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Contingent Valuation of Early Intervention Programs for Handicapped Children

Colette M. Escobar
Utah State University

Utah State University
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CONTINGENT VALUATION OF EARLY INTERVENTION PROGRAMS FOR

HANDICAPPED CHILDREN

by

Colette M. Escobar

A thesis submitted in partial fulfillment
of the requirement for the degree

of

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Contingent Valuation of Early Intervention Programs for
Handicapped Children

by

Colette M. Escobar, Master of Science

Utah State University, 1986

Major Professor: Dr. John E. Keith
Department: Economics

Early intervention programs for handicapped preschool children
may have long-term implications for the children and their families.
Economic evaluations of these programs have been conducted to measure
costs and benefits, but parental willingness-to-pay has been overlooked
in these analyses. Parental willingness-to-pay, as a measure of con-
sumer surplus, could complete the measure of benefits and provide both
policymakers and practitioners with useful information for decisionmak-
ing. In this study, the implications of eliciting willingness-to-pay
responses for an early intervention program for handicapped preschoolers
are discussed. A survey technique, known as the contingent valuation
method (CVM), is applied to a program to empirically estimate
willingness-to-pay for the total program and for particular components
of the program. Also investigated are the implications of using a
rationality test in the survey to determine if consumer responses are in

accordance with assumptions for rational consumer behavior. Results indicate a relatively high willingness-to-pay for the program as a whole, but a low value is associated with program components. This implies that parents may value these programs more for the respite rather than specialized services offered. Results of the rationality test support the hypothesis that such a measure is necessary in survey designs of this nature.

(59 pages)

CHAPTER I

INTRODUCTION

Early intervention programs for handicapped preschool children have long-term implications for the children and their families. Since the early 1960s, literally hundreds of educational programs have been created to offset the adverse effects of poverty and handicapping conditions for very young children. The efficacy studies which have been done point to a myriad of benefits attributable to early intervention. These have been measured in terms of the change in lifetime earnings, the reduced cost of care later in life, and the generally improved economic and emotional status of the family unit. While these benefits are certainly valuable, the benefit of such programs to the parents, measured by their willingness-to-pay, is typically overlooked.

Most early educational programs are publically provided and, thus, assume the status of "public good." This, despite the fact that the public is rarely involved in decisions which affect the process. Educational professionals are responsible for program development, regardless of how much value the public places on a program, or components of a particular program. Policymakers determine how to allocate resources among public programs based on the research studies which have been done to determine the cost-benefit ratio, or cost-effectiveness, of particular programs. Because the value of these programs to the parents is not considered, it seems unlikely that the term "public good" is

anything more than a metaphor. Appropriate benefit estimation can be accomplished by accurately assessing parents' valuations of these programs, in addition to the other benefits, and return the educational process to the status of a "public good."

Nature of the Problem

Both the efficacy and economics of early education programs for disadvantaged and handicapped children have been demonstrated over the years, with most of the research indicating that these social investments are justified--from an economic, as well as societal, criterion. The emphasis has been upon costs and benefits accruing to individuals and society, but one important benefit is overlooked--the parents' willingness-to-pay for the program. A technique that captures this component is the contingent valuation method (CVM).

The role of the CVM, in the context of an early childhood intervention program, is to estimate the benefits of the program to the parents of developmentally disabled, disadvantaged, and mentally retarded preschool children by measuring their willingness-to-pay (WTP) for the program. Ideally, the CVM will identify the value of the program as a whole, and components of the program, to the parents.

The objectives of this study are threefold:

1. To elicit willingness-to-pay measures for an early intervention program for handicapped preschoolers in Iowa Area Education Association (AEA) 12. This was accomplished via the contingent valuation survey. In a personal interview, each respondent was informed of the purpose of the survey questions and reminded that the state of Iowa guarantees their child(ren)'s education. With

this in mind, they were asked what tuition they would be willing to pay for the program if it were not publicly provided. These bids were used to estimate demand for the program as a whole based upon their own valuations.

2. The valuation of particular components of the program using the ranked CVM. In addition to the bidding procedure described above, the respondents were asked to rank order a set of ten alternative programs defined by four varying attributes: tuition, class length (half or full day), hours of speech therapy, and hours of physical/occupational therapy. The ordering of the choices yields an indication of utility and a demand curve for the program's attributes. In this fashion, it was possible to break out components of the program and determine parents' valuation of them.

3. To examine a possible test of respondent rationality. Due to the subjective nature of the bidding and ranking procedure, it seemed necessary to incorporate a test into the survey design which would indicate if the responses signified rational consumer behavior. To this end, one of the ten alternatives for a sample of the respondents offered more services at a lower cost. The "rational" respondent should rank this choice above the alternative which offered less services at a higher price or tuition.

CHAPTER II

THEORY OF CONSUMER CHOICE

Discussion of Compensating and Equivalent Variations

For public benefit-cost analysis, nonmonetary effects may be measured using compensating or equivalent variations (Thompson 1980). Compensating variations (CVs) are hypothetical payments (made to losers or taken from gainers) such that the initial level of utility is maintained, i.e., the individual is WTP (or willing-to-accept) X amount of dollars so that she is indifferent between having the program and paying (receiving) X and not having the program. Alternatively, the bids can be expressed as equivalent variations (EVs), where expenditures are minimized such that utility is constrained to a subsequent level, i.e., the individual is WTP (or willing-to-accept) a money amount such that she is indifferent between paying (receiving) and having the program and paying and not having the program. According to Thompson (1980), CVs and EVs represent an "optimal theoretical solution to valuation" (p. 57), because in most situations there is some amount that gainers would pay to receive benefits or losers could be compensated for disbenefits.

CVs and EVs represent the change in welfare associated with a change in price or quantity. As an example, the situation may be characterized by price (tuition), t, and the supply of (preschool) services, s, with demand given by the following function:

$$d = d(t, s, I)$$

where I is income and remains unchanged. Utility is expressed by the indirect utility function $u = v(t, s, I)$ and the expenditure function satisfies $m(t, s, I) = I$.

The welfare measures can be expressed as:

$$CV = I - m(t_1, s, u_0) = m(t_0, s, u_0) - m(t_1, s, u_0)$$

or

$$EV = m(t_0, s, u_1) - I = m(t_1, s, u_1) - m(t_1, s, u_0)$$

when only the price variable, t, changes.

The Hicksian compensated demand function gives demand for consumption activities when the individual's income is compensated such that she remains on the same indifference level. This is the solution to the expenditure minimization problem. In simple cases, CV and EV equal the area beneath the compensated demand curve. So, integrating the Hick's compensated demand curve:

$$\delta m(t, s, u)/\delta t$$

implies that,

$$CV = \int_{t_0}^{t_1} m(t, s, u_0)/\delta t \; dt$$

and,

$$EV = \int_{t_0}^{t_1} m(t, s, u_1)/\delta t \; dt$$

Similarly, as Mäler (1974) shows, the partial derivatives of the expenditure function with respect to the supply of services yields the demand price, or marginal willingness-to-pay, for a public good or service.

$$WTP = -\delta m(t, s, u)/\delta s$$

implying,

$$CV = \delta m(t, s, u_0)/\delta s \ ds$$

and,

$$EV = \delta m(t, s, u_1)/\delta s \ ds$$

where $u_0 = v(t_0, s_0, I)$, and $u_1 = v(t_1, s_1, I)$.

When prices and supply change in the same direction, for noninferior goods, Mäler (1974) shows that EV exceeds CV. But typically it is assumed that the two measures converge.

Willig (1976) showed for price changes that the difference between the two measures is negligible when the income elasticity is small and the commodity represents an insignificant portion of the budget. For quantity changes, Randall and Stoll (1980) provide similar theoretical results.

Figure 1 illustrates the case in which there is no income or wealth effect. Assume for simplicity that Y equals the supply of preschool services and X equals all other goods; the maximum amount a parent would be willing to pay to maintain their child in the program would be equal to $\overline{Y_0Y_1}$ (equal to CV), while the minimum compensation required for the loss of this opportunity is $\overline{Y_0Y_2}$ (EV). In the absence of a wealth effect, the indifference curves are vertically parallel, $\overline{Y_0Y_1} = \overline{Y_0Y_2}$, and the two measures are equivalent. In the presence of a wealth effect, the indifference curves will no longer be parallel and EV will be the greater of the two (Henderson and Quandt 1980).

Discussion of Rational Consumer Behavior

A basic postulate in the study of consumer behavior is that of rationality. Rational choice leads the consumer to utility
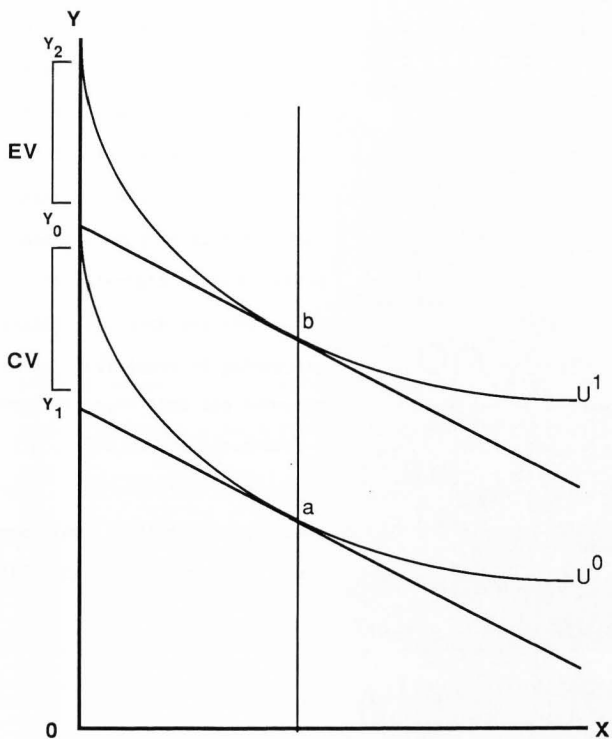
Fig. 1. Compensating and equivalent variation with no wealth effect.

maximization; by selecting among a wide variety of commodities, the individual chooses the consumption bundle from which she receives the greatest satisfaction. Preferences are the essential component of the individual's utility function. If a consumer derives more utility from

an alternative, call it A, then another, B, it is said that A is pre-
ferred to B. And, according to the assumption of the independence of
irrelevant alternatives, if B is preferred to another alternative, C,
then A is preferred to C regardless of the existence of B. Measurements
of utility are typically of an ordinal form, i.e., the consumer attaches
no numerical value to the alternatives; rationality merely suggests that
the consumer is able to rank alternatives in preferential order.

The concepts of indifference curves and the budget constraint are
necessary to such analysis. Baumol (1977) defines the indifference
curve as "that locus of points each of which represents a collection of
commodities such that the consumer is indifferent among any combination"
(p. 278). The budget constraint gives information concerning prices and
income. The rational consumer, seeking the most for the money, will
choose the combination of goods that will place her on the highest
indifference curve given her budget constraint.

CHAPTER III

CONTINGENT VALUATION METHOD

The contingent valuation method (CVM) is a survey technique which estimates the benefits to consumers associated with public or nonmarket goods. When the costs of a public good or service are analyzed in conjunction with these benefits, judgements can be made regarding the existence or continuation of the program; in this sense, it is a tool for the policymaker.

The survey creates a hypothetical market which directly elicits responses of willingness-to-pay (WTP). The reliability of these benefit estimates depends, to a large degree, on how much the consumer response in the hypothetical situation reflects a real market response. Obviously, the hypothetical market is seriously constrained by the limited environment of the interview and the questionnaire. For this reason, survey design is important; it should define the hypothetical situation accurately, giving the respondent the necessary information to make the valuation decisions.

According to Randall et al. (1974), the efficacy of the bidding game depends heavily upon the "reliability with which stated hypothetical behavior is converted to action, should the hypothetical situation posited in the game arise in actuality" (p. 135). The CVM has been primarily associated with valuing environmental assets, i.e., clean air and water, scenic beauty, pristine visibility, etc., and there is

substantial literature representing this technique as a means of valuing environmental amenities. Its first known use was by Davis in 1963 to estimate willingness-to-pay for big-game hunting in Maine. His landmark study recognized some of the shortcomings of the method, particularly response bias, and attempted to compensate for them. A decade later, Randall et al. (1974) utilized the method to estimate aesthetic damages from the Four Corners Power Plant and Navajo mine in New Mexico. They argued that political and popular pressures to control particulate emissions support the existence of such benefits and that there is a need to quantify them. In order to elicit an accurate measure of benefits, they felt desirable characteristics of a survey should include:

1.   A "realistic and credible" hypothetical situation,

2.   The provision of relevant examples to familiarize the respondent with the scenario,

3.   An account be taken for various attitudes regarding the good or service to be valued in order to isolate the relevant issues, and,

4.   The design must provide a measure of control for strategic behavior to eliminate, or compensate for, the "free-rider" problem.

Applying a carefully designed bidding game, they quantified the benefits of abating environmental damage caused by the mine and power plant.

The subjective nature of the bidding procedure raises both theoretical and empirical issues, the most serious of which continue to be debated in the literature. Brookshire et al. (1976) took the first in-depth look at welfare measurement accuracy and bias associated with the CVM.

Considerable controversy continues to pervade the measurement of welfare change, represented by a change in consumer's surplus. Marshall (1930) defines consumer's surplus as "the residual difference between the value of a consumption bundle to the individual and the amount he actually pays for it in the marketplace" (p. 152). This is calculated by integrating the area below the demand curve and above the price line. It is the divergence between the two prevalent measures of consumer's surplus, namely compensating and equivalent variation, which creates the concern for accuracy.

The willingness-to-pay bids obtained from the respondents can be expressed as functions representing either compensating or equivalent variations. Wide divergences between these measures have been documented for survey responses to the hypothetical market indicating that the CVM may not necessarily be included in this assumption. Knetsch and Sinden (1984) conducted numerous experiments of human economic behavior using real money transactions and reported a clear distinction between CV and EV. Similarly, Bishop et al. (1983) found WTP bids to be substantially lower than willingness-to-accept (WTA) in a study comparing CVM responses to those of a simulated market for goose hunting permits in Canada. On the basis of these results, they suggest using CV as a lower bound and EV as an upper bound on value (see also Gordon and Knetsch 1979).

While the reason for the asymmetry is not altogether clear, it may be partly attributable simply to human nature: people are more willing to risk opportunity money that they will have in the future (WTA) than their present endowment (WTP); they also may be protective

against feelings of loss, regret, or uncertainty associated with making a decision (see Knetsch and Sinden 1984).

In short, more than just a wealth effect is working to create the disparity between compensating and equivalent variation in CVM studies. The implications for policymaking are compelling. Depending upon the measure used, ambiguity could result in the computation of benefits and costs, rendering resource allocation decisions arbitrary. Further implications exist for indifference curve analysis. Exchange of goods may no longer be equal along the curve, and more than one indifference curve would be required to show acquisition and disposal decisions (Knetsch and Sinden 1984).

In Figure 2, as a parent exchanges money wealth (M) for more of the preschool services (P), she is equally well-off all along the indifference curve MP1. But, in the exchange of P for M (movement in the opposite direction) evidence suggests that MP_1 will no longer trace the line of equal utility, i.e., more of P is required in the transaction with M than would be required to acquire P. Now indifference curve MP_2 represents the levels of equal utility for a movement in this direction, suggesting two separate indifference curves to show these two decisions (Knetsch and Sinden 1984).

A related conceptual problem is the accuracy of the measure of social welfare obtained through aggregation of the bids. To determine the effects of interpersonal utility comparisons, it has been suggested that the distribution of income be varied. As in the case of individual welfare measures, Brookshire et al. (1982) show that a reliable estimate of welfare is obtainable if both income effects and the change in welfare are small.
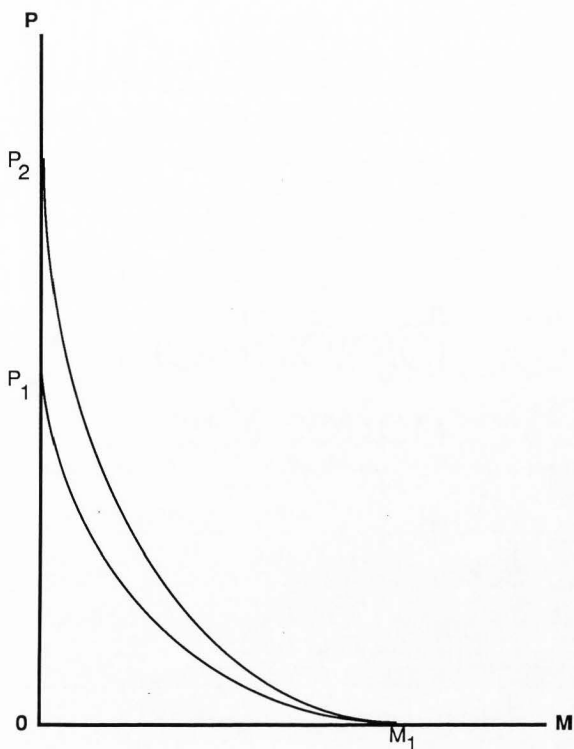
Fig. 2. Indifference curves representing acquisition and disposal decisions for a public preschool program.

Another issue arising from the hypothetical market is that of strategic behavior or bias. The possibility of strategic behavior arises when the respondent suspects his personal bid may have an effect on the overall outcome. Such behavior may occur if he is aware that his bid is significantly different from other respondents and he must be willing to present a dishonest bid. In general, strategic behavior is

easily detected by the presence of very high or very low bids relative to the mean bid. But the instance of strategic behavior has not been substantiated. Bohm (1972) conducted an experiment in which he estimated WTP for public television in Sweden. Even with incentives for strategic behavior present, it did not take place. Other studies corroborate this finding: Brookshire et al. (1982), Rowe et al. (1980), and Randall et al. (1983).

Other forms of bias associated with the CVM include:

1.   Information bias—Rowe et al. (1980) defined information bias as "a potential set of biases induced by the test instrument, interviewee, or process, and their effects on the individual's responses" (p. 97). Simply, the sequence of information and the quantity presented may affect the mean bid. This effect poses a more difficult problem as it is logical to assume that bids may depend heavily on the information the individual receives; unlike the market situation, in contingent markets there is little else to base valuation upon except information given in the survey or conveyed by the interviewer. As a solution, it has been suggested that a subsample of the respondents in the study receive a priori information about the mean bid and who will provide the service. These responses could then be tested for significant differences from the remainder of the sample, which did not have access to this information, to determine the magnitude of the bias (see Rowe et al. (1980) and Brookshire et al. (1976)).

2.   Vehicle bias—this is associated with the method of payment, such as entry fees or utility bills, which are used to simulate a real market payment mechanism. Bias is demonstrated when the mean

bids vary significantly with the payment vehicle or when the vehicle used is inappropriate for the circumstance, e.g., a wage tax for recreators using an out-of-state facility may seem unlikely to the respondent and be reflected in their bid.

3. Starting point bias--the choice of starting point in the iterative bidding process may introduce bias in two ways according to Cummings et al. (1984): (a) the respondent may incorrectly assume a range of values within which to bid, or, (b) the respondent may be unwilling to participate long enough in the iterative bidding to arrive at their true maximum WTP or WTA. Some authors have detected significant starting point bias (Rowe et al. 1980, and Desvousges and Smith 1982), while others found that the choice of starting point did not affect the outcome (Thayer 1981, and Brookshire et al. 1980).

In a study which applies various tests to determine the impact of bias on bid behavior, Thayer (1981) addresses the specific empirical complications posed by each of the biases. For both information and starting point biases, he recomends that: (a) a measure is taken which determines the significance of these variables to the respondents' bids, and (2) if it proves to be a significant variable, then it could be adjusted to achieve an honest bid.

Such results serve to reinforce the importance of the survey design; the respondent must be able to understand the methodology and be familiar with the nonmarket commodity in question, because bias behavior results from abstract and unfamiliar situations. Despite theoretical and empirical obstacles, the CVM is gaining acceptability. With its development, these lessen to some degree.

Ranked Contingent Valuation

The contingent ranking approach elaborates upon the CVM by including a set of alternatives in the survey design which are to be rank ordered. The alternatives are described by any number of attributes. The way in which the respondent ranks the alternatives provides an indication of consumer preference or utility. While market data are definitely superior, a recent article by Beggs and Cardell (1981) discusses two advantages to ranked survey data. First, a complete and accurate description can be given to the hypothetical situation to which the respondent can honestly react. Secondly, more information is made available to the researcher in the form of preferential rankings, i.e., a demand curve for the attributes is given. These ranked data allow separate coefficients to be estimated for each ranking by using an ordered logit model rather than the usual logit approach which considers only the most preferred alternative.

Using the ranked CVM, Beggs and Cardell (1981) estimated demand for electric cars. They derived an ordered logit model to analyze the ranked preference data. The results of the electric car study indicated that demand for electric cars would be small given their limited mileage range, thus, illustrating the use of the ranked CVM for assessing potential demand.

With the same ordered logit model, Charles River Associates (1981) quantified visibility benefits at Great Smokey National Park and Mesa Verde. Surveys conducted at each site elicited an ordering of choices under different conditions of visibility, entry fees, and site activity level. The ordered logit model assigned monetary value to the

benefits associated with a trade-off between visibility and entry fee. Results indicated that expenditure on pollution control would outweigh visibility benefits to the visitor.

The additional information obtained in the ranked data allows the experimenter to analyze the demand for specific aspects of the program, amenity or commodity in question. In assessing demand for the Iowa program, the set of parameter estimates derived from the ranked logit provides a measure of benefits associated with a change in the price variable--tuition--and a change in the other program attributes. Describing utility as:

$$U_{ij} = \beta_1 T_j + \beta_2 C_j + \beta_3 S_j + \beta_4 P_j$$

where u is the utility level of individual i choosing alternative j, T is the tuition level of alternative j, C is the hours of preschool class, S is hours of speech therapy, and P is hours of physical/occupational therapy.

From the above utility equation, it is possible to place a dollar value on program changes. To measure compensating variation, the initial level of utility is set equal to zero to determine WTP

$$\Delta U_{ij} = 0 = \beta_1 \Delta T_j + \beta_2 \Delta C_j + \beta_3 \Delta S_j + \beta_4 \Delta P_j$$

implies

$$T = - [\frac{\beta_2 \Delta C_j + \beta_3 \Delta S_j + \beta_4 \Delta P_j}{\beta_1}]$$

From the above equation, WTP for the program components is derived

$$WTP_C = \frac{-\beta_2}{\beta_1} \qquad WTP_S = \frac{-\beta_3}{\beta_1} \qquad WTP_P = \frac{-\beta_4}{\beta_1}$$

Since program attributes are specified in terms of discrete changes from a base of one-half day program with no speech or physical/occupational therapy to increased levels, it may be assumed that the changes are equal to 1. The coefficient on price, β_1, is expected to be negative for an increase in tuition, implying that a price change of β_2/β_1 for alternative j compensates for an improvement in the program. Therefore, β_2/β_1 is a monetary measure of the benefit associated with a change in the program (Charles Rivers Associates 1981).

Nonmarket Valuation of Educational Programs

While the CVM has been reliably used with reference to environmental issues, there is no application in education either to value programs as a whole or to value specific components of programs. It may be assumed that education is a public good, where the sum of the benefits exceeds the sum of the costs; therefore, the situation is directly analogous to the recreational/environmental problem and the same techniques are applicable.

The focus in the economics of education has been primarily upon measuring the direct benefits of education at different levels (see, for example, Becker 1965, and Psacharopoulos 1973) and the benefits of investment in human capital to society. These estimate both the private (books, tuition, and opportunity cost) and public (government outlays on education) costs of education. Various benefit-cost and cost-effectiveness studies for early intervention programs have demonstrated the efficacy and economic rationale for such programs.

The best-known and most widely cited economic evaluation of an early intervention program is the Perry Preschool Project (Weber et al.

1978). Subject selection was based upon low parental educational attainment and socioeconomic status and low I.Q. test scores. Subjects were assigned randomly to a treatment and no-treatment control group in five waves, with the first wave receiving one year of intervention at age four and subsequent waves receiving two years of intervention beginning at age three. These participants were then observed lontigudinally over an eight-year period and benefits attributable to the preschool education were calculated on the basis of the following criteria:

1.   Reduced educational costs for the participants in the preschool program in terms of less special education and/or institutionalized care required,

2.   Increased lifetime earnings calculated by extrapolating data from the 1970 Census for black males and females at various educational levels,

3.   Value of parent time due to being released from child-care several hours daily, October to May.

These benefits were quantified and compared with the operating and capital costs associated with the preschool program to determine the social rate of return. Results provide support for public expenditures on such programs; in all cases the net present value was positive. For a one-year program, the social rate of return was 9.5 percent and for a two-year program, 3.5 percent (Weber et al. 1978).

Additional benefits of the Perry Preschool Project are estimated in Barnett (1985) who conducted a benefit-cost analysis when the subjects were 19 years old. He reports the following benefits attributable to the Perry Preschool: reduced cost to society related to crime and delinquency, reduced welfare costs, and increases in earnings and

employment. In addition, an indirect measure of parents' willingness-
to-pay was taken based upon the cost of alternative childcare
($1.03/hour).

Another notable example is the INREAL study (Weiss 1981), which
is interesting because she comes the closest to valuing a program
component--speech therapy--and determining its cost-effectiveness.
Three- to five-year-olds, who were language-impaired and/or bilingual,
were randomly assigned to an INREAL treatment, a "naturalistic and
nonstigmatizing" method designed to ameliorate language problems (Weiss
1981, p. 40). The intervention was implemented daily over a three-year
period. Costs were estimated based upon the additional cost of incor-
porating an INREAL component to an existing preschool or kindergarten
program. The reduced need for special education and grade repetition
provided a measure of benefits. While the benefit analysis was not
comprehensive, benefits exceeded costs by a wide margin; again, the
preschool investment is substantiated (see also Selowsky (1976) for a
discussion of investment in preschool human capital).

The findings of the Perry Preschool Program and INREAL benefit-
cost analyses support the view that investment in early childhood educa-
tion for handicapped and disadvantaged children is economically and
socially justified. But, so far, no research has been done to directly
assess parents' willingness-to-pay for this public good. Usually,
parent time is assigned some value, which may or may not be accurate.
The CVM captures the compensating or equivalent variations and, there-
fore, reflects a true image of a program's benefits.

Furthermore, these and other studies never address the demand for
individual components of the programs, i.e., do parents (or society)

value different parts of the program differently, or is it just a baby-sitting service? The ranked CVM, discussed above, allows a program breakdown which determines values corresponding to each attribute of the program. This gives a complete picture of the benefits of the program and their distribution so that modifications can be made to maximize program benefits.

Test for Rationality

Noticeably absent from the literature is any mention of tests which could distinguish those respondents not acting in accordance with the assumptions of rational consumer behavior. Such a test may enhance the accuracy of the estimation results and would seem to be a worthwhile component of the survey. Considered in detail in a later section are the implications of such a test.

CHAPTER IV

THE EMPIRICAL STUDY

This study included the entire sample of the parents of the preschool children enrolled in the early intervention program in Iowa Area Education Association (AEA) 12. These were nine half-day preschool programs for handicapped children in a major city and nine full-day programs for handicapped children in the districts surrounding that city. For the present study, the children in these programs represented a variety of handicapping conditions: mental retardation (51 percent); communication disorder (28 percent); and the remaining children (21 percent) had physical impairment, learning disability, behavior disorder, and hearing impairment as their primary handicaps. The programs were similar in design, consisting of both group and individualized instruction. Therapists were employed to provide individualized services in speech/language and motor activities.

Prior to the holding of the interviews, socioeconomic information was collected on the characteristics of the respondents which included age, income, family size, parents' educational levels, and amount of time parents spent in training their handicapped children in the home (a copy of this instrument is available in Appendix A). The CVM survey was then conducted to establish their demand for the preschool program.

All parents were contacted to participate in the study and an attempt was made to personally interview each to obtain their willingness to pay for the program. Five parents could not make it to

the on-site interview and were contacted via mail and telephone. Only one parent failed to respond (Appendix B contains a copy of the survey).

The contingent valuation survey consisted of two parts: first, a bid was obtained from each parent which reflected their maximum willingness-to-pay to maintain the program in which their child was currently enrolled. The bids ranged in value from 0 to $9,000 per year with an opportunity to write in bids outside of this range. For each zero bid, the respondents were asked to give their reason (financial or otherwise) in order to distinguish protest bids. Once the initial bids were obtained, the respondents were given a survey to complete in which they were to preferentially rank ten alternative programs.

The ten alternatives were characterized by four attributes: tuition, class time, hours of speech therapy, and hours of physical and occupational therapy. The tuition, or cost of each alternative, was based upon the initial bids and the treatment the child was presently receiving in order to make it appropriate to that parent's willingness-to-pay, and to reduce the likelihood of starting point bias. For example, if the parent's initial bid was high, say $3,000, then the ten programs she was ranking would range in tuition values from $1,000 to $5,000; likewise, for a low bid, the alternatives to be ranked would reflect low tuition levels. The values ranged from $20 to $5,000. There were two levels of program--half-day (3.38 hours) and full-day (7.79 hours); three levels of speech therapy (ST)--0, 1, or 2 hours; and three levels of physical/occupational therapy (PT/OT)--0, 15 minutes, and 30 minutes.

Two measures of consumer surplus are estimated in the two parts of this contingent valuation survey. The elicited willingness-to-pay

values, or bids for the total program, can be considered equivalent variational measures of the benefits to the parents associated with the preschool. The case is illustrated in Figure 3. Hypothetically, the parents are giving up income to maintain their child's program and their budget is constrained to a new, lower level of utility. The rankings, obtained in the contingent ranking survey, represent movements along the new utility curve, U_1, or a compensating variational measure of surplus.
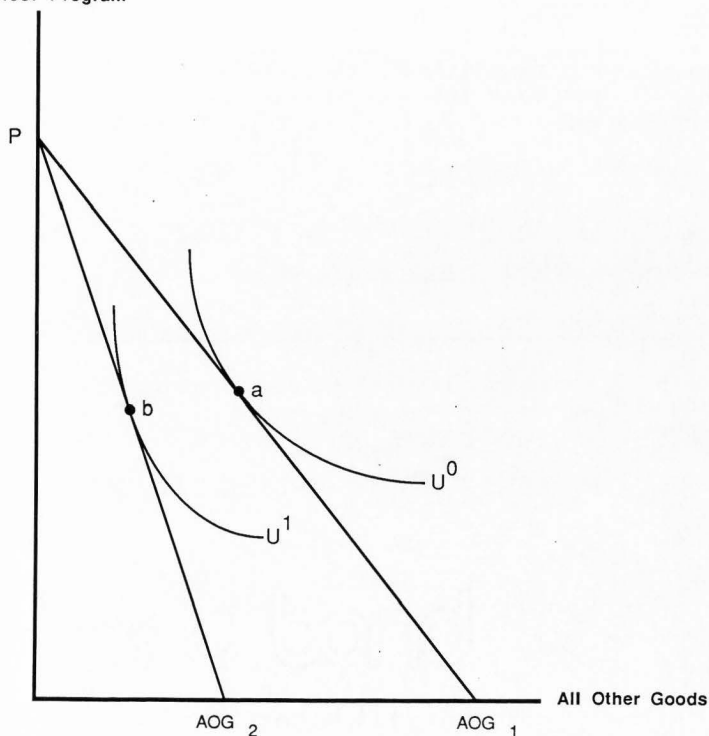
Fig. 3. Change in utility associated with willingness-to-pay values.

These rankings provide some measure of the offsetting change in income required to make the parents indifferent between their current situation and a new combination of prices and attributes.

A check on apparent rationality was incorporated into the Iowa survey design. An alternative with more therapy at a lower cost than another alternative was included in the ten alternatives for a subset of the respondents--based upon initial bids rather than on a random choice from the participants. Failure to select the lower cost alternative would imply either inconsistency with economic rationality or violation of the assumption of the independence of irrelevant alternatives. In the Iowa example, the alternative which offered more for less would, in effect, rotate the budget constraint; with the cost of therapy (T) reduced, ceteris paribus, new market opportunities are made available to the consumer who now attains a higher level of utility. In Figure 3, the consumer reaches a new optimum at point B where the new budget constraint, TM^*, is tangent to a higher indifference curve, U^*.

In determining what constituted "failing" the rationality test, two criteria were imposed; first, failure to choose the lower cost alternative with more PT/OT services; and, second, displaying a preference for PT/OT among the other rankings would imply either inconsistency with economic rationality or violation of the axiom of the independence of irrelevant alternatives, which this model assumes to hold true (McFadden 1974).

The data collection had three primary purposes: (1) to examine the socioeconomic characteristics of the parents; (2) to generate, via the survey, willingness-to-pay responses regarding the early

intervention program; (3) to generate willingness-to-pay for individual components of the program using the ranked preference data.

The contingent valuation survey just described provided the data necessary to facilitate quantification of the benefits of the early intervention program as a whole, and the benefits associated with a tradeoff between price (tuition) and a program improvement. Three statistical techniques were used in the final analysis. The first was an ordinary least-squares (OLS) regression of bid value against parents' income, educational level, and training hours given to the child, as well as the change in cognitive caper scores over the intervention period (September to May), and the child's current program. A second set of regressions regressed the probability of choosing the initial bid for the current program against the above-described independent variables using a logit approach. The dependent variable (BID) is categorical (initial bid = 1; all other bids = 0) and a maximum likelihood procedure is used. Another logit was run in order to analyze the respondents' first choice of program. The probability of the first alternative chosen was regressed against the same independent variables (first choice = 1; all other choices = 0). Finally, to analyze the probability of receiving the entire ranking, a ranked logit model was employed which accepted the ranked survey data. The choice of one alternative over another gives an indication of utility.

The basic model specification of the ranked logit model estimated coefficients for the four attributes: tuition, class, hours of speech therapy, and hours of physical/occupational therapy (PT/OT). A further specification included the interaction of price (tuition) and income. From the estimated coefficients, a compensating variation estimate of

willingness-to-pay for a change (improvement) in program was provided which indicated the benefits to parents associated with each program component.

Results

Ordinary least-squares regressions

Of the 83 usable interviews, the mean selected bid for the whole program was $773, with a standard deviation of $1,650. This represents an equivalent variational measure of benefits: parents move to a new, lower level of utility by paying to maintain their child(ren)'s program. Overall, the bids obtained were skewed toward the low values indicating low willingness-to-pay for this program. . An initial OLS regression of bid was completed which regressed bid value against income (Y), education of the father (EF), education of the mother (EM), father's time spent training his handicapped child (HF), mother's time spent training her handicapped child (HM), caper scores (a measure of the child's master of skills) (C), class time (CT), hours of speech therapy (ST), and, finally, hours of PT/OT (PT). This regression treated the bids as if they were continuous. Results were:

$$BID = 249.2 - .143Y + 56.6EF - 85.3EM + 115.3HF - 16.7HM + 4.8C$$
$$(-.82) \quad (1.83)^* \quad (-2.17)^{**} \quad (4.81)^{***} \quad (-.99) \quad (.34)$$

$$+ 537.9CT + 854.9ST + 504.0PT$$
$$(1.86)^* \quad (2.67)^{**} \quad (1.69)^*$$

where the numbers in parentheses are t-values, * is significance at the .05 level, ** is significance at the .025 level, and *** is significance at the .01 level.

The dependent qualitative variable obscures the interpretation of these results. Still, there are a few worthwhile observations to be

made. The significance of both class time and father's time spent working with the child is striking. There is an indication that technology is leading the choice from the highly significant class coefficient. That is, the actual program the child is enrolled in plays an important role in how the parent values the program—more so than the level of achievement. It should be pointed out that there is a strong correlation of coefficients between mother's and father's time spent in training the child (-.67). Other interesting results of the analysis are that caper scores (achievement) apparently were insignificant with respect to the value parents placed on the program. This might indicate that the parents are deriving more utility from other benefits of the program, such as respite. The correlation matrix also indicated a weak but positive (.16 - .175) correlation between the coefficients for the caper score and mother's and father's time in training, respectively. This provides support, albeit weak, for the recent popular hypothesis among early childhood researchers that the parental role of teacher is paramount for preschool-aged children.

It should be recognized that the use of ordinary least-squares estimation is inappropriate when the dependent variable is qualitative. If other conditions of the model are met, then the estimated coefficients are still consistent and unbiased, but they are not "minimum variance unbiased estimates" (Neter and Wasserman 1974, p. 131). Similar regressions have been used by many investigators in the recreation economics field in the past. In addition, the correlation of the independent variables also results in a degree of imprecision in the information provided by the regression equation.

Logit regressions

When the dependent variable is an indicator variable, empirical and theoretical evidence indicates that the regression line probably will be curvilinear. If this is the case, then the logistic model is appropriate because it is easily linearized (Neter and Wasserman 1974).

For the second set of regressions, the probability of choosing a given bid was regressed against the independent variables using a logistical-based maximum likelihood estimator. The results of these regressions, with respect to sign and level of significance, are presented in Table 1.

TABLE 1

RESULTS FROM LOGIT ESTIMATION OF BID CHOICE

Bid	CT	ST	PT	Y	EF	EM	C	HF	HM	NUM
0	-*	-*	+	-	-	-	+	-	+	14
100	+	+	-	+	-	+	+	-	-	14
250	-	-	-	+	+	-	-	-	-	23
500	+	+	-	-	+	-****	-***	-	+	14
1000	+	+	+	+	+	+	-	+	-	9
2000	-****	+****	-****	+****	-****	-****	+****	+****	-****	4
6000			MATRIX WAS SINGULAR							
9000			MATRIX WAS SINGULAR							

* t > 1.5
** t > 1.7
*** t > 1.9
**** t > 2.0
Num = Number chosing that bid

As can be seen from Table 1, the coefficients are infrequently significant except for the $2,000 bid, of which there were only four observations. It is notable that low bids occurred where the father's training time is high, suggesting that household income may be relatively low (reported mean income for this population is $15,854 with a standard deviation of $9,769.50). This corroborates the relatively strong relationship (-.20) indicated from the OLS correlation matrix between household income and father's training time. Also, the coefficients on the physical therapy variable display a relatively consistent negative relationship with bids, although the half-day and speech therapy programs are more consistently positive. In all, strong conclusions cannot be made with regard to the relationship between the size of bid and the independent variables due to the extremely weak statistical results.

A second logit regression used the ranked survey data to estimate the relationship between the respondent's first choice of program and the same independent variables plus the price, or tuition (T), associated with the program choice. Table 2 contains the results of that regression.

The significance levels, while still fairly low, were higher than for the logit estimation of bids. Again, the conclusion can be drawn that the technology is leading the choice of programs, i.e., the program in which the child is presently placed is the first choice of the parents. The full- or half-day class coefficient, CT, is always positive for half-day students and negative for full-day students; therefore, for the Iowa sample, the probability of making a given choice of program was consistently determined by the type of school day in which

the child was enrolled. Other notable results include: (a) the signs
on the speech therapy coefficients were also relatively consistently
negative for the half-day program children and positive for the full-day
children; (b) the income variable is generally negative with respect to
the probability of choosing half-day, and positive for full-day pro-
grams; (c) and the mother's education also was positively related to the
choice of half-day programs but not consistently signed with respect to
full days. Again, strong conclusions cannot be drawn using this speci-
fication since significance levels are so low. Various subgroups of
households, with a larger sample size, should be analyzed in order to
test the variables' significance.

TABLE 2

LOGIT REGRESSION OF FIRST PROGRAM CHOICE

Choice	T	CT	ST	PT	Y	EF	EM	C	HM	HF	NUM	%
01	-	+	-	-	-	+	+	-	+	-	7	8.43
02	-*	+	-	-****	-	-	+	+	+	-	10	12.04
03	+	+	-	-	-	+	+	-	-	-	9	10.84
04	+**	+**	-**	+	+*	-****	+**	+	-	-	10	12.04
05	-*	+	+****	+*	-	+	-***	-*	+	-	14	16.87
06			M A T R I X		W A S		S I N G U L A R					
07	+	-	+	-	+	+	+	+	-	+	4	4.82
08	-	-	+	-**	+*	-	+	-	+	-	8	9.64
09	+	-*	+*	+	+	+	-	+	-	-	6	7.22
10	-	-	-	+	-	+	-	+	+	-	14	16.87

Rationality test

Because the results of the rationality test have important impli-
cations for the analysis of the ranked survey data, it seems appropriate

to discuss these first. Of the 83 usable interviews, 20 respondents failed the rationality test. This represents 24 percent of the data. With almost one-fourth of the respondents failing the rationality test, the initial concern was that PT/OT was not a "normal good." That is, as incomes increase, demand for PT/OT would decrease and other goods would be substituted in its place. In such a case, PT/OT would be considered an "inferior good." Analysis of the data reveals that PT/OT is not an inferior good. For the 63 respondents who did not fail the rationality test, over 50 percent clearly preferred the alternatives which offered PT/OT. Among those who failed the rationality test, PT/OT did not rank as high, but PT/OT never represented the last alternatives chosen and was fairly well-spread out among the choices. We must then conclude that since PT/OT can be considered a normal good, those 20 respondents who failed the rationality test were irrational.

Two levels of irrational behavior are included in the following analysis. The 20 persons who did not choose the lower cost alternative and who displayed a preference for PT/OT in other rankings are analyzed first. Of these 20, 8 respondents ranked PT/OT higher at every other possible opportunity. For these 8, inconsistency is most apparent because they obviously prefer to have PT/OT services, but they failed to choose it when it cost less.

Ranked contingency model

The ranked contingency model (discussed in Charles River Associates 1981, and Beggs and Cardell 1981) was utilized to assess the value of specific inputs of the program. The rankings obtained from the survey reflect consumer preference, or utility, which depended upon the characteristics of the indvidual and the attributes of the alternatives.

The contribution of each attribute is estimated by a statistical process which yields a set of weights for the program attributes maximizing the likelihood of the entire ranking. This distinguishes the ranked logit from the ordinary logit which calculated the probability of the occurrence of just the first choice. (The ranked logit is derived from the usual logistic model in Beggs and Cardell 1981.) The axiom of the independence of irrelevant alternatives is assumed to hold for this model, which simply requires that the probability of choosing between alternatives is independent of the presence of other alternatives (McFadden 1974).

From the contingent valuation survey, information regarding the parents' valuation of the program components was obtained. The data were divided into four sets for purposes of analysis. The first contained all 83 observations; the second used only those respondents which had passed the above-described rationality test--there were 63 in this group; a third group of 20 respondents failed to choose the lower cost alternative but preferred (i.e., ranked higher) PT/OT in one of two other opportunites; and the fourth group of eight respondents preferred PT/OT at every opportunity but failed the rationality test.

For the basic model specification, the change in utility--represented in the rankings--was regressed against the four program attributes. The estimated coefficients indicate the significance of each attribute to the representative utility function. These results are summarized in Table 3. The numbers in parentheses are asymtotic t-values which are consistent, but not unbiased, for small sample sizes. Usually, for a one-tailed test, the t-statistic should be greater than or equal to two to be considered highly significant.

TABLE 3

PARAMETER ESTIMATES--BASIC MODEL SPECIFICATION

Attribute	$\bar{n} = 83$	$\bar{n} = 63$	$\bar{n} = 20$	$\bar{n} = 8$
Base				
Tuition (multiplied by 10^{-3})	-0.0002 (-2.8451)	-0.0003 (-3.0648)	-0.0001 (-1.9956)	0.0000 (0.0662)
Class	0.0478 (0.5535)	-0.0415 (-0.4152)	0.1079 (0.6189)	-0.4827 (-1.7513)
PT/OT	0.3791 (2.2574)	0.2034 (1.0681)	1.3194 (3.7122)	1.3192 (2.2762)
ST	0.2208 (4.8672)	0.1706 (3.2798)	0.3826 (4.2380)	0.8063 (4.9795)

Note: t values in parentheses
         values greater than 2.0 are generally considered highly significant

For the 83 observations (Table 3, column 1), the basic specifica-
tion yielded a correct negative sign on the price variable, tuition,
implying declining utility with an increase in tuition level, i.e., less
expensive programs received a higher ranking. The negative effect of
tuition, while quantitatively small, is quite significant. Hours of
speech therapy and PT/OT were also highly significant. Both have posi-
tive coefficients, implying that parents derive positive utility from
these services and alternatives, which contain greater amounts of
therapy time, were consistently ranked higher. The coefficient on the
class variable is not significant in the basic specification for the 83

observations. In column 2, the regression results for the "rational" group are similar. Again, the sign on tuition is correct, but this time only speech therapy is statistically significant.

The "irrational" group is represented in the last two columns. The results of the regression using these respondents support the theory of the rationality test. Contrary to intuition, tuition is insignificant in both cases. And PT/OT, which should have a negative sign if they did not choose it for rational reasons, is positive and highly significant. Essentially, the results are exactly opposite to what would be expected if these respondents failed to choose the lower cost alternative because they did not prefer PT/OT. These results suggest that PT/OT, in fact, does have a positive impact on utility for these respondents also.

In specification B (Table 4), income and tuition were interacted in an attempt to further refine the parameter estimates. The negative, highly significant interaction coefficient (columns 1 and 2) implies that with rising incomes, the impact of tuition on utility is diminished. Conclusions drawn regarding this specification may be considered suspect though, because income and tuition are obviously highly correlated. The income effect essentially swamps the tuition effect, whose coefficient changes sign. These results are not used in further analyses because it is not clear that this specification enhances the model's ability to predict the change in utility associated with a program improvement.

TABLE 4

PARAMETER ESTIMATES FOR SPECIFICATION B

Attribute	$\bar{n} = 83$	$\bar{n} = 63$	$\bar{n} = 20$	$\bar{n} = 8$
Base				
Tuition (multiplied by 10^{-3})	0.0001 (.7913)	0.0006 (4.6441)	0.0003 (-3.2284)	0.0001 (0.6408)
Class	0.0287 (0.3156)	-0.0237 (-0.2259)	0.1372 (0.7323)	-0.4795 (-1.6440)
PT/OT	0.4021 (2.3382)	0.1910 (0.9810)	1.2865 (3.5143)	1.3142 (2.2252)
ST	0.2282 (4.9262)	0.1696 (3.1934)	0.3755 (4.0301)	0.8075 (4.9367)
Income x Tuition (mutliplied by 10^{-3})	-0.0118 (-4.5946)	-0.0383 (-10.3178)	0.1074 (2.7932)	-0.5375 (-0.8765)

Note: t values in parentheses
        greater than 2.0 are generally considered highly significant

In order to interpret the results in terms of a benefit tradeoff between a base program and an improved program, i.e., the change in utility associated with a program improvement, the program characteristics are evaluated with respect to price. As described above, this will attach a monetary value to the change in program from the base (half-day class with no therapy time) to alternative programs. It is assumed that any change in the program which represents an increase in the time the child spends in preschool and/or in therapy is considered an

improvement. These benefit estimates indicate the parents' willingness to pay for an improved program.

The benefit estimates presented in Table 5 indicate somewhat surprisingly low willingness-to-pay values for the program components considering the mean bid of $773 for the total program.

TABLE 5

BENEFIT ESTIMATES OF WILLINGNESS-TO-PAY (IN DOLLARS)

Program Improvement

Base to Full Day Class				Base to PT/OT				Base to Speech Therapy			
$\bar{n}=83$	$\bar{n}=63$	$\bar{n}=20$	$\bar{n}=8^*$	$\bar{n}=83$	$\bar{n}=63$	$\bar{n}=20$	$\bar{n}=8^*$	$\bar{n}=83$	$\bar{n}=63$	$\bar{n}=20$	$\bar{n}=8^*$
.24	-.14	1.09	---	1.90	.68	13.19	---	1.10	.57	3.83	---

*Note: $\bar{n}=8$
division by zero

The seeming conflict between the relatively high willingness-to-pay for the whole program and the extremely low values for individual parts of the program may be resolved by considering what service this early intervention program actually provides. The negative willingness-to-pay for an increase in class time indicates that the parents prefer the half-day class over the full-day. Perhaps, three hours of respite

from the physical and emotional drain of caring for a handicapped child is enough, even if this time only represents a babysitting service. The overall benefit of respite could overshadow the value of special services which are very expensive as well as short in duration. Parents must recognize that these services are provided daily on a continual basis in the classroom activities anyway.

CHAPTER V

CONCLUSIONS

The purpose of this study has been to apply the concept of contingent valuation to the educational field. Empirical contingent valuation research yields considerable and useful data as long as the contingent markets are well-defined and the researcher has been careful and aware of complications associated with bias. These data can yield very accurate results for valuing unpriced, or "public goods." For both the public policy-maker and the entrepreneur, such results can be essential in decisionmaking. The reach and applicability of the CVM extends far beyond the field of economics; it can be used in any situation where nonmarket goods require valuation or potential demand is to be forecasted.

In the case of a public good, such as an early intervention program, the opportunity to create a well-defined hypothetical market and elicit accurate responses seems quite good. For one thing, all the respondents are intimately involved and, typically, are assumed to be very interested in the education of their offspring. Often they are directly involved using intervention techniques for therapy in the home. At the same time, however, such intimacy itself poses a problem, because the issue of handicapped children is such a delicate one. The emotional element may bias the results in favor of the program the parents have already committed themselves to. It may be that no matter how the

questions are worded, the outcome would be that the technology leads the choice.

From the contingent valuation study done for the early intervention program in Iowa, it is difficult to draw strong conclusions given the OLS and ordinary logit regression results. However, it appears that the program in which the child is currently placed has a significant impact on the parents' choice of the "best" program out of the alternatives presented. Secondly, the bid levels were relatively low, given the strong support for these programs indicated by parents in the interview process, and by the public in general. Only 20 percent of the parents indicated a bid of $1,000 or more per year for their current program. The relatively low bids may be a reflection of income levels, since a significant portion of these parents earned low incomes or were receiving public support; or they may reflect a strategic bias which would cause administrators to charge low tuition fees, if such fees were ever instituted.

The ranked logit was conducted to determine if there is an associated value for each service the program offers. These results were, by far, more meaningful than the previous. The estimated coefficients for the whole population are reassuring: prices and services provided are significant, which would be expected of any group of consumers. It seems safe to conclude that the respondents performed the ranking task with these things in mind; in this sense, the "game" worked. The change from the base class of a half-day did not represent an increase in utility as presumed. For the "rational" group, speech therapy did not contribute significantly to the representative utility function.

The rationality test was successful in identifying irrational consumer behavior, or those individuals who did not take the "game" seriously. For them, prices and quantity of services delivered produced counterintuitive results. While we can only speculate as to the reasons behind such responses, other researchers have found that CV surveys have often been met with a similarly obstinate response. It may be that confronting individuals with a hypothetical market—one in which they have no prior experience with the valuation of—is so artificial as to make valuation difficult. In a real market situation the consumer is less constrained in terms of information and aids to decisionmaking. In the hypothetical market, all the typical aids are fixed by the interviewer and survey design. It is highly unlikely that a hypothetical market could ever compensate for the real world parameters (Bishop et al. 1983).

In total, 63 of the respondents, all acting like rational consumers, took the game seriously and attempted to overcome the hypothetical nature of the market. Again, this is characteristic of the CVM. It is something that the researcher must take into consideration and try to compensate for. The power of the test is implied by these inconsistent responses and the inclusion of a rationality test into the contingent valuation survey is justified. While the CVM has been applauded for the quantity of information it produces, the necessary focus must be upon the quality of its content.

The low willingness-to-pay values are not surprising if the primary service this preschool provides to the parents is respite. The relatively high bids for the program seem to reflect that the benefits of child care far outweigh the benefits of specialized services.

Overall, this population is low income and probably would not purchase these services if they were not publicly provided. In this light, these results provide little justification for public expenditures on these special services.

For future research on this topic, a larger population, if possible, should be analyzed in order to overcome some of the estimation problems encountered, and also to provide a more sound basis for drawing conclusions.

Also, while private options do exist in special education, it was not within the workscope of this study to include them. It would be an ideal test of the methodology to make empirical comparisons between willingness to pay for public programs obtained by the CVM and actual market transactions for the private programs.

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APPENDICES

Appendix A: Parent Interview

Interviewer _____   Date _____

Location of Interview _____

Parents' Names _____   Telephone _____

Address _____

	Relationship	Age

Household Members:

                      _____   _____

                      _____   _____

                      _____   _____

                      _____   _____

                      _____   _____

                      _____   _____

                      _____   _____

                      _____   _____

                      _____   _____

                      _____   _____

                      _____

       The purpose of this interview is to determine the effect that parent time applied to the education and training of their handicapped child has on the child's development.   We will ask some questions about the family, and then we will discuss your keeping a log of the time which any member of your family spends in helping your child learn. Some of these questions may not seem relevant to you, but the informa- tion will help us examine all of the aspects of educating handicapped children.   Your answers will be kept in strictest confidence.   No one, other than the researchers, will be allowed to examine your responses. The information collected will be treated together, and no one person or family will be identifiable.

1.   Socioeconomic Data:

    A. Employment

       Occupation:

       _____ Husband _____

       _____ Wife   _____

       _____ Others   _____

       Hours Worked Per Week:

       _____ Husband

       _____ Wife

       _____ Others involved in family support

Wages Per Hour:

_____ Husband
_____ Wife
_____ Others

Annual Estimated Gross Wages Earned by Household Member During 1983
[if self-employed, use gross income estimate from primary occupation(s)]:

_____ Husband
_____ Wife
_____ Others

Income from Other Sources (indicate amount and sources):

_____ _____
_____ _____
_____ _____

B. Education (highest level/special education/vocational-technical):

Husband _____
Wife _____
Other members involved in aiding child _____

2. Purchases Made for Child's Help

Durable Items Purchased for Meeting the Child's Handicap (these are expenditures made once or a few times during the year for equipment or other aids for the child, which are used throughout the year):

Item	Dollar Value
_____	_____
_____	_____
_____	_____
_____	_____

3. If you give your child training or therapy in the home, please answer the following questions.

A. During which hours of the day do you typically train your child?

Husband _____
Wife _____
Other _____

B. How many days per week?

Husband _____
Wife _____
Other _____

C. In what area of the home do you conduct your child's training?

Husband _____
Wife _____
Other _____

D. Value of home:

1. If you own your own home, what did you pay for it, and when? How old is the house?

2. If you rent, what are your monthly payments?

4. Choice of Programs:

If you had a choice, what type of weekly program would you prefer your child to receive (rank from 1 = most preferred, to 3 = least preferred)? Give reason why chosen.

_____ 1 hour in home _____
_____ 5 half days in center _____
_____ 3 half days in center _____
_____ 5 full days in center _____
_____ 3 full days in center
_____ 4 half days in center, 1 hour in home _____
_____ 4 full days in center, 1 hour in home _____

5. What other services does your child receive?

_____ Medical
_____ Social
_____ Therapy

Average Time Per Week:

Speech _____
Physical or Occupational _____
Other _____

6.   Child Transportation:

        _____ Car Pool
        _____ Miles Driven Per Week (if you are in a car pool, use the
                miles you drive in that car pool per week and indicate
                the number of children in car pool)

        The information which is listed above will help us to examine the
effect of your participation in your child's education, but we also need
to know what your time and expenditures were for a sample period of
time.   On the following form, please indicate the amount of time which
you, your spouse, or others spent each day in direct aid to the educa-
tion of your handicapped child.   Also indicate any expenditure made in
conjunction with the training of your child.   Next, indicate the hours
(to the nearest 1/4 hour) worked outside the home for each employed
member of the household. Finally, please indicate the time and miles of
transporting your child to school, to therapy, or for medical services.

Appendix B: Contingent Valuation Questionnaire

The questions which we are going to ask you are aimed at finding the value of the early intervention program in which your child(ren) are enrolled.   There is no plan to charge a tuition fee for your child(ren) at the present time.   In fact, the State of Iowa guarantees your child(ren)'s education, as you know.   However, we are attempting to determine a value of various parts of the program, as well as the program itself, in order to give administrators information which they can use in decisionmaking.   We ask you to please give us the most accurate answers you can.

Assume that the State of Iowa were to apply a tuition charge, or admission fee, to your child(ren)'s current program.   You would have to pay this fee in order to have (each of) your child(ren) participate in the program.   Would you be willing to pay a fee of:

___$0   ___$100   ___$250   ___$500   ___$1,000   ___$2,000   ___$3,000

___$4,000   ___$5,000   ___$6,000   ___$7,000   ___$8,000   ___$9,000

___$10,000   ___$11,000   ___$12,000   ___$13,000   ___$14,000

___$15,000   ___$16,000   ___$17,000   ___$18,000   ___$19,000

___<$20,000   (Indicate how much $_____)

If you indicated $0 (you would be unwilling to pay anything to have your child(ren) participate in the program), please indicate your reason:

_____ The program is not worth any extra expense to me.
_____ No one should have to pay for the program.
_____ I could not afford to pay for the program.
_____ Other (Explain below).

Suppose that various kinds of programs were offered to different tuitions.   Professional time is the time spent by visiting or resident professional speech, occupational, or physical therapists in direct contact with your child.   Please rank these alternatives from the program and tuition fee you most prefer (1) to the program and tuition fee you least prefer (10):

Rank	Tuition*	Classtime Half Day Full Day	Hours per Week	
			Prof PT/OT	Prof Spt
_____	$ 2,400	Half	0	0
_____	3,500	Half	0	1
_____	4,350	Half	1/2	0
_____	5,250	Half	0	2
_____	7,000	Half	1/2	2
_____	5,850	Full	0	0
_____	8,750	Full	1/4	0
_____	8,200	Full	1/2	0
_____	9,350	Full	0	2
_____	11,350	Full	1/2	2

*Note: tuition levels vary depending upon the
parent's initial bid and the program the
child was enrolled in.