The association between length of stay in residential care and educational achievement: Results from 5- and 16-year follow-up studies

Jay L. Ringle *, Stephanie D. Ingram, Ronald W. Thompson

Boys Town National Research Institute, Boys Town, NE, USA

ABSTRACT

Research on the relationship between length of stay in out-of-home residential care and educational outcomes is scant and has yielded mixed results. This study investigates this issue by examining the relationship between length of stay in family-style residential care and education achievement. Participants belonged to one of two cohorts that were part of a larger follow-up study designed to measure functional post-departure outcomes. Cohort 1 had departed care 5 years earlier whereas cohort 2 had departed 16 years earlier. Findings for both cohorts reveal that longer lengths of stay are predictive of obtaining at least a high school education. Older admission age was also found to be a predictor in the 5 year cohort. Results do not support the notion that longer lengths of stay are counterproductive. On the contrary, these results suggest that longer lengths of stay in quality residential care may benefit not only the youth and their families, but society by reducing the societal cost (e.g., lost wages, crime) when an at-risk youth does not receive sufficient treatment.

1. Introduction

Many children entering out-of-home care present with a multitude of academic difficulties (e.g., low standardized achievement test scores, grade retention, and truancy) which place them at risk for dropping out of school (Burley, 2008; Trout, Hagaman, Casey, Reid, & Epstein, 2008). Most out-of-home care educational outcome research has been conducted with former foster-care youth. Reports of high school graduation/GED rates for these children vary depending on time to follow-up. For example, Burley and Halpern (2001) reported a bleak 34% graduation rate at emancipation (age 18 or older) whereas Courtney and Dworsky (2006) report a much better 64% graduation rate at around twenty-two months post-discharge from foster care. A less studied but equally important type of out-of-home care, residential care, has yielded similar graduation rates. Specifically, Kaminski (1998) found a 69% high school graduation rate among former residential care youth at five years post-discharge. This paper focuses specifically on former residential youth and the rate at which they obtain a high school education.

Regardless of whether or not one has been placed in out-of-home care, the lack of a high school education can lead to a host of problems. For example, in 2005, individuals 18 or older who did not finish high school earned 23% less than individuals with a high school diploma

and 39% less than individuals with an associate's degree (U. S. Census Bureau, 2006). Not surprisingly, high school dropouts are substantially more likely to rely on public assistance than those with a high school diploma (Adair, 2001). Not only do individuals lacking a high school education earn less, but they are more likely to experience early pregnancy (The National Campaign to Prevent Teen Pregnancy, 2001), or engage in high-risk behaviors such as delinquency, crime, or drug and/or alcohol use (Coalition for Juvenile Justice, 2001; Hoffmann, 2002). Regardless of whether these risky behaviors lead to high school dropout or if high school dropout leads to these risky behaviors, the direction of the relationship seems irrelevant as approximately 75% of state prison inmates failed to complete high school, as have 59% of federal inmates (Harlow, 2003).

A plethora of research has investigated predictors of dropping out of high school (c.f., Fortin, Marcotte, Potvin, Royer, & Joly, 2006; Garnier, Stein, & Jacobs, 1997; McNeal, 1999; Pong and Ju, 2000). However, pinpointing one or two clear predictors seems to be an oversimplification of the problem, suggesting that dropping out is more a "process" than an "event" (Deviney, 2006) and "is the end result or symptom of other problems originating much earlier in life" (Bachman, 1972, pg. 27). For example, research has found that repeating first grade increased the likelihood of dropping out of high school by more than threefold (Alexander, Entwisle, & Kabbani, 2001). Middle school repeaters were even more likely to eventually leave school early (Jimerson, Egeland, Sroufe, & Carlson, 2000). Thus, by the time that truancy, disciplinary problems, and failing grades surface in high school, it seems as if only an intensive intervention will be sufficient to reverse the process.

* Corresponding author.
E-mail address: jay.ringle@boystown.org (J.L. Ringle).

For some youth, this intensive intervention comes in the form of residential placement. Studies examining the educational outcomes of youth in residential care are few and have yielded contradictory results, especially those examining length of stay and educational outcomes. For example, some studies have found that shorter lengths of stay produce better outcomes whereas others conclude that longer is better. In one of the few studies to link length of stay to educational outcomes, Hoagwood and Cunningham (1992) studied children with Severe Emotional Disorders (SED) that were sent to residential care by their school district. Their findings suggest that a shorter length of stay was associated with better educational outcomes. While these findings are interesting, they are limited to a very specific population (i.e., children with SED referred by the school district).

Other studies suggest that there is a link between longer lengths of and positive educational outcomes. Studying youth in residential care, Daly, Thompson, and Coughlin (1994) and Daly, Friman, Larzelere, Smith, Osgood, and Thompson (1997) compared educational outcomes using five variables (i.e., help with homework, GPA, chance of going to college, years of school completed, and high school graduation) for youth who departed a family-style residential care facility on average four years earlier with a comparison group of youth that were accepted into the facility but were never admitted. It should be noted that the comparison group was considered a "treatment as usual" group rather than a "no treatment" group as many of the children eventually received some type of intervention elsewhere. Utilizing Hierarchical Linear Modeling, Daly et al. (1994, 1997) revealed that the residential group not only performed significantly better on all five variables than did the comparison group, but longer lengths of stay were also associated with better performance on all educational variables.

In the midst of these mixed results, we currently investigated the question of whether longer or shorter lengths of stay in a residential program are predictive of obtaining a high school education by early adulthood or the early- to mid-thirties. In this study, two cohorts of former youth from a large residential facility participated in the study: those who departed care 5 years prior and those who departed care 16 years prior. We feel that this study adds to the scant research base on the relationship between length of stay and educational outcomes for youth in residential care for two reasons. First, in addition to investigating the length of stay question, we are controlling for admission and during care variables (e.g., age at admission, presenting problems), which may be predictive of obtaining a high school education. Very few researchers have systematically studied residential care outcomes in such a manner (Trout et al., 2008). As such, the predictors other than length of stay were chosen on a conceptual rather than an empirical basis. Second, by using different cohorts from different decades (e.g., those who departed in the late 1980s and those who departed in the year 2000) and different ages at the time of follow-up (early twenties and early thirties), we intend to investigate whether longer or shorter lengths of stay in this particular residential program is a consistent predictor of obtaining a high school education, thus adding evidence to the length of stay question.

2. Method

2.1. Follow-up studies

Two follow-up studies were completed to measure functional outcomes of former youth who received treatment from a large residential treatment facility. Each study is described individually to gain a better understanding of the goals, participants, and survey.

2.2. Program/intervention

Youth were served by the program's Treatment Family Homes (TFH), an adaption of the Treatment Family Model. The Treatment Family Homes are a family-style, community-based program that treats six to eight males or females, usually ages 12 to 18, staffed by a specially trained married couple (Family-Teachers) and an Assistant Family-Teacher. Family-Teachers live in the home with the youth and provide structured supervision for youth in daily living and treatment activities. This program is based on behavioral and social learning theories and is characterized by five key elements: building and maintaining healthy relationships, developing interpersonal and life skills, developing oneself morally and spiritually, experiencing family living, and attaining self-determination (Davis and Daly, 2003). The goal is to work on both treatment and skill building in the home and application of skills in the community. Learning these functional independent living skills should help youth achieve success in all aspects of their life (e.g., school, family, work).

In conjunction with this family-style intervention, youth served by the TFH program receive a special focus on school and academics. This particular residential program consists of nine sites across the United States. One site has a large campus (i.e., the "main campus") with an on-site school. The other eight sites are smaller and youth attend off-site public schools. Regardless of whether they attend school on or off campus, school is an integral part of the youth's treatment. Every youth is required to spend a minimum of 1 h of supervised time each day on homework (oftentimes more), and there are consequences (e.g., removal of privileges) for unexcused absences (Thompson, et al., 1996). Further, every high school senior is required to design and encouraged to follow a post-departure "life plan" which serves as a blueprint through graduation and into adulthood (Ringle, Ingram, Newman, Thompson, & Waite, 2007).

Overall, the TFH approach taken by this particular residential care program has been found to be effective at producing positive behavioral change for youth both during and shortly after treatment (Huefner, James, Ringle, Thompson, & Daly, 2010; Larzelere, Daly, Davis, Chmelka, & Handwerk, 2004) as well as during intermediate- and long-term post-departure follow-up (Huefner, Ringle, Ingram, & Chmelka, 2007; Kingsley, Ringle, Thompson, Chmelka, & Ingram, 2008; Thompson, Huefner, Ringle, & Daly, 2005). Further, it is listed on the Office of Juvenile Justice and Delinquency Prevention Model Programs Guide as a "Promising Program" (Office of Juvenile Justice and Delinquency Prevention Model Programs Guide, nd).

2.3. Study 1: Five-year follow-up

2.3.1. Participants

The study protocol was approved by the organization's Internal Review Board (IRB), and informed consent was obtained from participants over 18 years of age. Parental/guardian consent, as well as participant assent, was obtained if the participant was 17 years old or younger. The 339 eligible participants in this study are former TFH youth who were admitted in the late 1990s and left the main campus program ($N = 215$) or one of the 8 other program sites around the country ($N = 124$) in the year 2000. Of the 339 possible participants, confirmed contact was made with 207 (61.2%). Of these, 188 completed the survey (90.8%), 7 agreed to participate but never completed the survey (3.4%), and 12 refused to participate (5.7%) resulting in a 55.6% participation rate for the eligible population. The average age for these 188 participants at the time of the study was 21.5 (range of 17 to 25 years of age). Participants were equally distributed between male and female and just over half were Caucasian ($N = 109$, 58%). The average length of stay in the program was 17.7 months (SD = 16.5 months; range = 7 days to 116.7 months).

2.3.2. Responder/non-responder analysis

Respondents and non-respondents were compared across 13 variables using logistic regression. Logistic regression is a variation of ordinary regression that is used when the dependent variable is a dichotomous (e. g., 0 = non-responder, 1 = responder) and the

independent variables are continuous, categorical, or both. Logistic regression produces two statistics which bear explanation: Wald and Exp (*B*). The Wald statistic is the statistical test for each coefficient in the regression model and Exp (*B*) indicates the increase in odds that an event will occur (e.g., being a responder) for each unit increase in the predictor variable.

Predictor variables for this analysis were chosen from available descriptive data collected at admission and departure from this residential program. The predictor variables for this analysis are: restrictiveness of placement prior to admission (0 = homelike setting, 1 = out-of-home/detention), sex (0 = female, 1 = male), age at admission in years, length of stay in the residential facility in months, site location (0 = main campus, 1 = other), number of problems reported at admission (from a 33-item checklist), race (0 = Caucasian, 1 = non-Caucasian), referral source (0 = private/other, 1 = court/legal), age at departure in years, a departure success scale, an indicator of school problems at admission (0 = no, 1 = yes), an indicator of aggression at admission (0 = no, 1 = yes), an indicator of drug or alcohol usage at admission (0 = no, 1 = yes), and any reported criminal behavior prior to admission (0 = no, 1 = yes). The model indicated that respondents and non-respondents were similar on all variables except for sex. Specifically, females were 3.1 times more likely to be a responder [Wald statistic (1) = 16.14, *p*<.05, Exp (*B*) = 3.11] than were males.

2.3.3. Survey

An 85-item survey was administered either by telephone (34%), mail (63.3%) or via the internet (2.7%), depending on the participant's preference. Our goal was to measure social functioning and quality of life domains. The eight practical life domains assessed were: (1) living environment; (2) family, relationships, and social supports; (3) religion, health, and well-being; (4) crime and legal system; (5) substance use; (6) education; (7) employment and income; and (8) current perspective on the impact of the program.

Surveys were administered for nearly a year and a half, between January 2005 and May 2006. For those choosing to respond by phone, the interview took approximately 30 min. All participants were reimbursed $25.

2.4. Study 2: 16-year follow-up

2.4.1. Participants

The study protocol was approved by the organization's IRB, and informed consent was obtained for all participants. Participants were selected from 587 youth who were accepted for admission to the TFH between May 1981 and June 1985. It should be noted that there was only one treatment site during this timeframe (e.g., the "main campus"). The participants in this study were part of a larger longitudinal study conducted throughout the 1980s. From this larger group, some individuals chose to discontinue participation in the study over the years (*N* = 103) and other individuals were deceased (*N* = 20). Thus, a total of 464 individuals were eligible to participate in the current study; 399 were admitted to the program (TFH residential group) and 65 were accepted for admission but did not enter the program for various reasons. For the purposes of this study, we only used information from those in the TFH residential group. Of the 399 possible participants, we made confirmed contact with 224 (56.1%) participants. Of these, 211 completed the survey (94.2%), 8 agreed to participate but never completed the survey (3.5%), and 5 refused to participate (2.2%). Thus, 52.9% of the eligible population participated. Because of the admission patterns in the early 1980s, 90.5% of the participants were male and 70.1% were Caucasian. The average length of stay in the program for those who completed the survey in the TGH residential group was 23.4 months (range 13 days to 105.6 months). At the time of the survey, the average age of the participants was 32.9 years old (range of 27 to 37).

2.4.2. Responder/non-responder analysis

Predictor variables for this analysis were also chosen from available descriptive data collected at admission, departure and in an original longitudinal follow-up study. Thus, respondents and non-respondents were compared across 20 variables using a logistic regression. Eleven of the predictor variables were collected at admission to the program: sex (0 = male, 1 = female), age at admission in years, race (0 = non-Caucasian, 1 = Caucasian), prior contact with the court system (0 = no, 1 = yes), number of problems at admission (from a 16-item checklist), institutionalized before age 6 (0 = no, 1 = yes), number of prior primary parent changes, number of prior placements in foster homes, number of prior placements in an institution, a scale of aggression, and a scale of prior drug usage. Two variables were collected at departure: length of stay in months, and a scale indicating the overall favorableness of the departure. Finally, seven of the variables came from the original longitudinal follow-up study (given approximately four years after departure): a scale of aggression, a scale of drug usage since departure, a victimization scale, a quality of life scale, a self-esteem scale, satisfaction with Family-Teachers (a married couple that live with the youth), and a scale of current feelings toward the organization. The model indicated respondents and non-respondents to be statistically similar on all variables examined.

2.4.3. Survey

The survey had 151 items and was administered either by telephone (58.1%) or mail (41.9%), depending on the participant's preference. Our goal was to measure social functioning and quality of life domains. The general topic areas were: 1) living environment and community involvement; 2) physical and mental health and well-being; 3) substance use; 4) household composition and family relationships; 5) safety; victimization, and criminality; 6) friendships and social activities; 7) education and employment; and 8) current perspective on the value of the residential program.

Most surveys were completed between February and December of 2002. For those choosing to respond by phone, the interview took approximately 45 min. All participants were reimbursed $50.

3. Results

3.1. 5-year follow-up study

Logistic regression was used to examine predictors of obtaining at least a high school education among the participants. Participants were considered to have a high school education if they reported that they graduated from high school during residential care, graduated after leaving care, or had obtained a GED. Eighty-three percent had at least a high school education (69.4% HS/GED; 7% Vocational Degree; 4.3% AA/Junior College; 2.2% BA). Of these, 57% reported that they had attended school within the past 12 months. However, there were no statistical differences in school attendance in the past 12 months between those with a high school education and those without (55% versus 52%; χ^2 = .043, *p* = .754). Further, twenty-nine (21%) of the participants reported that they had graduated while in care. Twenty-seven of those who graduated while in care departed the same month of graduation. As such, their lengths of stay were not considered to confound the analysis. However, for the two that did stay in care after graduation, we adjusted their lengths of stay to the month in which they graduated (reduced by 2 months and 3 months, respectively). Further, there were 37 (20%) participants that were under the age of 20 at the time of the survey. Of these, two participants reported that they were actively working towards obtaining their GED. Given that these two participants were 19 years old and of high school age, we took them out of the eligible sample. After adjustments, 155 participants (83%) met the criterion of having at least a high school education. Ten predictor variables were used in the equation. As very few researchers have studies that looked at educational outcomes in

residential care (Trout et al., 2008), these variables were chosen on conceptual rather than empirical basis. For example, it seems logical to look at participant characteristics such as race, sex and preadmission behavior when studying educational attainment. Of the ten available predictor variables, two variables were continuous: length of stay in months and age at admission in years. The other eight variables were dichotomous: race (non-Caucasian/Caucasian), site location (0 = main campus, 1 = site), sex (0 = male, 1 = female), any school problems (i.e., learning, attendance, or behavior; 0 = no, 1 = yes) at admission, preadmission criminal activity (0 = no, 1 = yes), any aggressive behavior (e.g., physical assault on peers or adults, verbal aggression towards others; 0 = no, 1 = yes) at admission, any drug or alcohol usage prior to admission (0 = no, 1 = yes), and restrictiveness of placement prior to admission (0 = homelike setting,1 = out-of-home/detention). Table 1 displays the means and standard deviations for the continuous variables and the percentages for the categorical variables and Table 2 displays the correlation matrix.

Two variables within this model were found to be significant, length of stay in months and age at admission in years. The coefficients indicate that longer lengths of stay and older age at admission are positively associated with obtaining a high school education. The other eight variables were not predictive of a youth obtaining a high school education (see Table 3). In addition, Table 3 displays the tolerance test for the predictors. The tolerance tests were produced using linear regression. This is an acceptable method for testing the collinearity among the independent variables as the model for the dependent variable (e.g., logistic regression) is irrelevant (Menard, 1995).

With logistic regression, one can examine the Exp (B) to estimate the increase in the odds of obtaining a high school education for a 1 unit increase in the predictor variable. For example, for each month that a youth stayed in care, they increased their odds of obtaining a high school education by 1.06 times or by 6%, controlling for all other variables. Likewise, for every year older a youth is when he or she enters care, the odds of obtaining a high school education increases 2.10 times or by 110%, controlling for all other variables.

3.2. 5-year follow-up analysis

The primary question in the present study was the association between length of stay and obtaining a high school education. However, the finding that older admission age was also significantly associated with educational outcome in the 5-year follow-up group is

an important finding. Intuitively, it seems that the older a youth is when they are admitted to the program, the more likely they are to graduate from high school while in care simply because they are farther along in their educational career. Indeed, there is a significant positive correlation in the 5-year cohort between age at admission and graduating from high school while in care ($r = .237$), $p < .01$.

Another possibility for this age effect may be that, as a group, different aged youth may enter residential care with more severe problems. For example, it may be that younger children are admitted with more severe problems than older children. Thus, having more severe problems may be a contributing factor to lower educational levels in young adulthood. As such, we explored admission data from two standardized measures of at-risk childhood behavior, the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) and the Diagnostic Interview Schedule for Children (DISC; Shaffer, et al., 1996). The CBCL is designed to assess competencies and problem behaviors in persons age 6 to 18, and consists of 118 specific items that assess child behavior problems. Eight syndrome behavior scores and three total scores (internalizing problems, externalizing problems, and total problems) are provided. The DISC is a highly structured psychiatric interview comprised of criteria and symptomatology derived directly from the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association, 1987, 1994). Counts of the number of internal, external and total diagnoses can be ascertained. It should be noted that DISC and CBCL scores were only available for the main campus youth with complete admission CBCL and DISC data ($N = 87$), representing less than half of the participants. As such, these scales were excluded from the main analysis.

A MANOVA using admission data for CBCL total raw score, CBCL internalizing raw score, CBCL externalizing raw score, total number of diagnoses of the DISC, a count of the number of internalizing diagnoses on the DISC, and a count of the number of externalizing diagnoses on the DISC as the dependent variables and age at admission as the independent variable indicated that age at admission does not predict problem severity at admission, $F (1, 85) = .887$, $p = .71$. Given that youth are admitted with similar severity of problems regardless of age, this argument is not supported.

3.3. 16-year follow-up study

As with the 5-year study, logistic regression was used to examine predictors of obtaining a high school education. Educational level was determined by the respondent's answer to the question: "What was the highest degree that you have obtained?" Any response of GED or greater (e.g., high school diploma, associates degree) was coded as having at least a high school education. For this sample, 90% had at least a high school education (66.4% HS/GED; 4.3% Vocational Degree;14.3% Associates/Junior College Degree; 3.8% B.A.; 1.4% M.A.). Only 29% of the participants reported that they had attended school within the past 12 months. Of those who attended school in the past 12 months, 31% had obtained a high school education whereas 10% had not. Unfortunately, these differences could not be statistically tested as there were insufficient cell sizes (e.g., there were only 2 participants without a high school education that had been in school in the past 12 months). Seven predictor variables were used in the equation. Again, like the 5-year cohort, the variables were chosen on conceptual rather than empirical basis. However, it seems logical to look at participant characteristics such as race, sex and preadmission behavior when studying educational attainment. Of the seven predictor variables, two were continuous: length of stay in months and age at admission in years. The other five variables were dichotomous: race (0 = non-Caucasian, 1 = Caucasian), sex (0 = male, 1 = female), any school problems (i.e., learning, attendance, or behavior; 0 = no, 1 = yes) at admission, problems with peers at admission (0 = no, 1 = yes), and any preadmission delinquent behavior (0 = no, 1 = yes).

Table 1
Descriptive statistics of the continuous and categorical variables used in logistic regression by cohort.

Continuous variables	5-year cohort				16-year cohort			
	N	Range	M	SD	N	Range	M	SD
Length of stay (months)	184	0–117	17.7	16.5	210	.43–105.6	23.43	19.07
Age at admission (years)	184	8.4–17.9	15.01	1.63	207	9.2–17.0	13.83	1.77
Categorical variables				N	% Yes	N		% Yes
Male				184	50	210		91
Caucasian				184	58	210		70
School prbs at admission				184	85	209		26
Aggression prbs at admission				184	72	–		–
Hx of criminal act at admission				184	55	–		–
In homelike setting at admission				178	45	–		–
Drug/alc at admission				184	55	–		–
On main campus				184	71	–		–
Delinquency prbs				–	–	209		36
Peer prbs				–	–	209		28

Note: "–"indicates that that variable was not measured in that cohort.

Table 2
Correlation matrix for predictors used in the 5-year follow-up logistic regression.

Variable	Constant	Length of stay (months)	Age at Adm (years)	Sex	Race (Cauc/Oth)	Hx of Agg Adm	Hx of Sch Prb at Adm	Hx of Crim Beh at Adm	Hx of drug usage at Adm	Site location (main campus or other)	Living restrictive at Adm
Constant	1.000	−.547	−.955	.004	.042	−.006	.181	−.217	−.257	−.353	−.075
Length of stay	−.547	1.000	.433	.081	−.040	−.140	−.114	.030	.064	.333	−.018
Age at Adm	−.955	.433	1.000	−.118	−.126	−.023	−.203	.214	.283	.148	.046
Sex	.004	.081	−.118	1.000	.111	.033	.055	−.225	.035	.087	−.146
Race (Cauc/Oth)	.042	−.040	−.126	.111	1.000	.120	.062	.032	−.131	−.038	−.020
Hx of Agg at Adm	−.006	−.140	−.023	.033	.120	1.000	.057	.006	−.258	−.059	.068
Hx of Sch Prbs at Adm	.181	−.114	−.203	.055	.062	.057	1.000	−.423	.004	−.090	.019
Hx of Crim Beh at Adm	−.217	.030	.214	−.225	.032	.006	−.423	1.000	−.308	.001	.095
Hx of drug usage at Adm	−.257	.064	.283	.035	−.131	−.258	.004	−.308	1.000	−.116	−.008
Site location (main campus or other)	−.353	.333	.148	.087	−.038	−.059	−.090	.001	−.116	1.000	−.261
Living restrictive at Adm	−.075	−.018	.046	−.146	−.020	.068	.019	.095	−.008	−.261	1.000

Table 1 displays the means and standard deviations for the continuous variables and the percentages for the categorical variables used in the equation and Table 4 displays the correlation matrix. For this cohort, length of stay in months was significant. The coefficients indicate that longer lengths of stay were significantly associated with obtaining a high school education. The other six variables were not predictive of a youth obtaining a high school education (see Table 5). In addition, Table 5 also displays the tolerance test for the predictors. Examination of the Exp (*B*) indicates that for each month that a youth in this sample stayed in residential care, they increased their odds of obtaining a high school education by 1.034 times or by 3.4%, controlling for all other variables.

4. Discussion

This study analyzed follow-up data from two separate cohorts of youth who departed long-term residential care; cohort 1 was admitted in the late 1990s, was on average in their twenties, and had departed 5 years earlier whereas cohort 2 was admitted in the early- to mid-1980s, was on average in their early thirties, and had departed 16 years earlier. Results for both groups indicate that longer lengths of stay are significantly associated with the likelihood of obtaining a high school education. Further, older admission age was associated with obtaining a high school education in the 5-year group. As follow-up analysis indicated, this finding may well be due to the fact that older children are simply farther along in their educational career when they are admitted and thus are more likely to graduate while in care. Interestingly, age at admission was not related to obtaining a high school education in the older cohort. This may be due

Table 3
Predictors for obtaining a high school education in the 5-year follow-up cohort.

Variable	B	Std. error	Wald	df	Sig	Exp (B)	Tolerance[a]
Constant	−9.91	3.61	7.55	1	.006**	.000	
Adm age (years)	.740	.214	11.99	1	.001***	2.10	.765
LOS (months)	.054	.024	4.85	1	.028*	1.06	.670
Sex	−.537	.553	.944	1	.331	.584	.941
Race	−.636	.534	1.42	1	.233	.530	.931
Site location	.557	.632	.778	1	.378	1.75	.873
Living restrictiveness (adm)	−.436	.567	.591	1	.442	.647	.904
School Prbs (adm)	−1.03	.686	2.27	1	.132	.356	.803
Drug/Alc usage (adm)	.707	.641	1.22	1	.270	2.03	.658
Criminal activity (adm)	.513	.663	.599	1	.439	1.67	.774
Aggression Prbs (adm)	−.644	.595	1.17	1	.279	.525	.839

Note. *n* = 173.
[a] Tolerances under .20 indicate problematic collinearity.
  * *p* < .05.
  ** *p* < .01.
  *** *p* < .001.

to two possibilities. First, as there were 16 years to follow-up for this group, it may be that simply the passage of time allowed the younger admits in this cohort to "catch up" with their older counterparts in terms of educational attainment. Second, the range for age at admission is smaller for this cohort, and the mean age at admission is two years younger (see Table 1). It may be that we didn't find an age effect due to the 16-year follow-up cohort being younger and more homogeneous in terms of admission age.

Of central importance to this discussion is the cost of providing quality care and achieving a high school education versus allowing a child to drop out of school. It has been estimated that the lifetime societal cost of one dropout (e.g., lost wages, productivity) is between $420,000 and $630,000. When the additional costs associated with untreated at-risk youth are considered (e.g., drug use, crime), this figure rises to between $2.6 and $5.3 million (Cohen & Piquero, 2009). However, the average cost for a child in this particular residential care facility is approximately $160 per day. Thus, given that the average stay for a child is between 18 and 24 months, this amounts to an approximate range of $88,000 to $120,000 (Daly & Ringle, 2009). This is a sizable investment, but a sound one, when weighed against the lost productivity of failure to complete high school and engaging in crime and heavy drug use. This $88,000 to $120,000 investment equates to approximately a 21 to as much as a 60 times return on investment when compared to Cohen and Piquero's (2009) analysis. Granted, this estimate is somewhat inflated as not every at-risk youth served by this program will abstain from dropping out of school and not every high school dropout will become involved with crime and drugs. However, the rates for obtaining a high school education for the 5-year and 16-year groups are 83% and 90%, respectively. As these rates are considerably higher than the graduation rates of at-risk youth in general (e.g., 50% rate for Behavioral Disordered youth; Lehr, Johnson, Bremer, Cosio, & Thompson, 2004), it seems as if the benefits clearly outweigh the costs.

The relationship between length of stay and educational attainment remains an interesting and relatively unexamined question. Although some researchers have investigated outcomes of youth in residential care, few have systematically studied the educational outcomes of such youth (Trout, et al., 2008). Thus, the present study contributes to the literature by using admission and during care variables to predict educational attainment at 5 and 16 years post-discharge. This study supports residential care research which suggests that longer lengths of stay may be a protective factor for maintaining educational gains during and after discharge (Daly, et al., 1994; Thompson, et al., 1996). Although results were all obtained from studies of the same residential program with a comprehensive treatment model emphasizing educational achievement, they suggest that programs which focus on educational skills and performance can produce positive educational outcomes. Indeed, appropriately placing a child in a quality out-of-home setting is the key as research has

Table 4
Correlation matrix for predictors used in the 16-year follow-up logistic regression.

	Constant	Length of stay (months)	Age at Adm (Years)	Sex	Race (Caucasian/other)	Hx of delinquency at Adm	Hx of school Prbs at Adm	Hx of peer Prbs at Adm
Constant	1.000	−.174	−.934	.136	−.142	−.261	−.012	−.160
Length of stay (months)	−.174	1.000	.053	.121	−.038	−.171	−.082	.080
Age at Adm (years)	−.934	.053	1.000	−.111	−.084	.139	.026	−.037
Sex	.136	.121	−.111	1.000	−.118	−.192	−.083	−.141
Race (Caucasian/other)	−.142	−.038	−.084	−.118	1.000	−.041	−.144	.176
Hx of delinquency at Adm	−.261	−.171	.139	−.192	−.041	1.000	−.009	.084
Hx of school Prbs at Adm	−.012	−.082	.026	−.083	−.144	−.009	1.000	−.130
Hx of peer Prbs at Adm	−.160	.080	−.037	−.141	.176	.084	−.130	1.000

shown that inappropriately placing a child in the wrong type of care can have negative consequences (Lyons, Terry, Martinovich, Peterson, & Bouska, 2001).

4.1. Limitations

There are a number of limitations to this study. First, for the five-year cohort, responders and non-responders differed on sex. Females were more likely to complete the survey. It may be that males were "worse off" (e.g., didn't have a phone, homeless) and thus were unable to be contacted. There is some indirect support for this argument as significantly more male responders were incarcerated (i.e., doing "worse off" as measured by incarceration) at the time of the interview [χ^2 (1, $N = 188$) = 18.56, $p > .001$]. This, however, does not appear to have impacted the outcomes as there were no sex differences for obtaining a high school education.

Second, the response rate for both cohorts was in the low- to mid-fifties (55.6% for 5-year the cohort and 52.6% for the 16-year cohort), which is a lower response rate than other follow-up studies of at-risk youth (c.f., Pecora et al., 2006; Thompson, et al. 1996). However, analyses indicated that the responder and non-responder groups were similar on most variables measured at admission, departure, and intermediate follow-up (16-year cohort only), suggesting that, with the exception of sex in the 5-year cohort, those who did not complete the survey were not systematically different from those who did. Although this is encouraging, we still cannot rule out the possibility that a sample bias may exist.

A third limitation is that our predictors for the two cohorts were constrained by the available variables asked about in the survey for each sample. As such, we tried to use similar predictors for both samples (e.g. *preadmission criminal activity* in the 5-year cohort versus *any preadmission delinquent behavior* in the 16-year cohort), but they were not a perfect match. This limits the comparability of the two cohorts. However, the main variable of interest, length of stay in months, was uniformly collected in the two samples, thus minimizing this concern.

Another limitation is that the possibility for a social desirability bias may exist as all conclusions are based on survey responses. All

telephone interviews were given by staff members (e.g., either the project researchers or hotline crisis counselors). It may be that participants feel pressure to answer the survey questions in a more positive light as they may see the interviewers as being somewhat biased. If this were true, one would expect different outcomes for individuals who completed the survey by mail/internet compared to individuals who complete the interview by telephone with a staff member. This did not appear to be the case, however, as there were no significant differences between these two groups regarding obtaining a high school education [χ^2 (1, $N = 186$) = .074, $p = .785$].

Finally, the external validity and generalizability of this study is limited as it focuses on one residential care program with a strong educational emphasis. Future studies need to be conducted in other residential care programs to determine if longer lengths of stay will consistently predict obtaining a high school education. A future study could compare programs that use different types of intervention models (e.g., shift staff). This type of design could also assess the effects of different program components (e.g., more or less emphasis on educational achievement).

5. Conclusion

The results of this study indicate that a longer length of stay in a residential care program can be predictive of a critical educational outcome: obtaining at least a high school education. These results do not support the counterargument that shorter lengths of stay are more effective in producing positive outcomes. Appropriate placement in quality residential care that focuses on educational skills and performance is likely the key to connecting longer lengths of stay to positive outcomes. These are important findings given that obtaining a high school education is indicative of leading a potentially more productive life with fewer societal costs. This study was one of the few to specifically examine educational outcomes for youth in residential care. Finally, given that similar results were obtained from two cohorts of youth at differing periods of post-discharge and different decades, results are encouraging.

Table 5
Predictors for obtaining a high school education in the 16-year follow-up cohort.

Variable	B	Std. error	Wald	df	Sig	Exp (B)	Tolerance[a]
Constant	−.910	1.97	.213	1	.644	.403	
LOS (months)	.034	.017	3.91	1	.048[*]	1.034	.878
Adm Age (years)	.145	.135	1.16	1	.282	1.16	.890
Race	−.395	.572	.478	1	.489	.674	.925
Sex	.621	1.13	.305	1	.581	1.86	.844
School Probs (adm)	.672	.670	1.01	1	.316	1.96	.949
Delinquency (adm)	.004	.513	.00	1	.993	1.00	.884
Peer problems (adm)	.833	.498	2.80	1	.095	2.30	.921

Note. $n = 207$.
[a] Tolerances under .20 indicate problematic collinearity.
[*] $p < .05$.

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