.

Differences in Behavioral Outcomes

The final step involved using the matched sample to examine behavioral outcomes at Wave 4 for youth in group care and those placed in family-based care. Findings indicate that there

[2]All behavior problem variables were not included in one model due to collinearity.

are no significant differences between the two groups with regard to any of the three behavioral outcomes. While not statistically significant, it should be noted, however, that a greater number of children in group care were within the clinical range for behavior problems for all three scales (e.g., total, externalizing, and internalizing) (see Table 4).

Follow-Up Analyses

Given the no-difference finding, we conducted follow-up analyses to understand whether youth included in the matched sample differed from the larger sample of children in group care ($n = 254$) or in family-based settings ($n = 937$). We used chi-squares and t tests to test for differences between the 157 children in the final matched sample and the remaining children with episodes in group care ($n = 97$). We found no difference with regard to any of the predictor variables except for chronic health problems. There was a higher percentage of children with chronic health problems in the matched sample ($p < .05$). In addition, we explored whether there were differences in the number of group care episodes in the two groups. While 94% of group care children in the matched sample had one or two episodes in group care, this percentage was much lower (68.2%) for children with group care episodes who were not included in the matched sample. There were also about 10% of youth who experienced between 5 and 11 episodes in group care, whereas group care children in the matched sample experienced four group care episodes at the most.

We further examined differences between the matched children in family-based settings ($n = 157$) and those who were not included ($n = 780$). No significant differences were found except for internalizing behavior problems, with the matched sample having a significantly lower percentage of youth who experienced internalizing problems in the clinical range ($p < .05$).

Discussion

Using data from the National Survey of Child and Adolescent Well-Being, the first representative longitudinal study of children and families involved with the child welfare system, this study used an empirical approach to identify a matched sample of youth with (a) episodes in group care or (b) stays in family-based care. It further examined behavioral outcomes for these two groups, using PSM, a rigorous analytic method designed to efficiently address differences in baseline characteristics in the absence of a randomized design. While there are a number of studies describing outcomes of group care, very few have used comparison groups, therefore raising concerns that any changes—positive or negative—associated with group care may reflect selection bias—that is, effects of confounding variables. There is reason for this concern since studies have consistently found that severity of clinical and psychosocial problems is a significant moderator of group care outcome (e.g., Gorske, Srebalus, & Walls, 2003; Lyons & McCulloch, 2006). A method that is being increasingly used in social science and social work research involves PSM, which efficiently addresses these confounding baseline differences and creates a matched comparison group. This method is particularly relevant in foster care and group care research conducted in real-world service systems where randomized trials are often prohibited due to ethical, legal, and practical concerns. It also facilitates rigorous comparative analysis of clinical survey data, such as the NSCAW study.

Baseline Characteristics

Findings show that of the total 254 youth with group care episodes, 157 could be matched to youth with episodes in lower level family-based settings. This indicates there was sufficient overlap in their sampling distributions on multiple factors. This is counter to the logic and philosophy of the system of care, which emphasizes community-based services in the least

restrictive setting whenever possible (Pumariega & Winters, 2003; Stroul & Friedman, 1986). The continuum of services for children is based on the assumption that the levels of setting restrictiveness correspond with a child's level of behavioral functioning. Thus, group care placement is theoretically reserved for only the most severe children in out-of-home care. As stated in the introduction, findings with regard to the relationship between behavior problems and the level of placement restrictiveness have been equivocal. Our findings confirm what has also been reported by a few other regionally based studies (Breland-Noble et al., 2005; Farmer et al., 2008; Lyons et al., 1998), namely, that there is considerable overlap between children in group care and those in family-based care. This is disconcerting, and the question is why, in the face of enormous cost and concerns about their effectiveness, children with behavior problems no more severe than those of children in lower level care would be placed in group care settings. Three explanations are put forth.

First, our finding raises questions about the criteria used to inform the placement process. Currently, there are no federal guidelines or admission criteria that would guide decision-making processes about placement into group care, and very little is known about the protocols individual child welfare systems use to guide this process. Most child welfare professionals would agree that group care placement should be reserved for youth with the most severe disorders. Yet prior empirical work suggests that many factors beyond clinical considerations determine placement decisions (Crea, 2010; James, 2004). Our finding suggests the need for systematic work in this area. Questions that would drive this work include the following: How are decisions about group care placements made? What factors do usual care child welfare systems consider when placing a child into group care? Future work could also address if it is possible to create protocols that would take into account the range of factors that have to be considered by workers, such as a child's behavior problems, prior placement history, bed availability, family situation, and so forth, and create algorithms that would aid in making the placement process more transparent and systematic.

Related to the concern about the opaqueness of the placement process is the suspicion among some child welfare experts that the supply side of group care settings also feeds demand for group care placement (Wulczyn, 2010). Group care settings and child service systems are engaged in complex relationships, each expected to work on behalf of the best interest of the child within given legal mandates, yet each also guided by its own service priorities and interests. Very little is known from an empirical standpoint about the dynamics of this particular relationship, but research investigating collaborative relationships within child welfare systems has pointed to the many complexities and challenges involved in such relationships (e.g., Darlington, Feeney, & Rixon, 2004; Horwath & Morrison, 2007). The question is whether the simple availability of a range of different group care settings lowers the threshold for placing a child into such settings. Or in other words, would service systems try harder to find alternative solutions in the absence of group care settings? Empirical work is needed to examine whether the saying "if you build it, they will come" holds true in this case.

Finally, our finding may also reflect the range of functions that group care plays for children in the child welfare system. Barth (2005) has contended that group care is often used less as a treatment setting than as a "service response to a perceived safety crisis" (p. 158). In some service systems, short-term group care settings play indeed an important stop-gap function in cases of such crisis or when other types of placements are not available (James, Landsverk, Leslie, Slymen, & Zhang, 2008). In the absence of data about the type of group care settings captured in this study, this possibility cannot be ruled out.

Behavioral Outcomes

Our study further found no significant differences for youth included in the matched sample with regard to behavioral outcomes at 36 months once baseline differences had been addressed. Why is this null finding of interest to the field? Given the generally poor perceptions of group care treatment, a no-difference finding seems to favor group care at first glance. Group care treatment has been described in the literature as a "failure option" (Lieberman, 2004), "a placement of last resort" (James et al., 2008), and a "warehouse" (Butler & McPherson, 2007), and the paradigmatic stance against group care in the current service system culture has fostered an attitude of low expectations when it comes to group care. As such, our non-significant finding does not support the notion that placement in group care results in worse outcomes (Barth, 2005) for youth who resemble those placed in family-based care. However, if one considers the enormous cost of group care, should we not expect significantly better outcomes? If a similar outcome can be obtained in a family-based setting for a fraction of the cost, it would be fiscally unwise, counter to system of care philosophy, and likely unethical, to place a child in the more restrictive group care setting. Group care can be 7 to 10 times as expensive as regular foster care, and in some instances, when children receive additional mental health services or are placed into group care settings out of their state of residence, the cost increases even further (Barth, 2002; Ward & Holmes, 2008). Barth et al. (2007) made a similar argument when finding that intensive in-home therapy is at least as effective in achieving positive outcomes as group care and encouraged the development of lower cost community-based treatment alternatives. However, there might be valid nonclinical reasons, which are poorly understood and unstudied, to place a child into a group care setting.

Study Limitations

Our conclusions need to be considered within the study's limitations. While a rigorous analytic method was used, it was limited by the relatively small number of children with episodes in group care. For some covariates, the cell sizes were small and, as a result, the standard errors large. However, the matched sample size did not vary much regardless of what conditioning variables had been included in the creation of the propensity score or what caliper size was used.

Furthermore, it should be noted that follow-up analyses revealed that the matched sample captured group care youth who had experienced fewer group care placements than nonmatched youth. This suggests that youth at greatest risk for poor outcomes may not have been matched and were not included in the comparison. These are the youth that may in fact be in need of more intensive treatment approaches and may only respond to treatments delivered in higher level placements, such as group care.

While children in the study were matched on many salient factors, it is likely that there are other factors that were not included. While PSM reduces bias, critics of this method have pointed out that significant biases may remain (Michalopoulos, Bloom, & Hill, 2004). For instance, recent work by Lee, Shaw, Gove, and Hwang (2010) showed that factors other than the ones included in the current study may affect group care placements, such as caseworkers' perceptions about youths' wishes about not being placed with a family, existing school connections, and youths' social skills. Future work in this area is needed to begin to adequately capture these variables.

In interpreting these findings, it should be further noted that group care is not a single monolithic construct but that the current study aggregated all group care placements into a single variable. We have no information about the types of group care settings captured in the NSCAW study or what types of treatment models may have been used. Stays in group

care as well as family-based foster care varied significantly in lengths. Studies that have examined patterns of children's movement of care have further shown that the placement of a child into a particular setting (e.g., group care) is often only one stop in a sequence of placements (James, Landsverk, & Slymen, 2004; Usher, Randolph, & Gogan, 1999; Wulczyn et al., 2003), and as such, it is possible that the totality of a child's placement experience has a greater effect on outcome than the effectiveness of a particular placement. The movement of children through out-of-home care across different settings with varying levels of restrictiveness continues to present a significant challenge in outcomes research of youth in out-of-home care as it is difficult to isolate the impact of a single placement.

Conclusion

Debates about the use and appropriateness of group care are likely to continue for many years. The current results suggest that service systems need to clarify criteria for entry into group care and develop protocols that would provide clear and objective guidance about who gets placed into group care. Given the lack of information about different types of group care settings used in the NSCAW study, our analysis does not answer the question of whether group care is an effective (or ineffective) intervention. But it does show that children, once their baseline differences are addressed, show no significant differences in behavioral outcomes whether they experienced stays in group care or whether they spent time only in lower level family-based care. How youth with similar characteristics end up in placements of differing restrictiveness and intensity should be the focus of continued study.

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Table 1

Sample Characteristics for Youth Who Received and Did Not Receive Group Care (n = 1,191)

Characteristic	Total Sample[a] % (SE) or *M* (SE)	Group Care[b] % (SE) or *M* (SE)	No Group Care[c] % (SE) or *M* (SE)
Gender			
Male	51.2 (3.3)	62.2 (7.2)	48.5 (4.2)
Female	48.8 (3.3)	37.8 (7.2)	51.5 (4.2)
Age *	8.1 (0.2)	10.4 (0.7)	7.5 (0.3)
Race			
Black	38.8 (4.7)	46.5 (8.0)	36.9 (4.9)
White	41.3 (4.4)	38.0 (7.3)	42.1 (4.6)
Hispanic	14.5 (2.6)	11.8 (4.3)	15.2 (2.8)
Other	5.4 (1.2)	3.8 (1.1)	5.8 (1.4)
Primary type of maltreatment			
Physical abuse	23.6 (3.1)	39.9 (8.2)	19.9 (2.9)
Sexual abuse	9.0 (1.9)	10.5 (2.8)	8.7 (2.3)
Physical neglect	18.6 (2.3)	10.4 (3.9)	20.5 (2.6)
Emotional neglect	37.4 (4.1)	33.7 (7.9)	38.3 (4.7)
Other	11.3 (2.9)	5.5 (2.2)	12.6 (3.5)
Family risk score	0.4 (0.01)	0.4 (0.03)	0.4 (0.02)
Total behavior problems (W1) *			
≥64	41.0 (3.4)	63.1 (8.5)	36.0 (3.9)
< 64	59.0 (3.4)	36.9 (8.5)	64.0 (3.9)
Externalizing behavior problems (W1) *			
≥ 64	38.7 (3.6)	62.1 (8.4)	33.3 (3.5)
< 64	61.3 (3.6)	37.9 (8.4)	66.7 (3.5)
Internalizing behavior problems (W1)			
≥ 64	25.7 (2.4)	39.2 (8.3)	22.7 (2.5)
< 64	73.3 (2.4)	60.8 (8.3)	77.3 (2.5)
Developmental problems			
Yes	21.8 (2.1)	19.6 (5.9)	22.3 (2.4)

Characteristic	Total Sample[a] % (SE) or *M* (SE)	Group Care[b] % (SE) or *M* (SE)	No Group Care[c] % (SE) or *M* (SE)
No	78.2 (2.1)	80.4 (5.9)	77.7 (2.4)
Chronic health problems			
Yes	29.3 (3.3)	38.1 (9.4)	27.3 (3.5)
No	70.7 (3.3)	61.9 (9.4)	72.7 (3.5)
Number of placements *	2.3 (0.1)	4.3 (0.4)	1.8 (0.1)
Urbanicity			
Urban	82.6 (4.3)	83.7 (5.8)	82.3 (4.4)
Rural	17.4 (4.3)	16.3 (5.8)	17.7 (4.4)
Insurance type *			
Medicaid	81.6 (2.6)	83.1 (6.6)	81.2 (3.2)
Private insurance	10.7 (2.0)	14.5 (6.7)	9.9 (2.3)
No Medicaid	7.7 (1.9)	2.4 (1.0)	8.9 (2.3)

W1 = data collected during Wave 1.

[a] $n = 1{,}191$.

[b] $n = 254$.

[c] $n = 937$.

* $p < .05$.

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Table 2

Logistic Regression Models for Youth With and Without Episodes in Group Care

	Youth With Episodes in Group Care Versus Family-Based Care					
	Model 1: LR With Total Behavior Problems		Model 2: LR With External Behavior Problems		Model 3: LR With Internal Behavior Problems	
Variable	**OR (95% CI)**	***t***	**OR (95% CI)**	***t***	**OR (95% CI)**	***t***
Age	1.20 (1.02, 1.40)	2.27*	1.20 (1.02, 1.41)	2.21*	0.21 (1.03, 1.41)	2.43*
Gender (ref: female)	2.84 (1.17, 6.92)	2.33*	2.89 (1.17, 7.15)	2.33*	3.17 (1.39, 7.25)	2.78
Race (ref: White)						
Black	1.15 (0.49, 2.74)	0.33	1.13 (0.45, 2.81)	0.26	0.93 (0.40, 2.19)	−0.16
Hispanic	1.05 (0.51, 2.17)	0.15	1.05 (0.52, 2.15)	0.15	1.09 (0.54, 2.20)	0.24
Other	0.56 (0.20, 1.54)	−1.14	0.61 (0.22, 1.67)	−0.98	0.57 (0.20, 1.63)	−1.07
Family risk score	2.96 (0.45, 19.54)	1.14	2.86 (0.38, 21.28)	1.04	2.88 (0.45, 18.24)	1.14
Primary maltreatment type						
Sexual abuse	0.45 (0.18, 1.09)	−1.79	0.45 (0.18, 1.10)	−1.78	0.55 (0.24, 1.26)	−1.43
Physical neglect	0.25 (0.09, 0.73)	−2.57*	0.23 (0.08, 0.66)	−2.76	0.23 (0.08, 0.69)	−2.65
Emotional neglect	0.55 (0.27, 1.12)	−1.68	0.56 (0.27, 1.16)	−1.58	0.52 (0.27, 1.02)	−1.94
Other	0.07 (0.02, 0.28)	−3.76	0.07 (0.02, 0.30)	−3.66	0.07 (0.02, 0.31)	−3.54
Total behavior problems W1 (ref = no)	2.21 (0.99, 4.92)	1.96*				
Ext behavior problems W1 (ref: no)			2.33 (1.11, 5.37)	2.25*		
Int Behavior Problems W1 (ref: no)					0.99 (0.31, 2.41)	−0.02
Developmental problems (ref: no)	0.69 (0.25, 1.90)	−0.73	0.75 (0.27, 2.07)	−0.57	0.78 (0.28, 2.17)	−0.49
Chronic health status (ref: no)	2.39 (0.89, 6.45)	1.74	2.38 (0.87, 6.47)	1.72	2.47 (0.89, 6.87)	1.77
Number of placements	2.04 (1.64, 2.54)	6.53	2.02 (1.62, 2.50)	6.47	2.06 (1.67, 2.55)	6.75
Insurance type (ref: no insurance)						
Medicaid	2.39 (0.82, 6.98)	1.62	2.28 (0.73, 7.07)	1.45	2.63 (0.93, 7.47)	1.85
Private	5.84 (1.25, 27.28)	2.28*	5.16 (1.12, 23.75)	2.14*	6.74 (1.46, 31.13)	2.48*
Urbanicity (ref: rural)	1.26 (0.51, 3.11)	0.50	1.16 (0.44, 3.03)	0.31	1.22 (0.49, 3.01)	0.44

N = 1,034 with some variation in *N* due to missing data; ref = reference group; OR = odds ratio.

* $p < .05$.

Table 3

Logistic Regression Models for Matched Samples (n = 314) With Caliper Range of 0.3

	Youth With Episodes in Group Care Versus Family-Based Care		
	Model 1: Matched Sample Based on LR With Total Behavior Problems	**Model 2: Matched Sample Based on LR With External Behavior Problems**	**Model 3: Matched Sample Based on LR With Internal Behavior Problems**
Variable	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
Age	0.97 (0.81, 1.16)	0.96 (0.79, 1.17)	0.98 (0.81, 1.18)
Gender (ref: female)	1.16 (0.33, 4.05)	1.14 (0.33, 3.96)	1.21 (0.34, 4.31)
Primary maltreatment type			
Sexual abuse	1.25 (0.44, 3.52)	1.27 (0.45, 3.59)	1.27 (0.43, 3.78)
Physical neglect	1.07 (0.22, 5.10)	1.06 (0.23, 4.88)	1.05 (0.22, 4.90)
Emotional neglect	0.55 (0.16, 1.93)	0.58 (0.16, 2.15)	0.51 (0.15, 1.79)
Other	0.17 (0.04, 0.83)	0.19 (0.04, 0.95)	0.17 (0.04, 0.82)
Total behavior problems W1 (ref: no)	1.34 (0.39, 4.51)		
Ext Behavior problems W1 (ref: no)		1.68 (0.49, 5.80)	
Chronic health status (ref: no)	1.03 (0.30, 3.57)	1.05 (0.30, 3.69)	0.99 (0.27, 3.61)
Number of placements	1.07 (0.81, 1.40)	1.07 (0.83, 1.40)	1.05 (0.81, 1.36)
Insurance type (ref: no insurance)			
Medicaid	1.11 (0.27, 4.52)	1.05 (0.21, 5.33)	1.01 (0.21, 4.73)
Private	4.03 (0.76, 21.46)	3.37 (0.52, 21.85)	3.84 (0.69, 21.48)

ref = reference group; OR = odds ratio; LR = logistic regression.

Table 4

Percentage of Youth by Level of Wave 4 Behavior Problems and Placement Status

	W4 Level of Total Behavior Problems		W4 Level of Externalizing Behavior Problems		W4 Level of Internalizing Behavior Problems	
Youth With Episodes by Care Type	**≥ 64**	**< 64**	**≥ 64**	**< 64**	**≥ 64**	**< 64**
Group care	46.5%	53.5%	40.0%	60.0%	37.7%	62.5%
Family-based care	31.0%	69.0%	38.0%	62.0%	23.1%	76.9%