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Guidelines for better children's television programming : a report on the program design features developed by the Children's Television Workshop.

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GUIDELINES FOR BETTER CHILDREN'S TELEVISION PROGRAMMING:

A Report on the Program Design Features Developed by
The Children's Television Workshop

by

LUTRELLE HORNE

A dissertation submitted to the Graduate School of
the University of Massachusetts in partial fulfillment
of the requirements for the degree of DOCTOR OF EDUCATION.

School of Education
Amherst, Massachusetts
May, 1973

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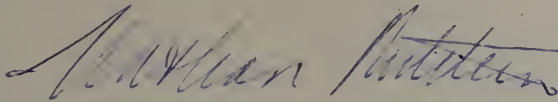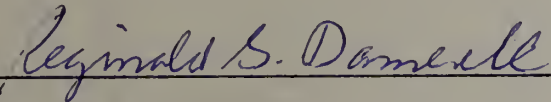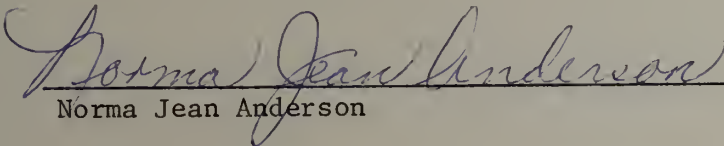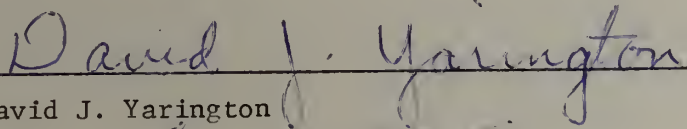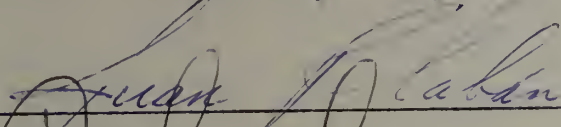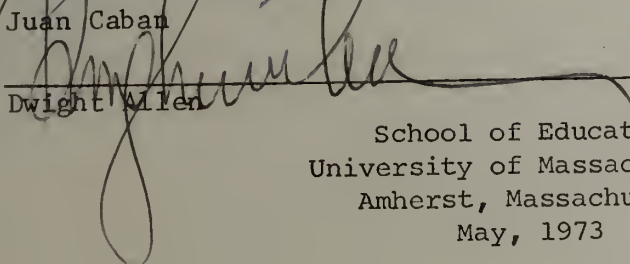Amherst, Massachusetts
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Guidelines for Better Children's Television
        Programming: A Report on the Program
        Design Features Developed by The
        Children's Television Workshop (May, 1973)
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        This dissertation examines the structure and experiences
of the Children's Television Workshop in producing "Sesame Street"
with the express purpose of developing guidelines for better
children's television programming. It is directed towards pro-
ducers, who hold ultimate responsibility for program content and
values, and towards educators and parents, who must define, with
the producer, the cognitive and behavorial goals of children's
programming.
        The examination of the origins and program design fea-
tures of CTW is focussed around the formative research component.
Formative research is a continuing process that seeks to improve
programs and provide producers with the type of information they
need to make production decisions. A number of methods are des-
cribed to obtain data on program appeal, program comprehensibility,
internal compatability, and activity-eliciting potential. Suitable
exhibits from the research files of CTW are used to show how forma-
tive research has worked in past production seasons. The study
then considers a number of organizational and interpersonal factors
in the use of formative research, and suggests some research methods
for low-budget projects. Chapter Three discusses the history of
CTW, focussing upon the formulation of goals and production values.
The success of "Sesame Street" is due in part to its experienced
television production staff and its decision to proceed with clear-
ly defined and objectively-measurable goals; thus, a goal is stated
"The child can recite the alphabet," rather than "The child knows
the alphabet." It then discusses how writers and producers work
together to achieve these goals and how the program is produced.
        There follows a discussion of the strengths and weak-
nesses of the magazine format. The original nine types of program
segments suggested by Joan Ganz Cooney to the Carnegie Foundation
were modified and expanded according to formative research results
and producers' intuitions based on those results. The high- and
low-appeal attributes are: functional action, strong rhythm and
rhyme, portraying children, on-screen disagreement and repeated
attempts to achieve something; low appeal bits are: comprehensible
spoken script, message monologues and the program identification.
Appeal is the first production value, and a model for predicting
appeal is presented.

Chapters Four and Five present guidelines for achieving cognitive learning goals and behavorial goals. The guidelines for cognitive goals are: Learning Through Play, Visual Attention, Selective Attention, Retention and Learning, Imitation, and Reality. The guidelines for behavorial goals are derived by the author from his experiences in producing those segments: they stress clarity, justification, shortness, visual means to show resolution, tempered language and action, and fair and equitable solution. Chapter Six examines some important production values for choosing content and for directing attention, and discusses the child's response to the storybook concept, to the sound track and to humor and incongruity. The final chapter calls for many more children's programs, each with carefully-defined and complementary purpose, rather than expanding present programs to serve multiple purpose which would dilute their effectiveness.

FOREWORD

The purpose of this dissertation is to provide some basis of understanding to educators, social scientists, parents, television directors and producers, and the general public on what can be done to make television programs for children better. Its basic assumption is that what makes television programs for children such a waste of the resources of both the child and television is that we have not thought deeply enough nor examined seriously enough the ways in which television programs for children can be designed, developed, and produced to have the best possible positive effect on the intellectual, moral, and affective development of children. This is the central problem: while the producer is and should be ultimately responsible for the content and production values and techniques of programs, the question of purpose and effect and how content and techniques fulfill or alter purpose and effect must be shared with others -- namely, responsible educators, researchers, and parents. The more factual information on children that is available to the producer, the more appropriately he can apply the various production techniques at his disposal in developing better programs for children.

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LUTRELLE HORNE

CHAPTER ONE: INTRODUCTION

The Problems of Better Children's Programming

The question of who should define "better" television programs
for children has been one of the biggest hindreances to improving
the quality of children's television. One reason for this is the
wide variation in individual response to program content usually
based on individual attitudes and values. Still another problem
is that almost all discussions on this subject are clouded by the
use of specialized jargon and biases -- depending on whether one's
profession is an educator, a social scientist, or a broadcaster --
to the extent that it is virtually impossible to establish any
meaningful dialogue. Third, and perhaps one of the most important
obstacles to better programming, is the preoccupation with the need
to obtain specific proof through research that certain kinds of
presentations are either harmful or not harmful. The Foundation
for Character Education in Boston convened a seminar five years ago
on improving the quality of children's television. The summary
of the seminar was published in a pamphlet which was titled

<u>Television</u> <u>for</u> <u>Children</u>.   The summary reveals the concern of

seminar participants over the critical subject of effects:

> The most conservative stand that one can take regarding
> effects is that television plays only a secondary role,
> that it reinforces values acquired from other sources.
> The Trustees of the Foundation ask any partisan of this
> cautious view to inquire into what values are being
> consistently reinforced by television: Helpfulness,
> caring, consideration? Indifference, malice, cruelty?
> Sophistication, simplicity, suavity? We could extend
> the list, but the question suffices, particularly if
> each producer and station manager puts it to his own
> programs. The question becomes even more vital if one
> accepts the contention supported by some researchers
> that television creates direct, primary effects with
> children.[1]

It is probably impossible to determine the influence of

one scene or the impact of a program as a whole from the many

other social influences that operate on the child. A scene which

gives pleasure to one child may very well arouse unhappy feelings

in another child. This does not, however, lead to the conclusion

that many broadcasters have followed: that, since specific effects

are so unpredictable and differ from child to child, content doesn't

matter as long as a slick show is produced, and that one is free to

program with immunity. Nothing could be further from the truth.

"Effects are not random and they are linked to program content."[2]

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[1]For salient discussions on this topic, see L. Bailya, 1959;
R. Garry, 1967; B. Greenberg, 1971; A. Himmelwert, H. Oppenheim, and
P. Vince, 1958; J. Kapper, 1953 and 1966.

[2]Foundation for Character Education, <u>Television</u> <u>for</u> <u>Children</u>
(Boston: Foundation for Character Education, 1965).

There is enough evidence at hand based on what we already know about children to predict that certain kinds of scenes such as cruelty to animals is likely to evoke negative reactions in the majority of children who view this. It is unfair to hold television responsible for the occasional weird behavior which a program may ignite in some child who is mentally unstable. It is fair, however, to hold producers responsible for the effect that the values and goals they incorporate in their programs will have on the majority of children who will view the programs. If it is probable that the presentation of certain kinds of scenes may have a potential negative effect on the majority of children who watch, the only responsible decision to arrive at would be to scrap this material in favor of scenes which are more likely to have a positive effect.

A fourth problem in the way of better programs for children is the either/or question of education versus entertainment. Many adults criticize television simply because they see it as a form of play in the entertainment it conveys. Children, they feel, should not watch television to be entertained, but only to learn useful, "wholesome" things. Some educators feel that there is a clear distinction between work and play, and that a television program which is not highly didactic does not provide maximum learning. Broadcasters, on the other hand, do not want to be thought of as being

"educational." This attitude may arise from the feeling that whatever is educational is dull and boring, as many educational programs have been in the past compared to commercially-produced programs. The separation of entertainment values and educational values is an arbitrary result of the biases traditionally reflected by both educators and broadcasters. The young child, most psychologists now theorize, does not make such clear distinctions between work and play or education and entertainment.

Perhaps the most pervasive obstacles of all have been the prevailing negativism and doubts that anything could ever be done to improve the quality of children's programs. This attitude is best expressed in the words of Paul Lazarsfeld when he testified before the Kefauver Committee in 1955:

> ... everyone talks about bad television programs and the effects which they have; but actually it would be much more constructive and enlightening to experiment with good programs. Why shouldn't it be possible to get reformers and writers together, and have them devise programs which everyone thinks would be desirable and beneficial? Would children listen to them? Would they have good effects? And even prior to that, do we really know what we mean by a good program? Are there people around who could write them? It is such a simple idea, but consider what has to be done to carry it out. You have to get psychologists and writers to meet and work together. You have to have funds to provide programs for experimental purposes, regardless of whether a television station is willing to put them on the air. But the aridity and the negativism of much of the discussion which takes place today can be overcome only if it is shown that there is something

like a good program, that there are people who can be trained to write and produce them, and that children are willing to listen to them.[3]

How the Children's Television Workshop Works

The Children's Television Workshop, the producers of "Sesame Street," has proved to the satisfaction of nearly everyone concerned, and especially to the children to whom it was aimed, that television can be purposeful, educationally stimulating, entertaining, and highly popular at the same time. It validated the thinking of those who had given serious thought to the use of television as a national educational resource as well as those who take the position in righteous indignation that television can be and ought to be better. Further, "Sesame Street" proved that, given adequate resources, talent, and preparation time, a daily, hour-long educational program directed to the preschool population could successfully compete in the open television marketplace against all that the commercial medium had to offer. It would achieve its educational goals by embracing the best of contemporary television entertainment techniques.

"Sesame Street" is the result of a study conducted by Mrs. Joan Ganz Cooney for the Carnegie Corporation. The study was designed to investigate the potential that television might have in providing

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[3]"Why So Little Is Known about the Effects of Television on Children and What Can Be Done," Public Opinion Quarterly, XIX (1955), 241-251.

stimulating supplementary educational experiences to the nearly
twelve million preschoolers between three and five years of age --
particularly the poor, the black, the rural whites, and the
disadvantaged -- who were receiving no systematic learning
experiences.

The need for such preschool educational experiences was
unquestioned -- a common finding of the mid-sixties' educational
research was that, for example, black children in New York City
often entered school a few months behind their fellow classmates
and then fell over a year and a half behind by the third grade.
The National Council on Educational Policy estimated at that time
that to provide such systematic learning experiences in a school
environment on a nationwide basis would cost over $2 billion -- an
astronomical amount compared to the spending for pilot projects
which would have formed the basis for such experiences. The
Educational Policies Commission of the NEA, after recommending
that all children be provided with the opportunity to go to school
at public expense at the age of four, estimated that such a recom-
mendation entailed five million children and that handling them
would cost at least $2.75 billion, not including construction costs
for the new classrooms needed to house this flood of youngsters.
Nearly half of the school districts in the nation had no kindergarten
facilities -- it was ironic that the nation's school system was

incapable of teaching youngsters at the age when learning is most rapid and useful. Clearly, the time for examining what many educators, psychologists, and other child specialists saw as a major element in many children's lives -- television, as yet an untapped educational resource -- was at hand.

The success of "Sesame Street" is now history, but to understand that success is to understand a production process that allowed educators, social scientists, creative artists, and television producers to reflect, reshape, and create a new and continuing dialogue on the distinctive technical attributes of the medium itself and the meaning they have for what children are capable of learning and using.

When the Children's Television Workshop was formed, it decided to regard itself as a workshop for experimentation in the uses of television with children. It considered everything it did as exploratory and subject to revision. The revisions were to be based on what was learned from and about the children it was trying to reach as they were observed responding to the program's content.

Because of the complexity and scale of the proposed venture, Joan Cooney decided that one of the most experimental aspects would be to try to achieve a real, working collaboration between production and research so that all the relevant energies could be funneled into the program's development at the early stages and so that production and research would operate as a single force toward continuous program improvement. Instead of the conventional

peripheral relationship with programming, research was integrated into the process. Research has almost always been used to police educational programs, to evaluate their effectiveness after they have been done, but not to contribute directly to improving the effectiveness of the programs as they grow. As conceived by CTW, research should be used as a program-building tool. Production would be guided pragmatically by what objective experience defined as most effective in reaching and educating the audience. This results in a feedback model which is a process of production, testing, feedback, and revised production that is, in effect, a process of continuous improvement. In order that producers and writers could receive the information they needed to know early in program development, researchers were used to help guide the program while it was being planned and produced. This acknowledges that the producers' knowledge about children was far from perfect and that information about what appeals to children and teaches them effectively will help improve the program as it goes along. Perhaps even more useful is the information on what approaches fail to attract and teach children, suggestions for modifications to strengthen these approaches, and recommendations to abandon hope-less direction while there is still time.

When this collaboration began, the writers and producers expressed some doubt that it could be done, thinking that perhaps

there were some very good reasons why it had not been done before. David Connell, the Workshop's Executive Producer, described his early skepticism as follows:

> My background was in commercial television where we
> felt we had developed a pretty good set of instincts
> about what kind of show would appeal to children of
> any given age. I frankly was skeptical about the
> ideal of researching every moment of a television
> show, and certainly of being told how to design it.
> There was the risk of intellectualizing the material
> to death and ending up with a program most notable
> for its monumental boredom. It would be like trying
> to analyze the elements of a joke, only to find that
> when we had isolated all the pieces, there was nothing
> learned and nothing to laugh about. But if "Sesame
> Street" was an experiment -- and it very definitely
> continues to be one -- this notion of broadcaster/
> researcher cooperation was the most bold experiment
> within it.[4]

As time progressed, both the researchers and producers learned a great deal about each others' language and about how to be useful to each other. The researchers not only learned to make useful observations about what worked and did not work with children, but also how to convey this information to the producers. The producers learned how to absorb and use this information and how to ask reasonable questions of the research staff. Soon a cooperative production/research relationship based on mutual trust and concern became one of the most characteristic features of the empirical nature of CTW.

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[4]Remarks before the International Seminar on Broadcaster/Research Cooperation in Mass Communication Research, University of Leicester, Leicester, England, December 19, 1970.

It is remarkable that such a perfect fusion of research and production could ever take place. It was possible because the research and production staff were both solely concerned with a single-minded goal -- creating the most effective program for its intended audience. Any difference of opinion could always be decided by asking, "How will the children react to this particular scene or technique?" Research reports objectively to production and almost never offers opinions or suggests production techniques. On the other hand, production accepts research findings with an open mind. A producer or writer does not, in this process of evaluation, feel the need to defend any of the material or techniques he has used in the event that research reports that his material did not work. This fusion is one of the most important factors in the creation of "Sesame Street" and "The Electric Company": it creates an atmosphere of an ongoing endeavor to always better serve and educate the children to whom the programs are aimed. This ongoing endeavor forms a data base for those concepts and production tech- niques that truly educate children, a data base that, as the programs enter each successive season, allows the refining of concepts, techniques, and goals.

It would be a mistake to assume that every production detail has been researched. The creative control of the program rests with the producers and very often the producer uses his "belly

button" when there are "facts" to the contrary of what he feels would be effective. In her conscious design of fusing research and production, Joan Cooney made production what she calls "first among equals" in order to reverse the conventional educational television way of operating in which educators use the television skills of producing and writing. CTW was a television enterprise and would be directed and controlled by television people. The television production team would use the expert knowledge of educators and researchers, but the creativity would belong to the production team.

The decision to put experienced commercial television talent in charge is the key to everything that followed, says Producer Jon Stone:

> It ultimately governed the look, the feel, and
> consequently the success of the television program.
> What this experiment is, is a marriage of production
> and education. Educational television has histor-
> ically begun with the educators, who develop a
> television show out of what they know. What they
> did in this case was to do it the other way around --
> that is, hire the producers and then bring in the
> educators to educate the producers through a series
> of seminars and meetings -- and a year and a half of
> really hard work in learning what we needed to know
> in order to do this. But then, the production
> decisions were made by the producers, not the
> educators. The research department, the educational
> advisors, the board of advisors, all of these people
> exist within CTW solely for the function of advising
> the producers what we should be doing with the tele-
> vision show, and then we make the decisions on how
> to do it.[5]

5"Educational Goal -- Television Enterprise," The Children's Television Workshop: How and Why It Works (Nassau Board of Coopera- tive Educational Services, 1971-1972).

The procedures followed in the production of "Sesame Street" were deemed so vital that essentially the same model was reapplied in undertaking "The Electric Company" series.

Formative Research

At the outset, just what role formative research could play was not at all clear even though its operational pattern was conceived and planned for in advance. There were no precedents, either from the field of educational television production or from the field of educational research in general, sufficient in scope or well enough documented to provide useful guidelines or models. From the beginning, research was conceived by CTW as a program building tool, a way of determining through objective experience what would attract children to watch and what would be most successful in meeting the program's educational objectives. By working within a feedback model -- already described on page 8 -- this formative research embodied the central idea of the Workshop: that it was an experiment that would continually improve its concepts and techniques. By the time planning for the production of "The Electric Company" was initiated, the usefulness of formative research had been well established. The effectiveness of the approach is borne out in reports of summative evaluations carried out independently by the

Educational Testing Service of Princeton, New Jersey, in order to assess the educational impact of the first and second seasons of "Sesame Street."[6]

Any new major television undertaking will no doubt embody some features of the CTW model. It remains to be seen which of its approaches will be found useful elsewhere and what kinds of new or modified approaches will be required to suit new situations. Anyone contemplating the use of the methods and procedures presented here should be cautioned that there is no perfectly dependable recipe and no assurance that successful production will result. Results now available from CTW's formative research are in the main not well validated because allocations of time and resources for that purpose would have detracted from the objectives of attending the widest possible range of significant production issues. Far more appropriate for generalization at this time are the formative research methods, procedures, strategies, and functions which can be adapted by other productions to suit their own unique program formats, objectives, target audience, and viewing context.

The Scope and Organization of This Study

The ideas, beliefs, and recommendations expressed in this dissertation are empirical rather than scientific and, because of this, should be of more immediate value to the producer faced with

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[6]Samuel Ball and Gerry Ann Bogatz, A Summary of the Major Findings in the First Year of Sesame Street: An Evaluation (Princeton: Educational Testing Service, 1970). _____, A Summary of the Major Findings in the Second Year of Sesame Street: A Continuing Evaluation (Princeton: Educational Testing Service, 1971).

the day-to-day task of developing programs for children. A
substantial part of the information presented in this study is
based on the experience I have lived through since the early
developmental days of the "Sesame Street" experiment.

Those experiences of the Children's Television Workshop which
I have selected to report on and examine are those principles and
elements that I believe are most useful in helping other producers
better achieve the goals and values they incorporate into their
programming. Because of this direction, the dissertation is
organized to first give a fairly complete view of the scope and
main thrusts of the Children's Television Workshop's formative
research, with the idea that much of what is revolutionary and
experimental about CTW comes from the fusion of research with
production. It then describes the major operational decisions
and structures that have made CTW what it is today; shows how the
initial formative research was used during an eighteen month
pre-broadcast period to define the major design features of
"Sesame Street," and was used afterwards to continue improving
the program; and presents, again for the producer, a model for
judging how these attributes will appeal to their intended audience.
Chapters Four and Five present guidelines that have arisen out of
the production of "Sesame Street" and "The Electric Company,"
grouped into two categories which somewhat overlap: cognitive

learning, and achieving behavioral goals. Chapter Six presents some production values for choosing content and techniques for directing attention.

It is not the intent of this dissertation, however, to offer the experience of the Children's Television Workshop, "The Electric Company," or "Sesame Street" with the idea that they can or should be transferred directly or imitated. They should serve only to help stimulate thinking and suggest some basic principles on which other creative talent can build. Therefore, the scope of this study goes beyond the CTW accomplishments. Although it is difficult to imagine any major program for children not incorporating many of the unique, innovative approaches of CTW from this point on, it is hoped that the broader scope of this dissertation will not only provide other program ideas but will lead to other alternative workshop models as well.

CHAPTER TWO: FORMATIVE RESEARCH[1]

The Distinctive Role and Functions of Formative Research

The most important factor underlying the distinctive form and style of product developmental research is its role as an integral part of the creative production process. It is important to maintain a clear distinction between this type of research on the one hand and that undertaken in order to test the validity of a theory or the measureable impact of an educational product or practice on the other. Research undertaken in the context of scientific validation is concerned with effects which have been hypothesized, a _priori_, within the framework of a broader deductive system; with the use of empirical and statistical procedures well enough defined so as to be strictly replicable (at least in principle); and with the highest possible degree of generalizability across many situations. In contrast, while research carried out within the formative context _can_ possess all these same characteristics, it need not necessarily, and does not, typically. The only pervasive criterion for formative research recommendations is that they appear likely to contribute to the effectiveness of the product or procedure being developed.

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[1]This chapter is basically a condensation of information from unpublished CTW research reports, notably, "Formative Research in Educational Television Production: The Experience of Children's Television Workshop," presented at the East-West Center Conference in January, 1972 by Dr. Edward L. Palmer, Director of CTW research.

It is neither expected nor required that they be validated by the research out of which they grew. Establishing their validity is the function of summative research.

As this view implies, to achieve the objectives of formative research, it is often necessary to depart from traditional research practices and perspectives. This is not to say that experimental rigor has no place in the formative context. However, for example, even where strict experimental and control conditions have been maintained, there is seldom anything to be gained by using tests of statistical significance. The creative producers often prefer to work directly with information about means, dispersions, and sample size. Also, whereas matching of experimental and control groups on the basis of pretest scores is discouraged where inferential statistics are to be used because of the conservative effect upon the significance of the results, such matching can be very useful, for efficiency, to maximize the reliability of information based on small samples.

In the area of sample selection, it also can be useful to depart from the traditional practice of including all age and socio-economic groups for which the educational materials are intended. Time and effort often can be saved by selecting a sample of average performers, or performers from the high and low extremes, or, where the intent is mainly to upgrade the lowest performers, a sample only of those. In general, where biased methods of sampling and biased

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methods of testing are more efficient than unbiased methods, and where the objective is not to make accurate population estimates, it is often useful to exploit the very biases which quite properly would be avoided in other research situations.

In practice it tends to be difficult for researchers trained and experienced in traditional approaches to adopt an appropriate formative research point of view. In the formative situation, their first responsibility is to improve a specific product or practice, and not to contribute to a general body of knowledge (although the two objectives certainly are not incompatible). Studies must first address the information needs of the product designers and not primarily the individualistic or special theoretical interests of the researchers. Covering a wide range of empirical questions may deserve priority over rigorous reporting or establishing careful experimental conditions, where it is economically impossible to achieve both, and where the usefulness of the results is not unduly compromised as a consequence. Quantitative indices such as per-centages, and highly detailed item-level data, if they communicate most effectively with the creative producers, are to be preferred over those which conform to standard practice for research reports. Broad, speculative interpretations of empirical results are typically more useful than interpretations limited to the more strict impli-cations of a study. And, as indicated earlier, biased methods of

sample selection and testing often can be employed to good advantage. However, in following these departures from standard research practice, there is a risk of producing misleading results. Accordingly, it is essential that the production recommendations be very carefully qualified. See Appendix C.

Formative Research Methods

A great deal of information useful to educational television producers can be acquired through the use of a few quite inexpensive and informal methods of field observation. More sophisticated methods can provide considerable additional information in some cases, but often add little to that which can be obtained more simply and economically.

The selection of research methods is particularly critical, because the attributes focused upon by these methods tend to become promiment among those focused upon by the producers. This is particularly the case when the producers themselves have participated in selecting the methods and thus in identifying the attributes deserving of their special attention.

CTW's formative research methods presently focus upon four principal program attributes, all considered instrumental in producing lasting instructional effects, namely: (1) appeal, (2) comprehensibility, (3) internal compatibility, and (4) activity-eliciting potential. These will be discussed in more detail below. First,

however, it is important to note that these attributes are identified
and used at the Workshop and are presented here strictly for their
heuristic value. It is convenient for the producers and researchers
to have a small number of highly significant program attributes with
which to associate both the host of related program design features
and the many similarly related field research methods. Not only
does reference to a limited number of attributes provide a manage-
able checklist for evaluating materials under production, and a
convenient categorical system, but it also invites researchers and
producers alike to identify new attributes, and for each attribute,
additional field research methods and program design features.

For each of these four attributes, there is not one but a
family of research methods, each typically yielding somewhat different
information than the others. In some cases a single method yields
information related to more than one of the four attributes. Also,
more than one method can be used in assessing any one of the four
attributes. In practice, where more than one method is used in
studying a single attribute, it is done either for cross-validation
of results or to provide complementary sources of information. For
example, the appeal of intact programs or program segments may be
tested by direct observation of the visual orienting response of
viewers; by questioning the viewers outside the viewing context about
most-liked program elements; or by dealing in preference comparisons

between intact programs or program types. Finally, it is very often
useful to combine the results from research focusing simultaneously
upon two or more attributes. As an example, for a poor segment,
the reason for its failure to produce post-tested achievements
may be illuminated by an investigation of its appeal, its compre-
hensibility, or the possibility that its entertaining and educational
elements are incompatible. It is important to note that this
particular type of analysis appears virtually nowhere in the standard
educational research literature, in spite of its obvious value.

Program Appeal

The appeal of a program has to do with its ability to capture
and hold the attention of the intended viewer. In the case of both
"Sesame Street" and "The Electric Company," there was no "captive"
audience. The programs were designed to attract the largest
possible number of at-home viewers. This meant they needed to be
sufficiently high in appeal to draw the children back to the set
from day to day and week to week, and to compete with popular enter-
tainment programming available on other channels.

Because the viewer could turn away at any time, and because
the two programs were designed according to a magazine format, with
successive brief segments addressed to very explicit educational
objectives, it was important to maintain high program appeal on a

moment-to-moment basis. Accordingly, research methods capable of focusing on appeal from moment to moment throughout the course of a program were developed and used. Some of these will be discussed in more detail below.

Appeal research bears upon a wide range of program design decisions. It reveals the effects of various forms and applications of music, and of music as compared with other types of elements. It indicates the most and least popular forms of live-action films, animations, puppets, and live performers. It indicates the attention-holding power of various types of individual or inter-personal activities, such as showing one person guiding another through a difficult task in a supportive versus demeaning manner; presenting conflict resolution through the arbitrary use of power versus cooperation; revealing the simultaneous perspectives of different characters; and portraying the struggle of an individual toward an achievement goal or toward improvement upon his own past performance, to mention a few.

Appeal research also helps to indicate for various conditions the amount of time over which attention can be maintained; the optimum amount of variety and the optimum pacing of events; the relative holding power of program elements which are and are not functionally relevant to the action; the ability of a segment to bear up under exact repetition; the most and least salient (memorable) characters; and the effectiveness of special techniques

such as pixilation, fast and slow motion, and unusual camera angles. In addition, research on appeal can show growth or decline in the popularity of specific program elements over time; the most and least effective uses of dialogue, monologue, and the voice-over technique; the relative effectiveness of ordinary or caricaturized voices; and the effect of sparse and pointed versus sustained verbalizations. It also can reveal the effects of incongruity, surprise, or fantasy as compared with straightforwardness, pre-dictability, and realism; the effect of different motives or intentions on the part of characters; of episodic versus linear styles of continuity; and also of familiar versus unfamiliar conventions and symbols dealing with time, sequence, interpersonal relationships, and the like. Finally, this type of research can be used to investigate characteristic individual or group preferences vis-à-vis such program design features.

As in the case of other methods, those used in measuring appeal were designed to direct the attention of the producers toward particularly significant program features. For instance, because the "Sesame Street" program was going to make use of many brief segments, and because a viewer could at any time freely turn away, turn the set off, or turn to a different channel, it was important to keep the moment-to-moment appeal of the program high. Accordingly, a method was introduced which yields data on the appeal of a program

for each successive 7.5-second interval over its entire length.
The method, referred to as the distractor method, consists of placing
one child at a time in a simulated home-viewing circumstance while
a black-and-white videotaped recording of a television program is
presented simultaneously with a color slide show flashed on a rear-
projection screen equipped with an eighty-slide carrousel. The
rear-projection screen, which is approximately the same size and
height from the floor as the television screen, is placed at about
a forty-five degree angle from the child's line of vision to the
television set. The child himself is seated in a chair three to
four feet away from and facing the television, but is free to move
about within the confines of the room at any time. A continuous
record indicates when the child's eyes are directed toward or away
from the set. For each viewer, the eighty-slide carrousel is
started at a different slide, so that the stimulus competing with
a given 7.5-second interval of the televised presentation is
different for each viewer. Composite graphs of the results are
studied by the researchers and producers in various ways in an
attempt to identify the elements of program content responsible for
high and low appeal. Exhibits A and B present examples of these
distractor studies.

A frequently used complementary form of appeal testing consists
of taking observations upon successive sets of viewing groups,

(EXHIBIT A:

EXCERPT FROM:
"Distractor Study --
Appendix A: Cumulative Distractor
Graphs.")

SHOW 1

MAXIMUM
POSSIBLE
ATTENTION

Intro. of "Sesame Street" sign

Gordon first speaks

Gorden makes D in cement

Begin D commercial —

D-Dudley

End D commercial —

Transition

Listen My Brother Group
"You Gotta Learn Something"

OBSERVATION POINTS
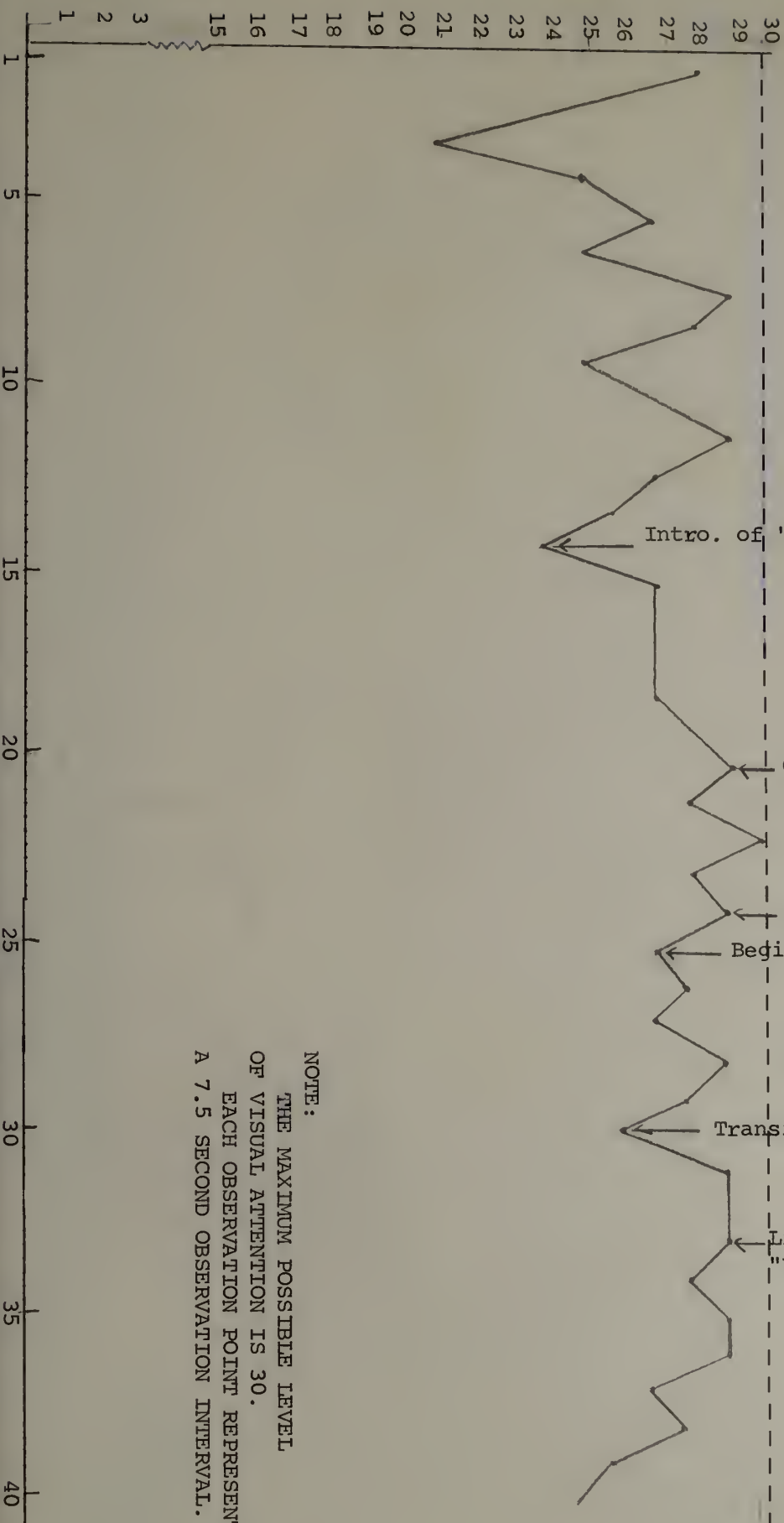
NOTE:
THE MAXIMUM POSSIBLE LEVEL
OF VISUAL ATTENTION IS 30.
EACH OBSERVATION POINT REPRESENTS
A 7.5 SECOND OBSERVATION INTERVAL.

EXHIBIT B

ATTENTION LEVELS OF SEGMENTS OF SHOW 167

Production Method	Segment	Average Visual Attention Level
Muppets interacting with cast members	People In Your Neighborhood	88
	Gordon & Grover Next to	79
	Average	84
Larry & Phyllis	Galoshes	83
Numbers (Mets) in order of appearance	Mets Miss on 15	71
	Mets Miss on 16	84
	Mets Miss on 20	86
	Average	81
Numbers (Jazz) (In order of appearance)	Jazz 6	82
	Jazz 6	78
	Jazz 6	77
	Average	80
Animation	V-Violin (2nd time shown)	96
	Alphabet Soup	91
	V-Hubley (2nd time shown)	91
	V-Imagination (2nd time shown)	80
	Solomon Grundy	79
	V-Hubley (1st time shown)	76
	V-Imagination (1st time shown)	73
	V-Virgil Veep	64
	V-Violin (1st time shown)	60
	Average	79

Production Method	Segment	Average Visual Attention Level
Muppets	Ernie & Cookie (Apples)	88
	Little Bird "Next to"	87
	Bert & Ernie (Jelly Beans)	83
	Monsters Sounds	82
	Grover & Zoo (Bird)	76
	Kermit & Professor (Part 2)	70
	Kermit & Professor (Part 1)	61
	Average	77
Street Scenes (Live Cast & Big Bird)	Susan Introduces V	65
	Bob Introduces V	58
	Oscar & Gordon Make V	59
	Hooper, Bob, & Big Bird & Boxes	53
	Hooper, Bob, & Big Bird & Boxes	59
	Susan Sorting -- Shapes	76
	Rhythmic Clapping	93
	Bob & Children Sing	89
	Bob & Children Sing	92
	Bob & Susan Body-Parts Song	86
	Average	77
Spanish	Mano-Hand	68
Introduction & Theme Song		62

where each group typically contains from three to five viewers.
Usually, four to six such groups are observed in testing a program.
A detailed record is kept according to predefined categories of
visual, verbal, and motor behaviors. Examples of these observations
are given in Exhibits C and D. The visual behavior of children in
viewing groups provides a cross-check on the distractor results.
The record of verbal and motor responses, in addition to reflecting
upon program appeal, helps to identify program approaches most
and least effective in eliciting active participation. The fruit-
fulness of this particular approach is very much a function of the
training and the creative interpretive skills of the researcher.

Audience surveys can provide much additional material on
program appeal, as can structured interviews, in which the salient
and lasting as opposed to the immediate appeal of various program
features can be determined. The salient appeal of an element is
particularly important where it is necessary to attract a voluntary
audience.

Program Comprehensibility

The comprehensibility of a program or segment concerns the
manner in which it is interpreted or construed by its viewers during
the actual course of its presentation -- what they grasp of the
intended instructional points, how they view the motives or intentions
of the characters.

EXHIBIT C

EXCERPT FROM:

Subject: Observations of Children Watching "Sesame Street"

Place: Open Door Children's Center
             100th Street and Columbus Ave., N.Y.C.

Date: May 4, 1970

Time: 11:30 a.m. to 12:30 p.m.

Show #:   126

Observer: Gloria Edwards

Comments: The Group Composition for the entire week is as follows:

             4 Girls --   3 Spanish Speaking
                          1 Chinese

             4 Boys   -- 2 Black
                          2 Spanish Speaking

             TOTAL EIGHT (8)

             The programs (five in total) were viewed after the
             children's lunch and during their usual nap time.

1-2. Show Identification and Opening
        1 child clapping
        some singing (seem to know the introductory song)

3.   Greeting - U
        Initial interest by the entire group
        Greater interest builds as Gordon creates suspense
        Total attention while looking for "U".

4.   Umbrella --U
        Almost all repeated the letter

5. Poverty - U
    Almost all laughed at the character
    1 child pointed

6. "U" Tag
    Group interrupted by outside teacher -- group atten-
    tion turned to her

7. Gordon U/V
    General talking about the letter "V"

8. Quick Cuts
    A. Mr. Hooper -- All watching; no special remarks
    B. Susan (Head Shot) All the children tried to make
        the "U" with their fingers
    C. Mr. Hooper and Goldfish Bowl -- The bit is ignored
        as they all try to make a "U" and "V" with fingers
    D. Gordon - U -- They all laugh at Gordon and point
        to the letter
    E. Susan - "V" on nose --
        General laughter
        Say the letters "U" and "V"
        Try to make signs with their fingers
        A few point to the letter and call out the letters

9. Story of "V"
    Excellent attention by the entire group

10. V - Virgil
    Two children are talking; others watch.

11. V - Violin
    Two or three children repeat the letter and try to say
    the word "violin"

12. Animal - Alligator
    Lost interest at the introduction of the skit (apprx. 6)
    Later: Greater interest (except 2) as script progresses

13. My Kitten
    Total group interest
    Several children clapping and saying "meow"
    "Hi, Kitty" one child remarked
    One child laughing

14. People in Your Neighborhood IV
    Start talking at the beginning of the skit -- stop

when Bob starts singing.
They sing along with Bob
One child snaps fingers
Great interest in bus driver/skit
Seem to like the "musicness" of the word "neighborhood"
1 child asked, "Did he get the bus?"

15. Big Bird - Big, Bigger, Biggest
No special reactions

16. Big, Bigger, Biggest
Some children know the script and talked along with characters
All are very enthusiastic since girl in the skit is their classmate (Dominique)
General laughter when the girl says, "Oh, it's beautiful"

NOTE: "Susan's Groceries" -- omitted (Item 17)

EXHIBIT D

EXCERPT FROM:

Subject: Observations of Children Watching Sesame Street

Place: Open Door Children's Center
            100th Street and Columbus Ave., N.Y.C.

Date: May 7, 1970

Time: 11:30 a.m. to 12:30 p.m.

Show #:   129

Observer: Gloria Edwards

Comments: The group was late in arriving (were finishing lunch)

1-2. Identification and Opening were missed

3. Greeting (Oscar)
            Called out and pointed to the letters P and R
            Seemed to like knowing the letters

4. Kermit R
            Attentive
            Calling out letters
            1 child talking

5. Letter P - Painting
            Not watching (talking among themselves)
            Later: 1 child pointed to the pony, "I like it"
            Another child called out the letter P
            Others generally playing

6. Ernie - Salesman, R-P
            1 child tells the group to be quiet
            2 children call out the letter P

7. Story of R
            All generally watching
            Liked the boat bit

8. P - Painting
        Called out the letter P
        Boys playing while girls watched

9. Roosevelt Franklin Alphabet
        Boys started dancing and clapping hands
        All laughed at one girl dancing
        All dancing except one girl
        Started singing letters with Roosevelt
        Really liked the music

10. Oscar Seats Kids
        Two watching intently (girls)
        The rest playing

11. Muppet Near/Far Tag
        Same as above

12. Kermit Close/Far
        Same as above

13. Oscar Just Right
        1 girl laughing at Oscar
        Others are playing

14. Bert's Nose
        Two girls watch with interest; they do not make any
        comments
        Others are playing

15. Tag - Leads Mysterious Nose Snatcher
        No one watching
        Playing with each other

16. Mysterious Nose Snatcher
        Three girls watch without comments

17. Sorting Game
        No one watching at first; then four start singing the
        song
        Two girls point to the one not like the other; seemed
        pleased about their knowledge; and continue to sing
        with Oscar
        Boys are tussling on the floor

18. Buddy and Jim Window Sketch
        1 child stretches out sleepily on the sofa (girl)
        No one watching

19. Hunt for Happiness Part I
        Two girls watching with interest

20. Where a Letter Goes
        Two girls sing the Post Office song; three boys start
        to watch; then all watch the skit

Comprehensibility testing, while useful in evaluating a viewer's understanding of the dramatic action, is undertaken primarily for the purpose of pointing up program design features involved in the presentation of the instruction. As such, it focuses upon the qualities of the televised message as these interact with learner characteristics. It is instructive to the producers to have an empirical check on their own assumptions about the comprehensibility of program design features they are employing, and even limited amounts of field research can help them to maintain a generalized sensitivity to this important attribute.

Some of the program design principles that this testing can identify are the production approaches which can help to clarify the relationship between an event occurring on the screen and the theme, the plot line, or the logical progression of the dramatic component, or between the instances and non-instances of a concept, the referents and non-referents of a term, or the most and least effective of a set of proposed solutions to a problem. Exhibit E shows a preliminary study of multiple classification; and Exhibit F, a report on the comprehensibility of the concept of "cooperation."

The unique conventions and capabilities of the television medium are frequently used to convey special meanings. The manner in which these conventions are presented will determine their comprehensibility to the viewer, and thus their effectiveness in

EXHIBIT E

EXCERPTS FROM:

MEMO

To: Production

From: Research -- Ilana Reich, Bruce Samuels, Barbara Reeves

Re: Multiple Classification

Date: October 15, 1970

     The following study was an attempt to clarify some questions
on the types of formats, stimulus dimensions, and methods of in-
struction most effective for teaching multiple classification
to "Sesame Street" age children.

     The specific questions asked were:

1.   Do children of "Sesame Street" age (3-5 year olds) know how to
deal with more than one dimension at a time?

2.   If they do not know how to do this, is teaching them possible?

3.   If teaching them is a possibility, which strategies are most
effective?

4.   a. the size of the presentation.
     b. the type of stimulus dimension learned easiest (size,
shape, number, or shading).
     c. the types of presentations most effective for teaching
the children (are some kinds of stimuli more attention getting
than others, i.e., triangle, or black over square or small).
     d. what kind of introduction would be best?
     e. what kinds of presentations would minimize positioning
effects?

Recommendations:

1.   Multiple classification is teachable on "Sesame Street".

2.   Format:

   a.   the 3x2 design should be used first, the 3x3 next, and the 2x2 last (if at all).

   b.   the first problems presented should use shape and number as the two dimensions.

   c.   children's preference for horizontal axis dimension should be considered and special emphasis placed on noticing the vertical axis dimension.

3.   Strategy

   a.   the introductory lyric should be accompanied by appropriate gestures.

   b.   the child's attention should be directed to each dimension separately with a full discussion of "sameness" and "differences". With many repetitions of the elements and stress on where the empty box is.

      (1) One strategy is to stress what is the same about the elements as "rectangle, rectangle, rectangle, circle, circle, circle, triangle, triangle...what? and then "small, small, small, medium, medium, medium, large, large, what?"

      (2) The second strategy is to discuss the sameness and differences as "small, medium, large, small, medium, large, small, medium, what? and then rectangle, circle, triangle, rectangle, circle, traingle, rectangle, circle, what?"

   c.   A more dynamic presentation prior to the board presentation would serve to introduce the two necessary concepts in solving the multiple classification problem, i.e., a discussion of an apple and the fact that it has more than one dimension (red, round, etc.) and then a comparison of an apple and an orange and how they are alike on some aspects and different on others (both round, but different colors).

Procedure:

   Sixteen children, ranging in age from 3 years 2 months to 5 years 11 months, were tested at the Union-Carver Day Care Center at 106th Street and Madison Avenue during the week of October 5, 1970. The children, 10 males and 6 females, were shown the nine test problems in a randomized order. The problems were presented on cardboard squares of varying sizes with the four possible answers placed next to the problem card. The children were encouraged to give their responses with explanations after the instructional lyric was read to them.

   If the response was incorrect, a full explanation was given to the child via varying techniques:

1.   removing from the 4 possible choices those responses that did not pertain to the one correct dimension, thus teaching the child in a step-by-step fashion where he looked at each dimension separately.

2.   placing all the four possible responses in the empty square and discussing why each one wasn't correct and why the fourth one was.

3.   simple correction of the child's error with a brief statement.

4   In some cases, where the child seemed receptive, the nine problems were presented a second time to establish the possibility of teaching the concept of multiple classification within a reasonable amount of time (or a reasonable number of presentations).

If the child responded correctly, an attempt was made to determine whether it was due to correct conceptualizations, chance factors, or "it just looks right".

Suggestions:

1.   Most of the children tested could not perform adequately on the problems, but some of the older children seemed to have learned the concept with instruction, and many presentations.

2.   In some dimensions, the method of presentation is important:
      a. The 3x2 design seems to be easiest to learn, with the 3x3 next, and the 2x2 hardest.
      b. Shape and number seem to be the more predominant dimensions in attracting the children with the other dimensions following: size, shading, function, and class (function and class were not tested).
      c. A large majority of the children chose to look at the horizontal axis dimension rather than the vertical axis. Also, there seemed to be a perseveration with the child choosing the answer card closest to the problem card when the child didn't know the answer.
      d. The children's own strategies could be used to develop teaching methods. Some of the children placed each answer over the corresponding square on the problem card and placed the remaining one in the empty answer square (of those using this strategy, some did this mentally, but most did this physically). Other children looked at one relevant dimension and eliminated the other answer cards and chose their answer from the fewer number of cards.
      e. The presentation and repetition of the lyric in itself was not sufficient for getting the children to respond. It was

useful for the time after the child understood what was to
identify the kind of problem that will follow. The use of hand
motions to indicate the space, up and down and across, seemed
instructive and attention getting for the children.

      f. In teaching the concept it was useful to stress "the
missing box" (for attentional reasons) the aspect of "sameness"
in the elements, and the "look up and down and across" from the
lyric. In the discussion of "sameness" and "differences" other
of the goals could be included, i.e., relational concepts such
as quantative relationships (some, most, less), size relation-
ships (big, bigger, biggest), etc. Also, the repetition of the
relevant dimension seemed to be especially helpful in that it
was impressive to the child -- "circle, circle, circle, square,
square, square, triangle, triangle, what?"

      g. It would probably be helpful, as a tool of instruction,
to include in each segment that is relevant to the problem of
multiple classification a more dynamic presentation surrounding
the static drawing board presentation. It could be possible to
discuss two separate dimensions of objects in the environment
that are varying in quantity, quality, etc.

Summary:

    In summary, it is suggested that the first production
attempts be made utilizing the suggested lyric, the 3x2 design
with shape and quantity as the varying dimensions. It is sug-
gested that the best method of teaching include the separation
of the two dimensions, both in the analysis of the problem and
the examination of the "different" aspects of the stimuli and
the whole problem itself. It is expected that the children
will learn how to deal with this type of situation.

EXHIBIT F

MEMORANDUM

To: Production

From: Research

Date: December 3, 1970

Re: Larry and Phyllis

An attempt was made to evaluate three of the Larry and Phyllis bits for interest level and educational impact for "Sesame Street" aged children.

Twenty-six children (ages 3-5) were shown "The Song," "Photographs," and "Drums and Guitars" -- the bits were embedded in ½ hour tapes that also contained alphabet and Roger Ramjet segments. Following the presentation, each child was questioned about his interest and understanding of the concept of cooperation.

Generally, the children showed interest and a very mild amusement during the Arkin bits, but no understanding of the concept "cooperation" or even "working together." Many of the children could not say the work "cooperation" or remember it from the tape when questioned.

Procedure:

Observations were taken during the viewing. Following the presentation these children were presented with a photograph of Alan Arkin and wife for identification purposes, and questioned as follows:

1. Did you like them?
2. What were they doing?
3. Why didn't it work?
4. What was the word they talked about?
5. What does cooperate mean?
6. How could they have done what they wanted to?

Summary:

Most of the children could not answer the questions and could only describe the situations in very brief terms -- i.e., "singing song," "playing drums."

Interest Level:

These segments as presented once, served mainly to entertain the children but it is not evident that they learned the concept of cooperation. Perhaps with repeated showings more educational value would be found. The children responded particularly to the more active or loud parts of the segments -- i.e., the ripping off of the pictures, the shouting, the beating of the drums. The least interesting parts seemed to be the confusion about the word cooperate, the beginnings of both the Song and the Drum segments.

Summary:

Generally, the most interesting was the Song with Photographs next and Drums and Guitars least interesting as shown by table #1.

1.   The majority of children had a Zombie reaction (Active non-verbal) for all the bits.

2.   There was more laughter in the Song than in the other two but less commentary.

3.   There was more distraction (standing, figeting) in Drums, and Guitar than the others.

4.   The commentary was mostly descriptive of the actual action with very few negative verbal responses.

Recommendations

1.   Future films of this nature should stress the motivation for using cooperation -- why it is the best way to solve the problem -- at the child's level of understanding.

2.   The presentation of the garbled words before the word cooperation was mentioned was confusing and not interesting for the children -- the word label for the concept (i.e., cooperation) should be especially clear.

BIT

	The Song		Photographs		Drums & Guitar	
	(Children) Number #	(Responses) Per cent	(Children) Number #	(Responses) Per cent	(Children) Number #	(Responses) Per cent
Zombie	11	52	16	62	9	39
Laughter	4	19	2	8	2	9
Standing, Fidget Looking away	4	19	4	15	6	26
Positive Verbal	1 (1)	4	4	15	6	26
1. Imitates Larry			1. ("both of them doing it") 2. ("He wants to fight") 3. ("BEEP BEEP") 4. ("There's a picture of a man too!")		1. ("He has to go like this: 'hmm'") 2. (repeats photo plot) 3. ("He has a guitar")	
Negative Verbal	1 1. ("I don't want that")	4	0	0	2 1. ("I can't hear") 2. (talks to observer)	9
Neutral Verbal	0	0	0	0	1 1. ("A - adorable") (refers to previous film)	4
	21	98%	26	100%	23	100%

communicating the meanings intended. These include the use of the flashback technique, of special lighting effects or special combinations of music and lighting, the use of various camera perspectives, of fast or slow motion, of pixilation, and of the matched dissolve between objects. They also include the close juxtaposition of events in order to establish a metaphoric or analogic relationship between them, and the use of conventions having to do with fantasy, such as presenting puppets and cartoon characters who move and talk like humans. Still others include the creation of "magical" effects, such as making an object instantly appear or disappear from a scene, or grow smaller or larger, and the use of exaggerated motions and consequences, as with slapstick and "banana peel" humor, to mention a few. Other conventions which can be used in more or less comprehensible ways are the speech balloon, the rules of games presented for instruction or entertainment, and rules involved in reading, spelling, mathematical operations, the interpretation of maps, and the like.

Still other facets of comprehensibility relate to timing, sequencing, and the use of redundancy, as in repeating an event exactly or with an illuminating variation, in restating a point from alternative perspectives, and in making use of introductions or reviews. The list could go on indefinitely, a fact which itself suggests the significance of this attribute in educational television research.

Again, as with the appeal testing, this area employs not one but a family of complementary research methods. One very useful approach is to present a program via a portable video playback system to an audience of one or more children, to stop the presentation at predetermined points so as to "freeze the frame," and then to ask viewers about events leading up to or likely to follow from the pictured situation.

If the research concern has to do with a character premise or with a character's motivation, the viewer might be asked, "What kind of person is he?" or "Why did he do (say) that?", or "What do you think he will do next?", "Why do you think that?", and so on. In one segment designed for "The Electric Company," the Short Circus, a musical rock group made up of children, was shown singing a song which contained the letter combination "ow" several dozens of times. As the "ow" song was sung, the printed "ow" was shown a number of times simultaneously. The intention was to provide repetitive practice in associating the spoken and printed forms of this particular letter combination. By using the method of freezing a single frame, it was possible to evaluate the extent to which members of the target audience actually perceived the speech-to-print correspondence. In this case, the letter combination was frozen on the screen at a point late in the song, and as the experimenter pointed to the printed letter,

the subjects were asked a question of the form: "Why is that there?", "What does it mean?"

In a related method, also used frequently in CTW's formative research, a program or segment is played once or twice through. It is then presented once again, but this time without the sound (or, in a variation upon the method, with the sound but without the picture), and the viewer is asked either to give a running account of what is happening or to respond to specific questions.

Other methods useful for evaluating comprehensibility include observing the spontaneous responses of children in viewing groups, and testing for achievement gains following their exposure to a program or segment. Exhibit G shows an example of the results of this method.

A strength of comprehensibility testing relative to traditional forms of summative evaluation is the opportunity it provides for discriminating between the most and least effective of the many individual segments devoted to a particular achievement objective. A potential but largely surmountable limitation is the tendency for these methods to produce biased results. Because comprehensibility testing is performed as the program is being viewed, and because the viewer knows he will be questioned, there is typically an over-estimation of a segment's effectiveness. In practice, this bias can be subjectively discounted, at best, and must further be weighed against the possibility that segments which produce no measureable learning when presented in isolation may be effective

EXHIBIT G

EXCERPT FROM A MEMORANDUM DATED MARCH 19, 1973
TO "PRODUCTION" FROM "RESEARCH"

GROUP OBSERVATIONS

Ten children at Union Day Care watched the test bits in viewing groups of three, three, and four. The children's reactions were recorded as follows:

Drummer Street

a. All children were very attentive.

b. Remarks: "street," "a street," "He's crazy," "street," "That means 'Sesame Street' is starting."

Upside Down #8

a. All children very attentive.

b. Remarks: "They're upside down," "They're upside down," "and they're upside down," "It's upside down," -- later on, same kid said, "It's still upside down," "That's the number 8," "He's upside down, too."

Drummer Telephone

a. All children very attentive.

b. There were not many verbal responses. Remarks: "telephone," "Sometimes they speak Spanish."

Matching House #9

a. All children very attentive.

b. Remarks: Three children said they had seen the bit before. "I like this"; "He has to go in #9"; "What happened to the dot?"; "He's going to go to 10"; "The 9 is supposed to be in house #9"; "I told you."

c. The kids were very excited about this bit; all watched very eagerly.

Alphabet Dancers X

    a. All children very attentive.

    b. Remarks: "It's a t," "I don't know what letter they're going to make," "It's an n and an o, too," "It's an x."

Emperor's New Gong

    a. All started out attentive; during the bit, four became inattentive.

    b. Many of the kids became disinterested as the bit progressed. Some were watching, but it was evident that they were not really enjoying what they were viewing.

    c. Remarks: "Wow, that made magic"; "Who is he?" (talking about the narrator); "What is that (the gong) called?"

U - Up

    a. Eight very attentive, two fairly attentive.

    b. Remarks: "up," "p."

U - Ugly

    a. All very attentive.

    b. Remarks: "up" (referring to previous bit), "ugly, right."

    c. All the children laughed a lot at this bit.

Multiple Classification (four short segments)

    a. All very attentive, except one child who became inattentive as bit progressed.

    b. Remarks: "A big one and a little one"; "Triangles, squares, triangles, squares" (this child kept repeating this throughout the bit); "Triangle, square," "Big square, little square, big triangle, little triangle"; "Oh, no, not again"; "Not that again."

    c. The children seemed to understand the concept of large and small better than they understood classification by geometric forms. Classification by color was not mentioned by any of the children observed.

d.   This bit elicited more verbal response than any of the others on this tape.

<u>Maria Sorting Song</u>

a.   All very attentive.

b.   Remarks: All the children laughed when the gorillas entered. "That's her boyfriend"; "That's a church"; "They eat up the food." One said of Maria, "That's me." "It's a church"; "a chandelier," "Bob is going to come," "Bob doesn't belong there," "That's pretty," "Hey, don't shake his hand, woman." "A man," "He's standing on a chair." When the sorting song asked, which one doesn't belong, one child went to the set and pointed to Bob.

Based on these observations, the most well-liked bits were: Matching House #9, Multiple Classification Bits, and Maria · Sorting Song. The least-liked bit was the Emporer's New Gong.

COMPREHENSION PROBE

Following are conclusions derived from the probe interviews conducted individually with ten children at Union Day Care Center.

Drummer Street -- All children recognized the word "street" when it was written. Most could not spell it on their own.

Upside Down #8 -- The children realized that the 8 was upside down; half of them said it was because the muppets near it were upside down. Half of the children gave some such answer as: "The little spot have to be on the top, and the big spot have to be on the bottom." One child steadfastly insisted that the 8 was rightside up when the bit began and that the muppets had turned it upside down.

Telephone -- When asked, "What word were they talking about?" six of the children correctly identified the word telephone. Two children did not know the answer, and two answered "street."

Matching Houses #9 -- Seven of the ten children correctly answered the question, "Which house is his?" Two children had seen the bit before and were able to predict the 9's exact route: "He's gonna go to the 2, the 5, the 10, the 9." Two children could not answer and one child insisted, "He's going to the three." Asked how he knew, he announced, "Because that's what number I am." There was some confusion among a couple of the children about the sound effects used when the 9 went to the wrong houses. One child explained that the barking dog meant that this was "not a real house," but a "doghouse." The burglar alarm led the same child to announce that this was not a house, but a school. The party sounds indicated a "place where they dance," and the ringing doorbell at the number 9 house meant that this was a "real house."

Alphabet Dancers -- Seven of the children were able to read the dancer configuration as the letter X. Two reported they did not know and one child could select X as the proper answer when offered several alternatives.

Emporer's New Gong -- Few children understood the gist of the story, although some children could answer questions when their attention was directed to the story while it was on the air. Most of the children were fascinated with the ringing gong and with the gong salesman hitting his head, but most of them were not listening to the emporer's complaints about "too loud" and "too quiet."

U - Up -- Half of the children could list some other words beginning with U, and all the children reported that the little boy had "gone up."

U - Ugly -- Almost all the children were able to report that ugly begins with U, but few could offer a cogent explanation of what ugly means. The children considered it an insulting term, but few knew why it is insulting.

Multiple Classification -- Most of the children could classify successfully by shape and size, but only two children understood the classification by color, probably because the white and gray were so close in hue. The children were very excited by this bit, many of them calling out in anticipation, "a big triangle! a little triangle!"

Sorting Song -- All of the children knew that Bob "didn't belong" because "he was a real man." One child announced that Bob didn't belong because "he doesn't have a note." Many children jumped up when the song asked "which one doesn't belong with the others" to point to Bob on the television screen.

CONCLUSIONS

Most of these bits were outstandingly effective in eliciting comprehension and attention, particularly Matching Houses #9, Maria's Sorting Song, and the Multiple Classification series. The Emperor's New Gong was least effective, and perhaps we should reconsider the wisdom of using this style. One miscellaneous comment re. the multiple classification bits: when classifying according to color, we should make the color differences quite evident.

in combination or when presented along with an appropriate intro-
duction or review. However, these limitations do not detract
seriously from the usefulness of such methods. The bias can in
fact be turned to an asset, as when it can be shown that a segment
of questionable value fails to make its point even when evaluated
by means of a liberally biased method.

Internal Compatibility

Internal compatibility is a program attribute which has to
do with the relationship of different elements appearing within
the same segment. The basic strategy underlying both "Sesame Street"
and "The Electric Company" is to attempt to effect instruction
through the use of television's most popular entertainment forms.
To this end, it is essential that the entertainment and educational
elements work well together. Without the entertainment, attention
strays, and without the education, the whole point of the presen-
tation is lost. In segments where these elements are mutually
compatible, the educational point is an inherent part of the
dramatic action and often is actually enhanced in its salience
as a consequence. In others, the entertaining elements override
and thereby actually compete with the educational message. Other
cases in which the relationship of elements becomes a concern have
to do with auditory-visual, auditory-auditory, and visual-visual
compatibilities.

The objective of formative research in this area is to shed light upon the program design features which make for a high or low degree of compatibility. As in the case of the other major program attributes discussed here, internal compatibility can be evaluated by means of a number of different research methods. In one, a panel of judges is asked to rate each segment of a program according to a predetermined set of categories defining the extent to which a segment's entertainment either facilitates or competes with the instructional content. Working from each segment's compatibility score, which is a composite of the ratings given by the various judges, it is possible to identify sets of high-rated and low-rated segments, and to present the producers with an interpreted list of each type. The interpretations identify program design features to be emulated, revised, or avoided.

Another method involves eye-movement research, which is especially useful in the case of "The Electric Company," because of the extensive presentation of print on the screen and the desire to find ways of motivating the child to read it. In most segments, the print appears on the screen along with competing stimuli. By using the well-known technique in which a beam of light is reflected from the cornea of the eye of the television viewing subject and recorded on a photographic device for later

interpretation, it is possible to identify the conditions under which the print is and is not read. Once again, the results indicate program-design features worth emulating and approaches which need to be revised or avoided.

Among the important program features focused upon by this method are the location of the print on the screen; the effectiveness of various ways of animating print; the effect of the exact repetition of segments upon the elements attended to; and the usefulness of special motivational devices, such as telling all but the punch line of a joke, and then presenting that in print.

Methods for measuring eye movement obviously have implications for the evaluation of program appeal, and in particular may be used to complement other methods of appeal measurement discussed earlier. They are also related to the category of methods taken up immediately below, those concerned with the assessment of a program's activity eliciting potential.

Activity Eliciting Potential

A widely expressed point of view about television as an instructional medium holds that due to the passivity of the viewer, the medium is virtually powerless to produce learning. There is no question that the medium has limitations in this regard. However, since it is patently obvious that television can and does teach,

a more constructive point of view is to examine conceptually ways
in which this capability comes about, and operationally, ways in
which it may be exploited. The position taken here is that the
activity eliciting potential of the medium, no matter how limited,
is nevertheless the chief basis for whatever effectiveness it has.

One significant form of activity television can elicit is
intellectual activity. Others include verbal behavior and gross
physical acts, ranging from television-modified performance on
tests of attitudes and achievements to the imitation of televised
models. It is important to note that the concern of the medium
can be either to exploit these effects as instruments of instruc-
tion or to foster them as instructional objectives.

Intellectual activities include integrating separately
presented items of information, anticipating upcoming events,
forming new concepts, imputing the motives and intentions of
characters, following progressively developed dramatic and
instructional presentations, and guessing answers to questions.
The viewer also actively evaluates relationships between premises
and conclusions, between information given and interpretations
made of it, and between codes of behavior and the actual behaviors
carried out by the performers. The viewer also frequently relates
new information from a televised presentation to his own prior
experiences and to his future plans. These are only a few of the

many possible instances.

No review of the capabilities of television vis-à-vis imitation and modeling will be given here, since those effects already have been the subject of considerable research and conceptualization.

It is understandable that from a superficial look at television's potential as an instructional medium many educators underestimate its ability to recreate the conditions known or presumed to be essential for learning. Tentative indications from formative conceptualization and research on the activity eliciting capabilities of the medium suggest that many of its presumed limitations may be at least partially surmountable. For example, it is often assumed that learning through trial and error or through trial and reinforcement cannot occur through one-way televised presentations, on the basis that there is no opportunity for reinforcement or information feedback to be tied to an action of the learner. This is not a trivial issue, from a practical standpoint, since vast amounts of money may yet be spent studying the use of two-way communication systems in connection with televised instruction. It turns out that conceptually it is possible to effect trial-and-error learning through one-way television, simply by the use of "if" statements. That is, the viewer may be offered a choice among provided alternatives, given time to make his choice (his point of most active involvement), and then given reinforcement,

or an accuracy check, of the form: "If you chose thus and so, you were correct (incorrect)." Empirical studies may or may not support the viability of such an approach, but it certainly deserves further investigation.

Similarly, the notion that certain activities containing a motoric component can be learned only through direct experience is in many instances questionable. For example, direct experience in the construction of alphabetical characters may have its most significant effect upon learning by controlling the scan of the eye over the configuration of the letter, by providing extended or repeated exposure to the letter, or by providing an occasion for the most common errors to be made and corrected. (See Exhibit C, supra.) But all of these are features one-way television can either duplicate or simulate. We need to know more about the effectiveness of such features when produced by one-way television. We also need to know more about the entry skills required under such conditions in order for learning to occur, and about possibilities for the facilitation of subsequent learning.

All this is not an argument in favor of unduly widespread substitution of television for physical activity among children, by the way, nor is it intended to deny the great importance of extensive direct experience in learning, especially in early learning. It is intended, rather, to urge more open and positive consideration

of some of the potential but not yet systematically explored capabilities of the television medium.

Why Formative Research?

Formative research, in the view taken here, is properly eclectic and pragmatic. In these respects, it is highly compatible with the current trend toward the very explicit definition of instructional objectives, followed by the development through systematic trial and revision of instructional systems for achieving them. This approach, incidentally, in no way diminishes the traditional role of the behavioral sciences in education or the usefulness of existing theory and knowledge. Rather, it holds that a useful step between basic research and educational practice is additional research of a formative sort, far more directly concerned with specific combinations of educational objectives, instructional media, learners, and learning situations. This is not to say that formative research is exclusively concerned with putting theory into practice. An equally valid function is that of starting with practice and transforming it into improved practice. Still another is that of providing hypotheses for further research and theoretical development.

One long-standing point of view in education holds that theories and results growing out of the "mother" disciplines of

psychology, sociology, anthropology, and the like will filter
into effective educational practice if enough educators have been
trained in these basic disciplines. While this approach has been
useful to a degree, it has not produced broadly satisfactory
results. Meanwhile, creators of new educational products and
practices have proceeded largely without the benefits of measure-
ment and research. This is partly because skill and training in
these areas have been linked to the process of theory construction
and validation, and partly because of an inappropriately rigid
adherence to traditional research practice within the product
developmental context. Formative research procedure promises to
help in creating a mutually constructive relationship between these
two overly isolated realms -- the science and the technology of
learning.

Some Considerations in the Use of Formative Research
Organizational and Interpersonal Factors

As technologically sophisticated forms of instruction come
into increasing prominence, it will be necessary to make increased
use of production teams whose members possess a diversity of highly
specialized talents. In anticipation of this trend, we need to
know more about related organizational and interpersonal conditions.
These conditions deserve attention in any attempts to establish a
working partnership between television research and production

groups, and they play a strikingly more promiment role in the
formative research context than in the context of more traditional
approaches to educational research. To illustrate briefly the
many and different types of factors involved, a major one in CTW's
case has been the opportunity afforded by an eighteen-month
pre-broadcast period for the members of the two groups to learn
about each others' areas of specialization. Another has been the
attitude that every new formative research approach is an experiment,
to be continued or discontinued depending on its merits as evaluated
by the producers themselves.

The fact that CTW's researchers and producers possess not the
same but complementary skills is also significant, largely because
it provides for clear and distinct functions on the part of each
group. Still another factor is that the producers, before joining
the project, made the commitment to try to work with formative
research. This prior commitment helped to support the cooperative
spirit through the early, more tentative period of the effort. Also,
as mentioned before, research never takes on the role of adversary
to be used against the producers in winning a point or pressing for
a particular decision. The producers hold the final power of decision
and are free to ignore research suggestions if production constraints
require.

In all, the factors consciously dealt with in the interests
of researcher-producer cooperation have ranged from the careful

division of labor and responsibility to housing the two staffs in adjacent offices, and from patience and diplomacy to occasional retreat.

Formative Research with Low-Budget Projects

With low-budget productions, the cost of sophisticated formative research can be so costly as to discourage its use altogether. However, a great deal of useful field data can be obtained quite economically if cost-effective research methods are employed, if favorable production conditions are established, and if considerable interpretive ingenuity is exercised by the researchers and producers. Experience with low-budget projects, both in the U.S. and abroad, suggests a number of research strategies and production conditions which are conducive to maximal effectiveness at minimal cost. As the examples below will make clear, most of these have shortcomings -- but tolerable shortcomings -- relative to more costly alternatives.

The Non-Empirical Checklist. Well-trained specialists who are experienced with a program's curriculum and target audience can provide many useful production suggestions simply by examining scripts, story-boards, or completed productions, and making judgmental observations for subsequent production guidance according to a predesigned checklist of significant program attributes. The checklist can include attributes and related program design features

such as those listed earlier in the Formative Research Methods section. The strength of this method lies in the fact that for minimal cost, a great number of attributes may be evaluated quite regularly and explicitly. The drawbacks include the fact that experts can be wrong, or will themselves often feel the need for an empirical test of their hunches. Also, they may fail to detect important patterns which only sophisticated forms of data analysis typically reveal.

The Segmented Format. While the segmented format can be relatively expensive to produce, it is ideal from the standpoint of evolving a program series -- with or without rigorous formative research -- over the course of a season or over successive seasons. One advantage is that it provides the greatest possible opportunity for production experimentation, although some set formats permit considerable variability, as well. Production approaches which prove to work well can later be used more extensively and those which work poorly can be dropped. In the case of a series with a highly varied format, formative research carried out between production seasons can provide particularly high payoff, for at that time there is a great deal of material to test and usually ample time to test it. Another strategy made possible with the segmented format is that of distributing production resources unequally over segments so as to produce a pool of higher-than-average quality material each

season for replay in the next. The advantages of this approach are that it yields an ultimate level of quality not otherwise attainable, and also that it makes possible an early demonstration for funding purposes of the additional effectiveness which can be achieved with the higher level of quality.

The Visual, Verbal, and Motor Responses of Viewing Groups. Group observations made during selected intervals over the course of a televised presentation can provide gross but useful information about a segment's appeal, its comprehensibility, and its activity eliciting potential. This method also provides the well-trained and ingenious observer with an occasion and an opportunity to observe a program very closely, to maintain an observational checklist, to accumulate quantifiable data for special analyses, and to make in-depth probes of subjects' responses either with predesigned follow-up questions or on-the-spot interviews. The cost/effectiveness ratio for this approach is as favorable as for almost any other conceivable approach.

Pilot Production and Evaluation. Pre-season pilot production deserves special consideration for a number of strategie reasons, one being the fact that extensive revisions are possible before the season begins airing -- at a time when extensive revisions present no threat to the integrity of the series. Another is that the producers are at that time most receptive to valid suggestions and most in a position to make use of them.

The Formative Use of Summative Data. Traditional forms of post-
season testing, of the sort typically carried out in order to evaluate
the educational impact of a program series over an entire broadcast
season, can provide a great deal of information for revising
subsequent productions. The value of this approach can be enhanced
by maintaining a careful record of the amount and type of production
treatment given to each objective or to the subject matter of each
test item and by then relating this record to magnitudes of tested
effects. In this manner it is possible to identify the quite
specific instructional strategies which are most and least effective.
Where it is possible to include in the interpretation further data
on the comprehensibility of the different production approaches,
on their appeal, or on the internal compatibility of their various
elements, the results can be more useful still. The obvious drawback
to the use of summative data for formative purposes is that the
results are not available until well after a full season's broadcast.

Summary

This discussion of the role, function, methods, and considerations
of the use of formative research gives the prospective producer of
a children's program a general overview of the major concerns of the
research staff of CTW. The following chapter will show both the
basis and the aftereffect of this research on the operational decisions
and structures of CTW before and during production. It shows how

the methods described above resulted in findings that were useful
to the production staff, what these findings were, and how they
were utilized in a magazine format that could effectively utilize
all of the potential production components and techniques avail-
able to the producer.

CHAPTER THREE: HOW THE CHILDREN'S TELEVISION WORKSHOP
DEVELOPED "SESAME STREET"

Initial Decisions

A major innovation in the development of children's programming
was CTW's decision that a carefully-selected, explicitly-defined set
of learning goals would be the focus of the program's teaching effort --
an effort which would seek to provide supplementary educational experi-
ences to help prepare children for school by stimulating their desire
for learning. The development of a curriculum was a matter of careful
and meticulous work. In the summer of 1968, CTW conducted a series
of five three-day seminars as the initial step toward establishing its
educational goals. The participants included television producers and
writers, writers of children's books, creative artists, researchers,
psychologists, teachers, and educators. These seminars dealt exten-
sively with the following topics:

1. Social, Moral, and Affective Development

2. Language and Reading

3. Mathematical and Numerical Skills

4. Reasoning and Problem Solving

5. Perception

These seminar groups were asked to suggest educational goals for the prospective series and to discuss ways of treating these goals on broadcast television.

The discussions of the seminar participants and the recommendations of the CTW board of advisors formed the nucleus of the resultant CTW curriculum goals. In a series of staff meetings following the seminars, a list of curriculum goals emerged. These goals were grouped under the following major headings:

I. Symbolic Representation

    a. Letters

    b. Numbers

    c. Geometric Forms

II. Cognitive Organization

    a. Perceptual Discrimination and Organization

    b. Relational Concepts

    c. Classification

III. Reasoning and Problem Solving

    a. Problem Sensitivity and Attitudes Towards Inquiry

    b. Inferences and Causality

    c. Generating and Evaluating Explanations and Solutions

IV. The Child and His World

    a. Self

    b. Social Units

    c. Social Interactions

    d. The Man-Made Environment

    e. The Natural Environment

Specific goals under each of these broad headings were stated, insofar as possible, in behavioral terms. For example, instead of stating the goal as "The child knows the alphabet," the "Sesame Street" curriculum specifies that, "The child can recite the alphabet." The curriculum goals of the first season of "Sesame Street" are presented in Exhibit H. This very specific terminology is an important consequence of the fact that "Sesame Street" was to conduct an experimental investigation into what television could and could not do in the area of preschool education. To test the effectiveness of such an experiment, CTW recognized that it would be necessary to measure the learning achievement produced by the series. Hence, the emphasis on behavioral, "testable" goals would serve as a common reference for the program producers and the designers of the achievement tests.

To further clarify the operational definition of the objectives, the formative research staff developed illustrative teaching strategies in order to clarify the meaning of the goals for the writers and producers. These strategies constitute what is called the "Writer's Workbook."

EXHIBIT H

MEMORANDUM

From: Research Department of Children's Television Workshop

To: -Production Department of Children's Television Workshop
      -Sam Ball, Educational Testing Service, Princeton, New Jersey
      -Advisors to Children's Television Workshop

Subject: Statement of the Instructional Goals for Children's Television Workshop

Date: December 31, 1968

BACKGROUND

As the initial step toward the establishment of its goals, Children's Television Workshop (CTW) organized a series of five three-day seminars during the summer of 1968, dealing with the following topics: (1) Social, Moral and Affective Development; (2) Language and Reading; (3) Mathematical and Numerical Skills; (4) Reasoning and Problem Solving; and (5) Perception. Representatives from a variety of fields attended these seminars, including psychologists, teachers, sociologists, filmmakers, writers of children's books, and creative advertising people, along with the key staff of CTW. Comprehensive reports on the proceedings, along with various other materials, served as the basis for a special meeting on setting priorities among goals, held September 23 and 24, 1968. Results were summarized in an earlier report entitled "Appendix I. Goals Meeting, Children's Television Workshop." The present statement of goals incorporates, extends, and supersedes that earlier report.

PURPOSES

This report is intended to serve various related purposes. First, it attempts to reflect with reasonable accuracy the suggestions of the many consultants to the project. Secondly, it attempts to provide a framework within which to organize the project's goals. Briefly, these now fall into the three large categories of (1) Symbolic Representation, (2) Problem Solving and Reasoning, and (3) Familiarity with the Physical and Social Environments. Thirdly, it proposes a limited set of priority objectives, toward which the CTW experiment, and therefore its production resources, should be especially directed. Fourthly, in addition to general statements of goals and goal categories, it provides a number of specific operational examples, which will hopefully provide further clarification for the members of the production staff. Fifthly, it will serve as a common reference for the production and the summative evaluation phases of the project, reflecting the necessity for maintaining a coordinated relationship between the two. Finally, the report should be useful in communicating with our sponsors, our advisors and consultants, and the general public.

INTERPRETIVE GUIDELINES

The following observations may clarify the attached statement of goals:

I. Experimental Nature of the Project

Children's Television Workshop is an experiment in the instruction of preschool children through the medium of broadcast television. Accordingly, we have not attempted to restrict our goals to those which may be achieved with certainty. In general, the objective is to learn whether (or to what extent) the priority goals defined here may be within the capability of broadcast television to achieve.

II. Overlapping of Goal Categories

Presenting a listing of goals may imply that each goal is considered (1) singly, in isolation from the others, and (2) as belonging to one goal category alone. We do not intend that the list be regarded in these ways. Rather, the goal categories clearly are overlapping, and there are many cases in which a specific goal has been placed under one heading when it could have been placed under another. For instance, certain goals under "Numbers," "Letters," or "Classification" could well have been placed under "Perceptual Discrimination."

III. Goal Priorities

The goals fall into two major sets in terms of priorities. The first set consists of those objectives presently seen as the primary instructional goals of CTW. Each of these is marked by an asterisk. Those goals not preceded by an asterisk may be dealt with somewhere in the program, but it is not anticipated that they necessarily will be the subjects of concentrated production efforts. The follow-up, or summative evaluation, will focus predominantly upon the higher-priority goals, and will include the measurement of the remaining goals only to the extent that the programs as produced appear to be capable of achieving them.

IV. Measurement Plans

Two main forms of follow-up evaluation will measure the extent to which the instructional objectives of CTW have been met:

(1) Exposing the children to limited program segments prior to and perhaps during the broadcast period under highly controlled or "optimal" viewing conditions, and measuring the immediate, short-term, program-specific achievements which may result.

(2) A nation-wide evaluation of the program's effectiveness to be carried out by Educational Testing Service of Princeton, New Jersey, following a design yet to be determined, but one which will probably emphasize "typical" conditions of broadcast viewing, the evaluation of long-term gains, and the use of standardized instruments.

December 31, 1968

The Instructional Goals of Children's Television Workshop

I. SYMBOLIC REPRESENTATION

The child can recognize such basic symbols as letters, numbers, and geometric forms, and can perform rudimentary operations with these symbols.

A. Letters

(Note: For most of the following goals, the training will focus only upon a limited number of letters. The entire alphabet will be involved only in connection with recitation.)

* 1. Given a set of symbols, either all letters or all numbers, the child knows whether those symbols are used in reading or in counting.

* 2. Given a printed letter the child can select the identical letter from a set of printed letters.

* 3. Given a printed letter the child can select its other case version from a set of printed letters.

* 4. Given a verbal label for certain letters the child can select the appropriate letter from a set of printed letters.

* 5. Given a printed letter the child can provide the verbal label.

6. Given a series of words presented orally, all beginning with the same letter, the child can make up another word or pick another word starting with the same letter.

7. Given a spoken letter the child can select a set of pictures or objects beginning with that letter.

8. The child can recite the alphabet.

B. Numbers

* 1. Given a printed numeral the child can select the identical printed numeral from a set.

* 2. Given a spoken numeral between 1 and 10 the child can select the appropriate numeral from a set of printed numerals.

* 3. Given a printed numeral between 1 and 10 the child can provide the verbal label.

* 4. Given two unequal sets of objects each containing up to five members the child can select a set that contains the number requested by the examiner.
Ex. Where are there two pennies?

* 5. Given a set of objects the child can define a subset containing up to 10.
  Ex. Here are some pennies. Give me two.

* 6. Given an ordered set of up to four objects, the child can select one by its ordinal position.
  Ex. Where is the third book?

* 7. The child can count to 10.

8. The child can count to 20.

9. The child understands that the number system extends beyond those he has learned, and that larger numbers are used to count larger numbers of objects.

C. Geometric Forms

1. Given a drawing or a cut-out of a circle, square or triangle, the child can select a matching drawing, cut-out, or object from a set.

2. Given the verbal label, "circle", "square", or "triangle, the child can select the appropriate drawing, cut-out or object from a set.

II. Cognitive Processes

The child can deal with objects and events in terms of certain concepts of order, classification and relationship; he can apply certain basic reasoning skills; and he possesses certain attitudes conducive to effective inquiry and problem solving.

A. Perceptual Discrimination

* 1. Body Percepts
  The child can identify and label such body parts as elbow, knee, lips and tongue.

2. Visual Discrimination

a. The child can match a given object or picture to one of a varied set of objects or pictures which is similar in form, size or position.

b. Given a form the child can find its counterpart embedded in a picture or drawing.
Ex. Given a circle the child can find the same shape in the wheels of a car. (This could be done with letters and numbers as well).

c. The child can structure parts into a meaningful whole.
Ex. 1. Using modelling clay and beans the child can fashion a head.

Ex. 2. Given two triangles and a model the child can construct a square.

Ex. 3. Looking at a picture of children with presents and a cake with candles the child can describe the picture as a birthday party.

* 3. Auditory Discrimination

   a. Initial Sounds
       The child can match words on the basis of common initial sounds. (see I. A., numbers 6 and 7, above)

   b. Rhymes
       The child can match words on the basis of rhyming.
   Ex. Given two or more words that rhyme, the child can pick or supply a third.

   c. Sound Identification.
       The child can associate given sounds with familiar objects or animals.
   Ex. Car horn, wood saw, moo of a cow

   d. Copying rhythms
       The child can copy a rhythmic pattern.

B. Relational Concepts

   * 1. Size Relationships
   Ex. Big, bigger, biggest; short, tall; skinny, little, etc.

   * 2. Positional Relationships
   Ex. Under, over, on top of, below, above, beneath, etc.

   * 3. Distance Relationships
   Ex. Near, far away, close to, next to, etc.

   * 4. Amount or number Relationships
   Ex. All, none, some; same, more, less; etc.

   5. Temporal Relationships
   Ex. Yesterday, today, and tomorrow; early, late; fast, slow; first, last

   6. Auditory Relationships
   Ex. Loud, louder, loudest; soft, softer, softest; noisy, quiet; high, low, etc.

C. Classification

   * 1. Given at least two objects that define the basis of grouping, the child can select an additional object that "goes with them" on the basis of:
                       - Size: Height, length
                       - Form: Circular, square, triangular
                       - Function: to ride in, to eat, etc.
                       - Class: Animals, vehicles, etc.

2. Given 4 objects, 3 of which have an attribute in common, the child can sort out the inappropriate object on the basis of:

- Size: Height, length
- Form: Circular, square, triangular
- Function: To ride in, to eat, etc.
- Class: Vehicles, animals

3. The child can verbalize the basis for grouping and sorting.

D. Ordering

1. Given the largest and smallest of five objects which are graduated in size, the child can insert the three intermediate objects in their proper order.

2. Given pictures of the earliest and latest of five events in a logically ordered temporal sequence, the child can insert pictures of the intermediate events in their proper order.

E. Reasoning and Problem Solving

1. Inferences and Causality

* a. Given a situation the child can infer probable antecedent events.
Ex. Given an apple with a bite missing the child can indicate that someone was eating it.

* b. Given a situation the child can infer probable consequent events.
Ex. Given a man stepping off a ladder, and a bucket of paint beneath his foot, the child recognizes that the man is going to step into the paint.

c. Ordering on the basis of causality
Given two or more events which are causally related, the child can place them in their appropriate causal order.

2. Generating and Evaluating Explanations and Solutions

* a. The child can suggest multiple solutions to simple problems.

* b. Given a set of suggested solutions to a simple problem, the child can select the most relevant, complete, or efficient.

3. Attitudes toward Inquiry and Problem Solving.

a. Persistence
The child persists in his efforts to solve problems and understand events despite early failures.

b. Reactions to lack of knowledge
The child exhibits no undue frustration or embarassment when he must admit to a reasonable lack of knowledge or when he must ask questions.

c. Impulse control
The child understands that reflection and planning may pay off where premature problem attack will not.

III. The Physical Environment
The child's conception of the physical world should include general information about natural phenomena, both near and distant; about certain processes which occur in nature; about certain interdependencies which relate various natural phenomena; and about the ways in which man explores and exploits the natural world.

A. The Child and the Physical World Around Him

1. The Natural Environment

a. Land, Sky, and Water
The child should realize that the earth is made of land and water, and that the earth's surface differs in various places.
Ex. The child can identify puddles, rivers, lakes and oceans when shown pictures of them, can tell that all of them are water, and can tell how they are similar and different in terms of size and depth.
The child can identify mountains and rocks although they differ in size and shape.
The child can identify and give salient facts about objects seen in the sky.
Ex. The sun provides heat and light during the day; the moon and stars provide light at night; airplanes carry people; rockets explore space.

b. City and Country
The child can distinguish the environment and natural life of the city from those of the country.

c. Plants and Animals
The child can classify a group of objects as plants although they differ in size, shape and appearance.
The child can tell that plants are living things, and and that they require sun and water to grow and live.
The child can name some plants that are grown and eaten by man.
The child can classify a group of objects as animals although they vary in size, shape, and appearance.
The child can tell that animals are living things, and that they need food and water to grow and live.
The child can associate certain animals with their homes.
Ex. The child can associate birds with nests; fish with water; bears with forests.

d. Natural Processes and Cycles

(1) Reproduction, Growth and Development
Given pictures of various kinds of young, the child can tell what they will be when they grow up. Ex. Calves and colts become cows or horses; tadpoles, frogs; caterpillars, butterflies; boys, men; girls, women.
The child can identify such seeds as corn, acorn, bean, and knows that after one of these has been planted a new plant will grow.
The child can identify birth, growth, aging, and death as stages in the life process of individual plants and animals.

(2) Weather and Seasons
The child can describe the weather and activities which are associated with summer and winter.
Ex. In summer the weather is hot and sunny, the trees all have their leaves, people wear light-weight clothing and may go swimming; in winter the weather is cold and snowy, many trees have lost their leaves; people wear heavy-weight clothing, and may go sledding or ice-skating.

2. The Man-Made Environment

a. Machines
The child can identify automobiles, trucks, buses, airplanes, and boats, and can tell where and how each is used.
The child can identify such common tools as a hammer and saw, and can tell how each is used.
The child can identify basic appliances such as refrigerator, record player, and stove, and can tell how each is used.

b. Buildings and other Structures
The child can identify some of the different types of buildings which serve as family homes, schools and stores.
The child can identify some of the materials used in building, such as bricks, wood, and concrete.
The child can identify as man-made such structures as bridges, dams, streets, and roads.

IV. The Social Environment
The child can identify himself and other familiar individuals in terms of role-defining characteristics. He is familiar with forms and functions of institutions which he may encounter. He comes to see situations from more than one point of view, begins to see the necessity for certain social rules, particularly those insuring justice and fair play.

A. Social Units

   1. Self

      a. The child knows his own name

      b. The child can specify whether he or she will grow up to be a mother or a father.

   2. Roles
     Given the name of certain roles from the family, neighborhood, city or town, the child can enumerate appropriate responsibilities. Ex. The child can name one or more principal functions of the father and mother, mayor, policeman, baker, mailman, farmer, fireman, soldier, doctor, dentist, baker, schoolboy or schoolgirl.

   3. Social Groups and Institutions of Concern to Children

      a. The family and the home
      The child views such activities as reading, playing of games, and excursions as normal family activities.
      The child recognizes that various types of structures all serve as homes.

      b. The neighborhood
      The child distinguishes between neighborhood areas that are safe and unsafe for play.

      c. The city or town
      The child recognizes various structures, spaces, and points of interest which make up the city or town.
      Ex. The child is familiar with the concepts of a zoo, park or playground, airport and parade, and with stores where various types of common items may be purchased.
      The child understands that there are many different cities, that they have finite boundaries, that various goods or products must be transported in and out, and that various modes of transportation are employed.
      The child identifies the respective functions of such institutions as the school, post office, and hospital.
      Ex. The child knows that people go to school to learn how to read and write; to the hospital if ill or having a baby.

B. Social Interactions

   1. Differences in Perspectives
     The child recognizes that a single event may be seen and interpreted differently by different individuals.
     Ex. Given a picture showing one boy in a bathing suit and another boy in a snow suit, the child can express the feelings of both boys in the event of snow.

* 2. Cooperation

The child recognizes that in certain situations it is beneficial for two or more individuals to work together toward a common goal. Ex. Two girls want to bring chairs to the table, but can only lift and carry them by working together.

3. Rules which Insure Justice and Fair Play

    a. Behaving by Rules

    The child is able to behave according to the constraints of simple rules presented either verbally or by models.

    b. Recognizing Fairness or Unfairness

    The child can distinguish simple situations representing fairness from those representing unfairness. Ex. The child can say whether a particular form of praise or punishment is or is not appropriate in a particular situation.

    c. Evaluating Rules

    Given a rule, the child can tell whether it is good or bad, and why.

    d. Generating Rules

    Given a situation involving interpersonal conflict, the child can furnish an appropriate rule for resolving it. Ex. Told that two boys both wish to play with the same toy, the child must formulate a rule that is equitable (neither may have it; they can take turns; etc.).

In the Workbook each objective is treated separately.
Strategies for achieving the objective are offered
and a variety of instances of the objective are
discussed. For example, to help the child develop
an awareness of other points of view the following
teaching strategies are suggested: (1) Start off
with the child's point of view and then present the
opposing viewpoint in juxtaposition with his,
(2) Have the child pretend he is someone whose point
of view is obviously different for the child's,
(3) Start off with a two-person situation where one
individual is totally oblivious to another's point of
view and develop a need for communication, (4) Keep
the situation constant and have several characters
enter, in turn, and react differently in the same
situation.[1]

The Writer's Workbook is continuously supplemented as writers and

producers seek clarification and interpretation of various goal areas.

In this way, script writing is tied to goals and priorities and the

translation of these goals into behavioral terms.

The goals provided a clear idea of where production should be

going but, before program elements could be created, some indication

of how much the child already knew about a given concept, and how much

the child was capable of assimilating from television to

give the creative staff estimates of what levels of skills they should

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[1]Barbara F. Reeves, The First Year of Sesame Street: The
Formative Research (New York: Children's Television Workshop, 1973).

aim to present. For most goal areas, however, there was little existant normative data and, therefore, they had to be collected by the CTW research staff. The CTW research department developed its own General Ability Measures. These measures were constructed solely for the purpose of providing base-line data on competence in major goal areas. In February of 1969, it reported the results of the testing of 68 four-year-olds from three New York City Day Care Centers. A summary of the results from this testing and a description of the test items is presented in Appendix B, Sections I and II. The research staff, still not satisfied that they were providing the producers with a true picture of their potential audience, conducted tests in over 40 homes to test children who were much closer to the population for whom the program was aimed. The results from this study are presented in Appendix B, Section III.

The initial decision to purposely confine the "Sesame Street" program to a set of carefully defined and objectively-measurable and cognitive instructional goals was based on three factors. The first factor was the need to demonstrate the success of the program on its viewers. In social-affective concepts the evaluation problems become much more complex. Therefore, even though social behavior comprises a significant aspect of the lives of the preschoolers who whould view "Sesame Street," because they were not objectively measurable in the same sense that symbolic concepts are measurable, they would have

to be deferred until subsequent broadcast seasons. Second, CTW was aware that the parents of the disadvantaged children, toward whom the program was primarily directed, wanted their children to be able to master the skills of reading, writing, and arithmetic. Tools for school seemed a plausible goal. Third, the child's self image was (and still is) an important consideration of CTW. It was widely shared by all the staff that a child's self concept is greatly enhanced when he acquires certain elementary skills of recognizing and labelling letters, numbers, geometric forms and can exhibit these skills to receive attention and admiration and self confidence. The child then knows that he is capable of learning something useful, and this feeling motivates further learning.

Perhaps the most important aspect of the decision to establish preparation for school as a goal of "Sesame Street" is the attitude that it would be better to concentrate on only certain universal goals all children could achieve. Television is a special and limited kind of educational medium. It can only serve to supplement other kinds of early experiences children receive from the total environment. Television must complement, not compete, with other educational experiences. The curriculum of "Sesame Street" is, therefore, a very arbitrary one. It does not attempt to cover the full range of preschool objectives.

Production Decisions

Infusing a program concept with meaning is one thing, but the implementation of specific goals in a systematic manner in an hour a day, five days a week, 26 weeks series is quite another. Volume production differs from the one-program-a-week or the one-a-year special. To produce a "special" may involve from six months to two years shaping and fashioning it. No continuity of production is required and the production pressures are over once the program is completed. The one-a-week productions require a permanent staff and an operational design and production process, but there is ample time to plan programs from one week to the next. In order to produce 130 one-hour programs within the space of four to five months, the program must have a point of view, an operational design, and a production process which sustains the quality and aims of the program. Further, producers with volume production experience and writers who can create on a sustained quality level under short dead-line conditions are pivotal requirements.

One key decision that Joan Cooney made at the very outset of CTW was to bring in successful commercial professionals to do an educational television program. This is radically different from the traditional educational TV practice of hiring educators or greatly talented but untested skills of a promising producer. The scope and magnitude of this project allowed no prospects for this,

as Mike Dann, then CBS program head advised her: "The challenge of turning out a daily hour program is so staggering, and you have no experience yourselves in doing it, that you must find a man who has done it. You cannot take the chance of getting someone who hasn't actually physically done this job."[2] Any search for experienced producers of children's programs is necessarily a difficult task. There are few. Children's programs have never occupied a high position in the structure of television in the United States. Producing programs for children offer limited financial rewards, and is considered to be among the low prestige positions. Thus, talented persons often use them as training ground for advancement to the more glamorous adult programs. The search for volume production experience, therefore, began and ended with David Connell, who had been producing some 300 programs a year of "Captain Kangaroo" -- the only commercial network program for children directed at a specified audience five days a week. There can be little wonder then why many of the CTW writers and producers are "Captain Kangaroo" veterans. This accounts for the fact that, although CTW created much of its own unique operational design and production processes to fit the character and aims of "Sesame Street" and "The Electric Company," there is a carry over of some of these elements from "Captain Kangaroo."

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[2]As quoted by Stuart Little, "Children's Television Workshop," Saturday Review (Feb. 8, 1969).

Writing for children has its own unique requirements. Besides professionalism, it requires caring for children and what happens to them. Such writers are also few in number. On "Sesame Street" and "The Electric Company," all of the writers' creative talents are directed by the instructional aims. There is a clearly-defined objective with absolute clarity of purpose. The writer expresses his talent in how he reaches the already given goals. Thus, he must understand the educational objectives in order to blend them with his own imagination and originality. In addition, a (good) television writer must have an understanding of the production techniques and technical devices -- the inherent possibilities and limitations of a complicated electronic medium. One of the most important requirements for a writer of children's programs is how to structure a program so that the hour moves from scene to scene with a balanced variety and pace that is geared to the needs, interests, viewing habits of the target child.

Generally, productions do not systematically plan so carefully that their specific goals as well as broad objectives are incorporated in shows on an individual program basis. In volume productions, however, the program objectives and specific content can easily be glossed over in the stream of daily decisions unless care is taken not only to achieve its aims, but to also maintain a consistent level of quality and a series coherence. A sound production process is vital. At CTW, the process begins with a curriculum coordinator who

builds what is called an assignment sheet (at "Captain Kangaroo" this sheet is called a theme sheet) from the curriculum goals. This assignment sheet is given to the writer. It is an outline of the curriculum categories, showing the amount of time to be given to each area. Since some of the areas are covered by a substantial library of existing animation, live-action film, cameo and other specially-produced material which is inserted into a given program, the writer is actually only responsible for writing 20 to 25 minutes of "wraparound" or live studio bits. Each program represents 1/130th of the total curriculum. The selection which the curriculum coordinator makes on the assignment sheet is based on the curriculum decisions already made by the production staff working with the researchers and advisors.

Usually, the writer has a week to prepare his script. It is his responsibility to structure the program, integrating the 20 or 25 minutes he has written with the already assigned library material. Ideally, for maximum variety, each program should include 20 minutes of wraparound, 20 minutes of animated and live-action film, and 20 minutes of muppet inserts. One copy of the script goes to the head writer and another to the research/production coordinator. Both review the script. If the research/production coordinator finds any scenes that are educationally unclear, she has a meeting with the head writer about it. The head writer sends the script back to the writer for rewrite when necessary.

Once the head writer is satisfied that the script meets the educational and entertainment values of the program, the script goes to the producer for final approval. If approved, then it goes to a script girl for typing and duplication. On occasion, the producer sends the script back for revision.

A two week preparation period is set in motion once the scripts have been distributed. The shows have been broken down into their individual production needs -- talent, music, graphics, illustrations, costumes, props, special effects, sound effects -- by a production assistant. Copies of the scripts have been received by the various production support departments: props, graphics, scenic, music, makeup, costumes, special and sound effects, and by the show directors and stage managers. These are reviewed by the various department heads to determine the areas of their responsibility and to make notes of the questions they need to ask at the weekly production meeting in order to determine very precisely what each script requires of them.

The weekly production meeting involves all production heads. At this meeting the production requirements of a week's scripts are refined in specific terms of color, size, quantity, shape, and so forth. In most productions, this meeting is chaired by the director, but on "Sesame Street" the producer has that responsibility because it is he who has to provide the program's point of view and has a better understanding of the sophisticated curriculum goals and their

interpretation. All of the elements are put together in the studio on the appointed day.

The live portions of the program, though appearing to be the easiest segments to produce, are actually the most difficult. The TV studio is where television finally happens. At the "Sesame Street" studio there is always a producer present. His responsibility is to make sure that all the production elements are present in the studio on the appointed day, make final judgement on them, interpret the curriculum goals of the script to the cast and director, rewrite the scenes that are not working, "buy" the scenes if he determines that they are on target or have them reshot if they are not. At the same time, he must preserve the artistic quality, the freshness, and the entertainment values of the program.

While making these decisions, the producer must keep in mind that the schedule demands that a certain amount of new studio material must be completed during the working day. It is important for him to have a realistic grasp of how much he can get from the actors and director on a given scene. To reshoot a scene until it is "perfect" will undoubtedly cause it to lose its freshness. The producer must know the point when reshooting is going to cause budgetary and scheduling complications. During the rehearsal and shooting, advisors and researchers are able to monitor through closed-circuit outlets back at the CTW office and phone observations about curriculum aspects to the studio producer.

When the studio day is over, the newly shot material is delivered to a videotape editor who, using the script rundown, assembles it together with the existing library segments.

Each completed program is viewed from beginning to end to make sure that the program works as a whole and that there are no educationally incorrect segments. If any educational errors are found, that program is sent back for revision.

The present level of CTW production efficiency evolved after a period of trial and error, and the tailoring of operational techniques long used in the business world to a television production. The operational techniques of "Sesame Street" may not apply to all productions since production requirements vary with the character of the program. Still, a television producer may use many of the procedures described here as guidelines to ensure that the objective and content of his program are not left at random.

The Choice of Format and Program Features

The choice of program format is one of the most important production values that CTW had to decide upon. It is easy enough to follow the tried and true format of successful television programs and such a method of format choice inhibits experimentation. There have been very few attempts to create a format which provides the child with direct sensory-visual experiences or presents conventional narrative episodic material in a non-sequential manner. This is because it is widely assumed that the content of a program dictates its format.

This assumption is only partly true. Other considerations in deter-
mining format are the program's specific objective, the perceptions,
feeling and other normative characterisitcs of the target audience.

Television program formats for children are far from being
exploited. Thus, it may be of greater value when considering format
to think about the kinds of attributes that appeal to pre-schoolers,
their level of comprehension and the techniques of presentation
that are most likely to interest them and stimulate their learning.

The majority of television programs specifically produced for,
not aimed at, children of two to twelve years old follow one of the
many forms of the magazine format. The magazine format is the most
flexible of all formats. Its danger is that without objectives and
planning it may easily decline into a melange of disconnected and
distracted segments of cartoons, inferior films and a condescending
host. However, with purposeful objectives and thoughtful planning,
the magazine format offers perhaps one of the most flexible of all
formats. The magazine format allows the producer to combine diverse
elements in the program which appeal to a wide age and interest
range in the children. It can accentuate novel experiences which
may be lost in a program devoted entirely to the novel experience
itself. The short segments are well suited to the attention span of
the preschooler and provide a change of pace which maintains his
interest level. The participation of the child is more readily
achieved with this format.

In volume production, the flexibility of the magazine format cuts the demands of continual output. It requires less writing time and less rehearsal time. The demands on the actor or performer are less difficult because he is not depended on to carry the whole program, only to provide a sense of continuity.

One of the most important values of the magazine format is that it allows controlled segmental experimentation. That is, a segment dealing with novel techniques or material can be inserted into the program and tested for its appeal and learning effectiveness without radically changing the appeal or effectiveness of the entire program. This capability is one of the most significant design features of the "Sesame Street" program.

Children are already accustomed to slick, action-packed television fare. CTW, therefore, believed that both the content and pace of the show had to be lively, entertaining, and varied. With these production values in mind, the program during its first year was free to experiment with all kinds of formats, talent, and teaching techniques. To accomplish this, Joan Cooney suggested in her initial proposal to the Carnegie Corporation "The Potential Uses of Television in Preschool Education" that a children's "magazine" with one- to fifteen-minute segments in different styles (film, studio, animation, etc.) might be one workable, lively, and flexible format. Continuity, she thought, would be provided by perhaps two hosts, a

man and a woman. Other personalities would appear regularly, such as a puppeteer, a science "teacher," a dancer or mime. Above all, the format would be the star of the show.

Formative research bore out this strong intuition. It showed that children were fully capable of staying with and enjoying a fast-moving program with discontinuous sequences of varying lengths, interrupted with teaching commercials and minus the traditional host with his careful and obvious lead-ins.

That rapidly-paced programming is generally more appealing than slower paced segments is a difficult finding to interpret because a program that is paced more rapidly often contains a variety of material. There is also more action taking place. The children are very attentive to action sequences, particularly those of an adventurous nature. To learn more about this, CTW research undertook a series of small group observations. The distractor method (discussed earlier) provided a detailed picture of where children were watching and where they were not. It did not tell us directly why they were attending to certain segments and not others.

CTW's preoccupation with the appeal of format and individual segments during the pre-broadcast development and the continuing revision of "Sesame Street" is based on this fact: no matter how effective the show may be in teaching the child, it has to reach and hold him first. Thus, in the development stages of "Sesame Street," numerous

questions dealing with appeal were raised. As mentioned earlier, these included questions such as: "What programs do preschoolers like best?" "Do they like animation better than live-action?" "How about animals?" "What's the best time for a program to be on the air?" "How long will a child this age watch it in one sitting?" "Do they like to see other children on TV?"

Furthermore, Joan Cooney, a Peabody award-winning producer herself, had some notions about the kinds of segments the program format might include. The nine segment examples listed in her original proposal to Carnegie Corporation are summarized below:

1. Story Reading -- As the host reads, we would see first the illustrated pages of the book and then dissolve into an inexpensive but effective kind of animation. The characters would literally come alive before the children's eyes. The specific learning goals would be to increase vocabulary, to develop reasoning skills, to increase skill in the use of language. Story reading would be kept entertaining and varied by means of the animation, a puppet to act as a foil and provide humor, and the personalities of the host and child.

2. Animation: Letters and Numbers -- The ABC's and the numbers one through ten could be taught simply and entertainingly through an animation series. The animation would embody the principles of commercial advertisements, utilizing simple, catchy jingles. Its success, like commercials, would depend on repetition.

3. <u>Games</u> -- Visual games will encourage the child to interact with the TV set and promote active rather than passive viewing.

4. <u>New Experimental Films</u> -- The creation of new films made especially for children would not only be visually exciting, but would <u>be used</u> to teach such abilities as concept formulation by encouraging children to use their senses, and teaching them relationships between different objects.

5. <u>Old Film Used in a New Way</u> -- Superb children's films from all over the world already exist,, many of which have never been on television. By breaking these films up into segments at various points and using such technical devices as "freeze frame," the imaginative ways in which existing film could be used are almost endless. Any film can be made "educational" simply by giving a child something to look for in it, by asking the right questions, by encouraging lively, rather than mindless, watching.

6. <u>Puppets</u> -- A "puppet drama" could be used to act out some of the emotional conflicts in a young child's life. A puppet, for instance, is caught lying about something to his mother; a puppet becomes so angry that he wants to hit someone, etc. The puppets would then talk with the puppeteer, a regular personality on the show, about what they might do.

7. <u>Mime and Dance</u> -- Simple mime and dance can help children recognize their own emotions ("Move the way you do when you get angry";

"Now try to do a dance to show how you feel when you're happy.") It
can also involve the child actively in the program ("March around
the room until the music stops"; "Waddle like a duck"; etc.). It
can also imaginatively teach information. Mime, for example, could
be used to have children use their bodies to form letters of the
alphabet.

8. <u>At-Home Projects</u> -- Young children can perform simple do-
it-yourself experiments at home. Any child can fill a glass with
water, mark the level, and watch evaporation at work, etc. At-home
arts and crafts would be suggested with the emphasis on free, house-
hold materials -- making dolls out of rags, creating collages from
odds and ends, etc. Arts and crafts could be used to reinforce material
on the rest of the show.

9. <u>Surprises</u> -- Just for fun, and to keep children expecting
the unexpected, the children's program should be full of surprises.
One simple idea would be surprise guest appearances of children's
television heroes -- Batman, Winchell-Mahoney, the hero of "Lost in
Space," Bill Cosby, Captain Kangaroo.

<u>Programming for Appeal</u>

All of the above ideas were only suggestions. The creative staff,
looking for new ways to make the show lively, varied and inventive,
created many more. The producers Joan Cooney hired were experienced

in programming for children and also had several notions of what pre-school children like and don't like. It was the responsibility of formative research to check out these notions. This is one of the most significant statements this paper can make: that producers have maximum creative freedom when it comes to programming for appeal values. Many of the prior assumptions and notions held up under research observation and testing, and many did not. Those that did not were eliminated or reshaped for further testing. The feedback from research, however, was the basis of rendering approximately ninety percent of the production decisions.

In order to check out these assumptions (i.e., the producers) regarding appeal values, a method of obtaining highly specific attentional data was needed. After considering a variety of response measures,[3] CTW selected "eyes" on the television set as our dependent variable. The distractor method was used to provide information on appeal for over thirty pieces of existing program material in addition to original pieces of production.

The results of this study provided format guidelines as well as information on the appeal of some of the contemplated individual segments. In the conduct of this study, CTW research devised a

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[3]Stuart Little, op. cit.

supplementary observational procedure from which was obtained a
clever understanding of why some fluctuations in attention occur.
An average attention level was computed for each piece of material
used in the distractor studies. This average reflects the attentive-
ness of the entire group of viewers over the course of the program
studied.

A table summarizing the average visual attention levels obtained
for a variety of material tested during the pre-broadcast season is
presented below:

Average visual attention levels for a variety of program
material tested during the pre-broadcast period.

PROGRAM TESTED	LENGTH	AVERAGE VISUAL ATTENTION LEVEL
Animal	9:45	.92
The Monkees	20:00	.91
Neighbors	7:45	.91
Pixie and Dixie	6:45	.89
Yogi Bear	6:45	.88
Captain Kangaroo (18)	14:00	.87
Man From Alphabet (clocks)	5:47	.84
Huckleberry Hound	6:45	.81
Lost in Space	10:00	.80
Man From Alphabet (penny)	5:47	.78
Dance Squared	3:20	.77
Saturday Safari	5:55	.76
Man From Alphabet (calendar)	5:57	.73
Captain Kangaroo (19)	14:00	.72
Kaptain Kangaroo (19)	56:45	.71
Alphabet	6:12	.71
Roundabout	14:33	.71
Quaker Oats Ad	1:00	.69
Rowan and Martin	17:00	.68
Birthday for Bird	6:18	.67
Misterogers	28:00	.65
Rich Cat Poor Cat	7:15	.64
Roger Ramjet	5:17	.63
Friendly Giant	15:00	.63
Rock in the Road	6:00	.61
What Am I?	11:30	.59
Eggs to Market	11:00	.57
A Ship Needs a Harbor	12:00	.51
Two Knots	9:00	.44

A list of the findings reported to production on the basis of these observations is as follows:

1. The children are extremely responsive to the sound track.

2. Children are confused when familiar television characters are presented in an unfamiliar context.

3. Children imitate many of the actions they see on television.

4. Children like to participate in games played on television.

5. Children enjoy watching something they understand.

6. Slapstick is a favorite with pre-schoolers.

7. Children attend longer if the material is varied.

8. Certain films are more appealing with repetition.

9. Attention is generally higher for animated segments.

10. Segments which show adults talking are generally low.

11. Children are generally attentive to animals on television.

By reporting not only the visual behavior of the viewing groups (i.e., eyes on or off the television set), but also the verbal and motion responses, the report from research to production on appeal provided a very good idea of exactly what the children were looking at in the program and what they thought about it. With this information it was possible for the producers to develop prototypes of all planned segments which in turn were also subjected to field evaluation.

While the studies on appeal provided numerous guidelines for building a popular program, they were not designed to determine which

features of the particular bits were controlling attention, but only
whether the entire segment was being attended to or not. They did
not, for example, indicate why children like animation, or whether
they preferred animation to live-action film, puppet or studio
segments. The importance of programming for appeal is, of course,
beyond question, for extended viewing is a minimum requirement for
learning. Their value, however, is not great when the features deter-
mining high appeal are not identified. They do not facilitate,
except by imitation, the design of other programs, nor do they
provide any reliable basis for predicting the appeal of new untested
material. In order to facilitate the transferability of appeal
measures and assign values of predictability to the program and its
segments, it is necessary to study the intrinsic design features of
the overall stimulus. None of the research to this point had done
this, nor related appeal to other program variables.

Dr. Lang Rust was the first to look at "Sesame Street" and "The
Electric Company" as a cluster of attributes affecting attention. His
is the first systematic attempt to identify effective stimulus variables.
For this reason his study is a significant predecessor to this writer's
attempt to provide guidelines for program development and design and
is presented in Appendix C. Under the auspices of CTW and using data
previously gathered by the research staff, Rust carried out an analysis
of the individual program segments (called "bits") of "Sesame Street"
and "The Electric Company, to which children respond with consistently

high and low attention. This study focused primarily on problems
of predicting appeal of new material. Program segments were defined
in terms of attributes.

Eight attributes, five predicting high appeal and three low
appeal were derived:

A. High Appeal Attributes

Functional action -- Bits that portray locomotion or active
movement through space that is directly functional to the
development of the plot or theme of the segment. Pointing,
writing, or arranging things by hand do not qualify; neither
do movements that are not directly functional to the plot
(such as walking around in order to switch scenes).
The bulk of the segment must portray this functional action,
be in very obvious expectation of it, or in clear reaction
to it.

Strong rhythm and rhyme -- Bits in which strong repetitive rhythm
and rhyme occur together, for most or all of the segment in ques-
tion. These qualities may be present in songs, verse, or "jive"
talk.

Portraying children -- Bits that involve children, or animated
child characters on screen for most or all of the segments.

On-screen disagreement -- Bits which have a theme of one character's attempting to correct another on reading, pronounciation, or writing. Both characters must be on screen.

Repeated attempts -- Bits in which the central theme is one of repeated attempts to achieve some concrete goal or standard. The standard may be set by a competitor's performance, by the performer's own achievement, or by some other concrete criterion which is made clear to the audience.

B.   Three attributes were discovered that were consistently present in low appeal bits:

Comprehensible spoken script -- Bits that have a spoken soundtrack that is comprehensible without reference to the screen. The whole meaning of the bit need not be auditory, but the auditory must make sense on its own. Telephone conversations usually have this attribute. This definition does not include bits involving the slow sounding-out of letters (blending).

Message monologues -- Bits in which there is only one character throughout, and where that character is on-screen in more or less stationary position, telling the audience something (reading to himself does not qualify). This definition does not include bits where the message is directed at other characters.

Program identification -- Bits that are devoted to the identity of the show or information about it: show number, name, theme, credits, etc.

Other Factors Affecting Appeal

The Rust study revealed three important considerations for pre-
dicting children's responses to bits, in addition to their intrinsic
attributes.

First, it was found that to estimate the appeal of a given bit,
one should use only the intrinsic attributes of the bit preceding it.
The contextual attributes of this adjacent bit do not exert a con-
textual influence on the one that follows.

Second, it was found best not to make any estimate of the response
to bits possessing no intrinsic qualities. They showed no general
trends toward high or low level appeal, nor were their scores
predictable from the attributes of preceding bits.

Third, it was found that context exerts a minimal influence on
response to bits longer than one minute. Apparently this is suffi-
cient time for children to adjust from previous levels of response
and to react according to the intrinsic qualities alone. Accordingly,
one should not use context to estimate children's response to long bits.

Integrated Model for Predicting Appeal

The model to be used to account for, or predict, the attention
scores obtained from pre-schoolers watching "Sesame Street" goes as
follows:

1. View the bits.

2. For each bit, record the attributes it is judged to possess, being careful to follow operational definition of the attributes. A particular bit might possess none, one, or several of the attributes.

3. If a bit has more high appeal than low appeal attributes, estimate that it will have a higher-than-average score.

4. If a bit has more low appeal than high appeal attributes, estimate that it will have a lower-than-average score.

5. If a bit has none of the defined attributes, or if it has equal numbers of high and low appeal attributes, look at the bit which precedes it. If that bit has more high than low appeal attributes, estimate a high score; and if it has more low than high appeal attributes, estimate a low score.

6. If both the bit in question and the bit that precedes it have none of the defined attributes, or if they both have equal numbers of high and low appeal attributes, make no estimate for the score of the bit in question.

Rust concludes that eight attributes that were defined through studying children's attention to a sample of "Sesame Street" material and the model that was developed for giving estimates of their attention scores yielded quite accurate predictions of the attention levels given by a new sample of children to three different "Sesame Street" shows. The new data also gave evidence that each one of the eight attributes could be useful in helping one to differentiate television material to which children would attend from that to which they would not attend so highly.

Summary

The Rust study provides a number of important guidelines for writers and producers who are concerned with designing program material and format for preschool children. Since the attributes have been demonstrated to have consistent validity, they are uniquely appropriate to the concerns of production. The attribute guidelines permit producers who have to make decisions about new material to do so with less need to test the material. They also provide a structure that allows writers to predict reasonably well what the response of the audience will be.

Many of the implications of the Rust study have been intuitively discovered by many producers and writers at "Sesame Street." The value of the Rust document is that it gives more credibility and confidence to those intuitions. One hopeful effect of isolating attention-controlling attributes is that television production for children could become more experimental and innovative with less fear of failure. As noted earlier, television producers know very little about what makes a successful television show and, therefore, tend to create "new" shows modeled on demonstrated successful ones. Having the effects of different attributes delineated from each other and those attributes to which audiences respond most consistently identified, new programming could be freed from following a pattern of sameness. If the attributes of appeal are no longer

a mystery, more effort could go into improving other aspects of programs. Perhaps this could lead to more programs with educational as well as entertainment values, since the learning aspects could be more appealing.

Rust feels, as does this writer, that if it were demonstrated that the attribute of violent crime shows that attract children is not the shooting and killing involved, but rather some more general quality, like functional action, then children could be offered material that would appeal to them as much, but which would not have the same threat of undesirable side-effects.

The implication that animation, _per se_, has no direct appeal to children may be important. The appeal of animation comes from the attribute of functional action that is present but is not necessarily a concommitant of animation. One can achieve the same level of appeal with non-animated bits and do it a lot cheaper. The real value of animation is that its technique allows for simple presentation of difficult concepts.

The findings about the influence of context is significant. These findings suggest that attention can probably be sustained across one visually unappealing bit provided it is preceded by a very high appealing bit. Thus, if a particular bit is needed to teach a very important but difficult concept and none of the high-appeal intrinsic attributes can be built into it, then it should be placed immediately following a very high appeal bit, and this

context will probably insure the child's attention to it.

Related to this point are two other implications -- a bit may be justified from the point of appeal alone, even if it has little or no instructional value since it can be used to increase attention to an important bit; and material with little intrinsic appeal attributes can be presented if it has high educational value. This suggests that the magazine format which presents independent self-contained program bits is especially appropriate for children's programming.

The Rust study demonstrates that children respond consistently to program bits that have the attributes he described. It was further demonstrated that the attribute definitions and the attribute model can accurately predict the responses of new viewers to new program material. Its outstanding feature is that others can use the attribute model successfully to differentiate television material to which children give high or low attention. However, this study has a number of limitations. The two most important limitations, in terms of this paper are: first, the attributes defined are not all of the attributes that may control visual attention in the target audience. Second, the attributes were derived, with respect to data, on visual attention only. It does not deal with the learning effectiveness of any of the particular attributes or design features. A study of the interaction of education and

entertainment values in "Sesame Street" and "The Electric Company" and the program design features that govern that interaction could be the subject of future research.

The premise of "Sesame Street" and "The Electric Company" (and I believe this should hold true for all children's programs) is that the program design should be focused on appeal. That is, it must be entertaining enough to attract and sustain attention before it can be instructive. In practice, this sometimes means a sacrifice of the efficiency of the instructional message to insure that the viewer's interest is maintained. In principle, however, it means embedding the instructional message in an entertaining context designed to optimize transfer of the educational content. It also means that the instructional message is not didactic but is ideally intrinsic to the structure of the whole scene.

The fact that education and entertainment can be blended into a highly popular television program for preschoolers has exploded the myth that children are not interested in learning from television, the doubts and vagaries that it could be done; and the CTW research has struck a blow for positive rather than negative research. The CTW productions and research continue to be experimental and have only scratched the surface in terms of the magnitude of the real need to provide educational experiences for preschool children. The learning impact of television is greatest on the young children

because, in the words of Wilbur Schramm, "their slate is relatively clean." The hope of many of the CTW staff is that the extraordinary, unexpected success of "Sesame Street" ultimately leads the commercial networks into more positive programs for children. This may eventually be so, but so far there has been little or no systematic effort to do this. The influence of "Sesame Street" is seen occasionally in "Captain Kangaroo," "Misterogers," the now defunct "Zoom," and in some advertising commercials. At present, there is talk among the network officials about upgrading the children's divisions, and we will have to await future developments.

CHAPTER FOUR: GUIDELINES FOR ACHIEVING COGNITIVE
LEARNING GOALS

A producer who is hoping to develop a successful television
program for preschool children will find that his success will be
in direct proportion to how well he has structured his objectives
and program content to his target audience. Although the answers
to many questions about the effect of television viewing by pre-
school children is not known, we know enough about their psychological
characteristics to provide some guidelines for television production.
Many of these psychological characteristics are based on the well-
researched findings of psychologists and social scientists; others
are based on observations; and still others, on "belly button"
instincts and "seat of the pants" hunches. Only those that appear
the most relevant to television are discussed here.

Learning through Play

The first assumption and perhaps the most important one is that
young children learn more about their environment through their own
natural learning style of undirected play than through any other
source. He is curious and constantly tests the environment in order

to gain control of it. Once he has mastered those aspects of the environment that are constant, he ignores them and attends to those that are capable of providing new experiences and useful information. Learning for him is electric. The more he learns, the more he wants to learn. Outside motivation is not necessary. The young child is motivated to learn because he needs to learn. The efficiency with which learning occurs is dependent on the quality of the experiences. All we need to do is make these experiences and information available. The importance of informal learning opportunities in undirected play is essential for young children.

The distinction between work and play, education or entertainment, is an adult attitude. Education and entertainment are seen as opposites. Education is good because it leads to a higher purpose. Entertainment is deserved only after it has been earned by having worked hard. These attitudes extend to television, which is often criticized because it offers entertainment rather than "wholesome things," i.e., things we can learn. Many parents find it difficult to allow their children full enjoyment of television because it "competes" with the child's learning competency. The young child, however, does not distinguish between work and play.

> I will tell you the most important thing about our
> audience ... they like what makes them feel good,
> and what makes them feel good is really accomplish-
> ment. That is [the young child's] pleasure. So

> if you combine his entertainment with a sense
> of accomplishment, you succeed.... There is a
> tendency in this country to look upon anything
> associated with school as a grind and a bore.
> It is not pleasurable, but play is. So when
> you begin something about literacy with adults,
> it can't be fun, and the illiterate adult is
> not going to watch it because he's watching
> "Laugh-In" too, or cartoons, or whatever.[1]

Learning and playing are not mutually exclusive for the preschool

child. Entertainment should be instrumental rather than incidental

to a child's learning.

Visual Attention

The preschooler has a limited language of words, of ideas,

and of concepts. He is just beginning to master language and has

difficulty both in expressing himself and in directing his own

behavior on the basis of words. The young child is more visually

perceptive than he is audile and he has problems in discriminating

excessive adult verbiage. Therefore, much of what he learns from

television is through the visual images presented. Segments in

which adults are constantly talking will generally score low

unless one of the following conditions prevails:

(a) A "show and tell" -- Rather than showing the speaker on

the screen for the entire period, frequently show what is being

discussed. The discussion must either precede the showing or

occur simultaneously with it. The thing or action must be concrete,

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[1]The Children's Television Workshop: How and Why It Works
(Nassau Board of Cooperative Educational Services, 1971-1972).

that is, physical or real in some substantial way, not absolute or inferred. In this way the speaker could say much more about a subject and still sustain the attention of the child.

(b) Talk is directed toward children who appear on the screen -- The child at home will probably attend to this because (1) the language will be language he can understand, (2) seeing another child on the screen may give the child at home the idea that this is something for him to hear, and (3) the child at home may identify with the child on the screen.

(c) An adult speaks directly with the viewer in the manner of Mr. Rogers -- Children generally respond when a warm adult comes on and talks to his "friends" at home. This seems to give the child the feeling that this program is especially for him.

Children do not seem to like a hard sell, pitchman approach nor the quality that some television performers have of talking down to them.

Observations suggest that preschoolers are generally incapable of understanding the double meaning of puns. While they do enjoy word play, they do not respond well to plays on words.

Selective Attention

Preschool children seem to have difficulty in discriminating between what is relevant and what is irrelevant to a specified

goal. They are readily distracted from the main content of a
television program by responding to incidental details. As the
child grows older, he will be able to disregard the incidental
aspects of the material and concentrate his attention on what is
of critical importance. Because preschool children have difficulty
in making such discriminations and in attending selectively, special
care must be given to direct his attention to those aspects of the
material to which we wish the child to respond.

There are many production values and technical devices, both
visual and auditory, which a skillful producer can use to screen
out irrelevances. This is not as simple as it appears. To totally
strip the material of all irrelevant details may render it so
bare and unartistic that it will be uninteresting. When non-
essential elements are absolutely necessary to make the material
entertaining and attractive, and may lessen but not totally destroy
the effectiveness of the point to be made, the decision should be
made to add the entertainment value. The assumption is that a
child has to first of all be attentive before he can learn. This
provides an important guideline for children's television production.
Children enjoy watching something they understand. In trying to
communicate an idea to children, the less "noise" masking the
message the better. This is true from an appeal as well as
from an achievement standpoint. The key here is understanding;
unclear identity of what is being portrayed at the time it is
being seen or heard serves to confuse the child and thus makes him

lose interest.

Retention and Learning

It can be assumed that preschool children, with their limited faculty of language and difficulties in conceptualization, learn more slowly than older children. Retention is dependent, in part, upon the ways in which information is received and used. Young children have a short attention span, possibly as short as one minute. Typically, they require frequent exposure and practice. From this it can be inferred that the probability of retention is more effective when (a) the material to be learned is short and simple, (b) new experiences are presented in relation to familiar ones, and (c) the material is presented in a variety of ways and repeated to allow the child rehearsal and self-checking. These assumptions provide obvious implication for program development:

Exact Repetition. Young children are attracted to advertising commercials. They represent a change of pace and are in essence an interruption. Children respond to interruptions. Many commercials often include jingles, slogans, and rhymes. Children learn these and often sing along and repeat the slogan or rhyme, enjoying the anticipation and participation they offer. The message the commercial carries is usually simple and straightforward, and it is designed for exact repetition.

Children like the visual quality of animation which most commercials employ. "Sesame Street" has deliberately imitated the techniques of commercials, especially in much of its letter instruction.

Exact repetition of animated films, live-action films, and videotaped segments has been a visible feature of the instruction in all goals and categories on "Sesame Street." It is assumed that the letter commercials benefit from a rehearsal effect in the same way that advertising commercials do. With sufficient repetitions, the child viewer begins rehearsing, often, even out of the viewing context, whatever part of the sound track he can remember. This rehearsing constitutes reinforcement of the learning. If repeating the words also carries the visual associations, the reinforcement, one can assume, is still stronger.

Another assumption of exact repetition is that while a scene may be repeated several times, the children experience it differently each time. Exact repetition will increase the child's ability to integrate conceptually a set of elements and relationships too numerous or too complex for him to grasp in a single viewing.

The recitation of the alphabet, for example, is a relatively trivial skill. It was included among the letter goals of "Sesame Street" mainly because it could become a badge of competence for the child who has mastered it. Despite its low priority, the alphabet was recited at least once in every program. The reasons

are as follows: assuming inconstancy of viewing, it seemed important to identify all the letters in each program lest any child be mis-led to believe that the incomplete set he had learned was all there was to learn; it was assumed that motivation to learn all the letters would be enhanced by the knowledge that there was a limit to the task; by presenting the letters visually as their names were rehearsed, recitation of the alphabet constituted a review of letters already identified and a preview of those yet to be taught; presen-tation of the alphabet might provide a useful opportunity for the viewer to discriminate between visually and orally confusable letters; and finally, reciting the alphabet was a natural occasion for the young child to overtly participate in the program.

One of the most interesting and successful treatments of the alphabet on "Sesame Street" is the recitation of it by James Earl Jones. Mr. Jones' recitation of the alphabet takes a full minute and a half. He stares compellingly at the camera throughout. His shaven head gleams in the closeup. His immense hollow voice booms the letter names ominously. His lip movements are so exaggerated that they can easily be read without the sound. As Mr. Jones recites the letters, they appear on alternate sides of his head. Each letter appears visually for a moment before it is named. Once named, the letter disappears and another brief pause ensues before the next letter appears and is named.

Observation of children viewing this recitation has led to a sequence of patterns that has been termed the "James Earl Jones Effect" by the CTW research staff. This effect actually appears to be a three-stage sequence of effects. The first time a child sees the performance, he begins almost at once to respond to the implicit invitation to say the alphabet along with Mr. Jones. On later repetitions he begins to name the letter as soon as it appears, before Mr. Jones has named it. The child is then able to self-check himself when Mr. Jones names the letter. With still further repetition, the child begins to anticipate the printed symbol as well. As soon as the preceding letter disappears, the viewer names the next. The effect is significant because it demonstrates the feasibility of simulating with the one-way medium of television the feedback and reinforcement so instrumental to learning.

Repetition with variation is another teaching strategy used by "Sesame Street" to facilitate retention and learning. It has been used successfully in two forms: (a) content constant, format varied, and (b) format constant, content varied.

Varying the format while keeping the content constant was assumed to promote generalization of learning. When a given concept or letter is featured, for example, it will be presented in at least two or three different animated films, muppet segments on videotape or special videotape segments for repetition, and a number of spots using live characters on the street. The letter

may appear sometimes as a three-dimensional object, sometimes as a line drawing, sometimes as a cardboard cutout, etc., but always retains its distinctive features as a letter despite its different surrounding format. Almost every curriculum goal is presented in several different formats so that a child learns to generalize what has been learned across several different forms of presentation.

Varying the content while keeping the format constant was intended to promote familiarity of convention and to thus cue the child on what to look for in the scene. One such visual convention is the speech balloon. Ten- to fifteen-second animated films called "balloon bits" were made for each letter of the alphabet. In these films a character, different for each letter, appears against a white background. The character pronounces the name of the letter, a word beginning with that letter, and then the name of the letter again. As the letter name is spoken, a balloon emerges rapidly from the character's mouth and the letter appears within it. As the word is spoken, its remaining letters also appear in the balloon. Within the balloon, the word forms into the object it names or dissolves into a scene illustrating the use of the word. A quick visual gag ensues, generally involving the original character, and the scene within the balloon then dissolves back into the letter as the character pronounces it a second time.

Repeated use of the balloon convention motivates and has conceptual advantages. First, recognition of a convention whose previous use has been amusing creates a pleasurable anticipation for its subsequent use. Second, if a previous use of the convention has contributed to learning, similar success with new material will be anticipated. Third, the speech balloon is such a strong symbol of the relationship of print to speech that the concept may be communicated without direct didactic reference. Fourth, while twenty-six different letters and the same number of different words are presented through the use of this convention, only letters and words are presented. Thus the convention serves to group the symbolic material it presents into a single class.

Another format convention has slightly different advantages. Sorting and classification skills have been presented by using a game involving the viewer at home. A card divided into quadrants shows three identical drawings and a fourth drawing which is different. One of the "Sesame Street" characters stands next to the card and sings a song that gives the rules of the game: "One of these things is not like the others. One of these things just doesn't belong ...." At the end of the chorus, the screen fills with a closeup of the entire card. Instrumental music continues while the child at home attempts to select the drawing which doesn't belong with the others. The correct choice is then indicated in the

lyrics of the second chorus, and at the end of the song the difference is carefully pointed out.

By repeating the same song and the same visual context each time the song is played, and by varying the content of the quadrants on the card, this convention achieves the same motivational advantages of the speech balloon convention. The convention used here is both visual and auditory. The song has eight bars of instrumental music before the lyric begins. When the child hears the instrumental, he is cued to begin looking at the quadrants for the thing that doesn't belong. He probably doesn't listen to the lyrics for the rules after he has played the game two or three times.

A producer can immediately see the importance of repetition to learning. There are certain perils, however, in repetition and it must be used judiciously. Although repetition enhances some television approaches and adds to their appeal over a span of time, some material suffers badly when repeated. Slowly-paced segments tend to decline in value with repetition. The length of the segment also seems to be a factor in how well it bears repetition. Longer segments do not do as well as shorter ones when repeated. When a segment presents many facets or perspectives that can offer new experiences with repetition, its appeal will be maintained; but when the child has exhausted it and nothing new is injected, it too will have to be discarded.

Imitation

We know from observation that young children imitate many actions they see on television. The imitations occur more frequently when the person on the screen does something with his body that a child can achieve with his own. When a cowboy draws his gun or gives the "bad" guy a roundhouse right, many children will mimic the action. Similarly, when a "Sesame Street" performer holds his fingers up and counts them or uses them to form a telescope, or points to a part of his body, most children will copy him. The film story of a hand that wants to make a lot of noise evoked a great deal of imitation. The hands start to clap slowly and softly and then proceed faster and faster, the noise level increasing on each clap. As this action takes place, the hands of the young viewers invariably follow the action.

Preschoolers show a strong tendency to imitate some action. If a character does something absurd, such as stepping into a bucket, the child will sometimes get up and pretend to walk around with a bucket on his foot too. Children also imitate verbal sounds such as laughter and giggling and certain simple recitations. It is assumed that this desire to imitate extends, though in more subtle ways, to all speech as well.

Children will learn to speak the language that most people speak around him. Constructive communication -- the asking of

questions as a means of acquiring information, talking through a
problem, or simply the enjoyment of the sound of words -- should be
demonstrated through interaction between the live characters when-
ever possible. Since varieties of speech forms exist, spoken
dialect and "street" language should also be used. Children get
a sense of identification with a program, and it will harm the
child's self-concept development if the program only presents
standard English while his speech patterns and those of his
family are not-so-standard English.

Young children respond to "models" of behavior. They learn
to recognize and label the emotions of fear, anger, love, happiness,
sadness, and others from television characters. Many psychologists
tell us that television can teach a child a wide variety of socially
desirable and socially undesirable behavior by the kind of behavior
that is displayed on the television screen.

The selection of a host is one of the most vital elements of
the program. It has been said that television is a medium in which
you cannot hide. The insincere, condescending, sarcastic, and
other undesirable traits and actions of a person will be quickly
revealed. The need for warm, positive models to whom the preschooler
can respond and therefore learn from cannot be disputed. Whether
the host is male or female is less important than his desirability
as a model who displays recognition, interest, and understanding to
the viewer.

The assumption that featuring children on the set to gain identification for child viewers is misleading. A child will as easily identify with adults if they are reflecting the emotions and experiences to which he attaches importance. There are, however, valid reasons for using children on the set. Children probably enjoy seeing other children on television only if the child is actually involved in doing something the viewer is interested in learning to do. This way the viewer can work at it with him. Children on the set can also be used to show that there is a real relationship between children and adults. Often children on the set will ask spontaneous questions which may not have occurred to adult performers. This interests the child viewer also.

Reality

The distinction between what is real and what is imaginary develops late in a child's life. Preschool children are highly dependent upon immediate perception. When a television character "dies," the child cannot differentiate between make-believe and real death. The differences between cartoon characters, puppets, and live characters are difficult discriminations for him to make. Dramatic rendering of real situations is probably just as real as real situations to the young child. All events have an immediate reality and not until the child is older will he begin to ask, "Is this real?"

Anyone who has watched the seriousness with which children engage in make-believe play is aware of how vivid and practical their imagination is. That this imagination has to do with every-day problems and doing things is no doubt due, in part, to the child's realization of how limited he is by his own lack of skill and abilities and by his dependent position as a child. Young children should probably be encouraged to use their imagination and to fantasize, but a child would seem to get his most satisfying experiences from his own effort and achievements rather than from the imagined or fantasized.

The ability to discriminate reality only comes with the development of abstract thought and growth in breadth of experience. Thus television material for children which is based on symbolic or abstract ideas will probably have little appeal to preschool viewers.

The issue of reality -- what kind? how much? -- is one of the most difficult problems the television producer has to decide upon. Conflict, aggression, and violence are facts of life in our society. There are strong beliefs that it is the business of children's television programs to portray this reality. Parents want their children to learn to live by the standards and realities of the adult world. The other side of the coin is that violence seemingly appeals to young children and such programs are relatively easy to produce. Thus in many children's programs violence and aggression

become substitutes for creative production. That is, they are the
central ingredients.

The basic characteristics of violence is physical action and
the exploration of emotions. The fact overlooked by most writers
and producers is that it is action and sounds, not violence per se,
that appeals to children. Young children, as mentioned earlier,
are visual-image oriented. They are fascinated by moving images
from birth. Various actions, movements, and suspense -- independent
of violent overtones -- are no doubt more satisfying to children
than violence. These certainly constitute a more positive alternative.

Many young children are alienated by violent presentations.
The child is more emotional than the adult. Experiences which are
emotionally neutral for an adult may arouse deep emotions in a
child. When he sees a television character with whom he identifies
in emotion-arousing situations, he becomes immediately apprehensive.
This is especially true when the character is in conflict or in
danger or on the losing end of a violent situation. Whether the
child recognizes the scene as only a presentation of reality or not,
he is, nevertheless, absorbed and concerned about the "reality" of
his hero since his emotions have an "all or none" quality and also
since the child cannot understand the often subtle or simplistic
reasons for conflict or violence.

There is no evidence to support the contention that children
are drawn to violence because it appeals to or satisfies their own

violent impulses. Children, with their limited language skills, cannot be relied upon to say. Children will generally express a favorable attitude towards any program they see in isolation, without direct or immediate comparison. Their preference is usually made known by a switch of the channel if they have control of the set. This is not a reliable index either, because there are virtually no programs specifically designed for preschoolers, with the exceptions of "Sesame Street," "Captain Kangaroo," and "Mister Rogers," and these programs are broadcast at different times.

Summary

Invariably, it is the adult who must decide what is good for children. Most of these decisions, however, are based on adult standards with little regard to the child's needs. Programs for children should deal with the situations and problems of childhood rather than with the situations and problems of the adult world. There is something wrong with the notion that a good television program is one that teaches a child to live in the adult world. The concerns of the child are with his own world. The child is not a miniature adult. Next, the question of how much and what kind of violence represents reality to the child is one of the most ridiculous albeit lamentable ones facing television today. Parents should not ask, "What harm does it do?" but whether or not it does any good. The humorous violence of slapstick comedy and cartoon comics probably does little if any harm to children. The violence

and aggression viewed by children on adult programs in all likelihood has little lasting harmful effects. But should this be the criteria television programmers use when the medium has great powers to broaden the experiences and skills of children in more positive ways? The overriding criterion should be whether or not the child is the better for the experience presented.

It would be a mistake for television programs designed for preschool children to ignore the existence of conflict and aggressive behavior completely. Children are often in conflict and are aggressive in play situations with parents and among themselves. The argument here is that in its treatment of reality, the presentation should focus for the most part on the immediate concerns of children and that presentation should be done in a positive way. The task of developing instructional materials and principles to achieve this objective was a major challenge to CTW in the 1970-1971 season of "Sesame Street."

CHAPTER FIVE: GUIDELINES FOR ACHIEVING
BEHAVIORAL GOALS

Introduction

The first year of programming was primarily designed to be
mainly cognitive or symbolic in nature -- to help children learn
to recognize and discriminate among letters, numbers, geometric
forms, and parts of the body; to develop relational concepts
such as distance and amount; to be able to classify, order, and
reason; and to expose a child to the natural and man-made environ-
ments. Although some social or affective goals were included as
part of the program's objectives since the first broadcast season,
they were so ill-defined that little systematic programming was
attempted. At the outset of the second year, a seminar was held
for the purpose of developing a set of social goals which, hopefully,
could be attained with the same degree of success that was achieved
with the cognitive goals of the previous year. It was decided that
those classes of interpersonal behavior -- cooperation, conflict
resolution, and differing perspectives -- were common to all
children. The statement was drawn up in Exhibit I.

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EXHIBIT I

STATEMENT OF INSTRUCTIONAL GOALS FOR
THE 1970-1971 EXPERIMENTAL SEASON OF "SESAME STREET"

Part A: Social Interactions

1. <u>Differing Perspectives</u>

    a. The child realizes that different individuals or groups may have different reactions in similar situations.

    b. The child demonstrates that he is aware of and values the feelings, preferences, and modes of behavior of other individuals and groups.

2. <u>Cooperation</u> -- The child recognizes that in certain situations it is beneficial for two or more individuals to work together toward a common goal.

    a. <u>Division of Labor</u> -- When a child is a member of a group that has a common goal, he realizes that the goal will be more easily achieved if each member of the group shares in the work or planning.

    b. <u>Combining of Skills</u> -- When a child is a member of a group that has a common goal, he realizes that the goal will be most easily accomplished if each member of the group contributes his own unique or special skill.

    c. <u>Reciprocity</u> -- The child realizes that in certain situations, in order to accomplish his goal, he must request the assistance of others and in turn assist them in accomplishing their goals.

3. <u>Conflict Resolution</u> -- The child can provide adequate resolutions to conflict when he is presented with a familiar conflict situation.

The next step was to derive specific instructional objectives
that would effect the broader instructional goals listed in the
statement. A series of seminars were held at CTW in which the
social goals were reviewed by behavioral scientists skilled in
the area of child development. The first area to be examined in
detail was cooperation. Cooperation was defined as: behavior for
the joint gain of the participants, or for partial or complete
acquisition of the individual goals of two or more participants.
It was assumed that children receive a high level of subjective
reward for coordinating their efforts. Further, a child is aware
that his cooperation has positive payoffs for others as well as
for himself. The original three cooperative strategies were
eventually expanded to thirteen. The expanded list of coopera-
tive strategies follow in Exhibit J:

EXHIBIT J

INTERPERSONAL STRATEGIES OF COOPERATION

Interpersonal Strategies	Descriptive Definition
1. Combining Different Resources	Bringing together two or more different items required to achieve a common goal
2. Combining Similar Resources	Bringing together two or more examples of the items required to achieve a common goal
3. Combining Different Skills	The alliance of two or more children, each with a different skill or behavior, to achieve a common goal
4. Combining Similar Skills	The alliance of two or more children, each with the same skill or behavior, to achieve a common goal
5. Role Differentiation	The apportionment of various parts of a complex task or game to each of several children
6. Trading	Two or more children agree to exchange or barter equally attractive goals (compare with reciprocating, exchange of means to an end or goal)
7. Reciprocity	Two or more children agree to exchange assistance so that each can obtain access to a common goal (compare with trading, exchange of the goal or ends themselves)
8. Taking Turns	Children's alternate use of a goal-object or goal-activity
9. Compromising	Arrival at a mutually agreeable and attractive alternative to conflicting activities

Identification of the second area considered, conflict resolution strategies, necessitated a definition of conflict. Conflict situations were defined as those involving two or more persons whose overt purposeful activities interfered with each other. Their activities may be directed toward the same goal, as when two children fight over a single toy. However, their activities may also be directed toward separate but mutually exclusive goals, as when one person wants to play the phonograph and the other wants to watch television.

The definition distinguishes conflict from aggression. Conflict involves mutually-interfering goal-directed behavior. If "A" hits "B" that is aggression but, by our definition, it is not conflict. "A" must be doing something that interferes with "B" or _vice_ _versa_ if the interaction is to be judged as a conflict situation.

Conflict resolution is the use of a strategy or strategies to deal with a conflict which has arisen. Although many strategies are specific to conflict resolution, some of the strategies of cooperation are effective in resolving conflict. The strategies that were identified are listed in Exhibit K:

EXHIBIT K

INTERPERSONAL STRATEGIES TO RESOLVE CONFLICT

Interpersonal Strategies	Descriptive Definition
1. Decision Mechanism*	A game or justification is introduced especially for arriving at a mutually acceptable resolution
2. Compromise*	An alternative to conflicting goals is agreeable to both sides
3. Distraction*	Attention is redirected from the problem situation to an agreeable or neutral one
4. Adaptation	The setting, behavior, or activity which led to conflict is changed
5. Intervention	Either the solicited or unsolicited presence of an adult or other (usually an outsider) is a major factor in the resolution
6. Separation	One or both parties disengage from an activity contributing to the conflict
7. Intimidation	One party retracts because of relative timidity or fear of incipient hostility
8. Fighting	Hostile verbalization or physical aggression that results from a clash of nearly equal wills
9. Conning	One party uses verbal persuasion or situational adaptation to convince a second child to do something that he initially found undesirable

* Recommended for "Sesame Street" programming.

Factors in Producing Behavioral Goals

The program elements directed towards the teaching of behavioral goals should serve as models for children, showing them positive outcomes. In order that these modeling situations be realistic, the situations used on the program must be those that actually occur in the lives of children. An example of how CTW researched this information is indicated in a memorandum dated June 12, 1970. See Exhibit L.

The social behavior of the children in the preschools and the categories of interpersonal strategies were assembled in a document called A Handbook of Information on Interpersonal Strategies. This handbook served a dual function. The first purpose was to provide the "Sesame Street" writers with material to draw on when producing programming to teach the social goals. It provided them with a catalog of social behaviors and social situations that were familiar to preschoolers. Thus the writers had a vehicle for reaching the preschooler with meaningful material. The second purpose of the handbook was to provide the raw material that would aid the development of effective situational response tests. The handbook contained descriptions of behaviors that were observable and potentially quantifiable, and also described the various settings in which the behavior occurred. By examining these natural settings, it was possible to determine those which might prove suitable for program development.

EXHIBIT L

MEMORANDUM

To: Production

From: Research

Date: June 12, 1970

Re: Social Problems of Four-year-olds -- A Morning in
                                            the Playground

Place: Open Door Day Care Center
             Columbus Avenue and 100th Street
             New York, New York

Observers: Lydia Kleiner, Bruce Samuels

Subjects: Four-year-old Children Enrolled at Open Door

Method: The observers stood on the sidelines of activities,
             taking notes on children's interactions during their
             regular morning outdoor play.

Block Pile

    Two boys are playing with blocks. A third boy says, "I want
to play." "No," they tell him. Third boy knocks down tower of
first and second boy.

    Three girls are building clock towers. Fourth girl tries to
gather some blocks. The three chase her away. She runs to a boy,
pulls a jump rope out of his hands shouting, "It's mine."

    Two children pulling on one clock. One begins to cry.
Observer suggests choosing by the odd finger method. Children
accept results.

Caterpillar

    Boy finds caterpillar, runs around pushing it in girls' faces.
Girls run. Boy tires of chasing them.

Five children (three boys and two girls) gather around cater-
pillar crawling on the ground. "What do we do with him?" asks a
boy. Another boy tries to drop a big wooden block on the cater-
pillar. Caterpillar escapes. Finally he succeeds in squashing it.
"Oh, you killed it," a girl cries. They look at remains. Girl
repeats, "You killed it," and boys run away.

Cry-baby

Girl labeled "cry-baby" by other children. She fights over
toys but claims she is hurt if she loses. She then runs to teacher
and cries.

Soap Bubble

Children involved in blowing soap bubbles. When teacher comes
by they all shout that they're wet from the soap, stop blowing bubbles,
and vie for her personal attention.

Taxi

One boy builds blocks all around himself, sits in the middle
and calls himself a "taxi." He tries to solicit passengers for
the "back seat." Children watch but no one joins him. Another
boy builds a similar taxi and a girl gets into the "back seat."
A girl tries to build her own taxi but blocks are all used up so
she gets in with first boy.

Wheelbarrow

Two children push two wheelbarrows with children sitting in
them. They run and collide. They continue crashing into each other.
Then one girl pushing says, "I wanna be inside." Boys inside don't
want to get out and game breaks up.

Roadblock

A girl places blocks in front of a boy sitting in a wheelbarrow.
"No, no, it's on the street, it's on the street," he yells. She
ignores him, then tries to push him in the wheelbarrow, but a block
is in the way under the wheel. She struggles to push over it; the
boy reaches down and tries to move it. Finally he gets out and
they turn the wheelbarrow in a different direction.

Bully

Boy goes to girl on bike, shouts at her, and shoves her off.
She goes away. Teacher sees this and forces boy to give bike back
to girl.

Adult Interference

Several times children approached observers asking "teacher" for help in solving problems. When observers insisted they were not "teachers" and couldn't help, children worked problems out themselves.

Building

Three girls are trying to make their own buildings with plastic clocks. Another girl helps one of them, making that building the tallest. It falls. Three girls then work on one tower and fourth girl needs more blocks -- "Put them here," they tell her. She looks at the tall building but still works on her own. When the tall building falls, the other girls work on hers, and all four make the tallest building together.

The producer of television programs for children may conclude that the processes described above are beyond his resources. The producer, however, can profit greatly from his own knowledge and observation of children. If the time or opportunity does not exist for seminars and research, he can discuss his ideas with his personal acquaintances who know children well -- parents, teachers, psychologists, social workers, day care aides, and children themselves. This producer, using this technique, has developed a set of guidelines for the presentation of conflict scenes.

When the decision was made to include some incidents of conflict resolution among the cast on "Sesame Street," the responsibility for producing these segments was mine. It was necessary, having always felt apprehensive about the possible consequence of this goal, to set up some constraints to minimize the possibility of negative outcomes. I would always meet with the cast on the studio floor prior to taping these segments to remind them of these constraints. The constraints evolved out of some assumptions about children, my own observation of children, and informal discussions with members of the advisory board. The presentation of conflict among adults and between adults and children seems to serve little useful purpose for the child. I assumed that mostly what the child saw was that there was a conflict and that he would not understand why there was a conflict because of the dependence on verbal means

to set it up. Direct appeal to the viewing child to choose sides
and overt manipulation to achieve one's ends was rules out completely
because of their negative values. One of the real dangers of
conflict was that children identify with the characters and, there-
fore, some child loses no matter which character "wins." Some
of the guidelines I developed for the presentation of conflict are:

1. The reason or problem must be absolutely clear.

2. The reason for conflict must be unquestionably justifiable.

3. The conflict should last only a short period of time before
the resolution is made.

4. Handshakes, hugs, and kisses are good visual means of showing
that the problem is resolved.

5. The behavior and language must be tempered, that is to say
modify the actions and emotions so that they don't take
on a heightened reality.

6. The solution must clearly be fair and equitable.

The presentation of reality is critical. Children, of course,
can learn from painful and unpleasant experiences but they learn
more effectively from experiences that are positive.

Though the foregoing assumptions about children may offer many
caveats to producers involved in the planning and development of
preschool programs, it must also be acknowledged that there are many
individual differences among children. Children of the same age

and sex differ in the rate at which they learn, the amount they retain, their verbal facility, their understanding of abstract concepts, their identification with adults, their dependence, etc. We can, therefore, not assume that all preschool children share the same characteristics. While certain similar traits may be found more often at one level of growth than at another, all children do not share equally in these traits. It is dangerous, therefore, to attempt to talk of the effects of television on preschool children. What may frighten one child may amuse another. What is fascinating to one may bore another. A teaching strategy may be effective with some children and not with others. The best that can be done is to attempt to find the type of experiences and strategies that are most likely to be useful to the greatest number of children of the target age. Assumptions about children and the effect of different experiences will not likely be equally valid for all children regardless of how careful we may be.

CHAPTER SIX: SOME IMPORTANT PRODUCTION VALUES ON CHOOSING CONTENT,
AND TECHNIQUES FOR DIRECTING ATTENTION

Although certain production values and television techniques have proven their significance in holding and directing attention, the most significant factor governing television production is that television is a visual medium and action is its key ingredient. Some subject matters require more imaginative creativity than others because they are less inherently visual or action-oriented. For instance, the presentation of art is difficult because it is static by nature; music, because it is an audio phenomenon; reading stories and storytelling because they are verbal and affective phenomena much more than they are visually interesting. These kinds of subject matter need to be presented in unconventional ways in order to make them appealing enough to hold and sustain attention. Are there certain kinds of material that are so devoid of visual and action attributes that their instructional messages cannot be embedded in an entertaining context? This writer believes that there are very few if any subjects of this kind. Given sufficient time, imagination, and creativity, almost any subject can be made appealing.

The reality of most production situations, however, is that few producers have sufficient time and money for expressing maximum creativity and imagination. The question therefore becomes: what are some of the presentation techniques? Should one, in fact, even attempt to present material that is difficult to produce? This becomes an especially difficult question when the producer feels that the subject matter in and of itself has inherent educational value to the child, notwithstanding the production difficulties. Reading books on television is one such example.

Reading Story Books

Reading story books on television has inherent learning value for the child, although the conventional presentation of a host sitting in a chair reading the story will be boring to most young children. Children like to have stories read to them; but it is the affective quality of cuddling up against an adult, helping turn the page, interrupting and correcting when the adult has missed a line of a story the child knows by rote, together with the self-esteem and one-to-one personal quality experienced in the warm interaction, that is significant here. None of this is transferrable on television. To present a reading story as described above for television will derive none of those values for the child viewer at home. In fact the child at home will probably become alienated by feeling excluded. This does not mean, however, that there are not other values to be gained from presenting story reading or that this is the only technique which can be used.

The inherent learning value of presenting story reading on television is to establish the pleasure in reading and to show the relationship of print to books and books to events. Books therefore ought to always be shown as books so that the child can make the association between the enjoyment of the story and the act of reading and can see the relationship between written and spoken words. There are many production techniques available for accomplishing this goal in a highly appealing, attention-sustaining way.

The first year of "Sesame Street," each program contained a story reading usually done by one of the four regular cast members for children on the set. The scene would begin with a wide shot, dolly in to a medium shot to show the book clearly, and then dissolve to a limbo setting where the camera panned each page of the story as it was being read. Background music was used over the limbo sequence. At the end of the story there was a cut or dissolve back to the performer and the children.

Another method was to begin with over-the-shoulder shots of the book as it was being read. This technique was used when the illustrations of the book were not visual enough to warrant a limbo sequence. The quality of the story reading throughout the series was uneven. It was too difficult to find 130 interesting books with good illustrative visuals for children.

The use of background music in many instances competed with the story itself, although the music was carefully selected to be nondescript. When the music was too high, there was an over-balance of music and words and the words became secondary to the illustrations and the music. When the music was low, the underbalance caused the child to focus on identifying its sound, thus losing the significance of the story and illustrations. After the first year both of the techniques of presenting story reading were discontinued. There were no specific recommendations from research that this writer can recall. The producers decided to try other techniques which were more appeal-ing. The limbo sequence and over-the-shoulder techniques are still valid techniques for presenting story reading, however. The production value to follow is that this method is too unappealing for daily presentations and that the use of music will not likely add to that which is visually static or unattrac-tive. The performer who is reading the story must be warm and sincere. Mr. Rogers has this quality while Captain Kangaroo and some of the "Sesame Street" performers do not.

Subsequent story reading techniques have been used on "Sesame Street." One is the use of the Muppets to act out a story being read by a cast member. The performer introduces the story with a book and then the camera dissolves to the Muppets who begin the action.

This is an effective way of presenting story reading; children seem to be particularly attracted to puppets and identify with them as persons. Another element gained in the use of Muppets is that they perform against beautiful scenery, in costumes, and as characters come to life.

Another interesting, but complicated and costly, way that "Sesame Street" has presented story reading is the use of chroma key. The scene begins with a performer holding a book. When the book is opened, the camera dissolves through a gobo to live performers acting out the scenes as the story is being read. Each time a new page is turned, the print of that page is revealed and the dissolve is made to pick up the continuing action. The print of each page remains on the lower half of the television screen (book page, as it were) while the action is taking place.

There are two other techniques of presenting story reading that have not been used by "Sesame Street." Westin Woods publishes books and then animates the book story into cartoons. The assumption is made that many children are familiar with the books and will know that the cartoon is an animation of the book. This may or may not be an erroneous assumption, but it would be quite simple to begin the cartoon by having the book open up into the cartoon so that the relationship of the book to the action is obtained.

Perhaps one of the most effective ways of presenting story reading is the way that Hal Holbrook "read" and performed as Mark Twain in the program "Mark Twain Tonight." Mr. Holbrook was made-up and costumed as Mark Twain. He performed in a setting that captured the flavor of the nineteenth century. He began the scene with a book which he clearly established he was going to read. After a few minutes "Mark Twain" opened the book, laid it on the rostrum, and proceeded into the story. The book was no longer visible and the viewer was already absorbed in the story. This method of presenting a story is unique and requires an extraordinary talent that few performers have. Mr. Holbrook uses many theatrical devices to heighten dramatic interest at appropriate times during the storytelling -- mopping his brow with a handkerchief, lighting a cigar, pointing his finger, walking across the stage to sit down, getting up from the chair, and so forth. All of these props and movements are used with sufficient economy so that they add to rather than detract from the story. Also Mr. Holbrook is adept at assuming the voice and character of each personality in a story. This is an example of how a presentation that might ordinarily be a disastrous occasion becomes a fantastic production because of the unique talent involved. One cannot imagine a child not sitting on the edge of his seat in rapt attention during this presentation.

Many of the production values described in the different
techniques of presenting story reading are transferrable to other
difficult-to-produce material. There are, in addition, two
important production techniques that have general application
in increasing the appeal of and directing attention to the
essential features of material that is difficult to present.
They are sound track and humor.

Response to the Sound Track

Directing attention is especially important in programs for
preschool children. It becomes even more important when the nature
of the material presented necessitates special attention-sustaining
and directive devices. Children have difficulty in discriminating
the relevant features from the irrelevant features of a presen-
tation; their attention span is short and needs relief. Music
and sound effects are one way of cueing the child's attention
back to the television screen. In viewing television, young
children tend to drift in and out of visual attention while
monitoring the program with the audial senses even when they
are not actively attending visually. Auditory cues in the form
of music or sound effects signal the children that a new and
interesting sequence is occurring.

It is difficult to overemphasize the importance of music
in children's programs. Children respond differently to various
musical styles. Simple melodies tend to effect rocking and

swaying in the young viewer. The bouncier the tune, the more intense the physical reaction. With some songs the children are almost compelled to get up and dance, and often do. The more familiar the child is with the words of a song, the greater the verbal response. A song with a bouncy melody might at first effect dancing; then, as the child is more familiar with it, he is more likely to rock back and forth while he sings along.

The vocal qualities of the sound track are important in sustaining the attention of young children. When the child hears a "muddy voice" or one that "sounds funny" to him, he concentrates on the voice and misses what the speaker is saying. Children have a preference for clear language.

Children particularly enjoy hearing other children's voices. Films that may evoke only a mild interest from young viewers are likely to be much more appealing when children's voices are added to the track.

Voice tracks can also be used in film to direct the child's attention to the relevant features of what is usually shown. Describing and commenting on the action being shown by the use of simple sentences such as, "Look at that tiger's teeth!", "What's he doing now?", "Watch him run," seem to be particularly effective with the young viewer.

In some of the "Sesame Street" films and telestrator bits, a group of unseen children is heard giving instructions to a seemingly magical hand as to how to draw an elephant. The artist is, in effect, the television screen itself, since the lines appear as if of their own accord. The film constitutes a gradual refinement of the drawing of a form which is absurdly unelephant-like. The children's comments and instructions are entirely spontaneous; their urgency increases with the succession of mistakes in the drawing. This technique cues the young viewer to participate by generating his own comments and instructions.

Another aspect of sound that appeals highly to young children is the use of musical words and rhyming. Some words hold a certain magic for children. Words like "valentine," "bubble," "Monday," "Batman," and others are words that children like to hear and repeat because they are enjoyable or playful. Research indicates that children attempting to speak or sing along with the sound portion of the program attended and remembered rhyming words quite early. They tune in quite readily to the pattern of auditory analogy. Eventually, with repetition of the rhymed material, the gaps between the remembered rhyming words were filled in and many children could successfully chant the entire jingle of a minute-long film as it was presented. As an enjoyable memory device, therefore, rhyme has been used to good effect.

Sound effects such as "boings" and slide whistles have long been widely used in film and television slapstick comedy and especially in cartoons. They convey a sense of comic physical movement. Children evidently recognize this synesthetic sound, associate it with comic fun, and use it as an auditory cue.

Movie films have always used the sound track for dramatic and comic purposes. The educational uses of sound conventions remain to be exploited. Although music and sound effects seem to play an especially important role in getting a child's attention, its use must be applied skillfully lest it be distracting. A child's attention will be lost if the music is associated with static visual material. To be effective, music and sound effects must be carefully integrated with movement in the visual content. A static visual presentation with indiscriminate music and sound effects will violate the child's expectation that visual action will accompany the particular audial cue.

Humor and Incongruity

Children enjoy humor and incongruity. Humor has always been the key ingredient of many programs whose purpose was purely entertainment. Its use in "educational" or learning situations has been looked upon with disdain. Instead it has been thought of as a diversion and a disruption to learning. Since this unfounded view

has been maintained for some time, it is not surprising that we know little about blending education and entertainment to the mutual benefit of each. That learning can be pleasurable, entertaining, and fun is sufficiently evident in the use of humor and incongruity throughout "Sesame Street." One essential fact about television is that a program must be able to entertain in order to attract and hold its audience. Humor is important for preschool television also because it helps hold the interest of older siblings and parents who often control the program choice.

Humor is also a helpful motivational device. When the learning to be achieved is associated with a funny character or situation, it makes the learning fun and perhaps easier to remember. However, humor must be handled with care, lest it compete with the learning and the child remember the humor but not the learning with which it is associated. The successful use of comedy, when there is a point of instruction, is the perfect coinciding of the comic moment with the most critical learning opportunity.

Humorous incongruity heightens attention. The child whose attention may have drifted because he expects a predictable conclusion will watch attentively when the payoff is incongruous. When the material is repeated, he will be alerted to expect the

unexpected funny conclusion. While the child is waiting suspense-
fully for the incongruous payoff, his attention is drawn compellingly
to the material to be learned. Nothing so pleases young children
as the element of surprise. They will direct their attention to
an image or movement that differs from their expectations. Tele-
vision provides several means of presenting such surprises and
incongruities. Slow motion and speeded-up action techniques show
people and objects moving at incongruous speeds; pixilation, a
technique whereby a person or object appears to be magically
propelled across the screen in animated comic movements, is one
of the most appealing techniques for children; stop-action and
instant replay give the child an opportunity to observe more
closely the characteristics of the scene to be focused on and
also surprise the child by letting him see action suddenly freeze
or be replayed; running people and a sequence of events backwards
provide another unexpected visual experience. Several camera and
editing techniques permit visual experiences far different from
those in the child's normal experiences. Closeup shots, for
example, show unusual and unexpected characteristics of common
objects. The use of chroma key, hand-held cameras, dissolves,
supers, and other techniques can provide unusual and surprising
perspectives.

Children seem to find slapstick comedy the most amusing comedy form. They laugh when the roadrunner is outsmarted by the rabbit and when the mouse foils the carefully laid plans of Felix the Cat, but they shriek with delight at the antics of "Laurel and Hardy," a pie in the face, someone falling down, or a foot in the bucket. Perhaps the exaggerated and unexpected actions characteristic of slapstick are the reasons for its success with young children. Pantomime, which also makes use of exaggerated actions, is also an effective comedy form for children. Spoofs or parodies, on the other hand, do not appear to be very funny to the preschooler. Moreover, what is funny tends to be physically rather than verbally oriented. Stand-up comedians attract little attention from preschool children.

Most material then, even if it is difficult to produce, can be made appealing and comprehensible by the use of imaginative production values and television techniques. Much thought should be given to the possible attributes and techniques that will accomplish these ends before an arbitrary decision that the material is not viable for television production or for the preschooler is made.

CHAPTER SEVEN: SUMMARY

There are several other questions that the producer of a prospective preschool children's program will be faced with. Some of the more salient ones are: What should be the content of the program? Will children be interested in this subject? What aspects of the subject will appeal to the largest number? What means of presentation will be most effective? Can children learn something from programs on crafts, music, or games? What production values and television techniques are best for holding and sustaining attention and for learning? What format works best for this particular kind of program and for this age group?

No set of general principles can satisfy all the specific production problems that will arise from these questions. Each of them contains different elements and requires individual evaluation based on several factors. There are, however, some guidelines which may be helpful in providing a sound basis for the producer's decision, and these have been presented in this dissertation.

The range of program ideas for preschool children has not been explored at all. The limitation of what is possible is still a matter limited only by the creativity of the program designers.

As of yet, there are no network preschool programs conceived,
written, and produced with any consideration of how they relate
to the child's level of development. Entertainment programs for
children are mainly concerned with reaching the largest possible
audience. Although data from the field of child development tell
us that it is possible to identify specific ways in which tele-
vision stimulates specific age groups, networks traditionally and
conveniently have aimed their children's programming to appeal to
to young people aged two to twelve. A more meaningful grouping,
based on our knowledge of children and on some deep thinking about
purpose, would be to program for the preschool (three through five),
juvenile (six through nine), preadolescent (ten through twelve),
and adolescent (thirteen through seventeen). If one accepts the
premise that television should offer children stimulating
experiences at their level of comprehension and interest, then a
wide diversity of programs is needed in all age groups and in
much more volume than currently exists.

The needs and interests of preschool children are so broad
in themselves that almost any program specifically designed for them
will have value. The television medium possesses many intrinsic
attributes which, when skillfully combined with appropraite produc-
tion values, can catch, sustain, and direct the child's attention
and therefore enhance his learning by a careful blending of educa-
tion and entertainment.

Children have a natural motivation to explore and learn. Since most children also have a natural attraction to television, it follows that children come to the television set to satisfy this motivation. Getting the child's attention is, therefore, less difficult than directing and sustaining it. The first factor to consider is that children are accustomed to watching the slick, sophisticated techniques and fast-paced adult programs. No matter how well-intended or "educational" a program may be, children will not watch it unless it appeals to them. Children will quickly switch the television dial in search of what is most appealing. A program for children then must, first of all, compete with other programs that are on the air. The recognition of this fact profoundly affected the CTW approach:

> One of the feelings I had was that little children were watching adult programs, and that, therefore, their tastes were for strong music and loud lines, much more than educators and parents admitted or, in many cases, noticed.... Now there is more than enough empirical evidence that the set is always on.... I realized that the preschoolers were watching it all day long, that they were watching those commercials. Therefore, they were used to this quick pace.[1]

That "Laugh-In," a radical departure from conventional entertainment with its rapid, unconnected series of visual movements full of humor and satire, was being watched and enjoyed by

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[1] Joan Cooney, as quoted by Stuart Little, op. cit.

preschoolers even though the language and satire was presumably

beyond their comprehension gave further credence to the idea that

"the child of the television age is highly literate where that

medium is concerned."

> I said it ["Sesame Street"] was going to be a
> "Laugh-In" for children. It was going to use
> all the techniques of animation, studio live-
> action, and film and was going to have commercials
> teaching letters and numbers.... We were going
> to have a cast of at least four, but we were not
> going to have a star of the show.... The format
> would be the star of the show.[2]

The design of the advertising commercial -- animation, appealing

music and other sound effects, the visual effect achieved by a

variety of camera techniques -- is powerful in terms of holding

attention. The shortness and simplicity of its message maximizes

its impact. In television programs it is also the sophisticated

program formats, techniques, and styles, perhaps even more than

content, that attracts the average viewer.

This dissertation was written with the thought that although

the programs of CTW themselves were well publicized, many of the

informal principles of learning and teaching, the specific production

and writing methods for children, and the design features are not.

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[2]Idem.

This is not, of course, to suggest that the essence of "Sesame Street" is the blending of education and entertainment and therefore should serve as a model for future "Sesame Street's." CTW has rightly thought deeply about the purpose of "Sesame Street" and has, to this point, resisted attempts to have it serve multi-purposes and special interests. To do so would only dilute its effectiveness. What is needed is many other children's programs, each with a carefully-defined and complementary purpose. Although the creation of similar programs, which purposefully blend entertainment with instructional information, is a step in the right direction, the uniqueness of CTW goes much further than sophisticated production techniques. That is part of it, but its essence lies in many of its lesser known attributes discussed in this dissertation:

1. An experienced creative production staff.

2. Sufficient time to prepare for production.

3. The inclusion of research as a fundamental element of the experience from the beginning.

4. Using research as an integral part of the program development process, testing segments and then programs for attention-holding and instructional effectiveness as well as for overall evaluation of penetration and impact.

5. Bringing the professional educator-advisor into an intimate working relationship with the creative and research staffs

so that, from the outset, his expert knowledge informs
the process of establishing goals.

6. A limited and clearly defined objective.

7. A respect for the intelligence and integrity of the child
and a "what does the four-year-old child think about this"
attitude.

8. An eclectic approach to technique which employs film,
tape, live-action, animation, as indicated, in contrast
to reliance on any single technique.

The guidelines discussed here are not intended to cover all
of the possible production and writing strategies; they do, however,
represent a considerable body of experience which should be con-
sidered in television presentations for preschool children. The
single most important point, a must, is that producers should think
deeply about what they are doing, consider what they do and how what
they do alters or fulfills purpose. I believe that most producers
want to do better children's programming. But it is not enough
to say, "It is my purpose to produce a good television program for
children." That purpose will have to be much more sharply defined.
The discussions of this dissertation should be valuable in helping
to define that purpose.

APPENDIX A

THE RESULTS OF THE SIX WEEK TESTING

AND THEIR

IMPLICATIONS FOR PRODUCTION

BODY PARTS

The data from the six-week testing indicate that the children
in day care centers are well able to identify and label the parts
of the body. With the exception of forehead and wrist,   70 per-
cent of the children in both experimental and control groups re-
sponded correctly on all recognition and labelling items. The
results were the same for identifying the parts of the body asso-
ciated with basic functions such as looking, smelling, etc.

The Body Parts Test is comprised of four subtests: (1) Pointing,
(2) Labelling, (3) Locating a body part given its function (multiple
choice) and (4) Identifying a body part given its function.

The total test consists of 42 items. The mean for the experi-
mental group for the total test rose from 35.01 at Pretest to 37.12
at Six-Week Testing while the control group mean rose from 34.83
to 36.18. The mean gain for the experimental subjects (2.11 items)
was slightly higher than the mean gain for the controls (1.35 items).
With the overall high level of performance, mean gains from Pretest
to Six-Week Testing were small. However, positive gains were noted
for both groups on each subtest. In each case, the gains were higher
for the experimental subjects.

Implications

The high level of performance on this measure implies that the majority of children from three to five years of age are already familiar with the level of knowledge about their bodies that is tapped by this test. This may not be true for children from disadvantaged areas who have had no preschool experience, however.

Recommendations

The gains made on items in the Body Parts Test which were not already at ceiling level on the Pretest are impressive. This indicates that for a child who is not already familiar with the body parts being tested, the methods used in the program were successful in raising his level of performance.

It is recommended then, that the show continue to deal with the body parts goals as it had done in the past. Since the children are familiar with body parts, these could be used to teach other goals. For example, the child can be shown that his nose is <u>between</u> his ears, emphasizing the relational concepts. Finger plays can also be used which stress relations and number concepts.

The similarities and differences between parts of the child's body can be compared to animals' bodies when they appear on the show. For example, the child has hair on his head while the animal may have fur over its body. They may both have two eyes; the animal may walk on all fours while the child walks upright on two legs, etc.

The child could be taught more about his body. For example, he can be shown how the skin, fingernails, and eyelashes act to protect him. This can also be compared with animals who have fur to keep them warm, feathers that repel water, etc.

LETTERS

The data from the Six-Week Testing indicate that although much headway is being made in the children's knowledge of letters, there is still a great deal of room for growth. Because of the emphasis that is placed on goals dealing with letters, the eight subtests are discussed individually below. (Sixteen letters were taught during the first six weeks -- A, B, C, D, E, G, H, J, M, O, R, S, T, W, X, AND Z.)

On each of the eight subtests, the mean gain for the experimental group from Pretest to Six-Week Testing surpassed that of the control group. The experimental mean rose from 27.18 at Pretest to 33.01 at Six-Week Testing, a mean gain of 5.83 items. The control mean rose from 30.37 to 32.38, a mean gain of 2.01 items.

Matching

On this subtest the child was shown a card on which a shape, letter, number, or form was printed. He was then required to find the identical stimulus from a set of four. Performance on this task was exceptionally high, over 90 percent correct at Six-Week Testing, on all items with the exception of the word "WHO."

Implications

These data imply that the children have a good understanding of this task and possess the skills necessary to perform success-fully when a single stimulus is involved. Errors occur when the child is asked to match a stimulus that is made up of several elements, such as WHO which is comprised of the three elements of W, H, and O.

Recommendations

Since both experimental and control children were able to match successfully when the match involved a unitary stimulus, it is suggested that less emphasis be placed on this skill. Rather the skills necessary to perform correctly on more complex matching problems should be stressed.

On the WHO item, the problem seems to lie in the strategy that the child uses to complete the task. He should be taught that a systematic approach is possible to solving such a problem. He is most probably concentrating his attention on only one element of the stimulus. In WHO, for example, he may only attend to the letter W. This could result in the child's matching WHO with WAR. In both words W is the first letter.

To correct this the child can be taught to make a systematic

check of each letter. This skill can also be emphasized in the
Sorting Game. The word that doesn't belong could have a different
last letter such as:

WHO   WHO

WHY   WHO

Another method that could be used to teach children the
strategy for matching would be to superimpose or matte the letters
of the word to be matched over each of the possible choices. If
this is done, the matte should proceed from left to right and each
letter should be confirmed. This would result in a match-mis-match
test. The important thing is for the child to realize that all of
the letters must match that of the standard before he can conclude
that they are the same.

Defining the Domain of Letters

Children were asked two questions to determine their under-
standing of the domain of letters and their function. They were
shown a page with eight printed letters and asked: (1) What are
these called? The percentage of children in the experimental group
answering this question correctly rose from 29 percent on Pretest
to 52 percent after six weeks of viewing, while the percentage of

control subjects answering correctly stayed relatively stable at about 40 percent correct. (2) <u>Are they used to read or are they used to count?</u> There was virtually no change in performance from Pretest to Six-Week Testing for either experimental to control children on this item.

Implications

These results indicate that although the children are becoming fairly familiar with the individual letters such as "W" or "J" they do not understand what they are or how they are used. They do not realize that "W" is a letter and that it is used to make words.

Recommendations

When the alphabet in its entirety or individual characters from the alphabet are presented, the point should be made that these are letters, that they are all letters, and that letters are used to make words.

Letters we have received from parents indicate that after viewing the program, children begin pointing out the letter they have learned in magazines and in books. This could be used to define the role of letters for the child. The letter could be pointed out in books. The point could then be made that we <u>read</u> books. We read words in books by sounding our the letters. Letters are for reading.

The domain of letters and numbers should be brought into contact and their respective functions should be distinguished. A game could be played where a pile of letters and numbers gets sorted into two piles: letters and numbers. As the sort is carried out, the child could be shown that 2, 5, 7, etc. are numbers and that they are put in the same pile because all are used in counting. O, R, W, etc. are all letters and they are used in reading.

Recognizing Letters

There were impressive gains in the number of children who were able to recognize specific letters after watching "Sesame Street." In the task the child was shown four letters and asked to "Find the W." The gains were generally higher for capital letters than for lower case letters. Although the gains are impressive, there is still room for growth. After six weeks of programming, the highest performance was on the letter J with 74 percent of the children identifying this letter correctly.

Some children when shown a set of four letters and asked to find the W are unable to do so, even though they can successfully label it when it is presented alone.

Implications

Although the children are becoming more familiar with the indi-

vidual letters taught on the program, they may not possess the strategies necessary to solve this task correctly.

Recommendations

In this problem type the child must sustain an image of the letter in question while he checks a succession of given letters to see which one matches his "standard." (Our experimental children seem to have problems when they encounter this format on a test, whether with letters, numbers, forms, or whatever.) For example, given the following -- A S P C A -- and asked to find the letter S, the children often need to be taught to know the following:

> -only one of the letters is an S
> -all of the rest of the letters
> are not the S (for the young child,
> this does not necessarily follow
> from the above statement. Each
> should be mentioned separately.)

Certain procedural strategies follow from the above. Since only one of the letters is the letter S, the child can be taught to make a systematic left-to-right check, proceeding letter to letter to test each against his "standard." For each letter he should make a "yes" or "no" decision relative to this "standard."

Since all of the other letters are not an S, the child can be taught to use the process of elimination. If he knows that the first letter is an "A," then this letter is definitely not the "S," and the number of choices is narrowed.

One way to make this clear to the child is to develop games that will teach him to use these strategies. For example, the standard he uses could be a real one. A cardboard S could be shown to the child and then placed in a box. The child could then be shown the set of cardboard letters, A S P C A. When a tentative decision has been reached about the correct letter, the standard could be taken out of the box and compared, systematically to each of the letters in the set.

Naming Letters

Substantial gains were made in the ability to name letters by the experimental group. The children were tested on 16 capital and eight lower case letters. Performance, in general, was better on capital letters.

For capital letters, the experimental man rose from 4.37 on Pretest to 6.34 at Six-Weeks Testing, a mean gain of 1.97 items. The control mean rose from 5.52 to 6.34, a mean gain of 0.82 items. Only 11 of the 16 letters tested were presented on the Show in the first six weeks of programming. Most of the gain was concentrated on these letters. For lower case letters, the mean gain for experimental was 0.78, and 0.44 for controls.

Implications

The gains made in naming letters suggests that the methods currently being used to teach this skill are working effectively. There still seems to be some confusion between letters and numbers and between letters and other letters.

The poorer performance on the lower case letters could be the result of several factors: (1) They are not stressed as heavily on the show. Although there are cartoons for lower case as well as capital letters, many of the additional scenes dealing with letters involve capitals. These segments seem to be important. More recent data (after three months of viewing) show impressive gains on the letter "i." This seems largely due to a segment on the show in which while Big Bird was guarding the letter "i," the dot ran away and was lost. (2) The children are shown two things, a capital and a lower case letter, and given the same name for them. This may be confusing for the child. He may think he made a mistake calling the capital letter by that name when he sees a small letter and is told that this is the "r."

Recommendations

The confusion between letters and numbers seems to occur for two reasons: (1) The child doesn't recognize that two domains exist and are separate. This could be clarified for him. (See the suggestions for teaching this distinction which appear on page 7:

Defining the Domain of Letters.)   (2) The child knows more names

for numbers than he does for letters. He may not know that 3 is

a "three" but the label three is available to him. When he is frus-

trated or confused he may try to name a letter with this label.

He has seen both letters and numbers on "Sesame Street" so in

many ways it is a good guess for him to make. This confusion

could be cleared up if the child had a definite stimulus to attach

this label to. For example, if he knew for certain that 3 was

"three" he would be less likely to call a K a "three."

The confusion that exists between letters seems to be rela-

ted to how they look. The mistakes that the children make are in

naming a letter with a label for a letter that resembles it quite

strongly such as B and P, and M and W.

The Workshop advisors suggest teaching the children to dis-

criminate between letters having a similar shape, but not between

letters which are reversals of one another such as M and W or b

and d. Some of the letters that could be taught in pairs so that

their differences could be stressed are shown below:

Capitals	Lower Case
F - E	a - d
A - H	n - h
O - C, Q, G	n - m
P - R	i - j
V - U	k - x
X - K	g - y
M - N	c - e
W - V	

There are several methods that can be used to teach children to discriminate one letter from other letters. The child could be shown one letter at a time and told to say or do something each time he sees the "f." In this situation a variety of letters could be presented but the child must only respond to the "f."

A second way children could be taught to discriminate among letters is by pairing letters where confusion may occur. When this is done the discrimination could be taught two ways. Taking the letter B, the letter could be paired with P. Each time the letters are presented the child must find the B. This could also be done by having the child name both letters when they are presented together.

The Sorting Game could also be used with the confusing letter pairs. The child could be asked to find the letter (B) which is not like the others (P's). The child could also be asked to sort B's and P's into separate piles.

Initial Letter Sounds

There was virtually no gain in the ability of children in the experimental group to discriminate initial letter sounds as measured by the ETS Letters Test. The children were shown four pictures and asked to find the one that started with T, C, A, or P.

Implications

If the child does not understand what we are asking in a problem like this, then the problem most probably extends to the situation where we say that Wanda is a W-word. We are using this technique to teach the letters S, T, and X. There is reason to question whether the children have any understanding of what we are saying to them when we talk about T-words, etc.

Recommendations

The children should be taught that letters have a name and a sound. When we read we say the sound of the letters. The segment on Kermit teaching the sound of B was very well done. Perhaps after this segment is shown the children could play a game where they must choose the picture that starts with B. Have simple pictures the children will be very familiar with such as Television, Bird, Cow, and Monkey. Take each word and check it against the B-sound. Some other methods for teaching initial letter sounds are described below:

-Present words with the same initial sound simultaneously
     instead of always sequentially.

-Talk quite directly to the point that each of several
     different words can have the same letter. For example,
     present the following pictures:

car   ring   rope   ribbon
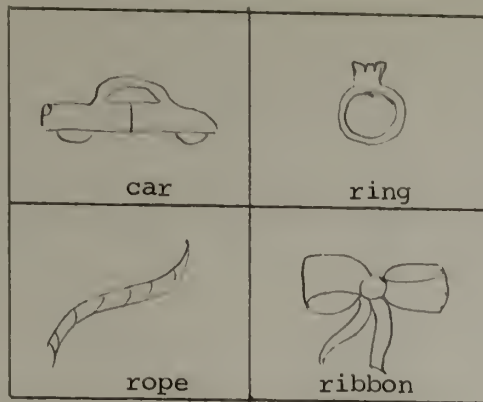
... then move a cut-out letter "r" from one word to the next. Point out that the words, ring, rope, and ribbon start with "r" and the word car ends with "r."

-Make a game of picking which of two pictures shows something starting with a given letter. For example, show the following pairs...

Pear   Ladder

Witch   Comb
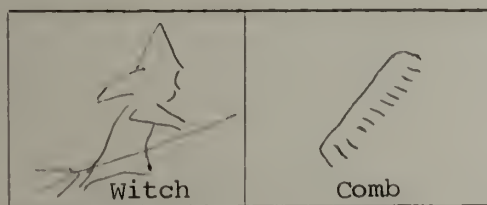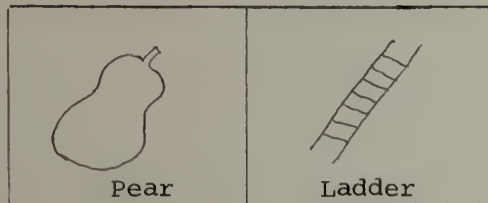
... and ask which picture shows something that starts with a "P" or "L" or "W" or "C." Guide the child step by step in going from the name of the object -- to the discovery of its initial letter sound -- to the identification of the printed letter form which represents that sound. -Do the process in reverse. Start with a letter, identify the sound it represents, and then locate objects or pictures starting with that sound.

Recitation of the Alphabet

Although there were substantial gains in the ability to recite the alphabet, at the end of six weeks of programming still less than 25 percent of the children could recite it in its entirety without making a mistake. There seem to be plateaus of learning; EFG, for example, seems to be learned as a unit. There is a definite drop in the percentage of children who continue to H.

Implication

The children seem to learn the alphabet in "runs." Errors seem to occur most frequently following certain specific runs. These runs should be linked together for the child. Often the runs are spoken as though they are a single word. Perhaps the child has not realized that the letters he is learning are the same things that make up the alphabet.

Recommendations

Have the child watch someone put together a disorganized set of letters to form the alphabet. Have one cast member start off saying the alphabet, A-B-C (each time finding the letter and arranging it in order.) Have this person stop at D, not remembering what comes after C. Let him find someone who can help with the next sequence...DEFG...again finding the letter each time. Continue until the entire alphabet is stretched out, in order, on the floor or street. It might be possible to take the letter that is being taught on a given day and have that letter be the one on which the cast member is stuck.

Be sure to point out that the alphabet is made up of these letters. Point out, too, that the alphabet is the complete set of letters, that there aren't any more. Maybe someone could sing the alphabet song to show that all the letters are there.

The use of the alphabet song to find what letter comes next should be demonstrated to the child. When Oscar couldn't remember "z"it would have been nice to have someone suggest that he sing the song and that might have helped him remember the "z."

FORMS

The Forms Test was comprised of two subtests: (1) Recognizing Forms and (2) Labelling Forms. This was a very short test, the entire measure consisting of only eight items.

On the first set of items, the children were shown another set of four forms. They were asked in turn to name the square, rectangle, circle, and triangle. Gains of over 30 percent were made by the experimental group in labelling the square, rectangle, and triangle. There was a 13 percent gain in the ability to label the circle.

In the second subtest, the child was shown a page on which forms were printed. He was asked in turn to point to the circle, the rectangle, a triangle, and another triangle. Performance was high for triangle and circle. One hundred percent of the children successfully identified the circle. There was a substantial gain in the number of children identifying the rectangle correctly, but at six weeks, there were still only 55 percent of the children who responded correctly on this item.

The experimental mean rose from 4.07 on Pretest to 5.37 at Six-Weeks Testing, a mean gain of 1.30 items. The control mean rose from 4.24 to 4.94, a gain of 0.66 items.

Implications

The methods that are presently being used to teach the names of these shapes are working effectively. Although gains have been obtained in the knowledge of rectangle, this form remains the least familiar.

Recommendations

The children were able to identify three of the four forms correctly on the recognition subtest (over 80 percent correct performance on square, and triangle). Still, with only the rectangle remaining unfamiliar to them they did not realize that this one shape that was left had to be the rectangle. If the children could use the process of elimination that was mentioned earlier in regard to items of this type, they would have successfully identified the rectangle. (See Page 9, Recognizing Letters.)

Of the shapes tested, circle was the most familiar at Pretest. The children should be most "ready" to learn this name if they do not have this label available to them. Still there is a proportionately small gain on this item in the labelling subtest. Perhaps we have stressed the concept "round things" while neglecting to teach the label "circle."

Rectangularity should be more heavily stressed. This should especially be done in identifying rectangular objects. Perhaps the "hidden figures" game could be used with the child required to find rectangles.

NUMBERS

In the area of numbers, like that of letters, substantial gains were made by the children viewing the program. In general, when the results of the Letters Test were compared with the results of the Numbers Test, scores tended to be higher in Numbers.

In the first Numbers subtest, Recognizing the Domain of Numbers, equivalent gains were obtained in experimental and control groups. In each of the remaining subtests, the mean gain for experimental group exceen the mean gain for controls.

The total Numbers Test consisted of 54 items. The experimental mean rose from 26.32 to 32.91, a mean gain of 6.59 items. The control mean rose from 30.85 to 32.71, a mean gain of 1.86 items. The 12.4 percent increment in performance by the experimental group compared to the 3.5 increment for control subjects indicates that substantial gains were made in the area of numbers.

Because of the central role numbers play in the program, the individual subtests are discussed below.

Defining the Domain of Numbers

As in the Letters Test, a page with eight printed numbers was presented and the children were asked two questions: (1) What are these called? There was no difference in the amount of gain made by viewers and nonviewers on this question. Both groups registered gains of about 20 percent with the number of children successfully answering the question at about 70 percent. (2) Are they used to count or to read? Over 80 percent of the children in both experimental and control conditions answered correctly.

Implications

Children are much more familiar with the domain of numbers than that of letters. Since there was little difference in performance of experimental and control children it is impossible to determine if the methods being used to teach this concept are working. Gain was made by the experimentals, but also by the controls.

Recommendations

Tell the children quite directly that 1, 2, etc. are not cabbages, fruit, or automobiles, but that they are numbers. (In explaining why certain things are not numbers, we can impart a great deal of information about what numbers are.) Explain that

numbers are used to count and that we count to find out how many things we have. (Strictly speaking, the written symbol is the numeral, or it can be called "the way we write numbers," but it should not be called a number, because teachers in school now tend to insist on the distinction.)

Distinguish between letters and numbers. This has been suggested earlier (See Page 7, Defining the Domain of Letters.)

Recognizing Numerals

In this subtest, four numerals were presented on a page and the child was required to find the 1, 4, 10, 2, 6, and 20, each from a set of four numbers. With the exception of 20, which was not treated in Jazz Numbers or the Henson Number Film, gains of around 20 percent were made by the children in the viewing group. Again in this subtest, the children had a high degree of familiarity with the three numerals that were not 20, but did not know how to use the process of elimination to determine that the one numeral they did not know was, in fact, the 20.

Implications

The methods presently being used to teach the recognition of numerals are extremely effective. The children are now showing

a high degree of familiarity with the numerals 1 through 10. The
data indicate that it is possible to go further in the area of
numbers, stressing the numerals 11 through 20.

Recommendations

The numerals 6 through 10 should receive more emphasis than
1 through 5. With the exception of the numeral 10 itself, there
is a drop in the percentage of children successfully identifying
numerals larger than five. There is an even greater drop in perfor-
mance on numerals larger than 10. For the children who have suc-
cessfully mastered the earlier numbers, it would be beneficial to
begin introducing material that is more advanced, particularly
recognition of the numerals 11 through 20. (We still recommend
introducing the concepts of enumeration and numerosity primarily
through the use of the first ten numbers.)

Naming Numerals

The data on naming numerals directly reflects the findings from
Recognition of Numerals. The drop in performance after 5, and the
even greater drop after 10 is reflected in the following data taken
from the Six-Week Testing of the experimental group:

Numeral	% Labelling Correctly
1	84
2	68
3	72
4	81
5	73
6	58
7	49
8	55
9	40
10	57
11	24
12	9
17	12
20	15

Implications

The results from the Six-Weeks Testing indicate that there have been substantial gains in performance of children viewing the program. The numerals 1 through 5 are now quite familiar. There is good reason to continue teaching 6 through 10 as about 50 percent of the children who were tested are still unable to label these numerals correctly. There is, however, good reason to go beyond the numeral 10, for half the children are already able to perform correctly on 1 through 10 and they are ready to learn more.

Recommendations

A heavier emphasis should be placed on the numerals 6 through 10, and an effort could be made to introduce the numerals 11 through 20. It doesn't seem that the same films would work as well for these higher numerals. In both the Jazz Numbers and the Henson

Number Films, numerosity is stressed. It is difficult for the child to visualize more than about five objects at once. It is suggested that straight labelling of numerals 6 through 20 could be taught if we choose to so extend our goals, much as it is done with letters. The children should see that this funny thing is a "six" or an "eight" as well as knowing that there are six things or eight things on the screen. The figure-eight in ice skating may be one way to introduce this. A football player with a numeral 12 on his shirt may be another.

Counting the Number of Objects (Enumeration)

The children were quite skilled at counting out up to five objects. Beyond five there was a substantial drop in performance.

Implications and Recommendations

As in the recognition and labelling of numerals, the children appear to have mastered the numbers one through five and are ready to go on to more advanced numbers. The problem, and the objective, is to prompt the children to add one more object each time they add one more number in the number sequence. They often count faster or slower than they add new objects.

Recognizing Relative Amount

Children were tested for their understanding of concepts like fewer, most, same, and more. This was done in a multiple-choice format. The child was shown several pictures depicting varying numbers or amounts, and was asked to point to the picture that had the "fewest ladybugs," etc. The concepts of "more" and "all" were fairly familiar to the children. Slightly over 60 percent were able to identify pictures with the "same number" and "most" correctly. The concepts of "fewer" and "fewest," on the other hand, were very difficult with less than 20 percent of the children responding correctly on these items.

Implications

The children are not as familiar with relative amounts as they are with specific number of objects when that number is one through five. The familiarity that the children have shown with the concept of "more" indicates that they may be ready for conservation problems. (See below.)

Recommendations

There should be a greater emphasis on concepts dealing with relational quantities. Comparatives and superlatives, especially, should be stressed.

It may be possible to begin teaching conservation of mass. This simply means that although a given object may change shape, the amount of material that comprises it will remain constant. This is usually demonstrated with clay which can be rolled into different shapes such as a ball or sausage-like shape. The child can be shown that two balls are the same, then one has changed shape but the two balls still have the same amount of clay in them. We should check with our advisors before introducing this sort of problem, but the data suggest that the children are ready for conservation.

Counting (Rote Recitation)

The data show that even prior to "Sesame Street" most of the day care children which comprise our particular sample could already count to ten.

Implications

Since the children are already able to count to ten, they are ready to learn more. The counting itself could be extended or the counting could be used as a tool for teaching the children other things.

Recommendations

Counting could be extended to 20. The progression from 11 to

20 probably will be more difficult for the children. These numbers are less familiar to them and they are "larger" words to learn. Perhaps these could be taught with a rhythm as with jumping rope.

The counting process can be used to help impart the concept that each successive number is one more than the previous one. This could be done in the following manner:

(1)   Begin with one object. Count it and call it <u>one</u>.

(2)   Add one object. Count again. Stop with <u>two</u>.

(3)   Proceed up to about seven, recounting the entire set each time one more object is added.

(4)   Let one of the characters have an "Aha!" experience to the effect that you don't have to count each time to know how many are there when you are adding one. It's simply the next higher number in counting.

(5)   Show this is true by predicting that the next number will be eight by counting. Then add the next object and count the objects giving eight.

This approach should help simultaneously the processes of rote counting, enumeration, addition by one and the iterative principle of number sequence.

Relations

In the relations test, there were ten items testing the following concepts: (1) Biggest, (2) Smallest, (3) Over, (4) Nearest, (5) On, (6) In, (7) Under, (8) Through, (9) Between, and (10) Around. The relations Biggest, Smallest, and On were familiar to the children at Pretest, and performance was near the ceiling on these items. There were gains of 25 percent or more on Over and Around. Performance was poor on the item testing for knowledge of In. On other measures of children's familiarity with concepts, this is usually one of the earliest learned. This suggests that it was not the concept but the particular item in the test that caused the low performance.

The experimental mean rose from 7.24 on Pretest to 8.28 at Six-Weeks Testing, a gain of 1.04 items. The control mean rose from 7.68 to 8.39, a gain of 0.71 items.

Implications

The improvement on the relations 'Over' and 'Around' suggest that the film "Over, Under, and Through" is having a positive effect in improving the children's familiarity with these concepts. It is puzzling that 'Through' does not show this same gain, especially since it receives the additional emphasis from the film of Alice

Braithwaite Goodieshoes. Perhaps it is the item on the test which is causing this result. In any case, the data seems to imply that the following relations need a stronger emphasis in the future programs: Nearest, Through, Under, and Between.

Recommendations

Some of the films and present methods of making these relational terms salient include the Alice Braithwaite Goodieshoes films, the Muppet who is found next to, under, and on top of the box, and the "Over, Under, and Through" film. More material of these types would be highly desirable.

A different approach would be to make the familiarity with these relations have some "pay of value" for the viewer. Games could be played with the viewing audience where they would be right if they picked the picture showing the man that is between or under the trees. The child could also be given riddles like "What is on your face and between your eyes?" "What is on your forehead and over your eyes? You have two of them?" " What do we put on our foot that goes between our foot and our shoe?" "What do we wear on our hand that we stick our finger through?" "What do we wear around our wrist that we put our hand through to put on?"

Using this type of an approach, some of the less familiar body parts would be emphasized together with the relational concepts.

It would probably be helpful in defining the relations to show what they do not mean. This could be accomplished by having someone make an error. When asked to put his hand through a hoop, Ernie might put his hands around it instead and be corrected by Bert.

Another approach might be to show a series of instances of a single relationship in quick succession. For example, consider the following questions asked in quick succession:

1. A place setting is shown without a plate.
   Ask: What goes between the fork and the knife?

2. Show a car with no wheels floating above a road.
   Ask: What goes between the car and the road?

3. Show two pieces of bread with a space between them.
   Ask: What goes between the slices of bread to make a sandwich?

4. Show the letters A and C.
   Ask: What goes between them?

SORTING

Two subtests comprise the test of Sorting. (1) Sorting and (2) Completion. In the Sorting subtest, the children were shown four objects and asked to find one that was different from the others or did not belong. Impressive gains were made on this subtest with the experimental group showing a 25.8 percent increment in performance whereas the control group showed an increment of 8.8 percent.

In the Completion subtest, the children were asked questions of the following type: "You eat bread; you eat chicken; what else do you eat?" Performance was very high on this subtest with the children in both groups reaching the ceiling on several items.

Implications

The gains in sorting skills among "Sesame Street" viewers were quite striking. They are perhaps the best evidence that the program is capable of teaching higher-level cognitive processes. The format used in testing for sorting skills is essentially the same as the format has proven to be very successful.

Recommendations

With the evidence that we have obtained showing substantial improvements in sorting following viewing of the "One of These Things Is Not Like the Others" segments, it seems highly desirable to begin extending this skill to other contexts.

One way to help the children generalize their newly acquired skill in sorting is to use one or more of the prominent elements from the present teaching format in connection with new forms or applications. For instance, the sorting song could be used in the following kinds of situations:

(1) Alter the form of the display in various ways.

    a. Set the four objects in a row, occasionally rather than always displaying them in the four-fold table.

    b. Find examples in everyday situations.

      - three whole eggs in their shells and one cracked in a frying pan.

      - three baby animals and one mother.

      - three good tires and one flat tire on a car.

      - eleven eggs and one cookie in an egg carton.

(2) Alter the basic structure of the problem.

    a. Show four balloons, three of which are inflated with lighter-than-air gas, and one which is inflated with plain air. You must release the strings to see which one is not like the others.

b. Show four people about to do a dance. When they start, one does it differently.

c. Show a large number of objects, two of which are different from the others. Adjust the song accordingly.

d. Show four strings of beads, where the beads on one string are arranged in a different pattern than the others.

(3) Occasionally show some important consequence of things being different from other things.

a. Show someone receiving an assemble-it-yourself toy with one wheel or one leg different than the others.

b. Show three yo-yos, one of which has no string.

c. Show four cupcakes, one of which has a finger-full of icing scooped out. Show four kids, one with icing on his finger.

d. Show a child being rewarded for being different in a situation, or a group of children picking the runt of a litter for a pet.

(4) Teach other goals using the same format.

a. Show four body parts, three of which are found on the face and one which isn't.

b. Show four children eating soup, one who is drinking from a bowl.

c. Show four children with a toy, three of who share their toy and one who doesn't.

Note that while it seems important to vary the fomat in order to teach the children to generalize their sorting skill, it probably is desirable to continue using our basic sorting format very frequently in order to help insure that the children possess basic sorting skill which is to be generalized through introduction of the various new formats.

CLASSIFICATION

The Classification Test was made up of 18 items. On this test the child was shown a set of three objects that had something in common. He was then required to choose another object (from a set of four) that belonged with the first three objects.

Children in the experimental group showed a 19 percent increment in performance compared with a 10 percent increment by non-viewers. The experimental mean rose from 8.16 on Pretest to 10.71 at Six-Week Testing, a mean gain of 2.55 items. The control mean rose from 8.68 to 9.71, a mean gain of 1.03 items.

Implications

The gains made by viewers on this measure again reflect the success with which "Sesame Street" is improving higher-level cognitive skills of its viewers. The high level of performance on items of this type suggests that more classification skills could be attempted in the program.

Recommendations

Multiple classifications could be approached in the following manner. The child could be shown three large red balls and then asked to find something that goes with them. First, have the child choose the fourth object from a set of three blocks and one ball. Then have the child choose the fourth object from a set of three small balls and one large ball. Finally, have him choose the fourth object from a set of two blocks, one small ball, and one large ball. Using this sort of technique one can stress first that the child must look for a ball, not a block. Secondly, one stresses the fact that the child is looking for a large ball. In the third stage these concepts are put together. Working in this way one can progress to even more difficult double classifications.

Another way to approach multiple classification is by showing a group of objects or people and finding how many ways they are the same. For example a set of vehicles may be the same because you can ride in them, but they also may have wheels, windows, doors, etc. A group of people may be the same in many ways, there may be several girls, some of the girls may have blond hair, the boys may all have sneakers or trousers, etc.

Bert and Ernie may have an argument about which two things go together in the following set of objects: a red ball, a red and

white striped ball, and a peppermint stick. Both are right. They

can begin naming how many ways the things are alike (round, have

red on them, etc.), and find that the balls have more things in

common than the striped ball and the peppermint stick.

PUZZLES

The Puzzles Test was made up of two kinds of items. In the first, the children were shown a picture with something wrong and were asked what was funny about it. In the second set, the children were shown a picture and asked to find what was missing. There were problems associated with some of the items on this test and it is currently being revised. Even on items that appear to be clear, however, such as a house with a door missing, performance was not very high. The mean for the experimental group rose from 5.34 to 6.55, a mean gain of 1.21 items. For the control group the mean rose from 5.94 to 6.71, a mean gain of 0.71 items. The Puzzles Test was made up of ten items.

Implications

There is a good deal of room for growth in this area. Basically, the child is being asked to define a problem. He looks at a picture where something is wrong or missing. He is asked to discover what it is that is wrong.

Recommendations

Very simple examples should be used to help the child discover
what is wrong in a set of situations. For example, the child can
be shown a glove with a finger missing, a car with three wheels or
a man with one leg. He can be asked to find what's missing. These
should be done one at a time. If the child cannot see what is
wrong with a glove that has a finger missing, he may see it when
the glove is put on by someone. Show clearly the finger sticking
out of the hole where the glove should be. Then have the person
pretend to go outside and get a very cold finger. This should make
it very clear to the child what is wrong with the glove and why it
is wrong. The same thing can be done with the car. Have someone
try to push a car with three wheels. Have someone try to walk on
one leg, etc.

APPENDIX B

TESTING FOR COMPETENCE

SECTION I

PERFORMANCE OF DAY CARE CHILDREN ON A TEST OF LETTERS

MEMORANDUM

To: Production
From: Barbara Frengel   February 27, 1969
Re: Letters

A general test dealing with letters was given to 68 four-year-olds from our
day-care centers. The results are summarized below.

1. Reciting the Alphabet

The results are presented graphically on the next page. The major findings
indicate that very few children in our target population can accomplish this task.

      - Only 36 of the 68 children could even begin to recite
        the alphabet.

      - Only 21 children could go beyond ABC

Looking at the graph it seems that certain letters are learned in sets. These
sets include:

      A B C
      J K L M
      R S T U
      W X Y Z

There also appear to be several stumbling blocks where the children get confused.
These are:

    C D, D E, E F, I J, and N O P

2. Labelling letters of the alphabet.

a. The entire alphabet was presented and the children were asked to pick out
and name the letters they knew. The results are presented below:

Letter	% Labelling Correctly
A	23.5%
B	20.6%
C	11.8%
D	10.3%
E	16.3%
F-Z	Less than 10%

b. Letters of the child's name

    (1) Labelling letters of their name
        The child was asked to label the first letter of his first name
        (Capital letter).

Reciting the Alphabet
(N = 68)

No. of children

36
32
28
24
20
16
12
8
4
0

A B C D E F G H I J K L M N O P Q R S T U V W X Y

LETTER Reached in Recitation

Eleven of the children or 16.3% could label this letter correctly.

(2) <u>Recognizing letters of their name</u>
If the child could not label the first letter of his name a card with the alphabet was presented and he was asked to find the first letter of his first name (Debby would be asked to find "D").

Twenty children, or 29.3% could recognize the first letter of their first name.

(3) <u>Writing their names</u>

Forty children wrote letters or reasonable facsimiles.

Twelve children wrote their first names. Seven did this perfectly and five with minor errors.

Twenty-nine children were able to write at least the first letter of their name.

The major finding here is that children seem to learn the letters of their own names first. Using letters in names should be a good idea, like "M is for Martha". In the J-Commercial, several children who were not able to label the J did call it a "Joe" or a "Julio".

First letters are learned first. Using words that start with the letter we are teaching is supported here.

3. Matching Letters

A card with the letters of the alphabet was presented. The child was given eight individual letters and asked to "put them were they go." The results are presented below:

Letter	% Matching Correctly
A	92.6
B	89.7
D	89.7
J	86.8
K	83.8
S	82.4
M	77.9
T	75.0

Except for the "T", this is the exact same ordering of difficulty achieved on the labelling task.

SUMMARY

1. Children are not nearly as familiar with letters as with numbers.

2. Very few children can recite the alphabet.

3. First letters in names are among the first letters children learn.

4. Children are much more familiar with the first part than the latter part of the alphabet.

5. There are some natural groupings that occur in learning to recite the alphabet (ABC, JKLM, RSTU). It might be good to present these together sometimes.

6. Some transition points are difficult. These should probably be stressed.

SECTION II

PERFORMANCE OF DAY CARE CHILDREN ON A TEST OF NUMBERS

MEMORANDUM

February 26, 1969

To: Production
From: Barbara Frengel
Re: The ability of four-year-olds from our Day-Care population to deal with
       NUMBER

Children in our three major Day-Care Centers (Union, Open Door and Grant) were given a general abilities test dealing with number. A copy of the test is attached.

The results will be discussed question by question.

1. Counting

This question provides information on counting. The child is encouraged to count as far as he can. Fifty-one percent of the children tested could count to six or over.

	% by School			% by Sex		% of Total
				Male	Female	
	Union (N=19)	Grant (N=28)	OpenDoor (N=19)	(N=34)	(N=32)	(N=66)
Not at all	10	21	10	20	9	15
1-5	32	28	42	35	31	33
6-10	16	36	32	20	38	29
11-20	26	14	16	20	16	18
21+	16	0	0	3	6	04

2. Labelling Numerals (1 to 5)

The numerals, one to five were presented in a random order and the child was required to name each numeral as it was presented. The numeral, 1, is fairly well known, with 62% of the children able to name this numeral. About 40% of the children could also name the remaining numerals, 2, 3, 4 and 5.

	% by School			% by Sex		% of Total
				Male	Female	
	Union (N=19)	Grant (N=28)	OpenDoor (N=19)	(N=34)	(N=32)	(N=66)
1	58	71	53	62	62	62
2	47	36	42	41	41	41
3	53	39	37	38	47	42
4	47	43	42	41	47	44
5	42	36	32	38	34	36

3. Recognizing Numerals (1-5)

Four numerals were presented and the child was required to choose the appropriate one. The results parallel those of the labelling task, but show about a 10% improvement. Again the numeral, 1, is well known and the remaining numerals (2,3,4, and 5) are identified correctly by about 50% of the children.

	% by School			% by Sex		% of Total
				Male	Female	
	Union (N=19)	Grant (N=28)	OpenDoor (N=19)	(N=34)	(N=32)	(N=66)
1	74	64	63	62	72	67
2	53	36	58	41	53	47
3	63	32	63	50	50	50
4	63	46	63	50	62	56
5	58	43	47	44	53	48

4. Matching Numerals

Here a card with five numerals is presented. The child is given the numerals 1-5 individually and required to match them with the appropriate numeral on the card. This is a very easy task for the child. It requires no knowledge of number but is a simple perceptual discrimination. The numeral, 5, was most difficult for the children to discriminate. When they erred, they most often confused it with 2 or 3.

	% by School			% by Sex		% of Total
				Male	Female	
	Union (N=19)	Grant (N=28)	OpenDoor (N=19)	(N=34)	(N=32)	(N=66)
1	100	100	100	100	100	100
2	100	86	95	94	91	92
3	95	93	100	94	97	95
4	95	100	95	94	100	97
5	89	75	100	85	88	86

5. Demonstrating an understanding of Number

Here children were presented with a pile of ten checkers and required to perform various tasks to demonstrate their understanding of numerosity. Ninety percent of the children know how many objects "one" represents. They also know "all". Only about thirty-five percent can count out three, four or five objects from a pile.

	% by School			% by Sex		% of Total
				Male	Female	
	Union (N=19)	Grant (N=28)	OpenDoor (N=19)	(N=34)	(N=32)	(N=66)
1	95	86	95	91	91	91
3	58	36	10	26	44	35
4	47	39	21	29	44	36
5	32	25	5	15	28	21
All	100	68	68	79	75	77

6. Recognizing an instance of number

These were multiple-choice items. Here children were asked to choose a clown with one balloon (from four clowns with varying number of balloons); an envelope with three stamps and an Indian with five feathers.

(The result on threeness is questionable because the stamps were not spread but bunched in the right-hand corner of the envelopes).

Again, "one" is very familiar to the children. Three and five were not so well known.

	% by School			% by Sex		% of Total
	Union (N=19)	Grant (N=28)	OpenDoor (N=19)	Male (N=34)	Female (N=32)	(N=66)
1	89	75	79	73	88	80
3	47	54	42	44	53	48
5	79	57	58	56	72	64

Summary

1. About half of the four-year-olds in day-care centers can already count above six. We will not get very outstanding differences in the summative findings if we gear our major effort in counting to 1-10. We should teach counting to 20.

2. Less than 50% of the children can label numerals 1-5 so this seems a legitimate goal. More know "one" so this should receive the least emphasis.

3. From the results of this test it seems that our major target should be teaching numerosity. This is where the children seem to need the most help. Counting out things in a forward progression might be a good way to do this.

SECTION III

A COMPARISON OF PERFORMANCES OF DAY CARE AND FAMILY DAY CARE CHILDREN

RESEARCH MEMORANDUM

To: Production
From: Research
Re: A summary report of the performance of four-year-olds on five
         general ability measures.
Date: June 11, 1969

    Following is a report on our testing efforts with day care and Family
Day Care children. After having tested day care children on several of our
general abilities measures, we became concerned that the information we had
gathered may not have truly reflected the abilities of children at home --
children who had not been exposed to a day care experience.
    Testing a group of children in their own homes was considered, but this
was not feasible for many reasons in addition to inefficiency.
    We were fortunate enough to gain entrance into Family Day Care homes.
These homes are described in more detail later. The important factor is that
we feel fairly confident in generalizing from the Family Day Care sample to
our target population.

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THE FAMILY DAY CARE HOME

The CTW research staff recently visited approximately 45 homes in the five boroughs of New York. The purpose of the visits was to test "hard to reach," disadvantaged four-year-olds in their own homes to determine their present level performance in the specific achievement areas represented in CTW's goals. We mainly wanted to know if the performance of such children is similar or markedly different from the performance of children enrolled in the regular established day care centers in which we have been doing research.

The 50 children tested were all four-year-olds. Each of these young children attends a day care program in an apartment near his home. Mothers conduct these all-day programs for a maximum of ten children in each home. The purpose is to provide care for children of mothers who could not otherwise take jobs.

The Home Setting

Every home visited had more than one child in it. Most homes had at least four children. Every home had at least one television set; many homes had two sets; some homes had three sets. A few homes had color television sets.

Our home visits were all planned. We entered no homes unannounced.

TV Utilization in the Homes

The television sets were on in about half the homes. No television set was tuned to Channel 13 when we arrived. Occasionally, a mother said she looked at Channel 13, but no mother indicated that Channel 13 was a part of her regular viewing pattern. Virtually every home we visited could receive Channel 13's signal.

The Educational Programs in the Homes

The quality of the educational work being done with the children in the homes varied greatly. Two homes visited were conducting a vigorous educational program with the mother in charge drilling the children in counting, learning letters of the alphabet, the pledge of allegiance, etc. However, the majority of the homes were conducting educational programs rated by us as "moderate to weak". In several homes there was no evidence at all of educational materials. There appeared to be no attempt on the part of the mother to formally instruct the children. We rated the educational program in these homes as "non-existent".

Comparison of Home Day Care Sites with Established Day Care Centers

The home day care centers conduct a much weaker educational program than the regular day care centers. It appeared to us that no home center or related agency maintained records as to the ages of the children under their jurisdiction. Some sent us to homes where there were no children of the age we were interested in testing.

This same lack of organization appeared in the homes themselves. Some of the day care mothers did not know the ages of the children in their homes, for example.

This leads us to conclude that, for the CTW utilization staff, the job of getting families from the neighborhoods we visited to watch our show will be every bit as difficult as we imagined. The TV viewers we saw are not in the habit of looking at Channel 13. In the homes we visited where TV was on, the programs being watched were quizzes and soap operas.

The children we tested varied, as might be expected, in their ability to answer the questions correctly. Some of the children, however, were not only unable to answer the test questions correctly, but they were unable to understand the questions we were asking.

The following tests were included in the testing battery: Body Parts, Matching Familiar Figures, Numbers, Grouping and Sorting, Letters. The results from these tests will be discussed separately.

TESTING PROCEDURES

and

RESULTS

GROUPING & SORTING

The interest here was what classes the child has available to him, and along what dimensions he can make appropriate decisions as to whether an object should be included or excluded from a set of objects.

Grouping: Two objects were placed on a piece of paper and the four choice objects were placed along side the paper on the table. The child was asked to choose the one choice object that belonged on the paper with the other two objects. A variety of phrasings was used to be sure that the child understood the task (ex. "Which one is the same as..." "Which one is like..." "Which one belongs with.." etc.)

Sorting: Four objects were placed on the paper. Three of these objects were identical in regard to the dimension in question (Form: round, Color: red, Class: vehicles, etc.) The third object varied in that dimension. Grouping and Sorting tasks were only administered to the Family Day Care sample. The results are presented below:

The Ability to Group & Sort Objects Varying in the Dimension of Similarity

Basis of Grouping	Grouping Number (N=50)	%	Sorting Number (N=50)	%
Color (Red)	25	50	30	60
Size (Large)	21	42	12	24
Form (Round)	13	26	11	22
Class (Animals)	35	70	6	12
Amount (Two)	12	24	15	30
Function (Vehicles)	22	44	10	20

MATCHING FAMILIAR FIGURES TEST

This measure provides information on the degree to which the child can match pictures of similar objects. In order to accomplish the match he must be able to notice the parts within a whole. The child is given one picture and must find the same picture from a set of four. These four pictures vary in different ways (a hat may have a slightly different shape, a different band, a different feather, etc.)

The test also is designed to be used as a measure of reflectivity. (How much time does the child take before he makes a decision?)

The data on the matching of familiar figures is presented below. In this case the day care sample is younger (3.6 to 4.6 years) than the family day care sample (4.0 to 5.0 years).

Copies of the test are available for anyone interested in seeing the pictures used.

MATCHING FAMILIAR FIGURES TEST

Number of Correct First Choices Per Problem

Day Care Center (N=27)

Problem	1	2	3	4	5	6	7	8	9	10	
N_c	11	11	8	9	20	8	1	15	3	8	Age range 3.6 to 4.6
%	.41	.41	.30	.33	.74	.30	.04	.55	.11	.30	

Family Day Care (N=50)

Problem	1	2	3	4	5	6	7	8	9	10	
N_c	23	25	40	21	33	22	12	33	15	19	Age range 4.0 to 5.0
%	.46	.50	.80	.42	.66	.44	.24	.66	.30	.38	

Composite (N=77)

Problem	1	2	3	4	5	6	7	8	9	10
N_c	34	36	48	30	53	30	13	48	18	27
%	.44	.47	.62	.39	.69	.39	.17	.62	.23	.35

BODY PARTS

The examiner pointed to the part of interest on his own body and said, YOU KNOW WHAT THIS IS. WHAT'S IT CALLED?, or simply, WHAT'S THIS? If the child was able to label the part correctly he asked, WHAT DO WE DO WITH OUR (EYES)? If the child was not able to label the part the function was not asked. After all the parts had been covered the examiner went back to those the child could not label earlier and said, SHOW ME YOUR (ELBOW). WHERE'S YOUR ELBOW? If the child could correctly identify the part the examiner questioned him as to the function of that body part.

A more comprehensive listing of body parts was included with the Family Day Care sample. The results are presented below:

Labelling & Identification of Body Parts

Body Part	Day Care (N=60)		Family Day Care (N=50)		Total (N=110)	
	%Labelling	%Identifying	%Labelling	%Identifying	%Labelling	% Identifying
1. Eye	85	98	82	94	84	96
2. Ear	95	100	82	92	89	96
3. Nose	100	100	92	98	96	99
4. Tongue	80	92	88	94	85	93
5. Teeth	100	100	96	100	98	100
6. Hand	90	100	82	100	88	100
7. Thumb	51	68	60	78	59	73
8. Elbow	42	75	18	48	32	63
9. Knee	58	86	58	92	59	89
10. Finger			58	92		
11. Arm			66	84		
12. Leg			70	92		
13. Head			74	98		
14. Foot			84	98		
			74	84		

IDENTIFYING FUNCTION OF BODY PARTS

	Family Day Care (N = 50)	Day Care (N = 60)
EYE		
Look, see, etc.	30 %	38 %
Blink, wink, etc.	8	20
Nothing or wrong	62	42
EAR		
Hear, listen, etc.	20	22
Clean, dig in, wear earrings, etc.	16	7
Nothing or wrong	64	71
NOSE		
Breath, smell, etc.	18	22
Pick, blow, sneeze, etc.	8	27
Nothing or wrong	74	51
TEETH		
Chew, bite, talk, etc.	46	40
Brush, fall out, etc.	2	18
Nothing or wrong	52	42
HAND		
Hold things, take things, etc.	18	25
Wear rings, wave, shake, etc.	14	37
Nothing or wrong	68	38
THUMB		
Hold things, pick up things, etc.	6	5
Count, suck, etc.	8	20
Nothing or wrong	86	75

	Family Day Care (N = 50)	Day Care (N = 60)
ELBOW		
Move your arm, bend, etc.	16 %	3 %
Lean on, put on table, etc.	2	7
Nothing or wrong	82	90
KNEE		
Walk, bend, crawl, etc.	34	23
Bump into people, scratch, etc.	2	3
Nothing or wrong	64	74
FINGER		
Touch things, pick up things, etc.	20	
Wear ring, scratch, etc.	8	
Nothing or wrong	72	
ARM		
Reach, move your hand, etc.	4	
For muscles, leaning, holding up, etc.	2	
Nothing or wrong	94	
LEG		
Walk, move, stand, etc.	34	
Put pants on, get in bathtub, etc.	4	
Nothing or wrong	62	
HEAD		
Think, look around, nod, etc.	12	
Comb hair, put food into, bump, etc.	30	
Nothing or wrong	58	
FOOT		
Walk, kick, etc.	36	
Put shoes on, socks, etc.	8	
Nothing or wrong	56	

	Family Day Care (N = 50)	Day Care (N = 60)
NECK		
To move head, to swallow, etc.	12 %	
Wear necklace, shirt	4	
Nothing or wrong	84	
TONGUE		
Eat, talk, lick, etc.	50 %	32 %
Bite, stick in the mouth, etc.	2	5
Nothing or wrong	48	63

###

KNOWLEDGE OF NUMBER

1. Counting
This question provides information on counting. The child is encouraged to count as far as he can.

	DAY CARE (N=66)		FAMILY DAY CARE (N=50)		TOTAL (N=116)	
	Number	%	Number	%	Number	%
Not at all	10	15	5	10	15	13
1 - 5	22	33	17	34	39	34
6 - 10	19	29	14	28	33	28
11- 20	12	18	11	22	23	20
21 +	3	4	3	6	6	5

2. Labelling Numerals (1 - 5)
The numerals, one to five were presented in a random order and the child was required to name each numeral as it was presented. Numeral 1 is fairly well known. About 40% of the children could also name the remaining numerals, 2, 3, 4 and 5.

	DAY CARE (N=66)		FAMILY DAY CARE (N=50)		TOTAL (N=116)	
	Number	%	Number	%	Number	%
1	41	62	25	50	66	56
2	27	41	16	32	43	37
3	28	42	19	38	47	40
4	29	44	21	42	50	43
5	24	36	17	34	41	35

3. Recognizing Numerals (1 - 5)
Four numerals were presented and the child was required to choose the appropriate one. Again the numeral 1 is well known and the remaining numerals (2,3,4, and 5) are identified correctly by about 50% of the children.

	DAY CARE (N=66)		FAMILY DAY CARE (N=50)		TOTAL (N=116)	
	Number	%	Number	%	Number	%
1	44	67	35	70	79	68
2	31	47	33	66	64	55
3	33	50	33	66	66	57
4	37	56	26	52	63	54
5	32	48	29	58	61	52

4. Matching Numerals

Here a card with five numerals is presented. The child is given the numerals 1 - 5 individually and required to match them with the appropriate numeral on the card. This is a very easy task for the child. It requires no knowledge of number, but is a simple perceptual discrimination.

	DAY CARE (N=66)		FAMILY DAY CARE (N=50)		TOTAL (N=116)	
	Number	%	Number	%	Number	%
1	66	100	48	96	114	98
2	61	92	43	86	104	90
3	63	95	47	94	110	95
4	64	97	47	94	111	96
5	57	86	47	94	104	90

5. Enumerating Objects

Here children were presented with a pile of ten checkers and required to perform various tasks to demonstrate their understanding of numerosity. Over ninety per cent of the children know how many objects "one" represents. They also know "all".

	DAY CARE (N=66)		FAMILY DAY CARE (N=50)		TOTAL (N=116)	
	Number	%	Number	%	Number	%
1	60	91	48	96	108	93
3	23	35	19	38	42	36
4	24	36	19	38	43	37
5	14	21	11	22	25	22
All	51	77	48	96	99	85

6. Recognizing an Instance of Number

These were multiple-choice items. Here children were asked to choose a clown with one balloon (from four clowns with varying numbers of balloons); an envelope with three stamps and an Indian with five feathers.

Again, "one" is very familiar to the children. Three and five were not so well known.

	DAY CARE (N=66)		FAMILY DAY CARE (N=50)		TOTAL (N=116)	
	Number	%	Number	%	Number	%
1	53	80	46	92	99	85
3	32	48	23	46	55	47
5	42	64	29	58	71	60

KNOWLEDGE OF LETTERS

1. Reciting the Alphabet
   Children were told... YOU KNOW THE ABC'S. SAY THEM FOR ME. If they didn't understand they were told... LISTEN. A - B - C YOU FINISH IT.
   The results are presented on page 17. Nearly 50% of the children could not even begin to recite the alphabet. Only 31% could go as far as "D" and less than 25% could go beyond "D".

2. Labelling Letters
   For the day care children the letters were presented in alphabetical order on two sheets, one with capital letters and one with lower case letters. The children were asked to find the ones they knew and then were asked, "What is that?" The results are presented below:

LABELLING BY DAY CARE CHILDREN (N=68)

Letter	% Labelling Correctly
A	23.5%
B	20.6%
C	11.8%
D	10.3%
E	16.3%
F-Z	Less than 10%

Presenting the letters this way seemed to overwhelm the children. For the Family Day Care sample the letters were presented individually on cards with the capital and lower case both in the card. The results are presented below:

LABELLING BY FAMILY DAY CARE SAMPLE (N=50)

Letter	% Labelling Correctly	Letter	% Labelling Correctly
A	48%	N	8%
B	28%	O	26%
C	16%	P	12%
D	12%	Q	12%
E	16%	R	18%
F	14%	S	18%
G	10%	T	14%
H	10%	U	8%
I	8%	V	10%
J	8%	W	14%
K	16%	X	18%
L	12%	Y	12%
M	8%	Z	8%

3. Matching Letters
   A card with the letters of the alphabet was presented. Eight of these letters were then presented individually and the child was asked to "Put this where it goes." The results are presented below:

PERCENTAGE OF CHILDREN MATCHING LETTERS CORRECTLY

Letter	Day Care (N=68)	Family Day Care (N=50)	Total (N=118)
A	64	56	78
B	91	56	76
D	91	56	76
J	88	50	72
K	72	54	65
S	96	52	78
M	79	40	63
T	78	46	65

DISCUSSION OF RESULTS

GROUPING & SORTING

Only Family Day Care children were tested for classification abilities. The most surprising result was the differences obtained between grouping and sorting on any given dimension. When the basis was color, comparable results were obtained with 50% being able to group on the basis of color, and 60% being able to sort on that basis (See page 4). Looking at the "class" dimension, however, 70% of the children given two animals and asked to find something that went with them could choose another animal from a set of objects. When these same three animals were presented along with a quarter and the children were asked to take something away that didn't belong, only 12% removed the quarter. In general, the percentage of children able to group on the basis of function, class, size, and color shows that this ability is one that can be achieved by the four-year-old (Chance = 25%).

Only on the color dimension did children sort objects above a chance performance.

The most appropriate way to teach these classificatory skills would seem to be by starting with a dimension where the child can "see" what is meant and then carrying out the same operations on a dimension to which he is less attentive.

MATCHING FAMILIAR FIGURES

The interest here was in the child's ability to pick out discriminable cues in order to find a duplicate among four pictures. Results are presented on Page 5. Items 1 and 9 were abstract designs, the remaining items were pictures of familiar objects. Item 7 was a face. Here the choice items were highly similar because several shading cues were lost in the Xerox process. Chance performance is again 25%. Item 9 was an extremely difficult discrimination.

In general, the results indicate that children this age were able to make these kinds of perceptual discriminations, even when they were fairly subtle.

It seems that this skill could be exploited. By using the abilities to match identical objects a basis for classification could be developed by moving from exact duplicates to highly similar objects (ex. all chianti bottles to all basketed bottles).

BODY PARTS

The results for Family Day Care and day care samples are very similar with Family Day Care performing on a slightly lower level. The children were highly skilled at labelling most of the body parts tested. They show little knowledge, however, of how these parts function. (See pages 5-8)

Wizard of Oz-type characters might be a good way to stress the importance of various parts (a rusted tin soldier can't move until the joints are oiled, a girl whose hair covers her eyes can't see until she cuts her bangs, etc.)

NUMBER

In general, there was little difference between day care and Family Day Care samples in their ability to deal with numbers. (Results are presented on pages 9-10.)

a. Counting: Looking at the graph on page 9 we see that most of the children know something about counting and they can usually count to a number somewhere between 1 and 10. This supports the earlier recommendation that we extend the counting goal to 20.

b. Labelling, Identification and Matching of Numbers: The children are fairly familiar with the look of the numerals 1-5 and over 50% of the children could identify a numeral when its label was provided although they were not as adept at providing the label themselves. Again, nearly all the children could match a given numeral with another numeral that appeared in a set of four numbers.

c. Numerosity: Although over 50% of the children tested could count beyond 5, their ability to enumerate has not extended this far. Perhaps what will be most helpful in the development of this skill are films like "Egg and Cookie" where their ability to count is made instrumental to them by being applied to objects (Sort of showing them how counting is used). When the children weren't required to count out objects themselves but were provided with stimuli depicting different amounts, (Recognition of an instance of number) the performance was markedly better. Some of this may reflect the multiple-choice item used here, however, where chance performance was 25% correct.

In summary, it seems that the children at the age tested had already begun to develop some number skills. Over half the sample could already count to ten and could recognize numerals 1 through 5 when provided with the label. They seem to need instruction in enumeration and labelling of the numerals.

LETTERS

Reciting the Alphabet: The data on recitation of the alphabet is presented graphically on page 17. A good portion of children could not even begin to recite (just under 50%). Of those who knew what was meant and could begin to say the alphabet, few could go beyond D in their recitation and less than 10% could recite the alphabet in its entirety. Often what happens is a confusion or omission of letters. It would seem that several spots where the alphabet is presented distinctly would be most helpful to the children.

Labelling and Recognition of Letters: Results are presented on page 11. In the Family Day Care sample, a substantial percentage of the children knew "A". There was some knowledge of "B" and "O", but little familiarity with any other letters.
Only 26% of the children could provide the label for the first letter of their own name. When asked to find the first letter of their name on a page of letters (Mary would be asked to find "M") only 36% were able to do this.

Matching Letters: Here we find the most outstanding difference between day care and Family Day Care samples (See page 12). Given a letter and asked to match it with an identical letter in a set of eight letters only about half of the children responded correctly. This same kind of task was presented with numbers and this difference between samples was not obtained. Neither was there a sample difference in the Matching Familiar Figures test discussed earlier. It seems that what would account for this difference is a lack of exposure to letters.

Recitation of the alphabet

N = 116

APPENDIX C

SPECIAL ANALYSIS OF DISTRACTOR DATA

ON THE FIVE "ELECTRIC COMPANY" TEST SHOWS

APPENDIX C

MEMORANDUM

To: "The Electric Company" and "Sesame Street" Production Staffs

Cc: Norton Wright, Lu Horne, John Page

From: Edward L. Palmer

Date: October 7, 1971

Subject: Special Analysis of Distractor Data on the Five "Electric
           Company" Test Shows

    Dr. Lang Rust, working as a consultant to the CTW research
department, recently completed the attached study, which attempts
to identify program attributes responsible for high and low appeal
as indicated by distractor data. Dr. Rust quite appropriately
presents his interpretations as tentative, in need of further
study and verification; however, I believe we should view them
as the most sound information presently available and that we
should try to follow their implications in designing new program
segments.

ATTRIBUTES OF "THE ELECTRIC COMPANY" PILOT SHOWS THAT

PRODUCED HIGH AND LOW VISUAL ATTENTION IN 2ND AND 3RD GRADERS

Langbourne Williams Rust, Ph.D.

Children's Television Workshop
Research Department

October, 1971

ATTRIBUTES OF "THE ELECTRIC COMPANY" PILOT SHOWS THAT
PRODUCED HIGH AND LOW VISUAL ATTENTION IN 2ND and 3RD GRADERS

This project was undertaken to discover those attributes that
control children's visual attention while viewing "The Electric
Company" pilot shows and to define the attributes in a way that
would make possible predictions of the visual appeal of new bits
and provide guidelines for the writing and production of new shows.

The procedure had been developed and tested as part of the
investigator's doctoral research. It is based on systems design
principles, and it uses the empirical data of subjects' responses
to particular stimuli to discover and define the general attributes
to which they respond. It is described fully in the dissertation,
Attributes that Differentiate Boys' and Girls' Preferences for
Materials in the Preschool Classroom: A Systems Design Approach,
by Langbourne Williams Rust, Ed.D., Teachers College, Columbia
University, 1971.

Data

The data for this analysis came from the CTW Reading Show
Research Staff Distractor Study on the five "Electric Company"

pilot shows. There were fourteen subjects from the second and third grades. Each subject viewed the shows on a monitor while color slides were flashed on a nearby screen, competing with the television material for the child's attention. The original distractor data had been calculated separately for two groups of seven children and resulted in percentage attention figures for every 7½-second period throughout the shows. These were retabulated for the present study to yield standard attention scores for each bit relative to the norm of the show in which it was found.[1] Appendix A presents the means and standard deviations of the percent attention scores for each of the test shows. Appendix B lists all the bits by name, gives figures on the duration of each, their raw percentage attention scores, and their calculated standard scores.

Scan List

The fifteen highest scoring bits and the fifteen lowest scoring bits were identified. They constitute the scan list and are listed in Table 1.

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[1]Since each show differed from the others in level and range of attention scores, the raw percentage attention figures were converted to standard scores. This permits more meaningful comparisons of bits found in different shows. Thus, a bit with 80% attention in show 1 (which had an average attention per bit of 68% and a standard deviation of 15%), was given a positive score of +0.8 (80% - 60% + 15%); whereas an 80% bit in show 4 (average appeal = 91%, standard deviation = 6.6%) was given a negative score of -1.7. 80% in show 1 is moderately high; 80% in show 4 is extremely low.

Table 1

Scan List: the 30 bits with highest and
lowest relative attention scores[a]

Name of Bit	Show	Duration[b]	Percent Attention	Standard Score
Credits	1	1	94.9%	1.79
Phone sightword	2	2	98.8%	1.73
Short Circus "e on the end"	1	13	89.9%	1.45
ALK monolith	4	3	100.0%	1.43
ph caveman animation	2	4	93.6%	1.32
"In your own words" court scene	3	2	94.0%	1.32
f, fr, ph marquee	2	7	91.2%	1.30
Short Circus "You can make up a word"	3	26	93.4%	1.26
ALL monolith	4	4	98.7%	1.23
Energy bridge	3	2	92.9%	1.21
G sounds contest #1	3	16	92.6%	1.18
2 Cosbys chip/chop	1	9	86.0%	1.18
Grapefruit animation	2	6	91.9%	1.18
Theater in the dark: Gus	3	7	92.2%	1.15
Movie set: "All for one..."	4	16	97.9%	1.11
Credits	5	2	41.7%	-3.25
Last word	5	1	43.5%	-3.10
Julia Grownup	4	39	74.1%	-2.58
Gag after Reasoner	1	2	30.8%	-2.57
Opening song	4	11	76.2%	-2.25
Cosby & Crank, f/ph	2	6	50.4%	-2.07
Gag	1	1	38.5%	-2.05
I Am Cute Very, animation	5	4	58.3%	-1.92
Phil on the Phone, animation	2	5	52.8%	-1.88
Crank call: quotation marks	5	9	61.1%	-1.70
Blow/grow/throw	3	3	63.5%	-1.67
Fargo North: go get gas	3	21	63.6%	-1.66
Cosby & Crank, hard g/soft g	3	13	63.7%	-1.65
"For" animation with DJ	2	4	56.4%	-1.60
Man in the street: uncle	5	6	63.0%	-1.55

[a] Relative attention scores are derived from the raw percentage attention data, and express the difference of a bit's appeal from the average for the show in which it occurs. They are calculated by subtracting the percent attention to the bit from the average percent attention to the show, and then dividing by the standard deviation bits in that show.

[b] Duration figures reflect the number of 7 1/2 second periods over which the bit extends.

It stands to reason that these bits highlight the attributes that most control children's viewing. Accordingly, the scan list bits were studied and contrasted to yield prototype ideas of the attributes holding particularly high or low appeal to the children.

Derivation of Attribute Definitions

After a prototype attribute had been defined, the investigator went through a list of all the bits in the shows and listed those denoted by the definition. The attention scores to the denoted bits were looked up. If the scores did not reflect a general trend of high or low appeal, the definition was abandoned and another was searched for. If, on the other hand, there was a consistent trend of response to the bits, an attempt was made to refine the definition. This was done by contrasting those bits reflecting the general trend of response with those to which the children responded differently. Whatever attribute the children were actually perceiving, the one that the investigator was trying to discover probably was not present in those bits so the definition was modified to exclude them, without at the same time excluding any of the bits with the appropriate levels of response.

Definitions were modified until further improvement was impossible. The optimal definition would denote a large number of bits, to all of which the children responded with either above-average or below-average attention.

When a definition could be improved no further, it was accepted, and the search began for a different attribute. Definitions were derived until as many of the bits on the scan list as possible were denoted and children's responses to them accounted for.

As a final phase of the design procedure, the derived definitions were studied to discover similarities among them. An attempt was made to discover more general definitions that would include several of the original ones within their scope without a weakening of performance.

Results: Derived Definitions

Nine attribute definitions were derived to account for the data. Their complete specifications follow.

High-Appeal Attributes

Six attributes were discovered which were consistently appealing in high-scoring bits and rarely present in low-scoring bits. Each one is named and described below:

1. Functionally-Relevant Action

> Bits in which there is on-screen locomotion or strong physical activity portrayed that is directly related to the primary meaning of the segment consistently result in high visual attention.

Pointing, writing, or arranging things by hand are not active enough to qualify under this definition. Action that is not directly

Table 2

Names of Attributes Discovered to Affect
The Relative Visual Appeal of Different Bits

Attribute Name	No. of Denoted Bits Attended to Above Average	No. of Bits Attended to Below Average
Functionally-Relevant Action	30	4
Strong Rhythm and Rhyme	16	5
Electronic Bridges	12	1
Involving Children	11	1
On-Stage Correcting of Verbal Performance	8	3
"Do It One Better" Theme	5	1
Comprehensible Spoken Script	17	30
Message Monologues	1	10
Starting/Ending Bits	6	12

functional to the plot or theme is not particularly attractive either. For example, in the "Fargo North" sequences, there is quite a bit of walking around, but the walking does not do anything meaningful; it serves merely as a device for getting people on or off stage or for keeping the characters in view while switching the scene to the decoding machine. Walking to the decoding machine is not a very salient feature of the plot. By contrast the physical activity in the movie set "All for One" bit is very relevant to the main theme and the children attended to it.

Thirty-five bits were denoted, and only four of them were attended to below average. Twenty-four of the bits were denoted by this definition and no other; only three of them were attended to above average.

2. Strong Rhythm and Rhyme

> Bits in which there is a strong repetitive rhythm and rhyme, either in songs, poetry, or "jive" talk (like that of Mel Mounds), consistently result in high visual appeal.

Twenty-one such bits were found, and sixteen had above-average attention levels. Eight bits had no other attention-controlling attributes than this one, and six of them were attended to at a high level. The data for this attribute would have been stronger if it were not for the fact, observed by the CTW researchers, that children would occasionally get up from their seats and dance around to particularly appealing songs. The "Sign Song" was attended to

overall at a level slightly less than average, but it should be pointed out that only the first half of it included any lyrics, and at that part the children's attention was at a higher level. When the lyrics stopped, visual attention dropped and so brought down the overall score for the bit.

3. Electronic Bridges

Electronic bridges were quite generally attractive to the children.

Of thirteen bits altogether, twelve were attended to at a high level. None of them possessed any of the other qualities discovered in this analysis. The source of their attractiveness is not altogether clear. Brevity is not it; short bits are not as a whole more attractive than long bits. More likely, they are appealing because they embody to the children something akin to the basic quality of "functionally-relevant action" discussed above.

4. Involving Children

Bits that involved children or child-like animated characters were consistently attractive to the subjects.

Eleven of the twelve such segments were attended to more than average. One of them was denoted by no additional definitions and it was highly attractive.

5. On-Stage Correcting of Verbal Performance

Bits in which one character corrected another on reading, pronunciation, or writing seemed to draw the children's attention to the screen, providing the characters were on stage.

Of eleven bits with this attribute, eight had higher than
average scores. All of them possessed at least one of the other
discovered qualities. Of the three bits not correctly accounted
for by this attribute, two possessed non-appeal attributes, and
the present attribute explains why four bits which otherwise would
have been expected to have below-average appeal in fact seemed
above average.

6. "Do It One Better" Theme

> Bits in which the central action is a theme of repetitive
> attempts to better the just-previous attempt, whether that
> previous attempt is done by a competitor (the two Cosbies
> bit) or by the central character (the movie set "All for
> One", the tongue-twisting theater marquee bits), attracted
> children's visual attention.

There were six such bits; five of them were very highly attrac-
tive and the sixth was only 1% below average. It may be that this
attribute is just another manifestation of the "functionally-
relevant action" attribute, but since there were two bits to which
the latter definition did not clearly apply, yet which seemed to
have the present attribute and were highly visually attractive, it
was decided to include this attribute definition as an independent
factor.

Low-Appeal Attributes

Three attributes were discovered that were consistently present
in low-appeal bits and seldom present in high-appeal bits.

1. Comprehensive Spoken Script

> Bits in which the spoken soundtrack alone is comprehensible, not requiring the viewer to look at the screen to understand what is happening, tend not to have high levels of visual response.

Bits involving the slow sounding-out of letters (blending) were not judged to be comprehensible on the soundtrack alone, and so were not denoted by this definition. All together, forty-seven bits were judged to have this quality; thirty of them were attended to at below-average levels. Forty-two bits had this quality and no other; only nine of these were attended to above average.

This attribute was not discovered until the end of the analysis. It was derived from a number of attributes that had previously been derived in the conventional manner. First, it had been discovered that bits that could be described as "verbal gags" had consistently low visual appeal. Second, all bits on which a telephone voice could be heard were unappealing (not just those including Crank). (This finding seemed reasonable: these children would have long ago learned to dissociate the sound of a voice over a telephone from the need to look for the source of that sound.) Third, it was discovered that bits in which all principal characters were seated tended not to have much visual appeal either (remaining stationary was not the reason; stationary characters who remained standing were not consistently unappealing). Finally, it had been found that eight of the

eleven bits that lasted longer than two and a half minutes had
produced lower-than-average levels of visual respones.

After studying these results though, it was seen that many of
the most unappealing bits shared one or more of these attributes;
the bits described as "verbal gags," "seated bits," or "telephone-
voice" bits especially seemed to share a common highly verbal
quality. A search was undertaken to discover and define a more
comprehensive attribute, and eventually the above definition was
approached. Those bits that had the previously-defined qualities
but that were not denoted by the present definition were found not
to have consistently low visual appeal, while the bits that had the
present quality but which had not been denoted previously were
found to have markedly lower levels of visual appeal than average.
So the other attribute definitions were abandoned in favor of the
more comprehensive one.

It may still be that gags, telephone voices, bits that are too
long, or seated characters have low visual attractiveness in their
own right. The data cannot be viewed as conclusive on this point,
but it can be said that they do not offer sufficient support for
postulating the separate identities of attributes.

> It appears that the presence of this attribute in a bit has an
> effect on the visual attention only when a particularly attrac-
> tive attribute is not present.

Of the eight denoted bits that had an attractive attribute, seven

were attended to at higher than average levels. Being comprehensible did not diminish their visual attractiveness.

The effect of this attribute was most consistent in the least popular shows. In shows 1 and 2, sixteen denoted bits scored low and five scored high. But in shows 3, 4, and 5, fourteen scored low while twelve scored high.

There are several factors that might have played a role here. It could have been that some as-yet undiscovered attributes were present in the comprehensible bits of shows 3 through 5. But there is no way of supporting that hypothesis without discovering the identity of those attributes, and one can question why the segments in shows 1 and 2 did not embody them.

There may have been contextual factors operating. Perhaps children turn away from the comprehensible bits when they are not very interested in the show as a whole.

It may be that children adopt different response strategies to different types of programs: in some they may look at the screen regardless of the bits' auditory sufficiency; in others they may respond less dominantly in a visual mode. If so, the qualities that lead children to choose one strategy or the other should be investigated.

Perhaps conditions extraneous to the program material led to the differential effects of this attribute in the different shows. If there were more distractions, the children may have looked away when they could do so without losing the thread of what was going on.

2. Message Monologues

> When there is a single character on the screen and he is in a more or less stationary position, telling the audience something (reading to himself does not qualify), children's visual attention seems to waver from the screen. Interestingly, similar sorts of messages directed at other characters were not as a group so unappealing.

There were eleven bits judged to meet the above criteria. Ten of them were below average in visual appeal. Five possessed no other defined attributes, and all of these were below average.

Although this attribute seems to be similar to the previous one (comprehensible spoken script), the two did not overlap completely. There were five bits that were "message monologues" but which were not comprehensible without reference to the screen, and they were all given low visual attention by the children.

3. Starting/Ending Bits

> The conventional opening and closing bits of the shows, and any bits that preceded the conventional opening, were found to produce generally lower than average visual attention.

This was true despite the fact that for one-fifth of the cases, children were seeing the bit for the first time and so might not have learned that it was the conventional opening or closing (each child saw five shows). Of the eighteen bits denoted by this definition, twelve had low visual response. Those four with higher attention were only very slightly above average. Thirteen of the bits had no other defined attributes, and nine of these were below average.

Two factors may have been operating here to produce low visual attention. It could have been that the opening bits caught the children before they had settled down to watch. This might not occur in a home viewing situation where the child has already settled in before the program comes on the air. Likewise, the closing bits may have been signals that it was time to go. It could also be that these children are conditioned by current television practice to not expect anything very interesting to happen during conventional openings and closings and so they do not attend closely to them.

Some Attribute Definitions That Did Not Work Out

Animation -- Bits with animated characters had been expected to be visually appealing. As a group they did reflect generally high appeal. Of thirty-six bits, twenty-five had higher than average attention scores. But this attribute was found to add nothing to the other attributes that had been discovered. The ten bits which were animated but which possessed none of the other defined qualities averaged only 0.02% above the norm; four of them were attended to less than average.

Many animated bits had the attribute of "functionally-relevant action." There were nineteen such bits, and only two of them had relatively low appeal. But the animated bits that did not have this

additional quality averaged below the norm in appeal. On the other hand, bits with functionally-relevant action that were not animated were visually attractive: out of sixteen, only three had below-average scores.

Clearly, then, it is not animation _per_ _se_ that is attractive; it is the quality of functionally-relevant action, which is often found in animated bits, to which children respond.

Music -- The existence of a musical score does not seem to be associated with visual appeal. Fifty bits had music for most or all of their duration. Nineteen of them were below average in visual response. But they averaged only 2.3% above the norm. More important, only one bit with much music had no other defined attributes to account for children's response, and it scored below average in visual appeal.

Lively Music -- This quality has been suggested as an attention-getter in the past, too. In these shows and for these subjects, it is associated with even fewer appealing bits than was music as a general category. Lively music excludes many of the bridges, the two "True-Blue Sues," and the three Monoliths, all of which were appealing. Also excluded from this category were the two "Love of Chair" bits, one of which scored above average and one below. The net effect is that "lively music" performs even less adequately than "music" does.

Overly-Long Bits -- The attribute of excessive length was discussed above while outlining the derivation of "comprehensible

spoken script." Although taken by itself this quality seems to be related to low visual attention, closer examination of the data reveals that the length of time is not the contolling factor. Eleven bits lasted longer than two and a half minutes; only three of these had above-average attention scores. But eight of these overly-long bits involved a comprehensible spoken script, only one of which was attended to more than average. The remainder, bits overly long but without this other attribute, were not low in visual appeal; two of them scored above the average and the third scored only 0.2% below. Additional evidence that duration was not a primary factor can be seen in the shifts of attention within the longer bits. If it had been time that was important, one would have found a gradual dropping-off of attention as time progressed; but often the opposite pattern could be noted: attention would increase with time as often as it would decrease.

Durations other than "two and a half minutes or longer" did not reveal any strong patterns. Of thirty-six bits between one and two minutes in duration, nineteen were above average, seventeen below. The twenty-three very short bits (seven seconds or so) did not show any pattern either. They averaged about 1% below the average for all bits in visual appeal.

Characters -- The identity of a character from bit to bit does not seem to affect the appeal of those bits directly. This is so

even when that character has been in very unappealing bits previously. Bill Cosby, for example, participated in some of the worst bits of all, but when he was in a good role, children attended to it. While making this point about identity, it should be stressed that characters do make an immediate difference in appeal. Who they are is not important in the sense of what they have been seen to do before. But who they are _is_ important in the sense of what they do right now. In a sense then, children appear to be forgiving of bad roles -- they won't hold it against an actor, but they are equally forgetful of good roles and it will not help a bad bit to put in a previously popular actor. The only way that would help would be if the actor changed the bit or changed his role in it. If Easy Reader were to play Julia Grownup's role, the children would like it no more than they did (unless, of course, he introduced an air of more functional action). And if you could get Crank on stage to play "All for one and one for all," he, too, might be a hit.

Attributes of Bits on the Scan List

Each of the discovered attributes was manifested in at least one of the bits on the scan list, which gives strength to the assertion that all the attributes have strong effects on viewing behavior.

The attributes which were strongest throughout the data accounted for the bulk of the scan list items. Eight of the fifteen most

Table 3

Attributes of Bits on the Scan List

Name of Bit	Attributes Possessed by Bit
Credits (Show 1)	Start/End
Phone Sightword	Functional Action
Short Circus: "e on the end"	Children, Strong Rhythm & Rhyme
ALK Monolith	Functional Action
ph Caveman, animation	Functional Action
Court Scene: "In Your Own Words"	
f, fr, ph Marquee	Functional Action, "One Better"
Short Circus: "You Can Make Up a Word"	Functional Action, Children, Strong Rhythm & Rhyme
ALL Monolith	Functional Action
Energy Bridge	Bridge
G Sounds Contest #1	On-Stage Correcting, "One Better"
2 Cosbys: Chip/Chop	"One Better"
Grapefruit, animation	Functional Action, Children
Theater in the Dark: Gus	Comprehensible Spoken Script
Movie Set: "All for one..."	Functional Action, "One Better," On Stage Correcting
Credits (Show 5)	Start/End
Last Word (Show 5)	Start/End
Julia Grownup	Comprensible Spoken Script, Message Monologue
Gag After Reasoner	Comprensible Spoken Script, Message Monologue
Opening Song (Show 4)	Start/End, Strong Rhythm & Rhyme
Cosby & Crank: f/ph	Comprehensible Spoken Script
Gag (Show 1)	Comprehensible Spoken Script
I Am Cute Very, animation	Message Monologue
Phil on the Phone, animation	Comprehensible Spoken Script
Crank Call: Quotation Marks	Comprehensible Spoken Script
Blow/Grow/Throw	
Fargo North: Go Get Gas	Comprehensible Spoken Script
Cosby & Crank: Hard g/Soft g	Comprehensible Spoken Script
"For" animation with DJ	Comprehensible Spoken Script
Man in the Street: Uncle	Comprehensible Spoken Script

appealing bits had the quality of functional action. Eleven of the fifteen least appealing bits had "comprehensible spoken script."

Table 3 lists the scan list items and the attributes they were found to possess.

The appeal of four of the bits was not successfully explained by the findings of this study. Among the attractive bits, two ("Theater in the Dark" and "Show 1 Credits") had low-appeal attributes, and one ("Court Scene: In Your Own Words") had none at all. Among the unattractive bits, one ("Blow/Grow/Throw") had none of the discovered attributes. On the whole these bits were quite short. They averaged twenty-four seconds in length, versus an average of sixty seconds for all bits. Brevity may have influenced their measured appeal in two ways. First, there was a greater chance of error in matching the raw percentage scores (which were taken for every seven and a half second period) with the program material for the short bits, so the actual appeal may not have been as high as the measured appeal indicates. Second, contextual factors probably have stronger effects on short segments than they do on long ones. Longer segments provide more time for the children to get over the effects of the just-previous bits and to respond to the intrinsic qualities of the one at hand.

Overall Performance of the Defined Attributes

Of the 149 bits in the five pilot shows, 133 of them (89%) were denoted by at least one attribute definition. One hundred nineteen bits (80%) had high-appeal or low-appeal attributes exclusively. Over all children's responses to those 119 bits were accounted for successfully at a rate of about four to one. Highly attractive bits were more successfully accounted for than relatively unattractive bits: a success ratio of five to one was reached for the former; a ratio of three to one, for the latter.

Fourteen bits had both high-appeal and low-appeal features. As a group, their mean was about one percent below the norm. One cannot conclude, however, that a mixture of high- and low-appeal attributes results in intermediate attraction. It depends on the particular attributes involved, as was pointed out in the discussions of the "comprehensible spoken script" attribute.

Sixteen bits were not denoted by any of the discovered attributes. They averaged about one-twentieth of one percent below the norm.

It seems that the greater number of appealing attributes a bit has, the more likely it is that children will find it appealing.

Children respond more consistently to bits with two or more high-appeal attributes or two or more low-appeal attributes than they do to those with only one attribute. The ratio was 11 to 1

for multiple attribute bits and 3.3 to 1 for single attribute bits.

Table 4 presents the summary data on which the above conclusions were based.

Some Limitations of This Research

The attributes discovered in this study are obviously not all of the qualities that control children's visual response to television material.

1. For one thing they relate only to relative appeal, not to absolute appeal. It was decided to use the relative measure (the standard score) instead of an absolute one (percentage attention) because the shows differed in both level and range of absolute appeal to such a degree that the factor of the show in which a bit occurred would have masked all other factors that might have been operating.

Relative and absolute appeal are strongly related however. The relative scores of bits in show 1, which had by far the lowest absolute level of response, were not nearly so successfully accounted for as were the scores of bits in the other shows. There were nine errors in that show alone, compared with an average of four per show in the others. The primary reason was that the absolute level of appeal which would have been relatively low in the other shows was relatively high in the first. Although the attribute definitions were designed to account for relative appeal, they also accounted better for absolute appeal in show 1.

Table 4

Summary Data

Appeal of Bits with Different Combinations
of High and Low Appeal Attributes

Attribute Combination	Number of Bits Attended to Above Average	Number of Bits Attended to Below Average	Standard Score
1 High-Appeal Attribute	41	6	0.59
2 High-Appeal Attributes	14	2	0.65
3 High-Appeal Attributes	2	0	0.65
1 Low-Appeal Attribute	14	33	-0.59
2 Low-Appeal Attributes	0	7	-1.38
1 High-Appeal & 2 Low-Appeal Attributes	1	0	0.16
2 High-Appeal & 1 Low-Appeal Attributes	8	5	-0.08
No Attributes	89	7	-0.04

2. The shows on which this study was based were basically similar. Only examination of shows that differ over the full spectrum of possibilities could reveal the nature of all features that can control visual response. On the other hand, one can assert that the features most affecting response to these particular shows, written and produced by the same people who will be making the new shows, are the ones of most importance to CTW's practical needs.

3. The procedure, in its present stage of refinement, can discover only those attributes that occur often enough in fairly undiluted form to distinguish them as unique. Many other factors may have been operating but not have been discovered because they occurred only in conjunction with other attributes that masked their effects. Because of the conventions of writers, clusters of attributes often occur together that, in fact, do not need to (for example, it was noted that "functional action" was a frequent quality of animated bits, though it is by no means a necessary correlate); but the result is to offer no evidence of their separate identities.

4. Because the task of this project was to discover the attributes highlighting the most and least appealing bits, attributes that might lead to intermediate levels of response were not discovered. Related to this high-response versus low-response dichotomy was the

all-or-nothing way in which attributes were treated. In reality
many of them may best be conceived as varying along continua
of strength. Ideally, one might be able to predict different
levels of response appropriate to different degrees of attribute
strength. (On the other hand this speculation rests on the assump-
tion that viewers do not respond to attributes as all-or-nothing,
and this assumption may not be warranted.)

5. It should be stressed that findings relate to visual
attention, not to attention as a global sort of response. It may
be that when a child attends visually, he usually also listens
and that when he looks away he ceases to listen attentively. But
that may not always be the case, and since there is no evidence
one way or the other, one cannot assume it to be true.

6. Another limitation has probably already become obvious to
the reader. Other persons may use the attribute definitions differently
from this researcher. A bit seen to possess a certain defined quality
to one may be seen not to possess it to another. This problem of the
reliability of the attribute definitions is a crucial one, for the
discoveries of this paper are useful only insofar as they can be
communicated so that others can use them. The magnitude of the
problem with these definitions is not yet known. It is a simple
matter to have a number of persons classify the bits on the basis
of the present definitions and to improve the definitions on the
basis of the outcome. But it has not yet been done.

Future Research Possibilities

There are some obvious needs for more research.

Research on Existing Data

Some research could be done with the present body of data.

1. An analysis of moment-to-moment differences in visual attention would lead to results with much finer-grained predictive power. Such analysis would relate the data on each seven and a half second time period to the program material within it instead of relating average attention scores for total bits to features characterizing them as a whole.

2. Absolute level (percentage attention) could possibly be investigated, but it is suggested that only shows 2, 3, and 5 be studied in this regard, as their means and standard deviations are most comparable. This would leave too few bits out of which to get results, so analysis should be on a moment-to-moment basis.

3. Attention change is a variable that should be investigated, both on the bit level and on the seven and a half second level. One would seek to characterize the attributes that lead to the greatest positive or negative shifts in attention leve. Obviously, the amount of shift that is possible depends on the absolute level of the preceding bit, so some variant of this measure would be required to compensate for this effect (otherwise one would discover that the most significant attribute of bits that reflect strong upward

shifts in attending is that they follow bits with low visual attention: all other factors would be masked). An index like "percent of possible change" also has its problems: in this light a shift from 95% to 100% is equivalent to a shift from 60% to 100%. Whatever index is chosen, some preliminary analysis would be necessary to determine whether change in attention level is a regular, predictable sort of variable in the first place.

4. Closer examination of the sound track might be useful. Although this researcher found no regularities in children's responses to bits with music or with lively music, a more intensive examination (perhaps by someone with a more sensitive ear) might produce some important discoveries.

5. A search for factors of context and pacing that affect a bit's visual appeal could be begun with these data, though it is possible that a greater variety of material will be required to give results with confidence.

6. Preliminary work on the inter-rater reliability of the present findings could be done, and the definitions of the attributes could be modified to produce consistently high agreement as to which bits possess which defined qualities ... it would be important in such work to check how producers or writers use the definitions in comparison to researchers. It is, after all, the former persons who need to apply these findings directly to new materials, so their ability to use them consistently is of paramount importance.

The stop-tape data already collected by CTW research on these shows might permit a search, similar in form to the present study, for the attributes of materials that are comprehensible or incomprehensible to the children. Comprehension itself could be looked at two ways: (1) vis-à-vis the children (do they have an understanding that satisfies them?) or (2) vis-à-vis the producers (do the children understand what we want them to understand?). In either case one would discover the kinds of things children do not or do understand and specify them in a way that could be used to guide further development.

Research Requiring More Data

There is a need to conduct a study that would involve a greater number and variety of shows and a sample of children that is larger and more carefully selected than the present one. The technique of data collection though would be basically the same. Such a study would be useful in a number of ways:

1. The attributes that had been discovered with the existing data could be validated by using them to predict the relative appeal of new bits and then comparing the predictions with the results.

2. Nearly all the research on the existing data could be done much more fruitfully on a larger body of data. More attention-controlling attributes could be discovered and their exact nature more precisely determined. If the data collection situation in the

new study were comparable to that in the old one, the two bodies

of data could be pooled, and a substantial savings realized (the

new study could involve fewer subjects). A thorough moment-to-

moment analysis might not be easier with more data: there might

be too much for one person to handle. A team of several persons

and the services of a computer with substantial memory capacity

might be required.

3. The search for contextual and pacing attributes would be

greatly facilitated. Five shows, all quite similar, permit only

limited inferences to be made about factors relating to show type,

progression, etc.

4. It might be possible to see whether children do in fact

adopt different response strategies for different types of shows.

The possibility was suggested in discussion of the "comprehensible

spoken script" data.

5. Attention change could be more validly studied as a

variable: rather than just using statistical manipulations (with

their attendant distortions) to discount the effects of just-prior-

level-of-attention, one could look at the bits following low levels

of attention and bits following high levels of attention separately.

The attributes that lead to rapid change would then be derived

independently for each set. One might find the attributes to be

similar in both cases, or different, but either finding would be

important.

6. It might be possible to record other sorts of response data at the same time as the visual attention data is gathered. One could then discover the features of bits that lead of rhythmic responses, singing, irrelevant activities, laughter, verbal behavior, surprise, etc., all of which would be useful information.

7. Finally, some between-child differences in response could be investigated. Differences related to age, reading level, IQ, sex, bilingualism versus monolingualism, or socioeconomic status could be discovered. Such information could insure that no shows are produced that inadvertently turn away important segments of the target audience. It would not make sense to investigate all of these between-child variables in one study: the sample would have to be too large to be practical. But perhaps two or three variables could be built into the sample selection and then could be studied in their own right (sex probably should be one of them, since there is strong evidence of extensive sex-typed preferences; reading level might also be appropriate since it relates so directly to the definition of the target population; age, too, might be worthwhile). Later projects could investigate some of the other differences. Trying to find out about all between-child differences at once, one would ideally have all levels of all variables represented in the sample. With six variables, each with only two levels, and with at least five children of each type and level, the sample would have to include 320 children. With

three variables the sample would have to include forty children, which is still three times the size of the sample already studied.

Studies of the Distractor Condition Itself

The effects of the present system of repeating the distractor slides should be evaluated. Presently, the distractors repeat three and a half times in a half-hour show. The distractor material itself may have variously distracting effects on different types of material or in different types of shows. One might conclude that a particular type of material is unappealing, whereas it may lack appeal only when a certain type of distraction is present. A study that uses different kinds of distracting material with the same television material would be easy to do, and a small sample would be sufficient.

It is also important to validate the distractor situation against a home-viewing situation, and to characterize the most potent differences between them. At this stage one cannot be too sure that behavior patterns in the distractor setting are comparable to those at home. Finally, one should take a more complete look at children's behavior in a distractor setting. There is an implicit assumption that children look either at the television screen or at the distractor, since only by making that assumption can one assert that one has control over the distractions to a child's

attention in the distractor setting. Obviously, other distractions can intrude (or be sought by the child). It may be found that providing a single distractor is not the optimal procedure. Perhaps two distractors, each with different sorts of material, would yield more useful results. Perhaps auditory as well as visual distractions should be present, active as well as static displays. Maybe manipulative stimuli would help. One advantage of having a large number of alternatives open to a child is that a choice to attend to one thing will not so much be a function of a choice against another thing, as may now be the case. Presently one cannot be sure if the data come from attraction to one thing or from repulsion from its only alternative.

Thorough study of the distractor condition, with an eye toward ways of improving it, is of utmost importance. This setting provides the basic structure upon which all else is built, and any distortions built into the data are magnified in later analyses. One must have utmost confidence in the appropriateness of the distractor situation if any confidence is to be placed on results that derive from it.

Conclusion

In conclusion, though, the attributes discovered in this project account strongly for the visual appeal of the different bits in the shows that were studied.

Their definitions may be refined by further research. Some of them may be found to be just extensions or facets of others. Slightly different formulations may lead to higher agreement among users. But as a group they embody the most powerful factors operating in the given context. Visual attention is not all that producers should be concerned with, but it is one of the most important variables. Little can be accomplished with a bit to which children do not attend.

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