

The Malleability of IQ as Judged From Adoption Studies

CHARLES LOCURTO

College of the Holy Cross

Estimates of the malleability of IQ depend largely upon the results of adoption studies. Moderate estimates presently range between 20 to 25 points. It is here argued that the standard adoption study in fact provides little unequivocal evidence of IQ's malleability. Further, the most prominent adoption studies of *contrasted environments*, studies wherein the biological family's socioeconomic status is clearly different from that of the adoptive family, provide malleability estimates that are more modest than has been claimed elsewhere.

I do not profess to have worked up the kinships of the Italians with any special care, but I have seen amply enough of them, to justify me in saying that the individuals whose advancement has been due to nepotism, are curiously undistinguished. The very common combination of an able son and an eminent parent, is not matched, in the case of high Romish ecclesiastics, by an eminent nephew and an eminent uncle. The social helps are the same, but hereditary gifts are wanting in the latter case. (Galton, 1869/1978, p. 42)

Irrespective of Galton's conclusions regarding the social heredity of Catholic Popes, for whom it was once commonplace to "adopt" young boys and raise them as "nephews," adoptions undoubtedly offer unique opportunities for assessing not only the heritability but also the malleability of IQ. In recognition of that fact, estimates of the limits of IQ's malleability, its *reaction range*, rely principally upon adoption studies (e.g., Scarr & Arnett, 1987; Zigler & Seitz, 1982). Adoptions are, of course, not the only evidence cited, but they have become increasingly important as one after another preschool intervention has failed to demonstrate lasting increases in IQ (e.g., Head Start Bureau, 1985; Lazar & Darlington, 1982; see Spitz, 1986, for a review of other evidence).

Even the most prominent demonstrations of apparently large gains in IQ as the result of some limited intervention have been recognized as overstated or flawed, some incurably so. The classic study by Skeels (1966) which suggested gains of 40 to 50 points is one such example (see Longstreth, 1981). Perhaps the paradigmatic example is the miraculous and mysterious Milwaukee Project in which

inner-city children were reported to have IQs equivalent to the average of college graduates at the time of school entry, and to hold a nearly 25-point advantage over control-group children (see Flynn, 1984, for a readjustment of these scores that appreciably reduces their magnitude but not the between-group difference). The long-awaited final report of that project offers a more modest picture: a 10-point advantage for preschool children by ages 12 to 14, 8 points in verbal IQ, and no significant differences between preschool and control-group children in reading or mathematics over the first 4 years of elementary school (Garber, 1988).

Naturally, given that adoptive families are typically well above average socioeconomically and that adopted children live for 8 to 10 years in these families before the curious psychologist comes along, adoptions might be thought of as the best possible place to look for positive changes in IQ. In a sense, they fulfill the promise of preschool interventions by providing a child with long-term exposure to the type of environment that presumably underlies the optimal development of intelligence. It is perhaps inevitable that in offering so unique a source of information adoption studies often appear much as interpretative riddles, differing as they do so widely in design and in the quality and quantity of information they provide (Locurto, 1988). Given these problems, and the fact that no single study contains all the needed information, it might be best to begin by summarizing the data on IQ for the most often-cited adoption studies. That summary is provided in Table 1.

Information about the adopted children's IQs can be seen in the first column to the left. The next column to the right provides the adoptive parents' IQs, information provided by only three studies. The IQs of the biological children of the adoptive parents are given next, and again only three studies reported this information. The last column gives the average IQs of children in families that were matched in one way or another to adoptive families. Four studies provided this comparison.

It is indeed difficult to draw conclusions from an array of data so disparate, but I think two generalizations are possible given the overall averages at the bottom of the Table. The first obvious point is that adopted children have above average IQs. The average of 106 seems quite reliable across studies (see also Plomin & DeFries, 1985, for similar data from an ongoing adoption study, the Colorado Adoption Project). The only clear exception is the study by Freeman, Holzinger, and Mitchell (1928) in which the average IQ was 95. That average was for the entire group of 484 adopted children studied, as well as for 34 of the adopted children who were placed into families where the IQs of biological children of the adoptive parents were known ($n = 36$; average = 112; Freeman et al., 1928, Table 11, p. 136). The Freeman et al. study might be considered unusual in that a subgroup of the adopted children were selected for study because they were suspected of retardation. If we consider only those adopted

TABLE 1
Summary of IQ Data for Major Adoption Studies

Study	Adopted Children's IQ	Adoptive Parents' IQ	Adoptive Parents Own Children's IQ	Comparison Group: Children's IQ
Freeman et al. (1928)	95 (16) ¹	—	112 (14)	—
Burks (1928)	107 (15)	—	—	115 (15)
Leahy (1935)	110 (12)	—	—	110 (15)
Skodak & Skeels (1949)	107 (14)	—	—	—
Scarr & Weinberg (1976)	106 (14)	120 (10)	117 (14)	—
Schiff et al. (1978)	107	—	—	115
Scarr & Weinberg (1978)	106 (9)	115 (11)	—	113 (10)
Horn et al. (1979)	111 (12)	114 (8)	112 (11)	—
Unweighted means	106	116	114	113

¹Numbers in parentheses here and elsewhere are standard deviations.

children among the 34 who had been placed before age 3, the average IQ rises to 100.

The second conclusion derives from studying the averages of the adoptive parents, their own children, and the children in comparison groups. The adoptive parents average 116, their own children, and the children in comparison groups, 113 to 114. These three averages might be taken as a sort of *global measure* of the ambient intellectual levels in adoptive families and in similar families in the community. They are as well about one-half to two-thirds of a standard deviation above the average IQs of the adopted children. In a sense, then, the IQs of adopted children usually fall short of the intellectual levels characteristic of their adoptive environments.

We might speculate that ideally, if IQ were highly malleable, adopted children's IQs might reach the average intellectual levels provided by their adoptive families. There are of course many complications attendant to this interpretation, not the least of which is the danger inherent in summing together so diverse an array of studies. More, the idea of an ambient intellectual level itself might well

be questioned, at least as it can be captured by the IQs of adoptive parents, their children, and comparison families. Should we accept that idea, there nevertheless remain many reasons why adopted children's IQs might fall below this level. These children, as an example, undoubtedly experience a number of adjustment problems in their adoptive families despite the best intentions of those families. Then too, not all studies provided for adoption within the first few weeks of life. In Freeman et al., for example, the one study in which adopted children's IQs were appreciably below 106, the average age of placement was greater than 4 years.

Problems of interpretation owing to adopted children's preadoptive experiences lead to the critical issue in assessing malleability from any adoption study. The adopted children's average IQ of 106 reveals nothing definitive about malleability unless it can be compared to what would be expected *if the children had not been adopted*. That question in turn evokes three others (Munsinger, 1975, provides a lengthy overview of methodological problems attendant to adoption studies). The first is: *Who is put up for adoption?* The answer, of course, demands knowledge of the biological families, information that is unfortunately often lacking. The closest approximation to adequate information might be the IQs of the biological mothers; but again, unfortunately, only two of the studies in Table 1, the Texas Adoption Project (Horn, Loehlin, & Willerman, 1979) and Skodak and Skeels (1949), have provided that information, and their data are fully contradictory: The Texas project reported biological mothers' IQs to be 109 on the Revised Beta, the test most often used in that study, whereas Skodak and Skeels reported IQs that averaged 86 for a subset of 63 of their biological mothers. There is scant other information about the average IQs of mothers who relinquish their children for adoption, but there is one often-cited survey of over 3,000 such mothers in Minnesota conducted during the 1950s. In that study the mothers' IQs averaged 100 (Pearson & Amacher, 1956).

If we take that average as a sort of rule of thumb, it suggests a 6-point gain for adopted children summed across all studies. Unfortunately, a second question makes interpretation of that gain difficult: *Who is adopted?* This question might seem identical to the first, but it may not be in every adoption study. Not all children offered for adoption may be adopted, or at least may not be adopted early in life as are most of the children studied in adoption research. As a corollary, certain types of babies, those with health problems or those suspected of retardation, for example, might be unlikely to be adopted, a fact noted in several adoption studies. Parents may have a say in all of this, especially with respect to adopting high-risk babies. There may also be a probationary period during which both the parents and the agency assess the correctness of the adoption. This was, for example, true in Skodak and Skeels, although it is not present in every adoption study.

There is a second aspect to the question of who is adopted that involves selective placement. Most of the studies in Table 1 have in fact reported positive correlations of one sort or another between biological and adoptive families. The

combined effects of selective placement along with these other factors render the sample of adopted children special, not unlikely above average in IQ as a group. Ideally, we would like to know the children's IQs at the time of adoption to document this possibility. Given the early age of adoptions, that information is of course lacking in most adoption studies. There is, however, evidence from Freeman et al. that selective placement results in the placement of higher-IQ children into "better" families—those typically found in adoption studies. It has already been noted that this study is unusual due to the comparatively low average IQs of the adopted children, and in that the children were not adopted until an average age of nearly 5. For a subgroup of these children their preadoptive IQs were measured. Although these children were placed into families that were generally rated below-average in status as compared to the entire group of adopted children, those who were placed into "better" families ($n = 33$) had IQs at the time of adoption of 95. Children placed into "poorer" families ($n = 41$) had IQs that averaged 88 (Freeman et al., 1928, Table 3, p. 119).

The special nature of the children in adoption studies is further illustrated by the answer to a third question: *Who is studied?*, a question concerning attrition. On average, about 25% of adoptive families decline to participate in adoption studies. If the adopted children in these families tend to be the lower scoring adoptees, then of course the group average of the children studied is increased. There is no definitive information on this point, and the authors of the Texas project point out that perhaps adoptive parents with problem children would be more likely to participate in order to receive an assessment of their children. However, just the opposite pattern is apparent in Skodak and Skeels. The subjects lost between the third and fourth testings, for example, scored five points below those remaining in the study on that third testing.

CONTRASTED ENVIRONMENTS

These factors combine to obscure a straightforward answer to the question of malleability as judged from the average adoption study. Fortunately, however, there is a subset of four studies that enable a more definitive answer to be drawn. They are studies of what might be called *contrasted environments*, studies wherein the biological families are distinctly below average in status as compared to the above-average status of the adoptive families (Locurto, 1988). It is from these studies that the most optimistic estimates of IQ's malleability have arisen.

Skodak and Skeels

This study is perhaps the most famous of all adoption studies. It has been discussed so much over the years that nothing more than a brief summary of its interpretative difficulties is necessary (cf., Jensen, 1973; Kamin, 1974, for contrasting views). Given the biological mothers' average IQ of 86 and their adopted-away children's IQs in adolescence that averaged 107, there seems to be

about a 20-point gain. It has been argued, however, that the IQs of the biological mothers were unreliable given that they were taken while the mothers were pregnant and soon after they had decided to relinquish their babies (e.g., Herrnstein, 1973). Further, the adopted children's nonadopted IQs are often estimated not to be 86, but 94 to 95 by assuming regression toward the mean given the mothers' low average. If so, the estimate of malleability derived from this study would be about 12 points.

There was as well selective placement: For educational level, the correlation between biological mothers and adoptive parents was .27. The authors reported that care was taken not to place children suspected of retardation, and as mentioned earlier, there was a long probationary period before an adoption was made final. There was also significant attrition during the study. It began with 180 children and ended 13 years later with 100. As a final point, one of the authors, Marie Skodak, did most of the testing of the adopted children. In itself, that would usually be of little distinct interest. It is cited here because of the duration of Skodak and Skeels. By the time of the fourth and final testing the first results of the study had already been published, the expectation of large-scale changes in IQ well known. So well known in fact that by the time of that final testing two of the subjects had read about themselves in earlier publications of the project. Not surprisingly, they reportedly "cooperated delightfully" (Skodak & Skeels, 1949, p. 95).

The Transracial Adoption Study

This study, by Scarr and Weinberg (1976), is the most prominent study of black children adopted into upper-middle class white families. As might be expected, the adoptive parents were highly educated, averaging nearly 16 years of schooling, and were above average in occupational status and income. Their average IQ was 120; their biological children's IQs averaged 117. The biological parents were less well educated, averaging 12 years of schooling, and had lower income levels. Unfortunately, their IQs were not available. They were on average 24 years old; the adoptive parents 36 years old. The adopted children were placed at an average age of 1.8 years, although as we will see, that average is misleading—many of the children were adopted prior to 6 months of age. The adopted children were tested at an average age of 7 and obtained an average IQ of 106.

On the surface, these data provide strong evidence of malleability. We might assume that without adoption black children would have IQs of about 90, at least as judged against the average of the black population in the North Central and Northeast regions of the U.S., the origin of most of the adoptees (see Kaufman & Doppelt, 1976; Scarr, 1984). If so, this study seems to show a gain of about 16 points or so for the adopted children, placing them above the average of white children in the Minnesota area, although well below the average of the biological children of the adoptive parents. There are, however, features of this study that render that conclusion more tenuous.

Most importantly, the sample of children studied by Scarr and Weinberg was in fact partly composed to two distinct subsamples: children of two black parents (B/B) and interracial children (W/B). Data for these two groups are given in Table 2 (from Scarr & Weinberg, 1976, Table 10). It can be seen that the two samples differed significantly with respect to their IQs: black children averaged 97 whereas interracial children averaged 109. The two groups also differed with respect to the intellectual levels of their biological and adoptive families. The pattern of the data indicates that the interracial children came from families of higher educational status and were adopted into higher status families. They were also adopted earlier, at an average of 9 months compared to 33 months for the black children. That, in turn, indicates that the interracial children spent more time with their adoptive families prior to testing and were subjected to fewer preadoptive placements.

Given the differences in background and placement between these groups, they require separate analysis with respect to malleability. For the 29 children of two black parents, the average educational levels of their biological fathers is about average to slightly above average for black males in Minnesota; the mothers are approximately 1 year below average. The children's average IQ of 97 is then seven points or so above the expected average for blacks in Minnesota.

For the 69 interracial children, their average IQ of 109 is more difficult to place against an expected average if adoption had not taken place. For all but two of these children the biological mothers were white. The mothers' average educational level of 12.4 years is about average for their appropriate comparison group. The black fathers' average of 12.5 years is one-half year above their comparison group average. The average IQ of whites in the North Central region is approximately 102 (Kaufman & Doppelt, 1976). If we assume the mothers to be average and the fathers above average, perhaps as high as 95, then a rough estimate of their children's IQs without adoption would be about 98 to 99. The adopted children's IQ of 109 is then 10 to 11 points above their expected average in the absence of adoption.

TABLE 2
Black and Interracial Subgroups in the Transracial Adoption Study

Group	IQs		Educational Levels			
	Adopted Children	Adoptive Parents	Adoptive Parents		Biological Parents	
			Mother	Father	Mother	Father
B/B (n=29)	97 (13)	118 (9)	14.9 (2.3)	16.5 (2.7)	10.9 (1.9)	12.1 (1.4)
W/B (n=68)	109 (11)	120 (10)	15.3 (2.0)	17.2 (2.8)	12.4 (1.8)	12.5 (2.2)

Note. B/B refers to children of two black parents; W/B refers to interracial children.

Admittedly, this is guesswork and it illustrates the difficulties encountered when sufficient data are not available. There are, unfortunately, several additional considerations that make the task of estimating malleability even more imprecise. The adopted children in this study, perhaps more than in any other adoption study, may well have experienced difficulties adjusting to their adoptive environments, reasonably more so for the black children than for the interracial children. Also, as in other studies there was attrition: About 25% of contacted families declined to participate. There also must have been appreciable selective placement of one sort of another in this study given that the interracial children were placed so much earlier and into families of higher status. We are told by the authors that the adoptive parents were not given a choice among which babies to adopt beyond the freedom to decide whether to adopt an older or handicapped child (Scarr, 1984, p. 148). But the fitting process came from some source; if not the parents then the agencies themselves must have had some leeway in deciding at least which babies to place first. The result, as the authors state, was that "this study has an unusual sample of children" (Scarr & Weinberg, 1976, p. 736).

There are, as well, additional problems related to our estimates of what the children's IQs would have been without adoption. Those estimates were based upon the educational levels, not the IQs, of the biological parents. Recall, however, that the biological parents were on average 24 years old. One of the typical occupations of the biological mothers was that of a student. As a result, it is possible that their educational levels would increase in subsequent years, thereby raising our estimate of their children's nonadopted IQs.

As a final point, there has been a 10-year follow-up to this study that reveals some disturbing trends for the black and interracial adopted children (Scarr, Weinberg, & Gargiulo, 1987). At the time of the follow-up the adopted children were 14 to 24 years old. Their IQs and educational achievements were described as having undergone a "considerable decline." At the time of this writing more information is not yet available, but even that summary description suggests that caution be observed in drawing strong conclusions about the lasting influence of even high-status adoptive environments on these children without the provision of an appropriate cultural milieu as well.

The French Adoption Study

In this study by Michel Schiff and his colleagues the biological parents were drawn exclusively from the (lower) working class.¹ The mothers were described

¹There have been at least three reports of this project: Schiff, Duyme, Dumaret, Stewart, Tomkiewicz, & Feingold (1978); Schiff, Duyme, Dumaret, & Tomkiewicz (1982); and Schiff & Lewontin (1986), which was in part an expanded version of Schiff et al. (1982). There is also a report by Dumaret (1985) which included a larger number of adopted and nonadopted children than in other reports of this project. Hence, the averages reported from Dumaret may differ slightly from those given in those other reports. Unless otherwise indicated, descriptions and results come from Schiff and Lewontin (1986).

principally as domestic personnel. The fathers were described for the most part as unskilled workers. The children were adopted into families described as highly advantaged: Most families fell into the upper 5% socioeconomically. The adoptive fathers were principally senior executives, their wives classified as junior executives or as having no occupation outside the home. We have, unfortunately, little further information regarding the biological and adoptive parents other than these socioeconomic estimates, and these are based solely upon occupations. Given only these descriptions, the French study is less informative than either Skodak and Skeels or the Transracial study, or for that matter all other adoption studies.

From these descriptions alone it would be virtually impossible to estimate what the IQs of the children would have been without adoption. The French study, however, contains one rather unique bit of information: For 20 of the 32 adopted children, nonadopted siblings were located and tested. These nonadopted sibs provide a heretofore untapped way of estimating what the IQs of the adopted children would have been without adoption (See Freeman et al., 1928, for another sort of sibling comparison). The average IQs of these nonadopted sibs was 95, as compared to 107 for the adopted children, on a group intelligence test. There were also two control groups. One was composed of the upper-middle class schoolmates of the adopted children. Their average IQ was 115, and provides the comparison IQ given in Table 1. The second control group was composed of the schoolmates of the nonadopted siblings, matched to the nonadopted sibs in social class. Their average IQ was 100 (from Dumaret, 1985, Table 2, p. 562).²

The average IQ of the adopted children in this study is then 12 points higher than their estimated IQs without adoption. We should note that with only 20 nonadopted sibs for comparison, the French study has by far the smallest sample size of any study thus far cited. This fact alone might lead one to caution in interpretation. Then too, the adopted sibs' average IQ is also 8 points below that of their upper-middle class schoolmates. Despite these potential caveats, the interpretation afforded this study has often been most favorable, as witnessed in the following summary:

The investigators managed to locate . . . 20 *biological* (italics in original) siblings of the adopted children; these biological siblings had been reared by their own mothers. Thus, the two groups of siblings are genetically equivalent . . . The adopted children had an average IQ of 111—a full 16 points higher than that of their stay-at-home siblings . . . The title of the Jensen article which spurred the renewed interest in IQ heritability was “How much can we boost IQ and scholastic achievement?” The Schiff study gives an unequivocal answer . . . (Kamin, in Eysenck & Kamin, 1981, p. 124).

²In other reports of this study both comparison groups were composed of schoolmates of the nonadopted sibs who were class-matched to the *adopted* sibs. [See Schiff & Lewontin (1986), Table 3-13, p. 72.]

This quote was preceded by a subheading entitled: "A big boost for IQ." Other accounts of this study were equally enthusiastic. Schiff, for example, repeated the title of Jensen's infamous article in one report and followed it with the phrasing, "A direct answer from a French adoption study." A later book devoted to the study was entitled: *Education and class: The Irrelevance of IQ genetic studies*. (Schiff & Lewontin, 1986). The Forward to the book happily declares that the authors "steadfastly and indeed belligerently declare their ideological bias to environmentalism" (p. v). It goes on to assert that this study has restored "our confidence that passion can ascend through meticulous science to genuine theoretical advance" (p. vi).

There is, clearly, something special about this study, and sufficient time should be taken to explore its intricacies if only to illustrate the interpretative difficulties inherent in even well-crafted studies of this sort. We might begin with the average IQ of 111 and the 16-point advantage that Kamin referred to, which is different from the average of 107 and the 12-point difference described here. The varying descriptions are the result of focusing on different tests. As noted above, the 12-point difference and the average IQ of 107 for the adopted children comes from a group-administered test, the only test common to all four groups in this study. Kamin chose the results of an individual IQ test given to the adopted children and their sibs but not to the control groups.

There are in fact several test results that one might use. Both the group test and the individual test provided total score IQs as well as separate verbal and performance IQs. Table 3 gives these total IQs as well as the separate verbal and performance IQs for all four groups on the group test (from Dumaret, 1985, Table 2, p. 562). The adopted children were significantly above their nonadopted siblings in terms of total IQ and verbal IQ, but significantly below their class-matched schoolmates (Control₁) on each measure.

Interestingly, the two sib groups did not differ significantly in performance IQ. Performance IQ may be particularly relevant here in that one-fourth of the nonadopted siblings were described as living in rural districts that have a bilingual tradition (Alsatian and French), whereas the adopted children were raised in families that spoke French exclusively (see Brand, 1987). Moreover, 39% of

TABLE 3
French Adoption Study: Summary of Results for Group Test

Group	Verbal	Performance	Total
Adopted children	104	107	107
Nonadopted half-sibs	91	101	95
Control ₁ (class-matched schoolmates of adopted children)	111	115	115
Control ₂ (class-matched schoolmates of nonadopted half-sibs)	95	103	100

the nonadopted sibs had mothers who were Alsatian (Dumaret, 1985, p. 568).

Then there is the matter of the italicized word "biological" in Kamin's quote. Presumably, the emphasis is added to insure that the unique properties of the sib comparison, this "genetic equivalence," are not missed. There is, however, a piece of information missing. The "stay-at-home" sibs as they are called were not full siblings—as might reasonably be inferred from the italics—but were almost exclusively half-siblings. They and the adopted children had a common mother but not a common father.

Last, there is the matter of the description that the stay-at-home half-sibs "had been reared by their own mothers." This statement is at the least misleading, and in some cases simply incorrect. Many of the nonadopted half-sibs experienced several forms of parenting. Some were not raised primarily by their biological mother. Others were never raised by their mother. The actual parenting of the 20 nonadopted half-sibs is summarized in Table 4 (from Schiff & Lewontin, 1986, Table 3.7, pp. 58–59). The alphanumeric characters on the left are identification numbers. Under the column labeled "Parenting" the different parenting conditions of the half-sibs are given. Each successive parenting is described in parentheses. Thus, subject 2B was first reared by nurses, then by the mother, aunt, and

TABLE 4
Parenting of the 20 Nonadopted Half-Sibs

Subject #	Parenting	Status
1B2	(2 parents)	R
2B	(nurses) (mother + aunt + uncle)	N
3B	(grandmother) (mother + second husband)	N-L
4B4	(2 parents) (father + uncle + grandmother)	L
5B3	(2 parents) (mother + second husband)	L
6B	("mainly maternal grandparents")	N-L
7B	(nurse paid by mother)	N
8B	("alternately:" mother + stepfather, grandparents)	N-L
9B1	(nurse) (mother + stepfather)	N-L
10B1	(grandparents) (mother)	N
11B3	(nurses) (mother) (institutional home)	A
12B	(2 parents) (mother + grandmother) (mother + second husband)	L
13B	(widowed mother) (grandparents) (mother + second husband)	L
14B2	(stable nurse)	N
15B2	(2 parents) (father)	L
16B	(widowed mother) (mother + companion)	L
17B2	(2 parents)	L
18B	(2 parents)	L
19B1	(2 parents)	L
20B	(grandparents)	N

Note. "R" indicates a child born before marriage; "N" indicates a biological child of a single mother; "L" is a legitimate child born during marriage; "A" indicates an adulterine child.

uncle. Subject 11B3 was raised first by nurses, then the mother, then placed in an institutional home. Subject number 20 was raised entirely by grandparents. The letters to the right indicate the legal status of the child: R indicates "born before marriage, recognized at the time of marriage;" N refers to a biological child of a single mother; L designates a legitimate child born during a marriage. The letter A refers to an "adulterine child."

It seems obvious that these nonadopted half-sibs experienced what might reasonably be called disrupted childhoods. In one report of this project they were described as having "little family stability." In comparison, the adopted half-sibs were characterized as benefitting from a "more stable emotional climate" (Dumaret, 1985, p. 559). Over half of the nonadopted sibs were described as illegitimate children born out of wedlock. Only four were raised by "2 parents," meaning the biological mother and a stepfather. Four were never raised by their mother. Curiously, five children were raised wholly or in part by nurses. We are told that in French the term "nourrice" or nurse "refers to a woman who has the general care of a child" and "is a veritable institution in France, especially among the working class" (Schiff & Lewontin, 1986, Footnote *a*, p. 87). Perhaps so, but it does not translate into being "reared by their own mothers." In one report of this study it was acknowledged in fact that the entire group of non-adopted half-sibs experienced a total of 29 different parenting combinations (Dumaret, 1985).³

The point here is that the half-sibs are to be used to estimate the IQs of the adopted-away children if adoption had not taken place. The 12-point difference between the two half-sib groups is attributed by some to the "boost" of the adoptive environment. One might be led to wonder, however, whether the disruptiveness of the nonadopted half-sibs family lives resulted in the lowering of their IQs, thereby contributing to the IQ difference between the two half-sib groups. Births out of wedlock and successive parentings by different adults are just the sorts of factors that an environmentalist would point to in interpreting the nonadopted half-sibs average IQ of 95. That average fell 5 points below the average of their social class-matched schoolmates (Control₂, Table 3). In fact, the nonadopted half-sibs fell below their class-matched schoolmates on each IQ measure.

Of course, these concerns do not compromise an environmental interpretation of the difference between the two sib groups. Another concern, however, does. The mothers of the nonadopted half-sibs had placed for adoption at least one other sibling. Were the nonadopted half-sibs perhaps not sufficiently fit to be adopted? Three of those children (6B, 10B1, and 12B) had tested IQs below 80. We cannot of course answer these questions without more information than is

³This figure refers to all nonadopted half-sibs, not just those closest in age to the adopted sibs who constituted the comparison group of 20 in the first reports of this project (i.e., Schiff et al., 1978; Schiff et al., 1982).

provided by this study, but the possibility presents itself that the adopted children were simply the more advantaged offspring among children growing up in lower and working-class environments. As Schiff and Lewontin (1986) point out, within each social class there is considerable variability in IQ such that about 10% to 15% of lower-class children score above the average of upper class children. Given that the adoptive families were far above average, we might rephrase the second question related to adoption studies to read: Who is adopted by upper class families? The answer, in many instances, is that the fittest babies are selectively adopted by these advantaged families. More to the point, if the more fit within the pairs of half-sibs did in fact come to constitute the group of adopted sibs, we might expect the two resultant sib groups to differ by on average about 14 to 15 points, given simply the average IQ difference between half-sibs reared *together* (from Plomin & DeFries, 1980).

The selective character of the adopted half-sib group is likely enhanced by a related concern. The French study began with 1136 adoption files from six adoption agencies. That number was reduced to 32 to get cases in which the biological parents were both unskilled, the adoptive families were high in socioeconomic status, and the children were adopted prior to 6 months of age.

The French Cross-Fostering Study

This most recent adoption study involving contrasted environments, by Capron and Duyme (1989), employed a unique four-group design in which the biological families of the adopted children were either low or high in socioeconomic status (SES), and the adoptive families were also either of low or high SES. The separation between the two SES levels was quite pronounced for both biological and adoptive families: Low status families ranked at the very lowest levels in education (average years of schooling for all low status families = 6.6)⁴ and on an occupational status measure, with occupational descriptions of "worker" or "diverse unskilled." In marked contrast, upper-class families ranked very high in education (average years of schooling = 16.1 for all high status families) and in occupational status, with occupational descriptions such as "physician" or "senior executive" (Capron & Duyme, 1989, Table 1).

The results with respect to IQ are given in Table 5 (p. 288). The top row provides the results for children whose biological families were rated low in SES and who were adopted into families either low or high in SES. These data represent in a sense a replication of the French adoption study if we assume that the average IQ of children born and reared in the same low socioeconomic class (average = 92) is a reasonable estimate of what these children's IQs would have

⁴One of the data points for educational levels contains an error. The average years of schooling for low-status biological parents whose offspring were adopted into low-status adoptive families is reported as 6.7 with a standard deviation of 1.1, but a range of only 5–5.9 (Capron & Duyme, 1989, Table 1).

TABLE 5
Adopted Children's IQs in the French Cross-Fostering Study

		SES of Adoptive Families	
		Low	High
SES of Biological Families	low	92	104
		(15)	(13)
	high	<i>n</i> =10	<i>n</i> =10
		108	120
		(12)	(12)
		<i>n</i> =8	<i>n</i> =10

been without adoption. If so, this comparison reveals a 12-point enhancement due to the adoptive environment (92 to 104), setting aside for the moment possible interpretative difficulties. The bottom row provides the results for adopted children born into biological families rated high in SES. If we assume that the average for children born in and adopted into that same high socioeconomic class is an estimate of their nonadopted IQs (average = 120), then this comparison reveals a symmetrical 12-point decrement in IQ (120 to 108). This latter comparison, it should be noted, is unprecedented given the inclusion of children from high SES families who were reared in low SES families (only 1 in 600 adoption files fit this category).

Some caution is in order in interpreting these data insofar as the small sample sizes yield quite low power estimates. For example, while the comparison between children born into low SES families and reared in either low or high SES adoptive families was significant ($t(18) = 1.773, p < .05$, one-tailed test; from Capron & Duyme, 1989, Table 2), it accounted for only 9% of the variance in IQ scores. However, the interpretative problems inherent in other studies of contrasted environments which may serve to mitigate clear-cut conclusions do not appear to be present in this study. For example, vital factors that might affect interpretation such as birthweight, age of adoption, number of years in the adoptive families (average = 14 years), and the prevalence of perinatal or neonatal disorders, were equated across all four groups. Also, as all subjects who were identified from adoption agency files were subsequently tested, there was no affect of attrition.

Moreover, the data regarding the status of the biological and adoptive parents suggest that the 12-point estimate of malleability was not compromised significantly by selective placement. In this instance, selective placement might mean that among children born to low SES families, the more fit of those children comprised the group that was adopted by high SES families. But that was not the case, at least to the extent that fitness is assessed by measures of parental educational level and occupational status. Children from low SES biological

families (top row in Table 5) did not differ in status whether they were placed in adoptive families low or high in SES. Similarly, children from high SES biological families did not differ in status whether they were placed in adoptive families low or high in SES.

Given the remarkable absence of selective placement, and considering the other well-designed aspects of this study, these data demonstrate more clearly than have other studies the malleability of IQ both in terms of enhancement and decrement. Interestingly, by assessing these data in a different way they also demonstrate the limits of IQ's malleability. The limits are revealed by holding constant the status of the adoptive families and considering only the effects of the biological families' status (that is, reading down the columns of Table 5). For example, consider the data for low-SES adoptive families. Children both born into and adopted by families rated low in SES averaged 92. However, children reared in low SES families who were born into high SES families averaged not 92 but 108. That difference suggests a certain stasis to IQ, a resistance to decrement despite long-term exposure to a low SES environment. A similar conclusion can be formed by considering the group of children born into and adopted by families rated high in SES. Their average of 120 was 16 points higher than children reared in environments of the same high status but born to low SES families.

Viewed from this perspective, it might be argued that while malleability is quite evident in these data they also reveal instances wherein low and high SES profoundly failed to affect IQ. Admittedly, interpretation of the 16-point difference that leads to this conclusion is open-ended. The invocation of genetic influences may be objected to, but the reliance on preadoptive environmental influences would seem to be hindered by the close matching of all four groups on many of the factors that might be expected to distinguish the two types of biological families. Naturally, it might further be argued that other SES-related differences in the preadoptive environments produced effects that could not later be overridden entirely by the adoptive environments. Aside from the *ad hoc* nature of that argument, it also appears that previous work has not identified background factors that, at least within their normal range of variation, so dramatically affect IQ (e.g., Bouchard & Segal, 1985; Broman, Nichols, & Kennedy, 1975; see McGue, 1989, for a similar point and for a discussion of the failure to observe interaction in these data).

ADOPTIONS AND THE LIMITS OF MALLEABILITY

It is worth a pause here to look back on the promise of adoption studies and assess how that promise has to date been fulfilled. We began with the observation that while adopted children have above-average IQs, by itself that fact is of little meaning unless the nonadopted IQs of these children can be fairly judged. That judgment turned out to be very much a matter of guesswork, and left few clear

conclusions with respect to malleability. If the children's IQs without adoption are unknown we might gain another vantage point on malleability by looking at the overall intellectual levels provided by their adoptive environments. If IQ is highly malleable, the adopted children's IQs might be expected to reach those levels, that is, to match the IQs of adoptive parents, their own children, or of comparison families. On average they do not.

It seems that the standard adoption study provides little certain evidence about the malleability of IQ. There is, however, something far more positive to be concluded from the four studies of contrasted environments. Despite their many differences, and setting aside interpretative caveats, there is a striking commonality about them regarding children from low SES families who are reared in high SES families: The estimated IQs of the children without adoption in each study were about 10 to 12 points below their measured IQs in their adoptive environments.⁵ The French cross-fostering study replicates and enlarges this conclusion by providing evidence that for children born into high-SES families and reared in families low in SES decrements in IQ occur in the same magnitude. Unfortunately, that 10 to 12-point gain or loss is far less than the predictions made during the early 1960s by Hunt (1961) and Bloom (1964) who spoke of changes on the order of 50 to 70 points. It is more cautious still than recent estimates which have been described as occupying a more middle ground but which nonetheless average 20 to 25 points (e.g., Zigler & Seitz, 1982).

The single most reliable evidence of malleability comes undoubtedly from the French cross-fostering study. Recall, however, that for children who experienced a change in SES between their biological and adoptive environments, their average IQs were 16 points different from the intellectual levels characteristic of their adoptive environments. That same pattern is also evident in both the trans-racial and the French adoption studies, and it is this pattern that leads to what is arguably a rather certain conclusion to be drawn from these studies. Simply put, *there appear to be limits in the extent to which even the most substantial environmental changes can affect IQ*. The clarity of this conclusion depends precisely on the failure to find evidence of higher malleability where it should most easily be seen—in studies of contrasted environments. This is not to imply that malleability is insignificant in these studies, only that it seems relatively modest where it might in theory be far more impressive given the potential for change provided by the adoptive environments.

⁵The nonadopted average was estimated differently for each study: In Skodak and Skeels, by assuming regression toward the mean from the biological mothers' average IQ of 86; in Scarr and Weinberg, by averaging together the estimated nonadopted IQs for the black ($n = 29$; estimated nonadopted IQ = 90) and interracial ($n = 68$; estimated nonadopted IQ = 99) children; in Schiff et al. (1978), from the nonadopted half-sibs; in Capron and Duyme (1989) from the two groups of adopted children who were born and reared within the same socioeconomic class.

REFERENCES

- Bloom, B.S. (1964). *Stability and change in human characteristics*. New York: Wiley.
- Bouchard, T.J., & Segal, N.L. (1985). Environment and IQ. In B.B. Wolman (Ed.), *Handbook of intelligence: Theories, measurements, and applications*. New York: Wiley.
- Brand, C. (1987). A touch of (social) class. *Nature*, 325, 767-768.
- Broman, S.H., Nichols, P.L., & Kennedy, W.A. (1975). *Preschool IQ: Prenatal and early developmental correlates*. Hillsdale, NJ: Erlbaum.
- Burks, B.S. (1928). The relative influence of nature and nurture upon mental development: A comparative study of foster parent-foster child resemblance and true parent-true child resemblance. *Twenty-Seventh Yearbook of the National Society for the Study of Education*, 27, 219-316.
- Capron, C., & Duyme, M. (1989). Assessment of effects of socio-economic status on IQ in a full cross-fostering study. *Nature*, 340, 552-554.
- Dumaret, A. (1985). IQ, scholastic performance and behavior of sibs raised in contrasting environments. *Journal of Child Psychology and Psychiatry*, 26, 553-580.
- Eysenck, H.J., & Kamin, L.J. (1981). *Intelligence: The battle for the mind*. London: Pan Books.
- Flynn, J.R. (1984). The mean IQ of Americans: Massive gains from 1932 to 1978. *Psychological Bulletin*, 95, 29-51.
- Freeman, F.N., Holzinger, K.H., & Mitchell, B.C. (1928). The influence of environment on the intelligence, school achievement, and conduct of foster children. *Twenty-Seventh Yearbook of the National Society for the Study of Education*, 27, 103-217.
- Galton, F.H. (1978). *Hereditary genius*. New York: St. Martin's. (Originally published in 1869)
- Garber, H.L. (1988). *The Milwaukee Project*. Washington, DC: American Association on Mental Retardation.
- Head Start Bureau. (1985). *Final report. The impact of Head Start on children, families, and communities: Head Start Synthesis Project* (DHHS Publication No. OHDS 85-31193). Washington, DC: U.S. Government Printing Office.
- Herrnstein, R.J. (1973). *IQ in the meritocracy*. Boston: Atlantic Monthly Press.
- Horn, J.M., Loehlin, J.C., & Willerman, L. (1979). Intellectual resemblance among adoptive and biological relatives: The Texas Adoption Project. *Behavior Genetics*, 9, 177-207.
- Hunt, J. McV. (1961). *Intelligence and experience*. New York: Ronald Press.
- Jensen, A.R. (1973). Let's understand Skodak & Skeels finally. *Educational Psychologist*, 10, 30-35.
- Kamin, L.J. (1974). *The science and politics of IQ*. Potomac, MD: Erlbaum.
- Kaufman, A.S., & Doppelt, J.E. (1976). Analysis of WISC-R standardization data in terms of stratification variables. *Child Development*, 47, 165-171.
- Lazar, I., & Darlington, R. (1982). Lasting effects of early education: A report from the Consortium for Longitudinal Studies. *Monographs of the Society for Research in Child Development*, 47(2-3, Serial No. 195).
- Leahy, A.M. (1935). Nature-nurture and intelligence. *Genetic Psychology Monographs*, 17, 236-308.
- Locurto, C.M. (1988). On the malleability of IQ. *The Psychologist*, 11, 431-435.
- Longstreth, L.E. (1981). Revisiting Skeels' final study: A critique. *Developmental Psychology*, 17, 620-625.
- McGue, M. (1989). Nature-nurture and intelligence. *Nature*, 340, 507.
- Munsinger, H. (1975). The adopted child's IQ: A critical review. *Psychological Bulletin*, 82, 623-659.
- Pearson, J.S., & Amacher, P.L. (1956). Intelligence test results and observations of personality among 3,594 unwed mothers in Minnesota. *Journal of Clinical Psychology*, 12, 16-21.
- Plomin, R., & DeFries, J.C. (1980). Genetics and intelligence: Recent data. *Intelligence*, 4, 15-24.

- Plomin, R., & DeFries, J.C. (1985). A parent-offspring adoption study of cognitive abilities in early childhood. *Intelligence*, 9, 341-356.
- Scarr, S. (1984). A reply to some of Professor Jensen's commentary. In S. Scarr (Ed.), *Race, social class and individual differences in IQ*. Hillsdale, NJ: Erlbaum.
- Scarr, S., & Arnett, J. (1987). Malleability: Lessons from intervention and family studies. In J.J. Gallagher & C. T. Ramey (Eds.), *The malleability of children*. Baltimore: Brookes.
- Scarr, S., & Weinberg, R.A. (1976). IQ test performance of black children adopted by white families. *American Psychologist*, 31, 726-739.
- Scarr, S., & Weinberg, R.A. (1978). The influence of "family background" on intellectual attainment. *American Sociological Review*, 43, 764-692.
- Scarr, S., Weinberg, R.A., & Gargiulo, J. (1987, June). *Transracial adoption: A ten-year follow-up*. Paper presented at the meeting of the Behavior Genetics Association, Minneapolis, MN. (Abstract).
- Schiff, M., Duyme, M., Dumaret, A., Stewart, J., Tomkiewicz, S., & Feingold, J. (1978). Intellectual status of working-class children adopted early in upper-middle class families. *Science*, 200, 1503-1504.
- Schiff, M., Duyme, M., Dumaret, A., & Tomkiewicz, S. (1982). How much could we boost scholastic achievement and IQ scores? A direct answer from a French adoption study. *Cognition*, 12, 165-196.
- Schiff, M., & Lewontin, R. (1986). *Education and class: The irrelevance of IQ genetic studies*. Oxford: Clarendon Press.
- Skeels, H.M. (1966). Adult status of children with contrasting early life experiences. *Monographs of the Society for Research in Child Development*, 31(3, Serial No. 105).
- Skodak, M., & Skeels, H.M. (1949). A final follow-up study of one hundred adopted children. *Journal of Genetic Psychology*, 75, 85-125.
- Spitz, H.H. (1986). *The raising of intelligence: A selected history of attempts to raise retarded intelligence*. Hillsdale, NJ: Erlbaum.
- Zigler, E., & Seitz, V. (1982). Social policy and intelligence. In R. J. Sternberg (Ed.), *Handbook of human intelligence*. New York: Cambridge University Press.