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ABSTRACT

There are a number of ways that government policy might increase the educational benefits that preschool children receive from television. These include (1) direct government funding of educationally oriented broadcasts; (2) strengthened Federal Communication Commission rules mandating more educationally oriented television; (3) a national center for children and television; (4) tax incentives for research, development, and production of educational broadcasts; and (5) continuation of the status quo. Each of these policies was judged by several criteria, including efficiency in promoting education, the equity in distributing costs and benefits, and the degree to which each satisfies individual preferences. The resulting data, along with data gathered from existing research and from a survey of 119 people involved with children and television, suggested that the present arrangement in broadcasting for preschool children is unsatisfactory and ineffective. However, alternatives to the status quo, including direct funding and tax credits and, to a lesser degree, a center for children and television, showed promise of effectively promoting educational benefits through television. Tax credits, rulemaking, and--to a lesser degree--the center and direct funding options appeared the most equitable of the options, while direct fundings and tax credits appeared best in satisfying preferences. (FL)

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TELEVISION AS AN INSTRUMENT  
IN THE INFORMAL EDUCATION  
OF PRESCHOOL CHILDREN:  
AN ANALYSIS OF NATIONAL OPTIONS

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### Summary

This analysis examines some ways government policy might increase the educational benefit preschool children receive from television, including direct government funding of educationally oriented broadcasts, strengthened Federal Communication Commission rules mandating more educationally oriented TV, a national center for children and television, tax incentives for research, development and production of educational broadcasts, and continuation of the status quo. These policies were judged by several criteria including efficiency in promoting education, the equity in distributing costs and benefits, and the degree which each satisfies individual preferences.

Data from existing research and a survey of those involved with children and television suggest that the present arrangement in broadcasting for preschool children is unsatisfactory and ineffective in educating preschool television viewers.

However, alternatives to the status quo, including direct funding and tax credits and to a lesser degree, a center for children and television, show promise of effectively promoting educational benefit through television.

Tax credits, rulemaking, and to a lesser degree, the center and direct funding options appear most equitable. Direct funding and tax credits appear best in satisfying preferences. (For a summary, see Tables 1 and 2.) Recommended is a policy of direct funding and tax credits, administered through a center for children and television.

### Analysis of the Problem Situation

Education is highly valued in our society, as the universal tuition-free schooling made available to all children between the ages of 5 and 18 demonstrates. There is, however, inconsistency in our social policies encouraging education. At the college and graduate levels, education is subsidized by direct grants and by tax deductions for contributions to educational institutions. At the elementary and high school levels, education is mandatory and provided tuition free. But during the preschool years, there is no comprehensive government program for promoting education for all children. Public concerns about government intervention in family life are legitimate, and suggest that a continual lowering of the age for the initiation of formal, compulsory schooling may not be an appropriate approach to this problem. A partial solution may be found in informal education through television.

Television is clearly an educational medium. With or without educational objectives, viewers learn from television. That television can and does have effects, both positive and negative, and on a wide range of human attributes, is well established. Comstock, in a review of studies on incidental learning from television, states that "television viewing outside of school is a source of information for children . . ." (1978, p. 17). And television may not only inform, but misinform (Hawkins & Pingree, 1981), providing distorted impressions of the world. But beyond simple facts (and fallacies) television has been found to influence even the acquisition of basic cognitive skills, such as the ability to rotate mental images of geometric objects (Rovet, 1976) and make mental representations of abstract concepts (Salomon, 1972, 1979).

Television viewing not only influences mental development, but also attitudes (Dominick & Greenberg, 1972), emotions (Bandura, 1977) and affective development (Dorr, 1981). And the range of influence runs from removing fears and anxieties (Bandura, 1977) to apparently fostering them (Gerbner & Gross, 1976; Bryant, Carveth & Brown, 1981). The influence of television appears to span the processes of creativity (Meline, 1976) and imagination (Singer & Singer, 1976, 1981a, 1981b). But the impact of television is not limited to internal states -- it is also manifest on behavior, both antisocial (see Rubinstein, 1980b) and prosocial (Stein & Friedrich, 1975; Baran, Chase & Courtright, 1979; Rubinstein, Liebert, Neale & Poulos, 1974)

A meta-analysis of television and social behavior (Hearold, 1979) found that TV viewing affects both prosocial and antisocial behavior and that absolute size of the effects are larger for prosocial viewing than for antisocial viewing. And that these effects are largest for preschool viewers.

When this accumulation of scientific evidence is combined with audience studies that show 2 to 5 year olds are heavy television viewers, spending between 2 to 3 of their waking hours each day watching TV (Epstein & Bozler, 1976; Hollenbeck, 1978), the two sets of data together suggest the enormous educational resource available in television.

The problem this analysis will address is how the previously untapped potential of television can best be directed into positive educational outcomes for preschool children. Given the importance of these formative years in a child's development, and the pervasive nature of the medium, early intervention through television could be crucial in producing beneficial changes in the social, emotional, and cognitive growth of our nation's children.

Although education is a constitutional prerogative of the states, the federal government has long taken a significant role in facilitating their

efforts. And since television programming is produced primarily at the national level, the most effective intervention in this process would also take place at the national level. Given these considerations, the analysis will focus on the ways in which Congress, the Federal Communications Commission (FCC) and the Department of Education may, through legislation or regulation, promote education of preschool children through entertainment television.

The general approach which this study will take is that of policy analysis, that is "the application of reason, evidence, and a valuative framework to public decisions" (MacRae & Haskins, 1981, p. 2). The particular model of policy analysis applied in this study is the "Bush Model" (Haskins, 1980) which is very flexible, and can be applied to a wide range of policy problems. This model of analysis consists of several essential components: definition of problem, selection of policy options, choice of valuative criteria, application of the criteria to the options and analysis of political feasibility. Having defined the problem, the next step in the analysis is the selection of the policies to be analyzed.

#### Selection of Policy Alternatives

Since its inception, television has been seen as a potential tool for educating children. A number of proposals have been made in attempts to realize some of that potential. Among the more prominent proposals are: direct funding for development and production of educational broadcasts for children; strengthened federal regulation of broadcasts with large child audiences; and a variety of proposals for national centers for children and television. Another approach involves offering tax incentives for research, development, and production of educational children's programs, thereby encouraging commercial

broadcasters to put more resources into such efforts. A final option is to continue the status quo.

### Status Quo

The status quo reveals that the Federal Communications Commission has done little to pursue its statutory charge to see that the broadcast stations licensed under its authority operate in the "public interest." An evaluation by the FCC (FCC, 1979) of guidelines issued to improve the benefits of children's programming (FCC, 1974) indicated that these guidelines, not backed by any perceived threat of sanctions, were followed by no improvement, and perhaps deterioration, in the educational benefit of children's programming on commercial stations. Furthermore, only modest and unsystematic federal funding has been made available for non-instructional, educationally oriented programs for children shown on public television.

### Direct Funding

The direct funding alternative is a strategy in which federal funds (along with private contributions) would be used to finance research, program development, and production of programs with educational objectives specially tailored for preschool children. These objectives would be developed and specific program segments designed to meet them through the coordinated efforts of developmental and educational researchers and program writers and producers. This approach has been tested extensively in the form of funding for such programs as "Sesame Street" and the "Electric Company." Because of the research done on these programs -- and "Sesame Street" in particular -- they provide substantial data for estimating the impact of such programming on preschool children.

### Rulemaking

Under the rulemaking alternative, the Federal Communications Commission would mandate that television stations licensed under its authority increase the educational value of programs they broadcast that have substantial preschool audiences. This policy would entail an extension of the general regulation of television in existence since its inception, and a strengthening of the specific regulations relating to educational values in programming for children embodied in the FCC's "Children's Television: Report and Policy Statement" of 1974. A specific set of proposals and arguments to support them were later developed by the FCC (FCC, 1979).

Despite the trend toward de-regulation, the rulemaking approach is not dead, and recent events suggest it may be gaining new life. A national commission on education recently recommended "federal regulation (requiring) educational programming for children (National Science Board, 1983, p. 60) and, in an apparently independent action, a bill has been introduced into congress to make such a rule into federal law (House Bill Demands, 1983).

### Tax Incentives

The tax incentive option would offer tax credits for expenditures in the area of research, development and production of educationally beneficial programs designed for children. This alternative would represent an expansion of current tax policy encouraging the educational activities of nonprofit organizations (through tax exempt status and tax deductible contributions) to include some educational activities of profitmaking organizations.



### National Center

A National Center for Children and Television would be an independent national facility funded by the federal government (along with private contributions), which would collect, disseminate, and fund research on children and TV. It would also offer awards for superior performance in each phase of children's broadcasting. Although proposals for centers similar to the one outlined here have been made and studied (see Rubinstein, 1980a; Van Dyck, 1977), such a center has not been established.

### Criteria for Evaluating Policy Options

In the evaluation of any public policy decision there are a number of widely agreed upon criteria which may be applied. Among the universal criteria that will be used in this analysis are: effectiveness, efficiency, equity, and preference satisfaction. Effectiveness will be measured as the impact of each policy on cognitive, social and emotional development. Efficiency is the ratio of benefits to costs. Equity can be judged by the equality of the distribution of benefits and costs. Preference satisfaction may be measured as the increased or decreased opportunity of those influenced by a policy to have their preferences satisfied. These criteria will be applied to each policy option in the context of the specific goal of increasing the educational benefit of television viewing by preschoolers.

### An Overview of the Impact of the Status Quo on Child Development

The first step in determining the educational effectiveness of each of the potential policies is to examine present viewing patterns of the preschool audience. According to recent industry estimates (Nielsen, 1981b), 2 to 5 year

olds view just over 27 hours of television per week averaged over the year. This level of viewing has remained relatively constant over the past decade.

One difficulty in accurately estimating preschool children's viewing by program type is the general exclusion of public television from commercial audience statistics. Where data are available for public television, they are generally not comparable to network affiliate and independent station audience statistics. However, using Arbitron data from 10 markets for 1977 and 1979 (Fontes, 1979) estimates of the relative audience of network, independent and public television may be made for weekday viewing. These data indicate that independent stations dominate the daytime, weekday preschool audience with an average rating among 2 to 5 year olds of 15.6, as compared to 6.4 for network affiliates, and 2.5 for public stations. These ratings numbers indicate that an average of 15.6% of all 2 to 5 year olds are watching independent stations, 6.4% network stations and 2.5% public stations on weekdays at any given hour between 7 a.m. and 8 p.m. Even assuming all public television viewing by 2 to 5 year olds is of educational programs, and including the audience of the six commercial stations showing "Sesame Street" as a syndicated program, at most, only about 12% of all weekday daytime viewing by preschoolers is "educational."

Since prime-time programming is overwhelmingly dominated by adult programming, and Saturday mornings by cartoons and other entertainment programs, the percentage of age-specific, educationally oriented programs of all programs viewed is probably even smaller than 12%. Even 10%, however, would represent an average of 2.7 hours of "educational" viewing per week for the 13 million American 2 to 5 year olds (Nielsen, 1982c).

Impact on Cognitive Development. Even using the conservative estimates of Cook and associates (1975, p.213) of the effectiveness of "Sesame Street" in improving scores on a test designed to measure skills indicative of school readiness, the effects were found to be moderately substantial. Analyzing data from the second year of the Educational Testing Service experiment in Los Angeles, and adjusting post-test scores for pre-test differences, they found that after 6 months of viewing, heavy viewers (averaging 4 hours per week) scored 93.9, while light viewers (averaging 1 hour per week) scored 88.7 and nonviewers scored 83.8. Using the effect size measure (Glass, McGaw & Smith, 1981) in order to allow comparisons between various measures of growth, these results indicate an effect size of about .37 for 2.7 hours of viewing per week for 6 months. This indicates that at that level of viewing the average child's score would increase .37 of a standard deviation. These results also suggest a diminishing return for high levels of viewing of the same program, since the first hour of viewing per week produces an effect (.21) almost equal to the effect of the next three (.23).

To give some substance to these "effects," they may be compared to the effects of preschool. Nieman (1971), in an evaluation of the Early Childhood Education Project in Cincinnati, found an effect of .442 on Metropolitan Readiness Test scores for 4 months of preschool as compared to no preschool. If we set the worth of this much cognitive benefit at its cost for this program (that is, conservatively assuming a benefit/cost ratio of 1), we may then estimate the value of preschool viewing of public television. Since this program cost \$325 for 4 months and had a benefit of .442, we may estimate the value of a "unit of effect" as \$735. If we estimate the impact of the 2.7 hours of educationally oriented public television viewing for 6 months at .37

by assuming equal effects for other educational programs such as "The Electric Company" and "Mister Rogers," then the value of 6 months viewing may be estimated to be approximately \$272 for the average child -- for a total annual benefit for the population of 13 million 2 to 5 year olds of approximately \$7 billion.

Even if we assume conservatively, as we will throughout this analysis, that only half of the benefit of education is measured in quantitative educational outcome measures (and assume against the evidence that educationally oriented programming has no other benefits, such as increased prosocial behavior), the total annual benefit for preschool children is still \$3.5 billion. And this is an estimate of benefits for preschool children, no others. Benefits accrued by older children would be in addition to this.

On the other hand, the other 90% of preschoolers' viewing consists primarily of cartoons, action programs, adult situation comedies, and other entertainment programming that have been found to be related to reduced cognitive growth in children. Specifically, studies indicate that television viewing in general is related to slower growth in performance IQ (Gadberry, 1980), lower grades (Burton, Calonico & McSeveney, 1979) and reduced rates of growth in reading skills (Hornik, 1978).

The data from the Gadberry experiment (1980) suggest a substantial effect on performance IQ (effect size of .911), but no effect on verbal IQ from restricting TV viewing to half of normal for 6 weeks. Because of the small sample size in this experiment, it would be unwise to project these figures to the population of all viewers. Still, they suggest the negative effects of noneducational broadcasts on cognitive growth are of the same order of magnitude as the positive effects of educational broadcasts, and because of the

larger amount of time spent with noneducational programs, that these negative effects are more important in absolute impact.

Impact on Social Behavior. Based on data from a content analysis of television violence done as a part of George Gerbner's Cultural Indicators Project, and combining it with estimates of effect from her meta-analysis, Hearold (1979) approximated the overall effect of present television programming. Using estimates from Gerbner which indicate that television is about 74% antisocial, 13% prosocial and 13% neutral, it may be estimated that the impact of all television is to enhance antisocial behavior by an effect size of .19. But even given the small proportion of prosocial programming, television's overall impact is to enhance prosocial behavior by about .09. Although these estimates are far from certain, and clearly oversimplify a complex process, they suggest that policies which increase the number and audience of prosocial programs (on commercial or noncommercial television) would decrease antisocial behavior and increase prosocial behavior. And this effect would be multiplied if prosocial programs were substituted for antisocial programs.

Impact on Emotional Development. In a review of research on television on affective development, Dorr (1981) states that televised violence and aggression have been shown to evoke negative emotional responses such as fear and anxiety, while prosocial and educationally oriented programs have been shown to evoke more positive emotional responses among children, including preschoolers. In addition, prosocial programs appear to have the potential for increasing self-awareness of emotional states and empathy with others. Again, the present programming and audience structure would suggest that much of this

programming has some negative impact, while the smaller portion of educational and prosocial programming has a positive impact on emotional development.

#### The Impact of Direct Funding on Child Development

Most of the evidence offered as indications of positive effects of the status quo (especially on cognitive development) are related <sup>to</sup> the impact of the most beneficial programs (e.g., "Sesame Street" and "The Electric Company") which are products of direct funding. Given the previously estimated level of benefits (\$3.5 billion per year for preschoolers), assuming that test measured benefit is half of the benefit of preschool, this would indicate that direct funding has been enormously effective.

#### The Impact of Rulemaking on Child Development

Rulemaking, unlike direct funding, has not been successfully pursued. The Federal Communications Commission guidelines enunciated in 1974 in the "Children's Television Programs: Report and Policy Statement" (FCC, 1974), were designed, in part, to "increase the amount and scheduling of educational and informational television programs for preschool and school-age children" (FCC, 1979, p.74). These guidelines are presently in effect. An FCC evaluation of the impact of these guidelines concluded that this approach had "produced no changes in the programming practices of broadcasters" (p.76) and had lead to "no increases in the amount of educational programming for children" (p.76; see also, Chamberlin, 1979).

With more stringent penalties, and better monitoring and enforcement, rulemaking might be effective, but such an approach would create a number of problems, including restrictions on the constitutionally guaranteed freedom of

expression of broadcasters.

### The Impact of Tax Incentives on Child Development

Offering tax credits for research and development of educationally oriented programs for preschool children would have an impact on development in direct proportion to the number of programs produced, the audience of those programs, and their educational effectiveness. Given the successful record of all three of the networks in commissioning and producing popular entertainment programs, and the success of such programs as "Sesame Street" and "Mister Rogers" in educating young children, there is little reason to doubt that the networks and independent producers could produce educationally effective children's programs. In addition, there is fairly conclusive evidence that such programs could draw substantial audiences on commercial television. Among all syndicated programs, the one with the highest average rating among 2 to 11 year olds is "Sesame Street" (Nielsen, 1982a). Since it is most popular among 3 to 5 year olds, it must dominate the 2 to 5 year audience in those six markets where it is shown on commercial stations. From this it seems apparent that if "Sesame Street" were a commercial venture, and widely broadcast as a network or syndicated program, it would be financially, as well as educationally, successful.

As Mielke, Johnson and Cole (1975) point out, however, "commercial television is neither organized nor administered to absorb the extra costs of curriculum development and evaluation; it is primarily interested in entertaining its audience." (p.iii) and for survival growth, commercial television is even more interested in making a profit.

If education became profitable, commercial television could reorganize in

the interest of education as well as entertainment. Tax incentives in the form of tax credits could underwrite the costs of programming, curriculum development and evaluation and make such programming costs competitive with those of pure entertainment programming.

If these "educational" programs were as popular as the average entertainment program now broadcast, (or more popular, as the "Sesame Street" data suggest they might be), they also would be more profitable. And finally, if the programs were about as effective educationally as the present publicly broadcast educational programming, then their overall impact would be greater because of the greater penetration of commercial television as compared to public television. In fact, comparing the average rating among 2 to 11 year olds for "Sesame Street" as a syndicated program on commercial stations (12.4) (Nielsen, 1982a) to its average rating on public stations (3.4) (Nielsen, 1982b), suggests that the potential effectiveness of commercial broadcasts is substantially larger than that of noncommercial broadcasts.

#### The Impact of a National Center on Child Development

Of the five options under consideration, the most difficult to evaluate is the center option. The effects that a center for children and television might have on the development of preschool children are all indirect and derivative. But since the effectiveness of current educationally oriented programs now shown is due in large part to child development and television research (i.e. Sesame St.), it is reasonable to assume that a center facilitating research would positively influence future programs.

In collecting, disseminating and funding research on children and television, a center might not only increase the amount but the effectiveness



of such research. In addition, the recognition, publicity and small measure of status that would be conferred by the awards that such a center would offer might be some incentive to those already involved in children's television production, and perhaps would even attract some new talent to the field. But even assuming that such effects would take place, estimating their size does not appear to be feasible.

Research and development never has guaranteed results, nonetheless, leading industries continue to invest in their future. A national center for children could provide an institutional focus for national investment in the television education of preschoolers. (Refer to Table 1 for evaluation of options.)

### Efficiency

Based on the evidence on the effects of the status quo, it appears that its cumulative impact on cognitive, social and emotional development is negative and clearly suggests a problem in this area. Leaving things as they are is one approach to the problem. However, rather than analyze the status quo as a separate option against some nonexistent ideal, it will be used as a baseline against which the other options are measured.

### The Efficiency of Direct Funding

A rough estimate of the efficiency of direct funding in producing educational benefit may be made by comparing the costs to the benefits of "Sesame Street." Because most of the appropriate data is available only for the time period circa 1970 all cost and benefit data for all estimates will be

expressed in 1970 dollars. The total costs for producing "Sesame Street" (in 1970 and 1971) ran in the range of \$7 million to 8 million per year (Cook et al., 1975, p. 332). In addition to the direct costs, there are the distribution and broadcast costs. Since many, if not most, public TV stations show the 5 hour-long broadcasts twice during each weekday (Nielsen, 1982a), we estimate that the average station broadcasts about 10 hours of "Sesame Street" each week, which represents about 8% of the 6 a.m. to 12 p.m., Sunday through Monday broadcast week. If we then prorate the total operating costs of the entire public television system for one year, \$195.4 million for 1972 (Mielke, Johnson & Cole, 1975, p. 56), then we may estimate the distribution costs of "Sesame Street" at \$15.6 million per annum (8% of \$195.4 million). Combining the higher program cost figure of \$8 million with \$15.6 million for distribution and broadcast costs (which overestimates actual costs since it ignores the fact that "Sesame Street" is shown in off-peak hours), we arrive at an estimate of total costs of \$23.6 million per year.

Using a variety of sources, Cook and associates (1975, p. 315) estimated the number of regular viewers of "Sesame Street" between the ages of 2 and 5 in the 1970-1971 viewing season to have been between 5.25 and 6.75 million. If we take the lower figure and then calculate that regular viewers watched the program about half the time (that is, about half a program every day or the whole program every other day), ignore the additional viewing of heavy viewers, and assume that those who were less than regular viewers did not view at all, we may make a very conservative estimate of the total amount of preschool viewing as 13.125 million viewer/hours per week or 682.5 million viewer/hours per year. This would appear to be a low estimate given that data from the first year evaluation of "Sesame Street" suggest an average of over 3 hours per

week for all children between 3 and 5 years of age (Ball & Bogatz, 1970, pp. 58-64).

Combining this viewing estimate with estimated costs, we may obtain a figure of 3.46 cents per preschool viewer per hour, for a total of \$4.50 per regular viewer per year. (An estimate which is substantially higher than that of Cook et al. of between \$.96 and \$1.24 per viewer per year.) Again using one-half of the educational replacement cost as the amount of benefit, with an estimated effect size of .35 for 6 months viewing at 2.5 hours per week and a "unit of effect" cost of \$735, we may estimate an individual benefit of \$257.25 per year and a total annual benefit for the 5.25 million regular viewers of \$1.35 billion. Estimating costs as the total of all costs for production and distribution (\$23.6 million) produces an estimated benefit/cost ratio of 57 to 1.

#### The Efficiency of Rulemaking

The incremental costs to the government of the rulemaking approach should not be substantial since the FCC as a regulatory body is already in existence and periodic reports on programming practices are already required of broadcasters. Costs to broadcasters would depend on any changes in programming costs and audience size, if any. Since educational programs (eg. "Sesame Street") have been produced at less cost than many commercial entertainment programs for children (Pearce, 1972, p. 11-14) and can be more popular (Nielsen, 1982a), there may be monetary benefits rather than costs to broadcasters. It is also difficult to estimate benefits, since no effective rulemaking has been invoked, and previous attempts using only guidelines have had no effect. Again, rulemaking, strictly applied, might produce results very

efficiently if only dollar costs were considered, and not those costs measured in terms of the loss of liberty of expression.

### The Efficiency of Tax Incentives

Network revenues for weekend children's programs were about \$91.53 million in 1970 (Pearce, 1972, p. 15) for 21 hours of programming per week for all three networks combined (p. 58). By including 16.7% of the nonprogramming costs (to represent the 21 out of 126 weekly broadcast hours between 6 a.m. and 12 midnight) of network affiliated stations, we may estimate the broadcast and distribution costs of weekend children's programs at \$99.45 million out of \$596.7 million in nonprogram costs (Noll, Peck and McGowan, 1973, p. 90). From these two figures we may approximate the total cost of the 1,092 hours of children's weekend programming as \$190.98 million, for an average cost of \$174,890 per hour.

During the following fall season, 1971, the average rating for all Saturday and Sunday morning network programs was 6.7 for all television households (Pearce, 1972, p. 44). Using data from a local market (Raleigh/Durham, NC) for the fall of 1981 for Saturday morning viewing (Nielsen, 1981a, pp. 54-56), we estimate that the rating among 2 to 5 year olds was at least twice that for all households, and for 6 to 11 year olds about half again that rating. Assuming that Saturday morning ratings reasonably approximate all weekend viewing, Sunday morning viewing being less, prime-time viewing such as "Walt Disney" being considerably more, we may estimate that the average weekend network television program has about 1.742 million preschool viewers, and an additional 2.010 million viewers aged 6 to 11. Considering only those children between 2 and 5 years old each hour of programming costs

about 10 cents per viewer. Including 6 to 11 year olds reduces the cost to 4.7 cents per viewer per hour.

If we assume that commercially financed and produced educationally-oriented programs would be about as educationally effective as the directly funded programs already produced (i.e. "Sesame Street"), and again assume test-measured achievement as one-half of the total benefit of preschool education, we may estimate the benefit per preschool viewer per hour viewed as \$1.94, for a potential total benefit for all preschool children for all network weekend viewing of \$3.65 billion. Given previous estimates of costs, the benefit/cost ratio is 19 to 1, for the conversion of commercial entertainment programming to educational programming. If viewers between 6 and 11 are included and assumed to have comparable levels of benefit, the benefit/cost ratio rises to 42 to 1.

These benefit/cost ratios are conservative estimates in the sense that they assume that a tax incentive must cover all costs in order to be effective. Although it is reasonably certain that the networks and their affiliates would find it economically attractive if they were guaranteed their present level of revenues, including profits, for producing educationally oriented children's programs, such a level of funding would probably not be necessary to be effective. As long as the networks and their affiliates were allowed to continue selling advertising on these programs as they do now, the great majority of costs would be covered by that income as long as audience ratings remained constant. And there would still be some incentive as long as the tax credit at least covered the additional costs.

But ratings, not additional costs, are the primary concern of commercial broadcasters. Many commercial entertainment shows for children, including

Saturday morning cartoons, cost substantially more to produce than "Sesame Street" or "The Electric Company" (Pearce, 1972, pp. 11-14). It is the networks' perception, however, that educationally oriented programs draw a smaller audience than entertainment oriented programs. The ratings picture from the fall of 1971 appears to document this. Further, it provides evidence that the networks have tried to produce and broadcast educationally oriented childrens' programming. On the Saturday morning schedule each of the networks had at least one "quality" or "educational" program. NBC had three, "Barrier Reef," "Take a Giant Step" and "Mr. Wizard." CBS had two, "You are There" and "CBS Children's Film Festival." And ABC had one, "Curiosity Shop." Without exception, the ratings for these programs were lower than the program that preceded it. The average rating for these six programs was 4.5 compared to 8.3 for the other "entertainment" programs (calculated from data in Pearce, 1972, pp. 44).

This is not, however, unequivocal evidence that "quality" and "education" cannot compete in the ratings race, although it does suggest that these programs did have some problem. In analyzing both the limited success of these programs in particular, and educationally oriented programs in general, one possibility raised is age-specificity. All six of these programs would appear to be targeted at the upper end of the 6 to 11 age spectrum. And it appears that educationally beneficial programming need to be targeted to a relatively narrow age span in order to be maximally effective. Schools, with age-graded classrooms, operate on the premise that educational effectiveness is related to age grouping. And if televised educational material that is above or below the level of a viewer is boring, there may be an upper limit on the ratings of educational programs which is lower than that of entertainment programs.

As far as Saturday mornings are concerned, however, the problem would not appear to be educational aim, but the group targeted. The success of "Pebbles and Bam Bam," a children's cartoon, (rating 13.2, share 49) compared to "Bewitched," an adult situation comedy, (rating 2.3, share 9) and "Barrier Reef," preadolescent educational program (rating 4.0, share 15) suggest a very young audience (Pearce, 1972, pp. 44). Data from a local market confirm (Nielsen, 1981a, pp. 54-56) that the majority of the child TV audience on Saturday morning is age 7 and under. If these educationally oriented broadcasts had been aimed at 5 to 7 year olds they might have received substantially higher ratings. The high ratings "Sesame Street" receives on commercial stations endorses this notion for other time periods.

But assuming that these ratings do represent insurmountable limits (which they do not appear to), educationally oriented programming would receive about 54.1% of the audience of entertainment-oriented programming with a rating of 4.5 versus 8.3 (Pearce, 1972, p. 44). In order for no loss to be incurred by commercial broadcasters, 32.8% of all revenues received at that time would have to have been supplied by tax incentives, since if all programs (average rating 6.7) were replaced with educationally oriented programs (average rating 4.5) the total audience would only be 67.2% of its previous size. Assuming that revenues are proportionate to audience, total costs would be 32.8% of \$91.53 million plus \$99.45 million for distribution costs (which would remain constant), for a total of \$129.47 million. This suggests an average cost (to the Federal government) of \$118,562 per hour of programming. With an average household rating of 4.5, we may estimate the rating among 2 to 5's at 9.0 and the rating among 6 to 11's at 6.75. Combining these two figures, we may estimate the cost per preschool viewer at 10.1 cents per hour, and using the

previously estimated benefit of \$1.94 per viewer hour, the benefit/cost ratio is 19. If we include 6 to 11 year olds and assume equal levels of benefit for them, the cost is reduced to 4.74 cents per viewer hour, for a benefit/cost ratio of 42. So either assuming present audience levels and having all costs covered by tax incentives, or assuming a reduced audience and having only the loss in revenues covered by tax incentives, similar estimates of efficiency are obtained.

Another less conservative estimate might assume no loss in audience, and therefore no loss in revenues, and estimate research and development costs at half the total costs of "Sesame Street" (which costs about \$61,500 per hour show). This gives a benefit/cost ratio of 110 for preschoolers alone, and a ratio of 472 for all children 2 to 11, assuming an equal benefit for all children regardless of age.

These estimates assume that the networks act as "benign, but rational, men," that is, that they have no preference for how they make the same profit, and would prefer to do good than not to do good.

But even if it is reasonable to assume that the networks act as economically "rational men," it is less reasonable to assume that a tax credit, as usually conceived, could be designed in advance guaranteeing the maintenance of current levels of profit for all of the networks. A law simply stating that any current producer of children's television programs would be guaranteed its current profit if it produced educational programs, prorated for the proportion of programs that were educational, would, but would also discourage productivity and would not encourage new producers to enter the market.

And if they are not benign, but not malevolent, they would have to be paid to do good. In that case, the tax credit would have to more than compensate



for the estimated loss of revenues. In this way, these estimates of efficiency are inflated.

But on the other hand, since all of these efficiency estimates assume that the viewing of educationally oriented programs will displace activities that taken in the aggregate have no benefit or cost. Given the high likelihood that this viewing will replace other TV viewing which has been shown to have detrimental effects, these estimates are deflated, both for direct funding and tax credits, since this technique assumes that the activities replaced have in aggregate no net effect. So, given these two offsetting biases, these estimates would appear to be at least approximately correct.

#### The Efficiency of a National Center

With all of the inherent difficulties of estimating the impact of a Center for Children and TV, and with costs entirely dependent on a relatively arbitrary level of funding, attempting to estimate efficiency in a quantitative fashion is probably not reasonable. Based on present practices in industrial research and development it appears that the common wisdom is that research and development is in the long term cost beneficial, even though the precise ratio of benefit to cost is unknown. In addition, the future success of other policies such as direct funding and tax incentives depend in part on research, such that the more resources that are put into those alternatives, the more beneficial additional research will become, and vice versa. Given the levels of benefit estimated for direct funding and tax incentives, even a marginal increase in their effectiveness could produce substantial benefit. Even if additional research on children and television had no other effect but to increase the effectiveness of "Sesame Street," by 1%, it would produce an

annual benefit of \$13.5 million (based on the previously estimated benefit of \$1.35 billion). Effects on other programs or other benefits would be addition to this.

And if the awards for excellence provided any incentive to those in field of children's broadcasting to produce better programming, or encouraged talented people outside the field to enter it, additional benefits might accrue. Given the small costs of offering awards, these would also appear to be cost beneficial. In sum, the center approach shows promise of a return of benefit well beyond costs, given the suggested funding of such proposals (\$12 to \$23 million, Rubinstein, 1980a).

#### Equity: The Distribution of Costs and Benefits

The impact on equity of each of these proposals can be separated into two elements, the distribution of benefits and the distribution of costs, and analyzed against two types of equity, horizontal and vertical. Horizontal equity being the equal treatment of equals, and vertical equity being the unequal treatment of those not equal so as to make them more equal.

Like most media for delivering education, including schools, educationally oriented television seems most likely to affect those who need it least -- the intelligent and those from educationally and socially advantaged backgrounds (See Minton, 1975). Brighter and socially advantaged children are more likely to view beneficial programs and to obtain greater benefits while viewing. The socially disadvantaged, on the other hand, are more likely to view less beneficial and even harmful programs.

Part of this vertical inequity is due to the present programming distribution system. Since commercial television reaches a much greater and

more diverse audience than public TV, options which encourage beneficial programming on commercial TV (tax incentives and rulemaking) would better promote equity among those of differing ability and advantage.

All of the options (except the status quo) suggest the possibility of some minor improvement in horizontal equity through the greater availability of beneficial programs to all groups. Because of the widespread use of television by almost all children, differences among policy alternatives between children of similar backgrounds and ability seem negligible.

The distribution of costs across the various alternatives is determined by each alternative's method of financing. For tax incentives, rulemaking and that part of direct funding and the center option financed by federal revenues, the costs will be distributed as income tax, which is to say in a reasonably progressive fashion. Private contributions to direct funding and the center for children and television will also be distributed in part as taxes since tax deductions must be replaced by additional tax revenues, and in part as voluntary obligations by the individual contributors, which are to be preferred since they entail less compulsion, and greater individual choice.

The horizontal equity problems inherent in all income tax funded projects are about the same for all the options. The problems related to inequities in the present income tax system lie outside this analysis, and can be overcome only by tax reform.

In addition to direct costs and benefits there are also indirect costs and benefits disbursed by each option. Under the status quo most costs are distributed indirectly through advertising in the form of higher prices to consumers, which is a regressive method of financing (Noll, Peck and McGowan, 1973, p.43). The direct funding option will distribute grants, and hence

personal income, to program producers, developers, and researchers. The rulemaking approach will distribute some additional funds to the Federal Communications Commission, and will impose additional production costs on broadcasters and may reduce revenues as well. These costs will then be borne in part by owners and stockholders but primarily by consumers via increased costs to advertisers. Tax incentives would probably lead to increased profits for commercial broadcasters and program producers, as well as additional money to developmental researchers and program consultants. Finally, the center option would obviously lead to income benefits for those employed by such a center as well as the beneficiaries of awards and research grants.

#### Preference Satisfaction

The preferences of two groups must be taken into consideration in estimating preference satisfaction: the preferences of preschoolers (and their parents), and the preferences of program producers and broadcasters. In reference to the first of these groups, direct funding would increase the number of available programs, and potentially the number of choices available to viewers, leading to an increase in preference satisfaction compared to the status quo. (Cf. Owen, 1975) Since tax credits should increase funds for program development and production, they also might indirectly increase the number of children's programs available. Tax credits might even increase ~~distribution~~ capacity as educationally oriented, all-children's channels became more attractive financially with these incentives.

Even without increased distribution capacity direct funding should increase audience preference satisfaction as broadcasters replace less popular

shows with more popular ones. Both tax incentives and rulemaking could lead to lower preference satisfaction if broadcasters, in attempting to obtain tax credits or comply with FCC rules, replaced programs with others less popular. Substantial effects of this type would not be likely since it is in the broadcasters own self-interest to maximize audience satisfaction, and hence audience size. The center approach would have no direct effect on viewer preference satisfaction, but both awards and research grants might lead, in the long run, to better production and hence higher audience satisfaction.

Programmer and producer satisfaction would be increased by direct funding and tax incentives as their freedom was increased with access to greater resources. Under rulemaking their freedom would be clearly and directly decreased. Again the center option could lead to marginal benefits over the long term as programmers and producers gained easier access to resources for enhancing the value of their productions.

### Survey Results

In addition to existing research, a survey of people involved and concerned with children and television was performed specifically for this analysis. This survey obtained independent evaluations of the policy options from individuals with a variety of viewpoints but all informed about children and television, representing all of the major participants in the policy-making process in this area (Tucker & Saffelle, 1982, p. 665).

The survey instrument consisted of a one-page questionnaire mailed in the second week of July 1982 to 195 individuals who by position or previous involvement had shown themselves to be concerned with both children and

television. The mailing list for the survey was compiled from several sources including participants in the study of a national endowment for children's broadcasting (Van Dyck, 1977, Appendix C); individuals who made comments to the FCC's Children's Television Task Force (FCC, 1979, Vol. 3, Appendix C); and from among those who held congressional or executive positions relating to children, television, and education. These individuals include advertising agency personnel and major advertisers on children's programs, advocates for children and television, broadcasters (both commercial and public), educators, representatives of relevant foundations and associations, communications lawyers, appropriate government officials, children's television producers, and researchers who have studied children and television.

Of the 195 individuals sent questionnaires (including a follow-up to those who did not reply within a month), 119 returned completed questionnaires and 12 explicitly refused. Excluding the 8 questionnaires returned for lack of adequate address, the response rate was 64%. Among subgroups response ranged from 47% for educators to 89% for broadcasters. (See Table 2 for survey results.)

For this analysis, the respondents are divided into two relatively distinct groups: those with ties to commercial television, and those without such ties. Those with commercial ties include advertisers and advertising agency personnel, commercial broadcasters and program producers, and their legal representatives, and executives of industry-affiliated associations. Those without commercial ties include advocates, noncommercial broadcasters and program producers, educators, government officials, <sup>a</sup>reserchers and executives of nonindustry associations and foundations.

Effectiveness

The tax credits option is the farthest from consensus of the five, being ranked first in effectiveness by those with commercial involvement and next to last by those without commercial involvement. This comparison of rankings may exaggerate the degree of controversy since the noncommercial group rated all four substantive proposals between good and very good. In general, those commercially involved were less generous in their ratings, and rated tax credits as a little above good, while those not commercially involved rated it as good.

In evaluating the Center option, those with commercial interests were substantially less positive about its potential effectiveness than those without commercial interests. The commercial group as a whole ranked it next to last in effectiveness (above only the status quo), giving it a rating slightly above fair, while the noncommercial group ranked it second (behind direct funding) with a rating between good and very good.

Desirability

Both the commercial and noncommercial evaluators felt the status quo was undesirable, ranking it next to last and last <sup>s</sup> respectively. Those commercially <sub>^</sub>involved found only rulemaking less desirable. This confirms the evaluations the two groups give to the idea that television could and should be made more educationally effective. Those not connected with commercial broadcasting are almost unanimous that it could (100%) and should (97%) be made more

educationally effective for preschool children. Those connected with commercial broadcasting endorse these same notions with substantial majorities (97% and 62%). Together these suggest that some effective action both could and should be taken.

The ratings of the options that both groups prefer any alternative to the status quo, with one exception. Those commercially involved found the status quo preferable to rulemaking. The most desirable option overall was direct funding. Those not commercially involved ranked it as the most desirable while those commercially involved ranked it second. Weighting both groups equally, it clearly receives the highest ranking. The center option is ranked second by those not commercially involved and third by those commercially involved. Tax credits again receive the least agreement being ranked first by those with commercial interests and fourth by those without commercial interests. Finally, the rulemaking approach is ranked last by those with commercial interests and third by those without them.

These rankings do not tell the whole story, however, as they tend to hide some other differences between the two groups. For example, those with no commercial ties rate the desirability of all of the actionable alternatives between good and very good. That is, any of these alternatives is desirable. And while those with commercial ties are not as positive in general, they still rate both tax credits and direct funding as good or better in desirability, and the center option as between fair and good.



Policy Recommendations

The options analyzed here are neither mutually exclusive nor exhaustive. With the exception of the status quo, which is by definition exclusive of any policy change, the policies could all be simultaneously enacted. Given the divergent interests involved in this problem, and the complementary strengths and weaknesses of the various options, a combination of these alternatives will be recommended. Often as a tentative first step toward policy change, recommendations are made for "more study" or "definitive research." This recommendation will also begin with a similar proposal.

Despite the difficulty in assessing the specific level of effectiveness that a Center for Children and Television might have, the efficacy of research is demonstrated in the effectiveness of the educationally oriented television currently available. And the idea of national awards for excellence in children's broadcasting, and even the idea of a center itself, is worthwhile as symbolic of our society's commitment to educational opportunity for its children. While independent of government interference, a national center would be a means to distribute funds for research, program development, and production. A first priority of such a center would be to fund an extensive independent evaluation of the cognitive development and funding issues mentioned above.

The quantitative analyses of effectiveness and efficiency of direct funding, as well as the consensus of both those with and without commercial involvement as to its effectiveness and desirability, lead to the conclusion that the continuation and expansion of this approach are in order. One amendment to past policy, however, should be made. In addition to having the

funding disbursed by an independent center, any programs produced under such a program should be made available to commercial as well as noncommercial broadcasters without restrictions on advertising. Such a change would assure greater effectiveness and greater equity in the distribution of benefits. For those who would object to such a policy on the grounds that commercials are harmful, the question remains whether it is somehow better for children to watch commercials during purely entertainment programs than during educationally beneficial ones?

Finally, I would recommend that tax credits for research and development of educationally oriented programs be tested in a limited fashion. The potential expense and uncertainty of such a program warrant careful and studied implementation. Such a test would be limited in the size of the tax credit (both as an absolute amount and percent of revenues of the organization applying for the credit) and in duration. After this trial, an evaluation would be made and the program could be expanded, continued or terminated. (See Tables 1 and 2 for a summary of these data.)

#### Feasibility

As a final element in this analysis, the feasibility of this recommendation will be considered. Despite the consensus of all concerned as to the possibility and desirability of increasing the educational effectiveness of children's television, and their general agreement on the most effective and desirable means to that end, they also were all relatively pessimistic about the possibility of any constructive change. Given the current fiscal and

political climate, it is not too surprising that both groups agreed that the most likely future is the present, that is, the status quo. Those with commercial ties ranked tax credits as the next most feasible, followed by direct funding and the center option. Those without commercial ties ranked direct funding second, followed by the center option and tax credits. Both agreed that with the present de-regulatory trend of the regulatory agencies that the rulemaking approach was least feasible.

Nonetheless, substantial agreement between these two groups as to the options suggests possibilities for change and cause for optimism. With both groups fairly supportive of all three elements of this proposal, the combination should be reasonably attractive to both. If a united front of advertisers, advocates, associations, broadcasters, educators, foundations, communications lawyers, programmers and researchers were to present and support such a proposal it would be difficult to imagine that the feasibility of its enactment could be so low that such an approach would not be worth pursuing. Especially given the potential benefits of direct funding and tax credits, and the insulation from political pressure their administration through an independent center might offer, we feel this option is worthy of serious consideration.

**TABLE 1**  
**Decision Matrix**

Policy options and criteria for increasing the  
educational effectiveness of television for preschool children

<b>Criteria</b>	<b>Policy Options</b>				
	Direct Funding	Center Option	Tax Credits	Rule Making	Status Quo
<b><u>Effectiveness</u></b>	+++	+	+++	-	---
<b><u>Efficiency</u></b>	+++	+	++	-	---
<b><u>Equity</u></b>	+	+	++	++	---
<b><u>Preference Satisfaction</u></b>	++	+	++	--	-

**NOTE:** These ratings are based on the analysis of existing research presented in the text of this paper.

The ratings run from very positive (+++) to very negative (---).

TABLE 2  
Summary of Survey Results

Could TV be made more educationally effective?			
	Number of		responses
	Yes	No	
Commercial	93%	7%	46
Noncommercial	100%	0%	68

Should TV be made more educationally effective?			
	Number of		responses
	Yes	No	
Commercial	63%	37%	41
Noncommercial	97%	3%	65

**Evaluation of Policy Options**  
By Commercial and Noncommercial Respondents

	<u>Effectiveness</u> (rank) rating	<u>Desirability</u> (rank) rating	<u>Feasibility</u> (rank) rating
<u>DIRECT FUNDING</u>			
Commercial	(2) 3.0	(2) 3.1	(3) 1.9
Noncommercial	(1) 4.0	(1) 4.1	(2) 2.4
<u>CENTER</u>			
Commercial	(4) 2.2	(3) 2.5	(4) 1.9
Noncommercial	(2) 3.4	(2) 3.6	(3) 2.3
<u>TAX CREDITS</u>			
Commercial	(1) 3.3	(1) 3.3	(2) 2.3
Noncommercial	(4) 3.0	(4) 3.1	(4) 2.2
<u>RULEMAKING</u>			
Commercial	(3) 2.4	(5) 1.9	(5) 1.6
Noncommercial	(3) 3.2	(3) 3.4	(5) 2.0
<u>STATUS QUO</u>			
Commercial	(5) 2.0	(4) 2.3	(1) 3.8
Noncommercial	(5) 1.3	(5) 1.2	(1) 3.4

NOTE: RATING SCALE

1 = poor    2 = fair    3 = good    4 = very good    5 = excellent

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