

Adoption Context, Parental Investment, and Children's Educational Outcomes

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Abstract

Adoptive parents invest more resources into their children than comparable nonadoptive and biological parents, a pattern strongly linked to parental socioeconomic status. But important differences among families related to adoption context (international, private, foster) could affect parental investment and its impact on educational outcomes. Using the *National Survey of Children's Health*, our findings indicate that parental investment strategies are contingent on adoption context and partially mitigate the negative direct association between adoption and educational outcomes. Internationally adoptive parents invest significantly more than do other adoptive and nonadoptive families. Without these parental investments, however, internationally adoptive children tend to experience the poorest educational outcomes. Even though parental investments can help mitigate internationally adoptive children's negative educational outcomes, private domestic adoptive families seem to be more successful at mitigation. Results highlight how social stratification dynamics shape selection into adoption venues while also influencing parents' efforts to invest and translate investments into educational gains.

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Although researchers generally agree that parents can make a difference in how their children perform in school, seemingly conflicting findings exist regarding how parental investments translate into school outcomes. To understand the mechanisms behind this investment–outcomes link, family and education scholars frequently focus on the school outcomes of children raised in nonnormative families, including but not limited to stepfamilies and adoptive families (e.g., Aschaffenburg & Maas, 1997; Cheng & Powell, 2007; Dalen & Rygvold, 2006; Downey, 1995; Freese & Powell, 1999; Lansford, Ceballo, Abbey, & Stewart, 2001; Lareau, 2003; Rueter & Koerner, 2008; Schwartz & Finley, 2006; Thomas & Tessler, 2007).

In a recent study of kindergarten and early elementary students, Hamilton, Cheng, and Powell (2007) compared parental investment strategies in adoptive and biological families. Their findings refute kin selection theories that biological imperatives will lead parents to invest more heavily into children who carry their genetic code than into nonbiological/adoptive children (Amato, 2005; Biblarz & Raftery, 1999), and instead highlight how social stratification shapes parental investment strategies (also see Cheng & Powell, 2007; Freese & Powell, 1999). Two-parent families with adoptive children invest more heavily and provide more educational resources than do two-parent families with biological children, leading Hamilton et al. (2007) to conclude that adoptive parents pursue a two-pronged *compensatory* strategy: First, above and beyond what we might expect based on socioeconomic status (SES) background alone, adoptive parents invest more “economic, cultural, interactional, and social capital” (p. 102) resources to mitigate disadvantages adoptive children are known/assumed to have experienced prior to placement. Second, adoptive parents foresee potentially negative societal reactions to their nonnormative family configuration and invest more to signal that they are “real” families (Hamilton et al., 2007, p. 98).

Notwithstanding their contribution, Hamilton et al.’s (2007) study raises new questions about variation among adoptive families. We know that *adoption context*—that is, international versus foster versus private domestic adoption—is strongly linked not only to characteristics such as age at adoption and negative experiences prior to placement but also to parental SES (Bimmel, Juffer, van Ijzendoorn, & Bakermans-Kranenburg, 2003;

Ishizawa & Kubo, 2014; Jacobson, 2014; Raleigh, 2012; van Ijzendoorn, Juffer, & Poelhuis, 2005; Vandivere, Malm, & Radel, 2009; Zhang & Lee, 2011). This suggests that significant selection bias operates among adoptive families. Yet we know little about the long-term implications this has for parents and children. Thus, we ask the following: How is *adoption context* linked to parental investments and to children's educational outcomes? How do experiences of nonadoptive children compare with those adopted via various contexts?

Though recent studies call for multivariate analyses to examine whether school-related outcomes differ systematically between adoptive and other children (see Hamilton, Werum, Steelman, & Powell, 2011), to our knowledge, few such studies exist. Extant research on educational outcomes for adoptive children rarely includes comparisons with nonadopted children (e.g., Vandivere & McKlindon, 2010), or it tends to focus on those with clinical problems or a history of institutionalization, which risks overestimating negative outcomes (Beckett et al., 2006; Bimmel et al., 2003; van Ijzendoorn et al., 2005). Researchers also tend to assume that children in all but the most normative families (two biological parents) experience deficits and comparatively negative outcomes across a variety of educational and well-being indicators (Amato, 2005). For that reason, and the small sample limitations of earlier data sets such as the *Early Childhood Longitudinal Study, Kindergarten* (ECLS-K) used by Hamilton et al. (2007), prior research has frequently collapsed adopted children with those in single-parent families and stepfamilies (e.g., Amato, 2005; Biblarz & Raftery, 1999; Downey, 1995; but see Lansford et al., 2001).

Using the *National Survey of Children's Health* (NSCH; 2007), our analysis extends Hamilton et al.'s (2007) work and addresses some of the data limitations they encountered. We pose the following three related research questions:

Research Question 1: How is adoption and adoption context linked to specific types of parental investment?

Research Question 2: How is adoption context associated with children's educational outcomes?

Research Question 3: How is parental investment associated with children's educational outcomes, independent of adoption context?

Our findings contribute to growing research on adoptive families and advance our understanding of the complex effects social stratification—which influences parental investment strategies—has on children's educational outcomes.

Empirical Background

How Is Adoption Context Linked to SES and to Social Stratification?

As one of the fastest growing nonnormative family forms, adoptive families comprise approximately 4% of all families, even with a recent decline in international adoptions (Evan B. Donaldson Adoption Institute, 2010; Fisher, 2003). According to nationally representative data collected by the *U.S. Department of Health and Human Services* (Vandivere et al., 2009), the structure of adoptive families differs from biological families in several important regards: Overall, adoptive families are more likely socioeconomically stable, have two older, employed parents present, fewer children, and are more likely to be interracial than the general population.

Additionally, important differences exist *among* adoptive families that warrant distinguishing by adoption context: Child deficits, SES, and other factors vary systematically between children who were adopted internationally, via foster care, or via private domestic channels (Ishizawa & Kubo, 2014; Jacobson, 2014; Kreider, 2011; Raleigh, 2012; Thomas & Tessler, 2007; Vandivere et al., 2009; Vandivere & McKlindon, 2010; Zhang & Lee, 2011). In all, these differences by adoption type point toward a strong selection effect that leads adoptive parents into an internally stratified adoption market.

For instance, international adoptees are considered at high risk for developmental and cognitive problems due to maternal and infant malnutrition and lack of prenatal health care (Vandivere & McKlindon, 2010). According to Vandivere et al. (2009), a majority of *internationally adoptive parents* belong to the top quintile of income earners, likely because private sector adoptions (international and domestic) typically are associated with significant expenditures. Almost uniformly, these adoptive parents hold higher degrees and are White, which augments social status differences, and are more likely to be married than other adoptive and biological parents. Unlike domestic adoptive parents, they are far more likely to adopt girls rather than boys (which reflects the pool of children available for international adoption), tend to have no biological children, and tend to pursue transracial/transcultural adoption (Zhang & Lee, 2011). In fact, whereas less than 25% of domestically adopted children are placed in transracial contexts, 84% of international adoptions are classified as transracial. In these ways at least, internationally adoptive families are the least similar to the traditional, normative “family ideal”—a middle-class, monoracial family with two biological parents married to each other (Biblarz & Raftery, 1999; Farr & Patterson, 2009; Hamilton et al., 2007; Hamilton et al., 2011).

Differences between internationally and *foster adoptive parents* are especially pronounced. The latter are far more likely African American than are other adoptive parents (Raleigh, 2012; Vandivere et al., 2009). They are less likely to hold at least a high school degree and to live above the poverty level than other adoptive parents (but more likely on both accounts than nonadoptive parents). They are more likely to have additional children (biological and otherwise) and to adopt same-race children (23% are relative adoptions). Because these children tend to be significantly older than other adoptees, they are often considered at high risk for health and behavioral problems (Beckett et al., 2006; Vandivere & McKlindon, 2010).

Compared with internationally adoptive and foster adoptive families, *private (independent or agency based) domestic adoptions* are most prevalent among Whites, who overwhelmingly adopt very young, same-race children (38% are relative adoptions; see Ishizawa & Kubo, 2014; Vandivere et al., 2009). These parents are significantly *less* likely than the general population and other adoptive parents to be married. They are *more* likely than the general population and foster-adoptive parents (yet *less* likely than internationally adoptive parents) to have postsecondary training and higher incomes.

Given these evident SES differences among adoptive parents, plus Hamilton et al.'s (2007) finding that SES differences per se are strongly linked to parental investment strategies, we ask the following: How is *adoption context* linked to parental investment strategies, and, in turn, to children's educational outcomes? Precisely because internationally adoptive parents have the most resources and the children they adopt are often assumed to have greater deficits than other adoptive children (Bimmel et al., 2003; Ishizawa & Kubo, 2014; Raleigh, 2012; Thomas & Tessler, 2007; van Ijzendoorn et al., 2005; Zhang & Lee, 2011; but see Beckett et al., 2006; Vandivere & McKlindon, 2010), we expect internationally adoptive parents to invest more heavily than other adoptive and nonadoptive parents. Prior research has shown that, in addition to classic economic resources, less instrumental or tangible forms of investments play an important role in shaping educational outcomes. These noneconomic investments include "cultural capital," or the cultivation of socially valued knowledge and skills through a child's participation in extracurricular activities; "interactional capital," or parental engagement with their child in activities at home, at school and away from school and "social capital," particularly knowing a child's friends and their family (Freese & Powell, 1999; Hamilton et al., 2007; Lareau, 2003; Werum, Davis, & Cheng, 2011).

Though data limitations prevent us from examining parental motivations directly, our work extends Hamilton et al.'s (2007) dual compensation argument: It is possible that both the goal to compensate for assumed

or actual preadoption deficits, as well as persistent negative attitudes toward interracial and immigrant families further compound international adoptive parents' investment strategies to demonstrate they are "real *American* families." Whether and, if so, under which conditions these investments are linked to educational outcomes is the second key question addressed in this article.

How Are Parental Investment and Educational Outcomes Related?

While the economic investments enable parents to provide their children with tangible resources to assist them to succeed academically (e.g., tutors, enrollment in private school), the nontangible investments broaden their child's knowledge base, provide parents with a more in-depth understanding their child and steer their child toward positive activities and peer influences (Aschaffenburg & Maas, 1997; Freese & Powell, 1999; Lansford et al., 2001; Lareau, 2003; Werum et al., 2011). Even eating family meals together is associated with academic success, both because of the conversations that arise during those meals and the correlates of family meals with other forms of engaged parenting (Meier & Musick, 2014).

Researchers frequently portray parental investment as a purposive if not outright instrumental means to improve achievement (for detailed discussion of the pros and cons regarding this economic conceptualization, see Downey, 1995; Freese & Powell, 1999; Lareau, 2003). Research also shows that few if any racial differences exist either in terms of parental investment or children's academic disposition, after SES is taken into account (Ainsworth-Darnell & Downey, 1998; Cheng & Powell, 2007; Kreider, 2011; Vandivere et al., 2009). For our purposes, we are concerned with whether the effects of *adoption context* persist once we control for SES and family structure, as suggested (but not directly tested) by Hamilton et al. (2007).

Moreover, research has consistently documented a negative association between adoption and behavioral, developmental, and educational outcomes (van Ijzendoorn et al., 2005), though differences by adoption context are rarely examined (but see Ishizawa & Kubo, 2014; Raleigh, 2012; Zhang & Lee, 2011). In 2010, *Adoption Quarterly* devoted a special issue to studies using the National Survey of Adoptive Parents. Contributors to that volume focused on differences in health and behavioral outcomes, especially clinical manifestations of problems among adopted children. However, these studies did not compare adoptive families with nonadoptive families, and they did not investigate the role of parental investment or educational

outcomes (e.g., Vandivere & McKlindon, 2010; also see Schwartz & Finley, 2006; Thomas & Tessler, 2007).

To our knowledge, Hamilton et al. (2007) remains the sole study that has examined links between adoption and parental investment. To repeat, it suggested that adoptive families invest in children more heavily than do biological, nonadoptive families, to compensate for deficits and to demonstrate that adoptive families are “real” families. Thus, we would consider finding that parental investment strategies differ by *adoption context* to support and refine their basic compensation argument. Given the adoption market’s internal stratification, internationally adoptive families in fact may have both the greatest incentives and greatest opportunities to employ dual compensatory strategies (Hamilton et al., 2011; Vandivere et al., 2009).

Existing empirical evidence suggests that the link between parental investment and educational outcomes differs systematically for all adopted compared with biological children. But that is just the beginning. We extend this line of reasoning to examine potential differences among adoptive families and compare them with nonadoptive families. Specifically, we ask the following: Are the compensatory effects of parental investment most pronounced for children adopted internationally—and, if so, compared with which other groups of children? Similar findings *across adoption context* would indicate that *adoption per se* is related to parental compensation strategies, as argued in Hamilton et al. (2007). However, if findings are *contingent on adoption context*, parental investment effects will be more pronounced for some adoptive children than others, suggesting that both compensation and stratification explanations are most pertinent to understanding variations in children’s educational outcomes.

Hypotheses

Hypothesis 1a: Following Hamilton et al. (2007), adoptive parents will invest more time and resources into their children than nonadoptive and two-parent biological parents. This will persist even when SES is controlled.

Hypothesis 1b: Among adoptive families, *internationally adoptive parents* will invest more into their children than other adoptive parents. If this compensatory pattern holds even when we take SES differences into account, it will also bolster and refine the second dimension of Hamilton et al.’s argument regarding the perceived need to demonstrate that international adoptive families, which by definition are immigrant and frequently interracial families, are indeed “real *American* families.”

Hypothesis 2a: We expect that adoptive children will have poorer educational outcomes compared with their nonadoptive counterparts, despite compensatory parental investment strategies.

Hypothesis 2b: Among adoptive families, we expect that the differential impact of parental investments on educational outcomes will accrue largely to *private domestically adopted* children, who tend to be placed in (monoracial) White, middle-class families.

Hypothesis 3: We expect that parental investment also serves as a *buffer* regarding the known negative, direct relationship between adoption or adoption context and educational outcomes. Consequently, including parental investment in the model will increase the negative effect of adoption and adoption context on educational outcomes. Such a classic suppression pattern would indicate that higher parental investments enable some adoptive parents to mitigate their children's otherwise even more negative outcomes.

Data and Method

Sample

We use the 2007 NSCH to examine the relationship between adoption context, parental investment, and schooling outcomes. The NSCH data are collected by the Centers for Disease Control and Prevention (2007) through phone interviews with a nationally representative sample of 91,642 parents of children younger than age 18 in order to study physical health and emotional well-being among children aged 0 to 17 years. Because school-related measures are not available for children younger than 6 years, our analyses only include cases in which the sample child is aged 6 to 17 years ($N = 62,421$), of whom 1,577 children are adopted (see Table 1 for details; <http://www.cdc.gov/nchs/slats/nsch.htm>).

The NSCH contains questions on school performance, attitudes and behaviors, family and living conditions, and a battery of questions about the focal child's physical and emotional health. The NSCH is uniquely suited to address our research questions, as it contains a range of parental investment variables that allow us to approximate (if not replicate) Hamilton et al.'s (2007) model, and a series of educational outcome measures. The NSCH also contains an unusually large number of families in which the sample child is adopted and provides unique information about adoption context (international, domestic private, and domestic foster adoption). This enables us to compare biological children (and others who were not adopted) with adopted children, and to compare children of different adoptive types, on a range of outcomes.

Table 1. Weighted Means for Key Variables by Adoption and Adoption Context.

Variable	Wording/coding	All adoptive families				
		Overall (N = 62,421)	Not adopted (N = 60,844)	Private adoptive (N = 617)	Foster adoptive (N = 611)	International adoptive (N = 349)
Cares About Doing Well in School	[Sample child] Cares about doing well in school. Scale: 1 = never/rarely to 4 = always.	3.493	3.499 ^{a, b, c}	3.239	3.140	3.237
Contacted by School	During the past 12 months, how many times has [sample child's] school contacted you or another adult in your household about any problems he or she is having with school? Scale: 0 = never to 4 = 4 times or more.	1.406	1.397 ^{a, b, c}	1.657	2.088	1.590 ^b
Completes Homework	[Sample child] Does all required homework. Scale: 1 = never/rarely to 4 = always.	3.466	3.471 ^{a, b, c}	3.231	3.097	3.336
Repeated a Grade	Since starting kindergarten, has [sample child] repeated any grades? 1 = yes; 0 = no.	0.106	0.104 ^{a, b}	0.167	0.198	0.088 ^b
Parent Attends Events	During the past 12 months, how often did you attend events or activities that [sample child] participated in? Scale: 1 = never/sometimes to 3 = always.	2.180	2.179 ^c	2.227	2.312	2.567 ^{a, b}
Know Friends	Regarding [sample child's] friends, would you say that you have met all of [his or her] friends, most of [his or her] friends, some of [his or her] friends, or none of [his or her] friends? Scale: 1 = none of his or her friends to 4 = all of his or her friends.	3.100	3.099 ^c	3.206	3.102	3.215
Meals	During the past week, on how many days did all the family members who live in the household eat a meal together?	4.938	4.930 ^{a, c}	5.042	5.420	5.512

(continued)

Table 1. (continued)

Variable	Wording/coding	All adoptive families				
		Overall (N = 62,421)	Not adopted (N = 60,844)	Private adoptive (N = 617)	Foster adoptive (N = 611)	International adoptive (N = 349)
Sports	During the past 12 months, was [sample child] on a sports team or did [he or she] take sports lessons after school or on weekends? 1 = yes; 0 = no.	0.587	0.586 ^c	0.606	0.555	0.743 ^{a, b}
Clubs	During the past 12 months, did [sample child] enroll in any clubs or organizations after school or on weekends? 1 = yes; 0 = no.	0.568	0.567 ^c	0.609	0.569	0.817 ^{a, b}
Private School	[During the last school year/Currently] What kind of school [was/ is sample child] enrolled in? 1 = yes; 0 = no.	0.106	0.105 ^c	0.106	0.082	0.215 ^{a, b}
Age Adopted	Age at adoption in years	—	—	1.857	2.495 ^a	2.207 ^b
Family Structure						
Two-Parent Biological/Adopted	1 = Yes	0.624	0.625 ^a	0.450	0.572	0.663 ^a
Two-Parent Step	1 = Yes	0.103	0.105 ^{a, b, c}	0.028	0.016	0.022
Mother Only, No Father Present	1 = Yes	0.202	0.200 ^b	0.232	0.287	0.280
Other Family Type	1 = Yes	0.071	0.069 ^{a, c}	0.289	0.125 ^a	0.035 ^{a, b}

Note. Adapted from the National Survey of Children's Health, ages 6 to 17 years subsample.

^aDenotes significantly different from private adoptive families ($p < .05$). ^bDenotes significantly different from foster adoptive families ($p < .05$). ^cDenotes significantly different from international adoptive families ($p < .05$).

Variables

Dependent Variables. The NSCH contains multiple *educational outcome measures*. We analyze four variables related to academic engagement, behavior, and performance. We include two variables that capture academic attitudes and engagement. Respondents were asked to assess whether the sample child cares about doing well in school and does all required homework using a 5-point scale (1 = *never* to 5 = *always*). Due to small number of respondents answering “never” or “rarely,” we collapse the original 5-point scale to a 4-point scale for both variables.

As discussed above, most extant research using clinical populations focuses on persistent, severe behavioral problems among adoptive children. Thus, we include a school behavioral outcome about how often in the past 12 months the sample child’s school contacted parents about any problems the child was having with school (0 = *never* and 4 = *4 times or more*).

Finally, since much of the sociology of education literature treats parental investment as a purposive (instrumental) means toward an academic end, we also include an outcome measure that gauges academic performance. NSCH measures of academic performance are limited, unlike measures typically present in data sets such as the ECLS-K. In light of these constraints, we use a dichotomous measure assessing whether the sample child had repeated a grade since kindergarten (1 = *yes*). Our *parental investment* variables, which serve as both independent and dependent variables in different analyses, are discussed below.

Key Independent Variables. Our key independent variable is *adoption context*, measured as three dummy variables: international adoption, private domestic adoption, and foster domestic adoption, with “not adopted” as the reference category. Because our multivariate analyses control for other family structure factors, the reference group “not adopted” de facto becomes coterminous with “two-parent biological” in all but the baseline models (also see Hamilton et al., 2007). This specification provides a test for kin selection theories positing that two biological parents should invest the most in their children compared with families in which at least one parent was not biologically related to the focal child.

The NSCH also gauges different forms of *parental investment*. We include six parental investment variables in an effort to reproduce Hamilton et al.’s (2007) model, albeit imperfectly. Their findings point specifically to the importance of *interactional social capital* resources. Thus, we include two measures aimed at gauging interactional investments by parents. Our first parental investment measure is a question asking parents how often they

attend events or activities in which the sample child participated, measured on a 4-point scale. The responses on this scale are highly skewed, so we collapse the “never” and “sometimes” response categories to create a 3-point scale. The second parental interaction variable comes from a question asking respondents about the frequency of shared family meals (0-7 days/week). We also include a social capital variable—familiarity with the child’s friends—which is measured on a 4-point scale where parents indicate they know 1 = none to 4 = all the child’s friends.

We use two additional dichotomous parental investment variables to gauge *cultural capital* resources: Specifically, we ask whether the sample child was a member of any club or organization, and whether the sample child participated on a sports team or took sports lessons after school or on weekends. To gauge the impact of *economic resources*, our final, dichotomous parental investment variable asks whether the child is enrolled in private school (1 = yes). This measure not only captures tangible financial expenditures for schooling but also the investment in the intangible social and cultural capital associated with attending private school.

Sociodemographic Controls. We control for age at adoption (in years), which varies systematically by adoption context, and which is associated with a higher risk of academic, emotional, and behavioral problems (0 = non-adopted). To gauge family structure, we include dummy measures of family types: two biological/adoptive parents (reference group), stepparent families, single-mother families, and other nonadoptive families. Results for these controls are reported in the tables. Coefficients for other controls, discussed below, are available on request from the corresponding author.

In addition, analyses control for the number of children in the household. Child’s gender is measured as a dichotomous variable (1 = male). Child’s and mother’s ages are both coded in years. We use five dichotomous categories for child’s race, with White serving as the reference group. (Data on parents’ race was not available to us). Instead of an SES composite, NSCH provides separate variables for parental education and income. The parent with the highest level of education is dummy-coded into four categories, with college graduate as reference group. To measure household income, we adapted the NSCH’s household income-to-poverty ratio, originally coded into eight categories based on the annual guidelines for measuring poverty established by the U.S. Department of Health and Human Services. All but one represent intervals above the poverty threshold (e.g., 1 = below the poverty threshold, 2 = 100% to 133% above the poverty threshold, 3 = 133% to 150% above the poverty threshold, 4 = 150% to 185% above the poverty threshold all the way through, 8 = 400% above the poverty threshold). Because the original scale

used unequal intervals, we converted this variable into a continuous measure by assigning the midpoint of the interval represented by each category for each respondent, thus conforming to the assumption necessary for correct regression model specification that independent variables are continuous. Consequently, a code of “2” on the NSCH measure is recoded to 1.165, which is the midpoint between 100% and 133%.

Analytic Strategy

We use ordinary least squares, binary logit, and ordinal logit regression to estimate models with continuous, binary, and ordinal dependent variables, respectively. We use multiple imputation ($m = 5$) to impute missing values to maximize our sample size and retain sufficient variation across adoption types (see Allison, 2002). All analyses use the NSCH child-level weight.

Table 2 estimates the direct link between adoption (with and without controls) and parental investment. Short of replication, this allows us to approximate the analyses of Hamilton et al. (2007) with a larger sample of adoptive children. Table 2 also extends their inquiry by determining the degree to which adoption context shapes parents' investment strategies (Hypotheses 1a, 1b). Table 3 estimates the direct link between parental investment and schooling outcomes across (non)adoptive groups. This analysis shows whether parental investment can mitigate the known negative direct impact of adoption (Hypotheses 2a, 2b; Hypothesis 3). In Table 4, we present evidence of the indirect effects adoption context has on educational outcomes via parental investment (Sobel tests).

Data Strengths and Limitations

For the purpose of our study, the NSCH has considerable advantages. Unlike ECLS-K and similar NCES data sets, it contains a sizeable subsample of adopted children ($n = 1,577$) that enables us to examine whether adopted children's outcomes differ systematically by adoption context. Hamilton et al.'s (2007) analysis was based on a small number of adopted children in the ECLS-K in kindergarten and first grade ($n = 161$). Though one may infer international adoption in the ECLS-K by intersecting children's country of birth with their adoption status, the derived measure is far from ideal, and the resulting N is prohibitively small, preventing Hamilton et al. (2007) from conducting such analyses. NSCH also allows us to address whether we can extrapolate from the ECLS-K to a larger, more heterogeneous population of adoptees. Finally, though the NSCH focuses on health and well-being, it also measures educational outcomes of interests to a broad audience. The NSCH

Table 2. Adoption Context and Parental Investment (N = 62,421).

	Parent Attend Events		Know Friends		Meals		Sports		Clubs		Private School	
	Baseline	Control	Baseline	Control	Baseline	Control	Baseline	Control	Baseline	Control	Baseline	Control
Adoption Context												
Private	0.08	0.31	0.24	0.55	0.11	0.02	0.08	0.28	0.17	0.18	0.00	0.07
Foster	0.32	0.62	0.02	0.36	0.49**	0.28	-0.13	0.12	0.01	0.11	-0.28	-0.24
International	0.84**	0.88**	0.27*	0.57*	0.58**	0.05	0.71**	0.53*	1.23**	0.88*	0.84**	0.47
Age Adopted		-0.07		-0.13		0.15		-0.09		-0.06		-0.17
Family Structure												
Two-Parent Step		-0.26**		-0.28**		-0.16*		-0.34*		-0.12*		-0.65**
Mother Only		-0.13**		-0.07		-0.16		-0.15*		0.00		-0.12
Other		-0.34**		-0.38**		0.04		-0.21*		-0.02		-0.21
T ₁	-0.79**	-1.52**	-3.98**	-5.15**								
T ₂	0.03	-0.56**	-1.39**	-2.48**								
T ₃			0.77**	2.109								
Constant					4.93**	6.90**	0.35**	-0.13	0.27**	-0.61*	-2.14**	-4.07**
Reference group	Nonadoptive families	Two biological parents	Nonadoptive families	Two biological parents	Nonadoptive families	Two biological parents	Nonadoptive families	Two biological parents	Nonadoptive families	Two biological parents	Nonadoptive families	Two biological parents
F	7.05	493.08	2.02	441.60	5.86	387.06	4.68	194.55	10.38	414.01	9.39	132.05
Model	Ordered logit	Ordered logit	Ordered logit	Ordered logit	Ordinary least squares	Ordinary least squares	Logit	Logit	Logit	Logit	Logit	Logit

Note. All analyses employ sampling weights. All control models include child gender, child race, number of children in family, mother's age, poverty level, parental education, and family income (descriptives and coefficients are available on request from the corresponding author). Adapted from the National Survey of Children's Health, ages 6 to 17 years subsample.

* $p < .05$. ** $p < .01$ (two-tailed).

Table 3. Direct and Indirect Relationship Between Adoption Context and Academic Outcomes (N = 62,421).

	Cares About Doing Well in School				Contacted by School				Completes Homework				Repeated a Grade			
	Baseline		Investment		Baseline		Investment		Baseline		Investment		Baseline		Investment	
	Control	Two biological parents	Control	Two biological parents	Control	Two biological parents	Control	Two biological parents	Control	Two biological parents	Control	Two biological parents	Control	Two biological parents	Control	Two biological parents
Adoption Context																
Private	-0.62**	-0.29	-0.38*	0.29	0.49*	0.29	0.33	0.33	-0.58**	-0.09	-0.18	-0.18	0.54*	0.53	0.61	0.61
Foster	-0.79**	-0.37	-0.46	1.16**	1.37**	1.16**	1.24**	1.24**	-0.78**	-0.28	-0.37	-0.37	0.75**	0.85**	0.90*	0.90*
International	-0.69**	-0.57	-0.74*	0.99**	0.49*	0.99**	1.09**	1.09**	-0.42**	-0.48*	-0.63**	-0.63**	-0.19	1.19**	1.32**	1.32**
Age Adopted		-0.19**	-0.19**	0.09		0.09		0.08		-0.20*		-0.20		0.01		-0.02
Parent Investment																
Parent Attends Events				0.17**		0.17**		-0.06				0.15**				-0.04
Know Friends				0.19**		0.19**		-0.13**				0.23**				-0.03
Meals				0.09**		0.09**		-0.07**				0.09**				0.02
Sports				0.18*		0.18*		-0.30*				0.13**				-0.37**
Clubs				0.14**		0.14**		0.08				0.01				-0.27**
Private School				0.08		0.08		-0.12				0.14**				-0.21**
Family Structure																
Two-Parent Step		-0.50**		-0.43**		0.70**		0.65**		-0.45**		-0.39**		0.62**		0.58**
Mother Only		-0.48**		-0.45**		0.63**		0.62**		-0.43**		-0.41**		0.40**		0.39**
Other		-0.16		-0.11		0.61**		0.58**		-0.39**		-0.33**		0.39**		0.36**
t ₁		-3.55**		-5.01**		1.41**		0.69**		-3.51**		-6.16**		-4.41**		-4.41**
t ₂		-1.95**		-3.37**		2.00**		1.32**		-1.86**		-4.45**		-2.68**		-2.68**
t ₃		-0.63**		-1.98**		2.42**		1.76**		0.55**		-3.05**		-1.24**		-1.24**
Constant																
Reference group	Nonadoptive families	Two biological parents	Two biological parents	Nonadoptive families	Two biological parents	Two biological parents	Two biological parents	Two biological parents	Nonadoptive families	Two biological parents	Two biological parents	Two biological parents	Nonadoptive families	Two biological parents	Two biological parents	Two biological parents
F	13.63	268.21	608.50	16.87	146.29	206.35	206.35	206.35	16.82	219.90	1033.72	1033.72	12.60	230.63	225.73	225.73
Model	Ordered logit	Ordered logit	Ordered logit	Logit	Ordered Logit	Ordered Logit	Ordered Logit	Ordered Logit	Logit	Logit	Logit	Logit	Logit	Logit	Logit	Logit

Note. All analyses employ sampling weights. All control and investment models include child gender, child race, number of children in family, mother's age, poverty level, parental education, and family income (descriptives and coefficients are available on request from the corresponding author). Adapted from the National Survey of Children's Health, ages 6 to 17 years subsample.
 *p < .05. **p < .01 (two-tailed).

Table 4. Indirect Effects of Adoption Type on Schooling Outcomes via Investment (Sobel Tests).

	Cares About School	Contacted by School	Completes Homework	Repeated a Grade
Parent Attends Events				
Private	0.053	-0.017	0.048	-0.012
Foster	0.106 †	-0.034	0.095	-0.024
International	0.149 **	-0.048	0.133 **	-0.033
Know Friends				
Private	0.105 †	-0.064	0.126 †	-0.013
Foster	0.069	-0.042	0.083 †	-0.009
International	0.109 *	-0.068 †	0.131 *	-0.014
Meals				
Private	0.001	-0.001	0.001	0.000
Foster	0.026	-0.019	0.025	0.004
International	0.005	-0.004	0.005	0.001
Sports				
Private	0.051	-0.085	0.036	-0.106
Foster	0.022	-0.368	0.015	-0.046
International	0.095	-0.160 †	0.067 †	-0.199 *
Clubs				
Private	0.025	0.014	0.002	-0.031
Foster	0.016	0.009	0.001	-0.030
International	0.123 *	0.069	0.011	-0.234 *
Private School				
Private	0.006	-0.008	0.010	-0.015
Foster	-0.020	0.029	-0.033	0.051
International	0.039	-0.057	0.058	-0.100

Note. Significance of indirect effect tested with Sobel test for mediation. Significant effects are in bold. Indirect effects were calculated using coefficients from Table 2 (model with controls) and the appendix.

† $p < .10$. * $p < .05$. ** $p < .01$ (two-tailed).

also allows us to examine the complex relationship between adoption context, parental investment strategies, and educational outcomes, while still enabling us to compare patterns with those found in the general population.

NSCH data limitations reflect its primary audience, who focus on prevention and treatment of medical conditions. In contrast to NCES data sets, the NSCH does not contain school-level measures, and its sole measure of academic achievement reflects the concerns of clinicians: grade repetition. The

other educational indicators available tap into children's academic engagement and behaviors, constraining our choice of dependent variables. Moreover, only some of our parental investment measures parallel those available in the ECLS-K and used by Hamilton et al. (2007). Finally, among private domestic adoptions, the NSCH does not differentiate between independent (family-to-family) and agency-based adoptions.

Another limitation concerns data accessibility. Because NSCH data are highly sensitive, the CDC limits access to a small number of restricted variables. We were granted access to a relatively small combination of restricted NSCH variables to conduct analyses specifically designed to address our research questions, such as restricted data on adoption context. Details regarding children's place of birth or residence, race of the child's parents, and health indicators (preplacement and postplacement for adoptees) were not made available. These restrictions made controlling for infant (and preplacement) mental and or physical conditions that may have shaped educational outcomes impossible. We use age at adoption as the best available proxy and address possible concerns about selection and robustness in the results section.

Results and Discussion

Descriptive Results

Table 1 shows weighted means for key variables by adoption context. Overall, children in adoptive families, especially foster adoptive families, have worse educational outcomes than those in nonadoptive families. Though all three adoption types show higher parental investment profiles than their nonadoptive counterparts, the differences are most pronounced between international adoptive and nonadoptive families. Notably, while foster adoptive parents on average have lower SES backgrounds than private adoptive parents (Vandivere et al., 2009), they invest more in the two interactional social capital measures included in our analysis. Not surprisingly, likely a reflection of SES differences, international adoptive parents invest by far most into extra-curricular activities and private schools. These initial findings seem to bolster both the compensation and the social stratification argument raised by Hamilton et al. (2007).

How Is Adoption Context Associated With Parental Investment Strategies?

Table 2 reports logistic and linear regression analyses for adoptive context and parental investment patterns. The results illustrate considerable variation

among adoptive families and *between* adoptive versus nonadoptive families. The baseline models suggest that parents of domestically adopted children (i.e., private or foster) differ hardly at all from nonadoptive families in their investment profiles ($p > .05$). This pattern persists in full models, where we effectively compare two-parent biological families and adoptive families by context, even after age at adoption and other family sociodemographic background factors are included as controls.

In contrast, parents of internationally adopted children stand out for investing significantly more interactional, cultural, and economic resources than parents of other family forms, a pattern that largely persists in full models. At face value, this finding appears to challenge a central aspect of Hamilton et al.'s (2007) compensation argument, which purports that all adoptive parents invest more proactively in order to counteract normative conceptions of "real families" defined in biological terms. Indeed, given that families of internationally adopted children tend to belong to the highest SES groups, our findings appear to bolster a modified compensation argument, as well as the social stratification argument. Specifically, our findings suggest that, while the first dimension of their compensation argument is confirmed (parental investment to address known or assumed deficits), the second dimension of their compensation argument can be refined: International adoptive families—which involve immigrants and usually are interracial—may feel the need to demonstrate not just that they are "real families" but "real *American* families."

Four of these six effects regarding international adoptive families remain stable when we control for SES and family structure effects. Perhaps not surprisingly, the coefficients for all three measures directly associated with financial resources (i.e., private school, extracurricular activities in sports, and clubs) decline in size and significance level in the full models. Notably, however, the coefficients for the two of interactional and the social capital investment measures (i.e., parents attend events, meals, and know friends) remain positive and significant and even increase in magnitude after adding controls. We interpret this as indicative of purposive efforts among international adoptive families to create stable family routines or perhaps (over)compensate as suggested above. Overall, these findings indicate that, above and beyond SES-based advantages, families adopting internationally invest into their children's education at a higher level than all other parents. This finding lends support to Hamilton et al.'s (2007) dual compensation argument in a modified form.

The analysis discussed above calls for an important caveat: Potentially, adoptive and nonadoptive parents may differ systematically in relationship quality and length, and social support. Though data limitations prevent us

from including these controls, Frank, Maroulis, Duong, and Kelcey (2013) provide an inferential technique to assess the robustness of our findings in light of potential omitted variables and selection bias: The more the estimated coefficient exceeds the threshold of statistical significance, the more robust the inference with respect to that threshold. For example, in the case of international adoption and “parents attend events” in our baseline model, the threshold at 0.05 is $1.96 \times$ the standard error of the coefficient ($1.96 \times 0.182 = 0.357$). Thus, to invalidate our tentative causal inference, 57% of the estimated coefficient ($[(0.836 - 0.357)/0.836 = 0.57]$) would need to be attributable to omitted variables. Applying this robustness test to our full models suggests that, for example, fully 38% of the estimated relationship between international adoption and parental investment (for “parents attend events”) would have to be attributable to unique characteristics beyond the controls already included in our models (see Table 4 for robustness test results).

How Is Adoption Context Associated With Children’s Educational Outcomes?

Table 3 confirms a persistent negative association between adoption and our four educational outcomes (see Lansford et al., 2001; Vandivere et al., 2009). The baseline model suggests that children adopted via foster care experience the greatest difficulties compared with other adoptive and nonadoptive children (e.g., for repeating a grade, the coefficients are .75 for foster adoption vs. .54 for private adoption). Five of the 12 negative associations between adoption context and educational outcomes persist when we control for differences in family background, but the dynamics shift in important and group-specific ways. In the control models, the coefficients for international adoption increase. This suggests that when children’s adoptive age and family background are held constant, internationally (not foster) adopted children have the lowest odds of completing homework (-0.48) and the highest odds of repeating a grade (1.19), though foster adoptive families are still more likely contacted by school officials than other adoptive families.

How Is Parental Investment Linked to School Outcomes, Independent of Adoption Context?

The full models in Table 3 add parental investment variables. Findings suggest that parental investment is directly associated with improved school outcomes. Thus, in broad strokes, our NSCH-based results mirror parental investment effects documented in other nationally representative survey and

panel data sets. More important, comparing partial and full models in Table 3 further enables us to take Hamilton et al.'s (2007) dual compensation argument to the next level: Given that internationally adoptive parents invest more heavily into their children's education than do other parents, can these fortified investments *mitigate the negative direct association* between international adoption and educational outcomes? Judging by changes in size of the coefficients and test statistics, the answer is a clear yes. Indeed, with higher investments in their children, international adoptive families are able to *suppress* the otherwise even more negative associations between international adoption and school outcomes.

We use "cares about doing well in school" to illustrate how this suppression effect works: Once parental investment is held constant, the coefficient for international adoptees grows and reaches statistical significance ($b = -.74, p < .05$). In other words, when internationally adopted children receive the same parental investment as children from two-parent biological families, they appear worse off (full model Table 3). However, recall, from Table 2 that internationally adopted children tend to receive higher parental investment than other children. When our models do not account for these compensatory strategies (base and control model Table 3), their outcomes seem less negative. Thus, as Hamilton et al. (2007) suggest but could not test directly, adoptive parents' compensatory investments can mitigate educational outcomes. Even though they cannot eliminate disparities between educational outcomes of internationally adopted versus biological children, these strategies allow adoptive parents to reduce their children's otherwise even more negative outcomes. We interpret this as supporting Hamilton et al.'s dual compensation argument, that is, the idea that (internationally) adoptive parents' compensatory investment may be intended to mitigate deficits and/or signal that they are indeed "real (American) families."

Yet, even if motivated by these dual compensatory goals, the effects of parental investments on educational outcomes are still limited, most likely because the risk for adverse academic and behavioral outcomes *is not randomly distributed*. In fact, such risks are linked to adoptees who have "experienced relatively serious environmental adversity before adoption" (Bimmel et al., 2003, p. 74). Typically cited causes include prolonged institutionalization or unstable fostering arrangements, neglect, and trauma prior to adoption. It may also include lack of access to prenatal care, maternal health problems, and malnutrition common in less affluent countries, and thus disproportionately affects internationally adopted children (Dalen & Rygvold, 2006).

What does this series of findings tell us? On one hand, adoptive families do invest more heavily, both because they can (stratification) and because

they want to invest (compensation). Indeed, our findings show that internationally adoptive families invest most heavily in their children's education, even when we take SES differences into account. This points toward the need to modify Hamilton et al.'s dual compensation argument so it captures that compensation strategies are most pronounced in international adoptive families.

On the other hand, Table 3 shows across the board that negative educational outcomes of children from adoptive families are more substantial in the investment models than in the control models—even as, in some cases, the benefits of parental investments make outcomes of children raised in adoptive versus biological families indistinguishable. This consistent pattern may give the false impression that different types of adoptive families are equally able to translate said investments into improved educational outcomes. However, recall from Table 2 that international adoptive parents invest substantially more than other adoptive parents, even controlling for SES. Taken together, this suggests that internationally adoptive parents' investments create *less substantial returns* on educational outcomes than do investments by private domestic adoptive parents. This pattern is reminiscent of Lareau's (2003) work that has shown that the differential benefits of parental investments accrue largely to children in (typically monoracial) White, middle-class families.

Results discussed above suggest that the direct link between adoption of any type and schooling outcomes is so strong and negative that it appears to overshadow our equally evident findings about the potentially mitigating role played by parental investments. Yet recall our hypothesis that parental investment will *buffer* the negative effects of adoption context on schooling outcomes. Such buffer or mitigation effects can take different forms. In ancillary analyses reported below (Table 4), we employ the Sobel test (Preacher & Leonardelli, 2001) to gauge mediation effects and pinpoint the mechanisms through which adoption context generates a specific impact on schooling outcomes. (In contrast, a "moderation" argument would imply that the effects of investments depend on adoption context, i.e., adoption context changes the way investment affects schooling outcomes.)

To assess the breadth and centrality of how investment mitigates educational outcomes, we test the indirect effect of each adoption type on each schooling outcome through each investment variable. We run 72 Sobel tests in all, 24 per adoption type (6 investment variables \times 4 educational outcomes). Results indicate that investment indeed *mediates* the impact of adoption on schooling outcomes, and it can do so quite effectively for some adoptive families. In fact, families who adopt internationally appear to see *broader returns* on their investments than do other adoptive families, at least

in terms of the variety of negative outcomes potentially mitigated. Overall, Sobel tests indicate that investment significantly reduces the negative educational outcomes in 11 of the 24 dimensions for families who adopt internationally. This compares with significant reductions in only three dimensions for foster adoptive families and two for private adoptive families. This confirms a mitigation argument, stressing that adoption context leads to varying levels of investment, which in turn, has potential to reduce negative schooling outcomes to varying degrees.

Taken together, these complex findings regarding the breadth versus centrality of investments illustrate the multidimensional power of Hamilton et al.'s dual compensation argument and the need to differentiate between different types of adoption. Adoptive parents' choices to invest economic, cultural, and interactional resources can mitigate negative effects and improve educational outcomes, but in contextually specific ways and not uniformly for all adoptive families.

Conclusion

Our findings, though straightforward, have complex implications. Investment strategies by families who adopt domestically (foster/private) are quite similar to those used by families with nonadoptive/biological children. Indeed, only parents of internationally adopted children report consistently higher levels of investment into their children, in ways that go beyond SES-related advantages. While this finding supports the basic stratification and dual compensation arguments raised by Hamilton et al. (2007), it also suggests an important modification. Selection dynamics related to social class shape both the use of specific adoption venues as well as subsequent parental investment strategies. The distinct investment patterns we find for international adoptive families indicate that the authors' argument about trying to fit in among "real families" may apply most poignantly to the interracial, intercultural, de facto immigrant families that characterize international adoption.

Regarding the relationship between adoption context, parental investment, and educational outcomes, we find both direct and mitigating patterns. Our findings mirror those of other studies regarding the direct, negative relationship between adoption and educational outcomes, though the magnitude of this effect is also contingent on adoption context. Finally, our findings regarding the direct, positive relationship between parental investment and educational outcomes also mirror those of other studies and nationally representative data sets—but with an important twist. Most important, we show that parental investment *does partially buffer* the negative direct association between

adoption and educational outcomes. But these partial mitigation effects are also highly contingent on adoption context: Whereas private domestic adoptive families seem to be able to buffer most successfully, ancillary analyses suggest that internationally adoptive families may be able to harness the broadest mitigation impact.

To summarize, while our findings confirm those of Hamilton *et al.* (2007) in broad strokes, our study further accentuates how adoption patterns stratified by social class and race affect parental investment strategies as well as the educational outcomes of adoptive (and nonadoptive) children. If anything, our results suggest that the effects of social stratification at large, which shapes the adoption venue parents select, as well as the resources they can allocate post-placement, are even stronger than Hamilton *et al.* (2007) assert. Our findings also suggest that adoptive parents' compensation strategies matter—whether partly motivated by efforts to demonstrate that they are “real families” (Hamilton *et al.*, 2007) or efforts to mitigate real or assumed “serious environmental adversity before adoption” (Bimmel *et al.*, 2003, p. 74)—even as they cannot completely eliminate the effects of societal and personal adversity experienced.

Our analyses also point to the need for future research that examines in greater detail what motivates parents generally, and adoptive parents in particular, to pursue particular investment strategies. This would help address the question of who benefits the most from these compensatory strategies (or, in Lareau's [2003] terms, under which conditions “concerted cultivation” pays off). It also may inform our understanding of how to gauge the impact of investments more accurately—whether by looking at the sheer magnitude of effects or their breadth across multiple investment strategies.

Moreover, given the distinct findings regarding internationally adoptive families, future research might capitalize on access to nationally representative data regarding interracial family dynamics (Cheng & Powell, 2007; Kreider, 2011; Thomas & Tessler, 2007; Vandivere & McKlindon 2010; Zhang & Lee, 2011) and families with same-sex parents (adoptive and otherwise; see Raleigh, 2012; Powell *et al.*, 2010). These efforts, combined with the potential to access newly available restricted data, will advance social science on a timely issue that generates great public interest.

Finally, some of our findings regarding adoption context, especially with regard to differences between domestic foster and private adoption, could also be linked to differences in laws and regulations across states (Children's Bureau, 2013). While such explorations are clearly beyond the scope (and data availability) of our project, future research could examine how differences and changes in state-level domestic adoption regulations (e.g., open/closed adoptions, birth parents' rights, safe haven laws, adoption expenses)

may create unanticipated effects on children's long-term outcomes, education, and otherwise.

Appendix

Effect of Investment on Schooling Outcomes (With Controls).

	Cares About Doing Well in School	Contacted by School	Completes Homework	Repeated a Grade
Parent Investment				
Parent Attends Events	0.170**	-0.055	0.152**	-0.038
Know Friends	0.192**	-0.117**	0.231**	-0.024
Meals	0.093**	-0.068**	0.089**	0.015
Sports	0.180*	-0.305**	0.127**	-0.375**
Clubs	0.139**	0.078	0.013	-0.265**
Private School	0.082	-0.122	0.139**	-0.212*
Age Adopted	-0.323**	0.067**	-0.302**	0.198**
Family Type Controls				
Two-Parent Step	-0.434**	0.653**	-0.395**	0.578**
Mother Only	-0.448	0.618**	-0.411**	0.392**
Other	-0.118	0.581**	-0.334**	0.369**
τ_1	-3.259**	0.780**	-4.431**	
τ_2	-1.600**	1.412**	-2.698**	
τ_3	-0.181	1.853**	-1.263**	
Constant				-2.943**
F	592.68**	200.95**	1070.19**	215.17**
N	62,421	62,421	62,421	62,421
Model	Ordered logit	Ordered logit	Ordered logit	Logit

Note. All analyses employ sampling weights. All "with controls" models include child gender (1 = male), child race (five categories, White = omitted), number of children in family, family structure (two biological parents omitted), poverty level, mother's age, parental education level, income level, age at adoption (0 = nonadopted). Detailed coefficients for full-control models are available on request from the corresponding author. Adapted from the National Survey of Children's Health.

* $p < .05$. ** $p < .01$ (two-tailed).

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Authors' Note

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