

Science, Education, and Equality, in the United States

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Introduction

What are the effects of school experiences on children? Is it possible for schools as instruments of a society to correct past injustices, done for example, to the poor or to members of a minority race? These are the questions that have guided a great deal of research during the last ten years in the United States. It is the purpose of this paper to review a portion of the evidence and some reactions to it before making general comments about these issues as researchable questions.

The idea of achieving equality between groups of people, particularly black and white, rich and poor, has been a modern day goal for policy in the United States since the 1954 Supreme Court decision *Brown vs. Board of Education, Topeka, Kansas*.

The modern drive on the part of Black Americans for educational equality probably began soon after the Second World War but it surfaced for most Americans in 1954 when the Supreme Court said that equality of opportunity required that Black and White children attend the same schools; that separate but 'equal' educational facilities were inherently unequal. Thereafter came the turmoil of the federal government and southern state governments in direct conflict over the desegregation of school facilities. (Remember Little Rock?).

In 1960 John F. Kennedy assumed the Presidency with overwhelming support from Black Americans. It was hoped that he would implement the promise of equality with legislation. It was during the 1960's under Kennedy and then Lyndon B. Johnson that the promise was turned into action to aid the unequal to become equal. Programs were directed particularly to helping the poor and members of racial minorities. The theories that guided these efforts saw inequality as a direct function of educational opportunity. It was assumed that doing

well in school meant doing well in society. As night follows day so was success believed to follow from doing good school work.

In the United States education is usually synonymous with school. Little distinction is made between the things children learn and what they must be taught. Great faith is placed in the power of teachers and schools to change children. The United States is a land of people who believe in shaping things and events to suit themselves. Technological success has reinforced this belief. It is a 'can do' country. Consider the following quotation from the Supreme Court of the United States in the 1954 case that began the modern effort to achieve educational (school) equality.

'Today education is perhaps the most important function of state and local governments . . . it is the very foundation of good citizenship. Today it is a principal instrument in awakening the child to cultural values, in preparing him for later professional training, and in helping him to adjust normally to his environment. In these days it is doubtful that any child may reasonably be expected to succeed in life if he is denied the opportunity of an education. Such an opportunity . . . is a right which must be made available to all on equal terms'. (Brown et al. vs Board of Education Topeka, 1954).

Here can be seen the faith in school success; the belief in the power of education to make good citizens and the belief that the lack of equal educational opportunity leads to a diminished chance in life. Viewed from the perspective of 1974 it is a hopelessly oversimplified view but in 1954 it not only seemed right, it seemed possible. It was the promise of the 1954 view that led to the programs of the 1960's.

The social legislation of the 1960's, Head Start, The Elementary and Secondary Act, and many educational innovation projects shared a point of view about the causes of social inequality. It was believed that the root of the problem lay in the early

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life of the child. Poor, and especially poor Black children were the victims of an inferior home and school environment. This inferior environment had its most devastating effects during the earliest years of the child's growth and led to early school failure which eventually led to early school leaving. Leaving school before graduation was considered a guarantee of failure in society.

The plan of the legislation was to improve pre- and early elementary education, especially where there were many poor Black children. It was believed that effective remedial programs would reduce the inequalities between social class and racial groups and lead to a society where the opportunity to 'make it' was equal for all citizens. It was and it still is an important goal, but as we now know, it isn't easy to attain.

The Measurement of the Effects of Compensatory Education

In the period from 1964 to the present there has been a great deal of research on the effects of compensatory education programs. By compensatory education is meant school programs designed to overcome the effects of poverty and racial segregation.

Among the studies the *Equality of Educational Opportunity* survey (Coleman, 1966) stands out for its comprehensive nature. Also, the evaluation of Head Start pre-school programs by Cicirelli et al (Cicirelli, 1969) is significant. In the same year Arthur Jensen published in the *Harvard Educational Review*, a paper (Jensen, 1969) that cited data from the existing literature on Compensatory programs and went on to propose a genetic hypothesis to account for inequality. And finally in 1972 Christopher Jencks et al. (Jencks, 1972) published their comprehensive reevaluation of the questions raised and data presented in these and many other studies. To adequately describe the current state of our understanding and confusion concerning education and equality as Jencks presents them in 1972 it is a good idea to begin with a short review of the results prior to 1972.

In the 1964 Civil Rights Act, Congress authorized a study to determine the effects of desegregation on the achievement of black and white children. The report *Equality of Educational Opportunity* (EEOS) was published in 1966. (Many know the report by the name of its senior author, James Coleman, hence the 'Coleman Report'). A representative sample of over 6,000,000 children from all regions

of the United States in grades 3, 6, 9, 12 were surveyed. Coleman summarized the results of this voluminous (over 700 pages) study.

'In 1954 the Supreme Court held that separate schools for Negro and White children are inherently unequal. This survey finds that, when measured by that yardstick, American public education remains largely unequal in most regions of the country, including all those where Negroes form any significant proportion of the population'. (Coleman, 1966).

Of the achievement tests used in the study Coleman says they ... 'measure ... the skills which are among the most important in our society for getting a good job and moving up to a better one, and for full participation in an increasingly technical world'. (Coleman, 1966).

On these tests minority children were found to score generally lower than white children and 'the deficiency in achievement is progressively greater for the minority pupils at progressively higher grade levels'. (Coleman, 1966).

'Schools bring little influence to bear on a child's achievement that is independent of his background and general social context; and that this very lack of an independent effect means that the inequalities imposed on children by their home, neighborhood, and peer environment are carried along to become the inequalities with which they confront adult life at the end of school. For equality of educational opportunity through the schools must imply a strong effect of schools that is independent of the child's immediate social environment, and that strong independent effect is not present in American schools'. (Coleman, 1966).

Head Start was a federally funded pre-school program that became perhaps the most famous symbol of the compensatory education movement. It was symbolic because it was focused directly on the major presumed cause of inequality i.e., the early experience of the young child. It was widely believed that the experience of the young child growing up in poverty and of being discriminated against had devastating effects on his ability to learn when at age six he started school. With urging from many social scientists the Congress established a program designed to give pre-school children from backgrounds of poverty an opportunity to catch up *before* they started regular schooling. They were to have a 'Head Start' so that they would begin school on an equal footing with their more advantaged peers.

The results of the program were evaluated using the standardized tests given to some of the children at the end of pre-school and then after they had completed a year or more of regular elementary school. It was hoped that these children would show test score gains as a function of pre-school, and in many cases they did. It was further hoped that these gains – which were sufficient to equalize them with peers at the beginning of the first grade of school – would persist. This they did not do. It was found that Head Start programs did not produce measurable effects that persisted into early elementary years of schooling. Once again these children were behind.

Then in 1969 Arthur Jensen published his now famous article in the Harvard Educational Review, 'How Much Can We Boost I.Q. and Scholastic Achievement' (Jensen, 1969). In it he surveyed the evaluations from several experimental compensatory education programs. Then he reviewed the evidence concerning genetic influences on I.Q. His view: that I.Q. is primarily influenced by heredity. Finally he cited research on the average difference of 15 points between the I.Q.'s of Black and White Americans. His conclusion was that if the evidence is 'taken all together (it is) a not unreasonable hypothesis that genetic factors are strongly implicated in the average Negro-White intelligence differences.'

The earlier studies of compensatory programs had provoked criticism but the Jensen paper set off an explosive reaction. His recounting of what happened to him during the years after the publication of his H.E.R. paper (see Jensen, 1973) gives a good idea of the feeling that was generated by the frustrating results of the intervention studies and the implications that were adduced from them by Jensen and some others.

Jensen had committed heresy against the prevailing faith. American social scientists supported compensatory education as the road to equal opportunity during the 1960's based upon the almost universal belief in man's malleability. It was believed that children who were poor and Black, who lived in substandard dwellings, who had too little to eat and who attended inferior schools did poorly for these reasons; not because of anything unchangeable in themselves. It was an article of faith among most academic social scientists that poor school performance which lead to unequal opportunity could be changed by changing the environment of poverty and racial injustice. Inequality was an environmental product not a genetic one.

Until Jensen, the negative research results could be explained as the result of, 'too little too late', or because 'you can't change 200 years of history over-

night'. Until the Jensen hypothesis those were plausible replies within the orthodox environmentalist faith. But Jensen challenged the faith, and that changed disappointment to frustration and disagreement to hate. Heretics against our current dogmas are no more welcome in the 20th century than were the heretics of earlier times.

Inequality

This brings us to the most recent and the most comprehensive of the studies of equality and education.

Inequality (Jencks, et al., 1972)* is a book by Christopher Jencks and a group of co-authors working at the Center for Educational Policy Research at Harvard University. They undertook to reanalyze the effects of the reform programs of the 60's including data that had already been separately published, for example, the Equality of Educational Opportunity survey (EEOS), Project Talent, the U.S. Census and others. Some of the results are necessarily repetitions of those from the earlier studies.

What is new is the comprehensive presentation of all of these data in one book and the conclusions that are offered by Jencks.

The presentation is complex as one would suppose from the nature of the subject but the general technique for defining inequality is not difficult to conceptualize. Inequality is the 'coefficient of variation', i.e., the standard deviation divided by the mean. In other words, measured variance equals inequality. Using this coefficient it is possible to compare the variation between two or more groups in some measured outcome. Smaller coefficients meaning more equality and vice versa.

The complexity of the book makes it impossible to give anything like an adequate summary of the findings. The subjects covered are *Inequality: in 'the Schools'*, in *'Cognitive Skills'*, in *'Educational Attainment'*, in *'Occupational Status'*, in *'Income'*, and in *'Job Satisfaction'*. Here the focus will be on a selected set of results that primarily concern schools and children.

On School expenditures and their effects

Jencks reports that 'educational opportunities are far from equal' in the U.S. (Jencks p. 37). If one

* References to *Inequality* hereafter listed with page number.

looks, for example, at the amount of money spent in different states of the United States and within states between local school districts discrepancies are found. Expenditures vary from an average yearly per pupil rate of \$ 1,237 in New York State to \$ 438 in Alabama. Children of the rich tend to go to schools where more is spent for education and also, children of the wealthy stay in school longer. So that in any one year and certainly over a lifetime the wealthy have more spent on them.

To report on the differences in the amount spent on the schooling of blacks and whites it was necessary to extrapolate from data about states and district differences where the concentration of blacks and whites varied. The result: 'Our best guess is that America spends about 15-20 percent more per year on the average white child than on the average black child'. (Jencks, p. 28).

When the relationship between school expenditures and performance was examined it was found that increasing expenditures in poorer districts would not raise students' performance on standardized tests. 'When we compared an impoverished high school to one that spent twice as much, students in the rich school gained no more between 9 and 12th grades than students in the poor school'. (Jencks, p. 94). There were also no policies or resources that could be found that produced consistent gains in student achievement. In summary then, School monies are not equally distributed throughout the United States because schools are funded from the property tax in each local community. Since most black children come from poorer districts Jencks et.al. 'guess' that less is spent on their education than on that of white children. However, when achievement test results are examined it is found that school expenditures are not related to test scores.

On Cognitive Skills and Jensenism

It is Jencks's view that 'most schools claim to develop [cognitive] skills' and that, 'many people feel that schools have 'failed' because they do not teach these skills equally to everyone.' This makes it important to examine cognitive inequality as measured by standardized tests.

It is at this point that the hypothesis of Arthur Jensen is examined. It had been Jensen's contention that approximately 80% of the variance between I.Q. scores was likely due to genetic influences. Jencks finds however that: 'virtually no American study supports the claim that genes account for

80 percent of the variance in test scores. Our guess, based upon all the disparate sources of evidence . . . is that heritability of Stanford-Binet scores in the United States is around 45 percent. This estimate could be off by 10 percent either way, and it might be off by as much as 20 percent either way.' (Jencks, p. 71). 'Our main conclusion after some years of work on this problem is that mathematical estimates of heritability tell us almost nothing about anything important.' (Jencks, p. 76).

'There has been a recurrent debate about whether differences in average test performance should be attributed to genes, environment, or both. The evidence is consistent with all the theories'. (Jencks, p. 82).

Jencks believes that genes are the predominant influence in tested inequality, with next in importance being the 'total environment'. These two factors combined are estimated to be responsible for from 58 to 90 percent of tested variance. 'Equalizing the amount of schooling people get might reduce cognitive inequality . . . by 5 to 15 percent, although this estimate is very rough.' (Jencks, p. 109).

On racial segregation and desegregation

On the effects of racial segregation the '... best guess is that desegregation raises black scores by 2-3 points. Eliminating *all* predominantly black schools might therefore reduce the overall black-white gap from 15 to 12 or 13 points.' However, 'most cognitive inequality is within racial groups, within economic groups, and within schools. Desegregation will not affect these disparities much'. (Jencks, p. 106).

On the relationship between race and educational level it was found that the 'overall difference between black and white educational attainment is much smaller than the difference between black and white test scores, occupational status, income or almost anything else we can think of.' (Jencks, p. 142). Jencks concludes that 'discrimination seems to have trivial effects. (Jencks, p. 143).

In an examination of the determinants of level of educational attainment it was found that using 'almost any reasonable set of assumptions, family background explains nearly half the variation in educational attainment.' (Jencks, p. 143). By family background is meant all those features of the environment that make things alike for brothers and sisters.

Though Jencks relies on test scores and other

objective indices for his analyses and conclusions he is also careful to point out that these are not 'all embracing' outcomes and that measures of non-cognitive outcomes of both children and perhaps more importantly of adults must be tested before more conclusive statements can be made. Since these factors are not 'readily measurable' they are considered in a four page note that ends with a statement of belief, 'that the non-cognitive effects of schooling are likely to be more important than the cognitive effects. But we do not know what these non-cognitive effects are likely to be.' (Jencks, p. 134).

Some of The Conclusions

The data analysis in *Inequality* was a team effort by Jencks and his co-authors but the co-authors dissociate themselves from his conclusions.

'The present text was written by Christopher Jencks. It embodies his prejudices and obsessions, and these are not shared by all the co-authors.' (p. V.).

This suggests that *Inequality* is in fact 2 books. One is the data and their analysis, the second, conclusions from these data. Therefore, it is useful to examine some of the conclusions before turning to the reactions of others to *Inequality*.

Perhaps most significantly it is the Jencks view that 'None of the evidence we have reviewed suggests that school reform can be expected to bring about significant social changes outside the schools.' (Jencks, p. 255). This is the case because home influences are greater than school influences, because changes that can be effected through reform, e.g. curriculum changes, do not alter the way teachers and students treat one another and because enormous effects must occur in school to have 'significant' effects on adult income.

'Our research suggests, . . . that the character of a school's output depends largely on a single input, namely the characteristics of the entering children.' (Jencks, p. 256).

Since the school does not have measureable long term influences Jencks believes that the focus for reform should be on the immediate influences of school on teachers and children. Since so much of the time of teachers and children is spent in school it is important that schools be pleasant, exciting places. Not because it will change the future - that we have trouble showing - but because it is better for them right now.

Also, since there seem to be no long term benefits to one or another sort of education Jencks argues

for a diversification of educational choices in each community. It cannot in his view be bad and might very well be good.

Jencks himself was most concerned with adult income level as an outcome variable. 'The evidence we have examined shows that neither family background, schooling, nor cognitive skill explains much of the variation in men's incomes.' He feels that greater income equality can only be brought about by direct governmental action to make incomes equal. 'This is what other countries usually call socialism. Anything less will end in the same disappointment as the reforms of the 1960's.' (Jencks, p. 265).

The Reaction

Reaction to *Inequality* as to the Jensen paper first appeared as a series of invited papers in the Harvard Educational Review, a Journal that has had a central role in all of these matters. There was also a symposium of the American Education Research Association on *Inequality*. The following are some selected comments from these two sources.

The most vigorous criticism came from 2 black social scientists whose reactions are indicative of the anger that these matters have generated.

'The social science rationalizations for the benign neglect or malignant rejection of non-white human beings in America both reflect and reinforce the pervasive racism of America. Social scientists who contribute to negative policies are agents of injustice. The question comes whether social scientists should be permitted to have any direct role in decisions about equality among human beings. . . In the role of follower of the 'political mood' social scientists are indistinguishable from politicians [Clark, 1973].

'Research from eminent social scientists . . . all seem(s) to point to the conclusion that blacks and lower class people are about where they ought to be in the society - at the bottom - and that all efforts to move them, or let them move themselves are futile . . . Jencks' book and its sister studies will make it much easier to undo the civil rights and equal opportunity advances of the 1960's. It is once again Reconstruction undone' [Edmonds, 1973].

Other comments were:

'*Inequality* might be summarized as 'nothing affects anything'. Or, more accurately, as fifty to seventy percent of what goes on does not seem to be explained by anything else that goes on.' [Thurrow, 1973, p. 107].

The social institutions [universities in this case] in which people like Jencks are found 'generate debates which *in themselves*, not in their answers, serve the interests of the ruling powers of the U.S. and perhaps all of 'Western Capitalism'. [Michelson, 1973, p. 92].

'Inequality is destined to reshape research directions as well as policy in many areas, although it is likely to be unread by most researchers who discuss it. It will probably close out a decade of research with the EEOS data. Its existence is a monument to the usefulness of secondary data analysis, which is both its greatest strength and greatest weakness. It deserves to be read by all educational-behavioral scientists if for no other reason than the fact that few of the summaries, . . . have captured anything but a fraction of the essence.' [Schoenfeldt, 1974, p. 153].

'Despite its limitations, *Inequality* represents a very scholarly and sophisticated treatment of the diverse literature on family background, IQ, schooling, occupational status and income. If my own reactions are typical, a careful reading of this book will prove to be immensely useful to any scholar who may be interested in this important field of research.' [Astin, 1974, p. 159].

And finally from James Coleman, the senior author of the EEOS-'Coleman Report':

'What is clear is that improving 'school quality' by the standard measures of quality [class size, quality of textbooks, school physical plant, teachers' experience, library size and others] has little effect on cognitive skills. [Coleman, 1973, p. 137].

On Inequality and research techniques

There are any number of critical comments that one might offer as a response to the Jencks et.al. presentation. No one writes a book that deals with such a complex subject without leaving a flank exposed. Very specific challenges have been made to the data and its analysis and to the conclusion drawn from that analysis. Readers who wish more information about these criticisms are referred to the sources cited above. Here the discussion will be more to the general issues raised by large studies for public policy purposes.

The ability of criticism to create doubts about adequacy on inadequacy of a particular research study is not encouraging to those who support the critics. Jensenism, the EEOS, the Head Start study and other similar studies have all had their methodological critics, but the conclusion that schooling has

little or no effect upon children, generally remains. It would appear that once you accept the scientific frame of reference of these large studies you are powerless to contradict them with criticism. Only comparable studies with different results will do that. With respect to *Inequality* it should not be hard to convince others that a writer who offers his 'best guess', as Jencks does so often, is guessing. And that his guesses ought to be considered just that, particularly in view of the impact of the issues which he has addressed. But arguments of that sort don't seem to be effective when he has a mass of statistically treated data to 'support' his guess. Efforts to create doubt about what some perceive as the negative conclusions of the Jencks study often seem to lead to a greater belief in the guesses, rather than the opposite. Numbers and scientific research have become powerful convincers, even when they are acknowledged to be only marginally relevant to the issues at hand. This is a problem that social scientists must at some point address. Their best guesses have the power to create conviction in others and to influence government policy.

Inequality has received a good deal of praise for its methodology. It is far from being the weakest of the social policy studies. Many researchers feel that it is the sort of work more of us ought to be doing to 'solve' problems.

Studies like *Inequality* are viewed as the best method to obtain answers to the questions of public policy that face all industrialized, educationalized societies. In general this view rests upon a belief in the objectivity and measurability of significant outcome variables. Though Jencks acknowledges that his outcomes are not necessarily the most significant ones he does not shrink from drawing important conclusions based upon what he does have.

Policy research studies as represented by *Inequality* have several characteristics in common. They are based upon the largest, most representative sample obtainable. Group measures are taken for independent and dependent variables and finally 'correlational measures' between the two are used to assess the 'explainability' of input variable with output. For example, how much of earned income is 'explained' by I.Q. or numbers of years of schooling, etc.

It is this general model for doing research that needs to be examined. Particularly the general assumptions upon which it rests and its likely effect in terms of policy.

Why is it that policy studies are usually studies of large groups of people? The answer is representa-

tiveness. If small groups are tested then results will not be generalizable to the public at large and decisions will therefore be wrong. But on the other hand, do large groups ever represent any single subgroup or individual? It is puzzling to contemplate how policy made for a group, particularly a large one, is ever implementable in any sane way. What good is a policy made for a non-existent central tendency when eventually we must deal with individuals.

Perhaps policy should be based upon studies of small groups of individuals studied rather intensively. Actually, there is no need to choose one or the other, large study or small, when both can be done and in fact would compliment one another, but if one did have to make a choice it would seem wiser to base decisions on fine-grained studies rather than gross because group measures are always the effect of combined individual influences. As the learning psychologist knows, a smooth group learning curve can mask 'all or none' processes that go on in each individual. So too, do large groups hide individual effects. In applied research, where we will eventually do something to someone, it seems foolhardy to make decisions with *no* information about individuals.

As an example take the case of the relationship between schooling and income. A fine-grained study of individuals would certainly reveal a welter of influences that interacted with schooling leading to eventual job status and income. It is very likely that when these life-influencing events were included in the analysis an effect of school would be present. It is hard for anyone who has been through the schools to believe that they are not an important influence. But whether such turned out to be the case or not, our understanding of the relationship between school experience and outcomes would be clear. Only through such an analysis could policy be made sensibly.

A shift in focus would require a shift in methodology. What we have done is use the most convenient measures as indices of effects. We study what we can measure, not necessarily what is important. There is no reason why this must continue. Answers to our queries about the effects of school on children are not easy to measure because we do not understand very well what these outcomes are likely to be or how the school might be producing them. Uncertainty about outcomes cannot be overcome by operational statements *sans* understanding. Definitional accuracy about what is measured is indispensable to measurement.

Inequality relies on standardized tests, expenditures, income and other similar readily-at-hand indices. Why should these be considered important in deciding about the value of schools? Do they get their value from their importance or from their convenience? Since when does equality in any important sense equal income, or number of years of schooling? There seems to be no answer for these questions in *Inequality* or its sister studies.

There is no need for those who are concerned about the effects of decisions on individuals to accept the verdicts of studies like *Inequality*. Scientific methodology is almost dogma, but not quite. There are alternative ways to gather information about people that do not require a premature rush to quantify and correlate. These techniques are necessarily more difficult and time-consuming because large samples cannot be quickly accumulated, and if the quality of the data is not to be destroyed even small samples may not yield clean measures of central tendency. But our understanding of the thing which we seek to understand can be enhanced by observing without allowing the premature use of scientific filters to restrict our view.

There is no need to cast aside useful tools, and measures can be useful tools but only if they are consistent with our needs. *Inequality* is a good example of a study whose needs were not served by the measures available. It is not the case that we are able to measure things like equality and inequality well or at all. Certainly we all know what Jencks measured and operationalists would say we know therefore what he meant by inequality. But we know too that operational definitions do not stay in their procrustean beds; once they appear in print they rise and grow to fit common usage. This is an effect that cannot be ignored where public policy is at issue. [For a similar argument concerning measurement see Langeveld, 1968].

Another factor that seems to be common to studies like *Inequality* is the reliance on correlations between measures to 'explain' variance. What does 'explain' mean in this context? Clearly it cannot mean cause. Every elementary student of statistics is aware that correlations do not show cause and effect but merely covariation. 'Explain' can only mean therefore that when means and variances are equated the two distributions vary together to this or that degree depending upon the magnitude of the index. Is this useful information for making decisions about people? It is hard to see how.

If we are to make a decision to do anything for children in school we necessarily do it because we

expect something good to come of it. For our act to cause some future (even if immediate) event. There is no way to get information about what we need to do from correlations. 'Explain' is a very weak word and unfortunately it tends to connote more than it should. Correlations don't explain anything; they merely pose puzzles. Why does the variance tend to overlap to a given degree? Correlations can't explain it and therefore are of minimal value as inputs to decisions.

Inequality and its sister studies are hesitant and perhaps misleading steps on the road to an answer about schools and their effects. These studies have created controversy among social scientists but nevertheless they tend to serve as 'interim' guides to decision making in the absence of other 'scientific' evidence to the contrary. Unless such contrary evidence is presented soon and convincingly the prevailing opinion about school effects is likely to remain pessimistic for a long time. The almost magical belief in numerical transformations as a substitute for understanding rather than as dependent upon understanding lies at the root of this dilemma.

What is equality of opportunity? It is a human goal like truth, justice and brotherhood; an ideal. Human societies seem to need such goals and they appear quite valuable. However, in a time when science as a method of gaining knowledge about the world is considered by some as an absolutely unimpeachable technique there are dangers in such goals being trivialized and destroyed. We cannot now measure any of the above and that is not necessarily bad. It is simply not true that we can objectify everything for which there is a word. Some things are ephemeral and can only be changed by making them concrete. This is not to negate efforts at objectifications but rather to suggest that such efforts must rest on more than expediency. Just because it would be more scientific if we could measure equality doesn't mean that we have the knowledge to do it. Physics, our model for the measurement process, has definitions resting on understanding of the properties it measures. There is no shortcut to measurement without going through understanding.

Based upon the evidence to date it would be difficult to come to any conclusion about the ability of a society to achieve greater equality through its schools. But it can be said that research which suggests that such an answer is not only possible, but has been achieved, is deceptive. What is true is that we don't know. It is also true that if we reduce our efforts to create that society we may never find out.

A final comment about Equality and Genetics

The controversies about the IQ and genetic inheritance are not fruitful. They yield no testable hypotheses. But hypotheses themselves do have effects upon our efforts to achieve a better society. The scientist cannot delude himself into believing that his hypotheses are derived from some store of truth separate from his own views as an observer nor can these hypotheses once they are known, be kept from influencing the next look we all take at the world around us. The debate about our ability to arrange an educational environment that helps the children who need help most has been irrevocably changed by Jensenism. It is hard to see how this hypothesis has been helpful and it is easy to see how it has been harmful.

This raises the very disturbing question of how one keeps from entertaining harmful hypotheses or even how one knows that either in the short or long term an hypothesis is going to be helpful or harmful. To recognize such questions as legitimate is itself helpful. The answer to the question lies perhaps in a more ecological-historical perspective on science and society. The scientist is capable of separating variables that in fact depend upon one another for their existence, e.g. heredity and environment, but is he able to return them to their natural state after analysis? To do that requires a broader perspective about the way any set of variables fits in with its surroundings. It is trite to say that scientists have become overly specialized but it is also true. It may be that this very specialization is what leads to the dogmatic insistence on the value of untestable hypotheses.

The value of the scientific enterprise ultimately rests on its applicability. To the extent that scientists are aware of the problem they seek to solve it would seem unlikely they would propose harmful hypotheses. This too would seem to argue for a broader perspective on one's research and how it 'fits' into the problem world.

Conclusion

It has been the intent of this paper to present some of the results and conclusions from a selected set of American studies by focusing on *Inequality*, a study of the power of schooling to produce differential, equalizing changes in children. Little has been said about the specific problems of methodology, or of clarity of writing style in this study. This is not to say that such problems do not exist. Those

interested in a more specific treatment of the methodological controversies will do well to read the appropriate critical articles cited here as references. It was the attempt of this paper to raise a broader set of questions about the relationship between research techniques and meaningful answers to the critical issues faced by all of us in the human sciences.

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