The Cohort Trends of Family Size and The Rise of Female Advantages: Examining the Relationship between Family Resources and College Enrollment

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In the past few decades, there have been several demographic changes in family structure, such as the rise of non-marital families, high family dissolution rates, and shrinking family size (McLanahan & Percheski, 2008). According to 2010 Census data, the average household size decreased over multiple decades, from 4.60 in 1900 to 2.58 in 2010 (Census 2010). Shrinking of a family size resulted increased allocation of educational resources per child in the family (Deschênes, 2007; Guo & VanWey, 1999; Lee, 2009; Raley & Bianchi, 2006). Demographic changes affect the allocation of educational resources on children's higher education, including parents' time, money, energy, involvement, encouragements, and investment strategies in each child at home (Behrman, Pollak, & Taubman, 1989; Dalton & Glauber, 2006; Mare & Chen, 1986).

Previous research has confirmed that large family size and number of siblings are negatively associated with children's achievement and post-secondary education (Behrman, et al., 1989; Mare & Chen, 1986; Powell & Steelman, 1989; Steelman & Powell, 1989). However, few studies have focused on the trend of smaller families and how this modifies the distribution of family resources per child at home in favor of different subgroups (e.g., gender, race and ethnicity, social skill and school achievement). Whether smaller family size increases or decreases the opportunities for college enrollment may depend on how parents distribute resources and how children respond to this structural change. Examining the change in family size over time is one way to track how families distribute their resources in supporting children's post-secondary education in response to the changing family demographics.

Although the field of educational studies acknowledged that parents' resources contribute to college enrollment, little is yet known about whether this increase in family educational resources has contributed to the rise of female advantage in college enrollment and achievement. The ability of families to allocate resources to their children depends on several family characteristics, including marital disposition of the parents, family size, parents' education and occupation, and children's gender.

Gender differences in college attendance and achievement is a growing inequality in the U.S. But how gender-specific resources flow within and outside families and how this

contributes to this stratification process remains inconclusive. Some scholars have found that girls appear to respond to the social-cultural resources and demographic changes more effectively than boys through cultivated behavior (Diprete & Buchmann, 2006; Dumais, 2002; Lareau & Horvat, 1999), parents' investment (Chiappori, Iyigun, & Weiss, 2009; Dalton & Glauber, 2006; Hopcroft, 2005)) and smaller sibling size (Dalton & Glauber, 2006; Lee, 2009; Steelman, Powell, Werum, & Carter, 2002). These structural advantages play key roles in gender parity, especially in respect to those resources parents are likely to invest in their daughters rather than their sons. While previous research may emphasize the effect of gender-specific resources, much less attention was paid to the effect of inter- and intra-family gender-specific resources on the difference of children's college enrollment and achievement.

The goal of this research is to understand how the effect of parent resources on children's college enrollment varies by cohort in the trend of smaller family size, and how this trend is modified by children's gender and parents' SES status, efficacy, and intergenerational relationship. Overall this research aims to understand how the effect of parental resources on college enrollment varies by cohort, sibling size, children's gender and parents' preference and investment strategies.

Research Design and Data

Our study aims to answer the following five research questions:

1. Has the distribution of parental resources by sibling size changed over time?

2. Do trends in the relationship between parental resources and college enrollment differ by children's gender?

3. Has the role of sibling size in mediating the relationship between parental resources and college enrollment such as college entry and college achievement changed across birth cohorts?

4. Does the effect of sibling size in mediating the relationship between parental resources and college enrollment differ by children's gender?

5. Do trends in the relationship between parent-children relationship and college enrollment differ by family structure and by parents' employment status?

In order to answer these questions, we utilize data that includes the number of sibling at home, family resources, parents' investment strategies and measures of children's non-cognitive skills and cognitive achievements so that we can demonstrate the effect of inter- and intra-family gender-specific resources on the difference in children's college enrollment and achievement. In addition, covariates that measure children's school performance and college preparation in early adolescence are used contemporaneously, rather than retrospectively. We use follow up data to track how early school performance and parents' educational investment affect later college enrollment. Our data offers reasonable

comparability in these measures across birth cohorts. We are able to meet these data requirements by using survey data on four cohorts of children: High School and Beyond 1980, the National Education Longitudinal Study 1988, the National Longitudinal Study of Adolescent Health 1994-1995 and the Education Longitudinal Study of 2002. These data allow us to compare four cohorts of 14-20 year olds youth interviewed in 1980, 1988, 1997 and 2002. The data sets are selected when meeting the following conditions: (1) covering a wide span of birth cohorts of American youth; (2) including information on family background, sibling size, parental resources and standardized measures of cognitive skills; (3) including comparable measures of non-cognitive skills and parent-children communication; and (4) includes detailed measures of college enrollment and achievement. We describe each of these surveys in more detail below.

The first cohort comes from the sophomore class survey of High School and Beyond (HS&B), a nationally representative sample of high school sophomore students first surveyed in 1980. The sample includes information on family background, standardized test scores, non-cognitive traits, college enrollment and achievement for 27,683 sophomore students from 988 schools across the US. 14,670 students were in the sample in all 5 waves.

The second cohort comes from the National Education Longitudinal Study of 1988 (NELS88). NELS88 started with the survey of a nationally representative sample of 8th graders (aged 14), who participated in the first follow-up study two years later in 1990, when respondents were in 10th grade. The follow-up data offers the same variables as the base-year survey (1988) including standardized test scores, non-cognitive skills, and family characteristics. The later waves describe college enrollment and achievement. The first follow-up study covers 16,589 high school sophomore students originally interviewed in 1990.

The third cohort comes from the National Longitudinal Study of Adolescent Health (Wave1 to Wave 4, 1994 - 2008). ADD Health started with a survey of a nationally representative sample of students in Grades 7 through 12 during the 1994 – 1995 school year. Approximately 19,000 adolescents were selected for the longitudinal in-home survey. The later waves describe college enrollment and achievement. The second and fourth follow-up studies cover approximately 9,000 high school students and their college enrollment.

The forth cohort comes from the Education Longitudinal Study of 2000 (ELS 2002), a nationally representative sample of 10th graders in 2002. The study provides information on cognitive as well as non-cognitive skills. The sample includes about 12,441 students from 750 schools across the US.

These four cohorts allow us to describe trends in three major types of family resources-financial resources, cultural resources and social resources, sibling size, parent-child relationship and parent efficacy. Previous scholars have identified two socio-psychological processes that may serve as the facilitators in allocating family resources

to children's high education (Crosnoe 2004; Offer & Schnider 2007): (1) parent-children communications and emotional distances; (2) aligned action between parental support and their children's college plan. We expect that parent-children relationship quality, aligned actions, and children's prior school performance are the main determinates in the configuration of resource allocation within the family. This leads to our main analytic framework. We list the potential patterns of resource allocation in the family in Table 1.

In Table 2, we report gender, race group and the number of siblings across the four datasets. The number of siblings is our main mediator in the relationship between parent resources and college enrollment. As it shows that the average sibling size decreases from 4.17 and 3.92 in 1978 and 1980 cohort (HS&B) to 2.27 in 1988 cohort (NELS 88) and 2.21 in 2002 cohort (ELS 2002). We examine whether and degree to which smaller sibling size contribute to the rise of female advantages in college enrollment and achievement.

Table 1: Configuring Resources Allocation by Parents' Efficacy and Aligned Action condition on Children's Prior School Achievement

	Daughter's prior school experiences			**Son's prior school experiences**		
	High	Middle	Low	High	Middle	Low
Parent Efficacy						
(1) Parent-Children relationship quality						
Financial resources	H[a]	H	M[a]	H	M	M
Cultural resources	H	H	M	H	M	M
Social resources	H	H	H	H	M	L[a]
Aligned Action						
(2) Parent-Children educational expectation						
Financial resources	H	H	H	H	M	L
Cultural resources	H	H	H	H	M	L
Social resources	H	H	H	H	M	L

Note. [a] indicates the intensity of parents' willingness and involvement to invest children's college education. H=high investment, M=middle investment, L=Low investment

Table 2: Simple Descriptive Statistics across Four Dataset

	Survey Year	White	Black	Hispanic	Female	Male	Number of Siblings
H&B(senior)	1978	45.16%	24.51%	24.33%	52.69%	47.31%	4.17
H&B(sophomore)	1980	64.89%	13.16%	17.55%	50.15%	49.85%	3.92
NELS (88-92)	1988	69.03%	9.61%	13.30%	52.48%	47.52%	2.27
ADD Heath	1994	66.00%	24.00%	7.00%	51.60%	48.40%	2.34
ELS (02-08)	2002	53.60%	12.50%	13.60%	50.10%	49.90%	2.21

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