

**Summative Evaluation of *Dragon Tales***

**Final Report**

**CONDUCTED FOR  
SESAME WORKSHOP**

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by

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# EXECUTIVE SUMMARY

## Background

This is a summative evaluation of whether the children's TV series, *Dragon Tales*, is meeting its educational objectives. *Dragon Tales* was produced with funding from the Corporation for Public Broadcasting through the U.S. Department of Education and created to fit within the Ready to Learn block of programming on PBS.

The series was designed to help children 2 to 6 years old (with a primary emphasis on reaching 4 year olds) develop strategies for meeting challenges in their lives: social challenges like developing and maintaining relationships, emotional challenges like coping with fears, physical challenges like learning new skills (e.g., learning to ride a bicycle) and cognitive challenges like trying to follow clues and solve problems.

Within the framework of enhancing children's readiness to face challenges, three educational goals were defined for the series:

- To encourage young children to pursue the challenging experiences that support their growth and development.
- To help young children recognize that there are many ways to approach and learn from the challenging experiences in their lives.
- To help young children understand that to try and not succeed is a natural and valuable part of learning.

To achieve its goals, *Dragon Tales* presents children with a magical world on the TV screen where two young children, Emmy and Max, and their dragon friends have adventures together. Along the way they face the kinds of challenges that young children are likely to face. The educational premise is that by using dramatic situations to convey the kinds of developmental challenges faced by the viewers themselves, and by providing them with models for coping with them, they will become emotionally invested, pay attention to what the characters do, and expand their repertoires for facing the challenges in their own lives.

Facing challenges requires getting children to see situations in terms of goals or objectives, and to respond by taking initiative and trying to master them. Therefore, the kinds of models that *Dragon Tales* characters provide entail framing goals, trying different approaches to solve a problem, and persisting until an appropriate resolution is reached. In addition, the series also models the benefits of collaborating with others to meet the challenges that they face.

### Purpose

The primary objective of the current study was to find out whether regular watching of *Dragon Tales* has a positive effect on 4-5 year old children's pursuit of challenges in their everyday lives and on their establishment of collaborative relationships with others.

Secondary objectives were to determine whether the show is appealing, involving and comprehensible, whether it stimulates interaction between parents and children and whether it gets integrated into children's lives, beyond the immediate context of the TV viewing situation.

## Design

The project was broken down into 3 studies, two using school viewing, one using home viewing.

### School Viewing

***Overall Effects Study*** - evaluated the cumulative effects of *Dragon Tales*, when it is viewed on a daily basis for several weeks, by measuring pre-test/post-test changes on a number of resilience factors related to facing challenges and forming collaborative relationships. A control group, which viewed a different educational TV series (*Between the Lions*), provided a baseline for separating the effects of program content from normal developmental changes over the viewing period. The control program was selected because its curricular objectives, which focus on reading, have little overlap with the *Dragon Tales* curriculum. Consequently, the control program (which has been shown to be educationally effective in other research) was not expected to have a significant impact on the variables measured in this study relative to the experimental group.

***Episode Attention and Comprehension Study*** - evaluated children's attention levels and comprehension of emotional and goal-oriented content in a selected number of *Dragon Tales* shows. The control program provided a point of comparison for assessing attention levels to *Dragon Tales*.

### Home Viewing

***Home-Viewing Study*** - evaluated natural home viewing patterns, program appeal and the relationship of *Dragon Tales* to child behavior and parent-child interactions at home.

The designs and instruments are described in more detail in the descriptions of each of the studies that follows.

## Findings

*Dragon Tales* had a broad-based impact on the degree to which viewers demonstrated goal-oriented behavior and social collaboration with peers. Appeal, comprehension and attention levels were high. In addition, it stimulated many adult-child conversations about key program themes in the normal course of viewing at home. Highlights of the key findings from each of the studies are presented here:

The Overall-Effects Study showed that *Dragon Tales* viewers demonstrated significantly more positive change in goal orientation and social relationships than children who watched the control program over the same period. These differences were robust, being reflected across a variety of different kinds of measures that included ratings by various groups of individuals with different roles who saw the children in different settings.

- According to ratings by parents, teachers and researchers, *Dragon Tales* viewers made statistically significant gains, relative to the control group baseline, in how often they "Choose challenging tasks," "Start or organize play with others," "Share with other children," and "Cooperate with others."

The Episode Attention and Comprehension study showed that *Dragon Tales* elicited significantly closer attention from children during viewing compared to the control group. In the key comprehension areas of understanding characters' goals, emotions, and persistence, it appears to have been successful.

The Home-Viewing Study showed that *Dragon Tales* was more likely to be children's favorite program, relative to other children's programs. *Dragon Tales* viewers were significantly more likely to co-view with an adult than any other show, and to have side-bar conversations with their parents about trying to accomplish things and (at a marginal level of significance) about their emotions, sharing, and the use of Spanish relative to children who did not view *Dragon Tales*. Parents particularly liked *Dragon Tales* for its life lessons, moral values, imagination, and the interactive elements of singing and dancing which were perceived as having a positive impact on children's emotional state. Finally, parents reported that *Dragon Tales* viewers were significantly more likely to sing its theme song and to pretend to be in Dragon Land than in the places portrayed in favorite programs of non-*Dragon Tales* viewers.

The cumulative data from these studies indicate that *Dragon Tales* is achieving its objectives. The contribution that *Dragon Tales* is making to young children's development is consistent with the framework that has been established by the National Institute of Early Childhood Development and Education within the U.S. Department of Education. This framework emphasizes the importance of the 3 R's of Early Childhood Education: Resilience, Relationships, and Readiness.

# IN-SCHOOL VIEWING - OVERALL EFFECTS

## Design Details

The *Overall-Effects Study* looked at the full sample of children before and after a 4 to 5 week viewing period in which they viewed selected TV programming in class. It included an experimental group and a control. The experimental group watched 20 episodes of *Dragon Tales*. The control group watched 20 episodes of *Between the Lions*. See Appendix C for a list of episodes used from each series. Both the experimental and control groups were studied on a pre- and post-test basis.

### Design Controls

- 1) A *control group* was used to highlight the differences between children exposed to different program content;
- 2) *Pre-post measures* were used to highlight the changes that occur within children after watching a particular diet of programming; and,
- 3) *Blind experimental design* was used to prevent the expectations of teachers and interviewers from having a distorting effect on the recorded results. They were simply told that we were conducting a study of what children take away from a sampling of children's programs. Thus they were completely unaware of which program was our experimental treatment. In the field, we subjected our control classes to all the same procedures as the experimental classes..

### The Control Program

*Between the Lions* served as the control program. Like *Dragon Tales* it is an educational series targeted to young children which mixes educational and entertainment elements in a fantasy structure. Like *Dragon Tales*, it was currently broadcast over PBS stations nationwide. It was selected because its curricular objectives, which focus on reading, have little apparent overlap with the test program. Consequently, the control program (which has been shown to be educationally effective in other research) was not expected to have a significant impact on the variables measured in this study relative to the experimental group. The assumption was made that in the control group, any pre-post changes that occurred in the areas of facing challenges, persisting at tasks, and forming collaborative relationships with peers would most likely be the result of maturational or other extrinsic factors in the lives of the viewers, and not the result of exposure to program content.

### TV Exposure

The children watched the TV programs for ½ hour a day as a part of their in-school group-time routine. The viewing was conducted as a normal, unremarkable part of the class experience - as a recreational or relaxation part of the day, not as a didactic stimulus. The point was to assess the effect of viewing the show when kids watch it without adult mediation, not when it is used as a teaching tool.

The sequence of the programs shown in both the experimental and control conditions was rotated, so as to minimize the effects of the sequence (and in particular, the effect of the last show they happened to see) upon the children's behavior in the post-test.

## Sample

The sample included 340 children enrolled in 48 classes in 12 schools in Northern New Jersey, New York and Southern Connecticut, drawing from a broad mix of racial, ethnic and economic backgrounds. Twenty-eight percent of the children understood Spanish, according to their parents, and 85% understood English. Appendix A lists the schools and summarizes the racial and economic profile of each one.

All the children met the following conditions:

**Age:** 4 or 5 years old at the start of the study.

**TV Exposure:** They were initially recruited to screen out any children who had already watched either *Dragon Tales* or *Between the Lions* at home. This was determined by a questionnaire filled out by the child's parent a week or two before viewing in each class began. See Appendix D - Exhibit 1 for the form. The Main Tab book (Appendix F) summarizes the frequency with which the children watched these and a sampling of other children's programs.

After the field work was done, it was found that about 15% of the *Between the Lions* kids had been at least occasional viewers of *Dragon Tales*. They were screened out of the sample for the purposes of the analysis in order to avoid the possibility of having some of the non-*Dragon Tales* children (by virtue of home viewing) be inadvertently exposed to *Dragon Tales*.

**Parent Permission:** For all children used in the study, a permission form was filled out, signed and returned prior to the start of fieldwork. A copy is attached in Appendix D - Exhibit 1a.

Half the children were in the experimental group (watching *Dragon Tales*), half were in the control (watching *Between the Lions*). Each treatment group had equal numbers of boys and girls at each age. See items #3-#5 in the Main Tab book (Appendix F) for the specifics.

## Methods

All measures were administered twice: once before the program viewing period began and once when it was completed. Copies of all the instruments are included in the Appendix D. There were three basic types of instruments used in the Overall-Effects Study: an **assessment questionnaire** filled out by teachers, parents and researchers, **individual child interviews** that used play-based tasks to measure children's task persistence and collaboration with peers, and **direct observations** of children's goal-



oriented and collaboration behavior during free-play periods in class. Each of these measures is described more fully under their separate headings.

### **Assessment Questionnaire: The Devereux Early Childhood Assessment**

Assessment questionnaires were filled out for each child by three people: the child's teacher, one of their parents (or their primary caregiver), and the researcher who observed them during free-play. All raters used a similar instrument, answering 19 questions about how often they had seen the child behave in one way or another. The questions were taken directly from the Devereux Early Childhood Assessment Scale for children ages 2 through 5 years.

The Devereux Early Childhood Assessment Scale was originally developed to help teachers and parents identify young children who are socially and developmentally at risk. It grew out of the extensive research during the 1990's on the topic of "resilience", a factor that appears to underlie the ability of some children to successfully face the stresses and challenges of life. The Devereux has been heavily researched and validated for the study of resilience, and is currently in wide use in early education. Nearly all of the schools we worked with were familiar with the instrument, and about half of them claimed to have used it at some point.

The original instrument was adapted in the following ways:

***Fewer Items.*** The original questionnaire included many items for assessing "Attachment" and "Behavioral concerns," neither of which were of direct relevance to the current project. We included only the 19 items that were described as measuring "Initiative" and "Self Control."

***Rating Time Frame Modified.*** The original instrument asks raters to evaluate what they had observed in a child's behavior during the previous 4 weeks. Because the pretest and post tests were only 5 to 6 weeks apart, we narrowed the time frame down to a single week for parents and teachers, and to the single observation day for researchers (who would only have seen the child for one day anyway.)

***Fewer Response Categories (for researchers).*** Parents and teachers used the 5 frequency categories of the original instrument (never, rarely, occasionally, frequently and very frequently). These made little sense for researchers, though, who would have seen a child only for an hour or so. They were given 3 categories with which to answer each question: Never, Once or More than once.

***Scoring.*** The original Devereux took the raw rating scores (0 to 4) and, following a formula derived from norms and a factor analysis, calculated composite scores for the 4 general factors of concern to them: Initiative, Self-Control, Attachment and Behavioral Concerns. For this study, to make the raw data easier to read and to make the 3-point researcher ratings more compatible with the 5-point teacher and parent ratings, we converted all ratings to 2-point scales: "frequently or very frequently" vs. "less than

frequently" for teacher and parent ratings, and "Once or more" vs. "Never" for researcher ratings.

In other respects, such as the wording and sequence of the questions and the wording of the instructions, the instrument was unchanged.

**Criterion Measures.** Of the 19 Devereux questions that were included in the tests, eleven spoke directly to the *Dragon Tales* program objectives. These criterion measures were:

Goal-orientation

- Do things for himself/herself
- Choose to do a task that was challenging for her/him
- Keep trying when unsuccessful (act persistent)
- Try different ways to solve a problem
- Focus his/her attention or concentrate on a task or activity
- Accept another choice when her/his first choice was unavailable

Collaboration

- Start or organize play with other children
- Share with other children
- Ask other children to play with him/her
- Cooperate with others
- Participate actively in make-believe play with others

### **Individual Child Interviews**

**Pre-Post Structured Building Task.** Prior to the start of each child's interview, a basket with 25 colored wooden blocks was placed on the table. Three of the blocks were taken from the basket and set on the table in front of the child's chair in a bridge-like construction: two pillars with a crossbeam.

When the child came into the room and was seated, the interviewer told the child that s/he had begun building "this" (with no further specification), asked the child to complete it, and sat back to observe and record what the child did.

**Criterion Measures.** The key elements recorded during this phase were:

- How long the child worked on the task;
- How many blocks (of the 25) got used in the construction;
- How intense the child's level of involvement appeared to be while building;
- Whether the child announced spontaneously what s/he was building; and
- When the child was through did s/he describe the construction as a single coherent unit (like a kitchen or a parking garage) or as a number of discrete, unrelated items (e.g., "here is a sandwich and this is a car and this is a box").

**Pre-Post Dramatic Play Building Task.** The second part of the child interview spun a dramatic scenario. A doll named Pat has been working on a structure built with the blocks, but then a big wind comes along and blows it down (the interviewer

demonstrates). Pat was too small to pick up the pieces. What was s/he to do? But just then, her friend (a second doll) comes along and says, "Hi Pat, What's up?" Pat tells the friend what happened and then ... At this point the interviewer asks the child what happens next and records the child's actions and dialogue.

During the pre-test, children got into the play and acted it through, showing varying degrees of helpfulness, collaboration and persistence. However, on the post-test they tended to just echo whatever they had said during the pre-test and rush through the motions of putting the construction back together. It was as if the focus of the task was no longer the plight of the characters, but the memory of what the child had done on the same task in the pretest. It no longer appeared to be functioning as a projective task. Feedback from the field researchers alerted us to its problems early on, and when a preliminary check of the data revealed clearly impoverished data, we dropped the projective component of the interview from the analysis.

### **Direct Observations During Free Play**

Once before the viewing began, and again after it had ended (approximately 5 to 7 weeks later), field researchers visited the classrooms and observed each child's spontaneous behavior during a free-play period. The items covered under the rating protocol can be found, in their paper form, in Appendix D. Most of the time, the data were actually collected by entering them directly into a handheld computer, using proprietary software. This system made the researchers' task vastly simpler, alleviating them of the burdens of shuffling reams of paper, juggling a stopwatch, and keeping track of which child to observe when. The handheld computer did all of that work for them.

Children were observed according to a strict time-sampling schedule. Each of up to 7 children was watched for 4 minutes at a time, one after the other until all the children had been observed. At this point they would be cycled through again and again until the free-play period was brought to a close.

Particular attention was paid to the child's involvement in physical tasks. Whenever a child was seen to be voluntarily engaged in a physical task, an extra set of ratings was conducted. Physical tasks were defined as activities in which the child was observed to be making something, practicing some physical skill (with the focus on the actions as opposed to what they were producing), playing with materials (as in just doodling or fiddling with pieces or a medium like finger paint), or performing a classroom job or role (like cleaning up or feeding the gerbils).

***Criterion Measures.*** Percent of physical tasks that involved making something, as opposed to practicing, playing with materials or doing a classroom job;  
Extent of cooperative play, as opposed to parallel play or solo play;  
Asking peers to help;  
Offering help to a peer;  
Percent of time spent on physical tasks; and,  
Involvement level when involved in a physical task.

# Results

## Overall Series Effects

**Assessment Questionnaire.** A multivariate analysis of variance of pre/post change scores on criterion Devereux items and interview status (whether or not a child was interviewed about particular episodes during the viewing period) was performed. It showed a significant difference between the series ( $F = 2.524$ ,  $df = 11$  and  $235$ ,  $p = .005$ ). Independent means tests showed that *Dragon Tales* had a significantly positive impact on the frequencies with which children chose challenging tasks, initiated play with others, asked other children to play, shared with others, and cooperated with others.

**Individual Child Interviews.** The multivariate analysis of variance of children's pre/post change scores on the criterion measures also showed a significant difference between the series:  $F_{11,235} = 2.296$ ,  $df = 5$  and  $175$ ,  $p < .047$ . Independent means tests showed that *Dragon Tales* exposure had a significantly positive impact on children's tendency to describe their block building in terms of a coherent goal.

**Classroom Observations.** Analysis of the free-play behavioral-rating scales did not show a significant impact by *Dragon Tales*.  $F = 1.01$ ,  $df = 8$  and  $125$ ,  $p = .367$ . In the absence of a significant overall effect, statistical tests of the component measures were not evaluated.

## ASSESSMENT QUESTIONNAIRES

### Composite Devereux Ratings

The data presented in this section are a composite of the ratings made by all three raters. The scores in the table were produced by taking the average of the three raters on each child: teacher, parent and researcher. As such, they give the most generalized picture of the impact that *Dragon Tales* and the Control program had upon the viewers. They reflect how the child was perceived by a variety of people both at home and at school.

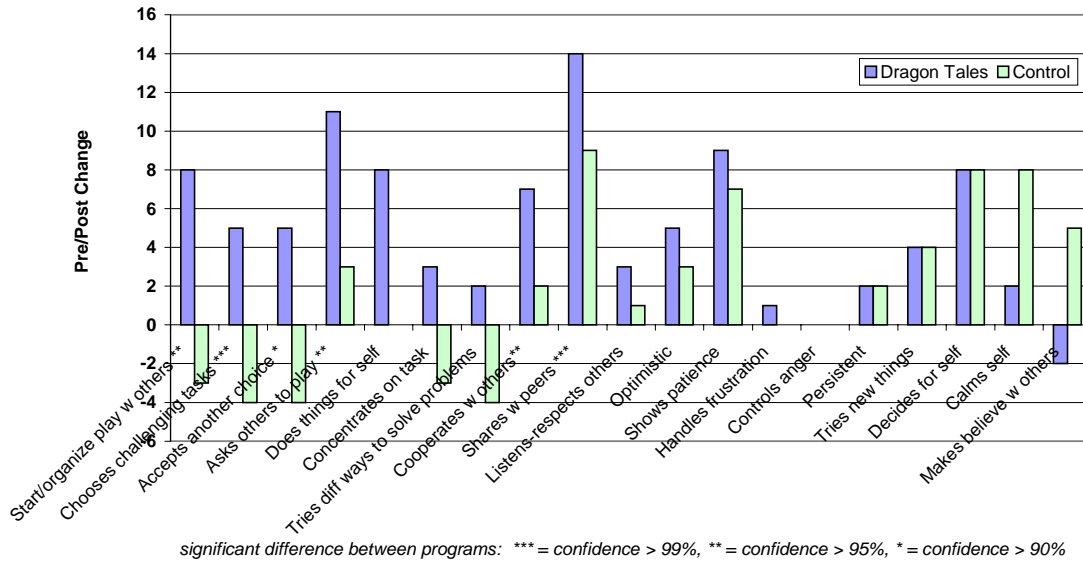
The first chart (All Rater Devereux - Pre/Post Change Scores) plots the pre/post change scores for *Dragon Tales* viewers and the control group. The second score from the left, for example, shows that on the question of how often the child chose tasks that were challenging, the *Dragon Tales* viewers gained 5 points between pre-test and post-test, while the control group lost 4 points.

The second chart (All Rater Devereux - Relative Changes on Criterion Items) focuses on the net gain or loss that was computed by calculating the difference between the *Dragon Tales* and the control groups' pre-post test change scores. For example, the net gain for *Dragon Tales* viewers on the "Chooses Challenging Tasks" item was computed by calculating the difference between the *Dragon Tales* change score (+5) and the control change score (-4) on this variable, giving the *Dragon Tales* group a net gain of 9 points. It

lists the differences on the 11 criterion items that most directly assess the curricular objectives of *Dragon Tales*.

In absolute terms, *Dragon Tales* viewers gained on 17 of the 19 items, showed no change on one and dropped on only one. On many of these items, the control group also had some degree of gain.

**All-Rater Devereux - Pre/Post Changes**



The statistical analysis that was conducted addresses the question of whether the differences between *Dragon Tales* viewers and the control group are real or whether they may have occurred by chance. Another way of looking at this same issue is by asking whether the gains noted for *Dragon Tales* viewers occurred as a result of normal maturation or as a direct result of being exposed to the series.

When we focus on the 11 criterion items that most directly assess the curricular objectives of *Dragon Tales* (see page 9), four of the criterion items showed *Dragon Tales* to have a statistically significant impact on children at a confidence level of 95% or higher. These were:

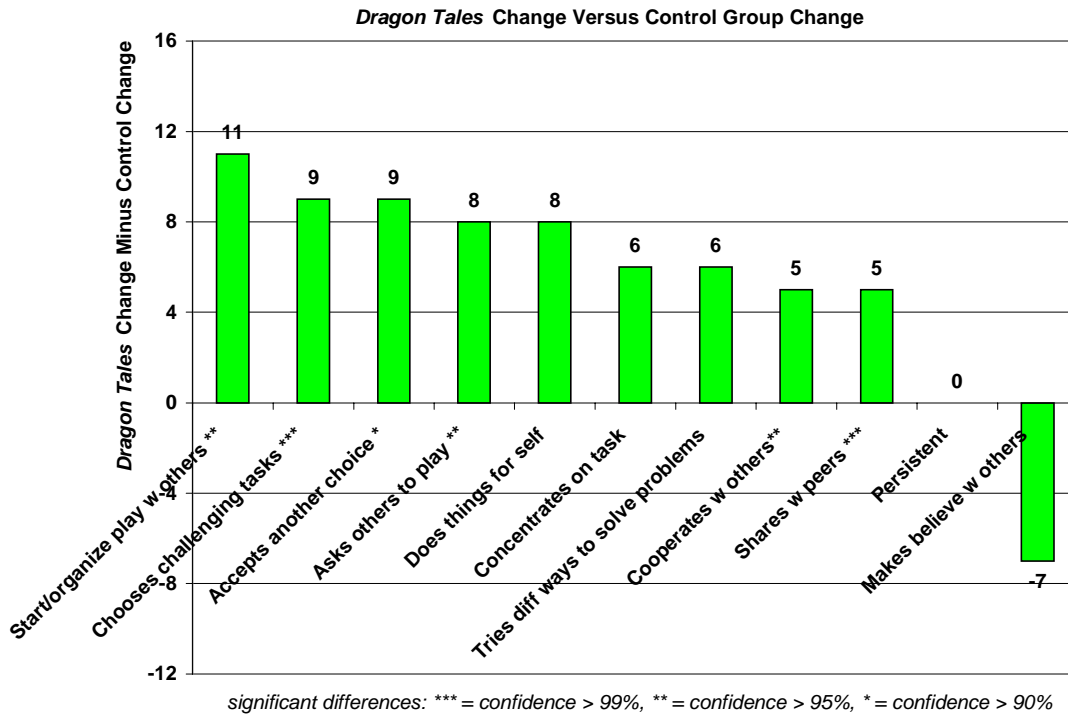
- Starts or organizes play with other children
- Chooses to do tasks that are challenging
- Asks other children to play
- Shares with other children

One item showed that *Dragon Tales* had a marginally significant impact at a 90% confidence level:

- Accepts another choice when the first is not available

Of the other seven criterion items, nearly all showed trends in the same direction and reinforce the general conclusion that watching *Dragon Tales* contributed to viewers becoming more sociable, open, confident and goal-oriented and collaborative. Of the 19

## All-Rater Devereux - Relative Changes on Criterion Items



items used in the study, only one (“Makes Believe with Others”) showed the opposite trend. This trend was not significant. Although this item was not related to the core educational objectives of *Dragon Tales*, it might seem surprising (since *Dragon Tales* is a fantasy-based series) that this is the one area where the experimental group seemed to lose some ground relative to the control group. This trend should probably not be given much weight since the differences between groups were not significant and there were no Devereux questions about solitary fantasy play. A full analysis of this variable would require coding what the children do during fantasy play to see how it might be related to what the children were watching. This type of analysis was beyond the scope of the current project. Results in the Home-Viewing Study (which compares the impact of viewing *Dragon Tales* to a wide range of children’s shows and uses a more naturalistic approach) provides a different picture of *Dragon Tales*’ impact on make-believe play.

The scores on which these charts were based along with the statistics on the *Dragon Tales* vs. control group differences can be found in Appendix G.

Statistical significance tests of the difference between *Dragon Tales* and control group scores take into account not just the levels of the means but also the variability of scores within each group. This is the reason that larger difference scores are sometimes not as significant as smaller ones.

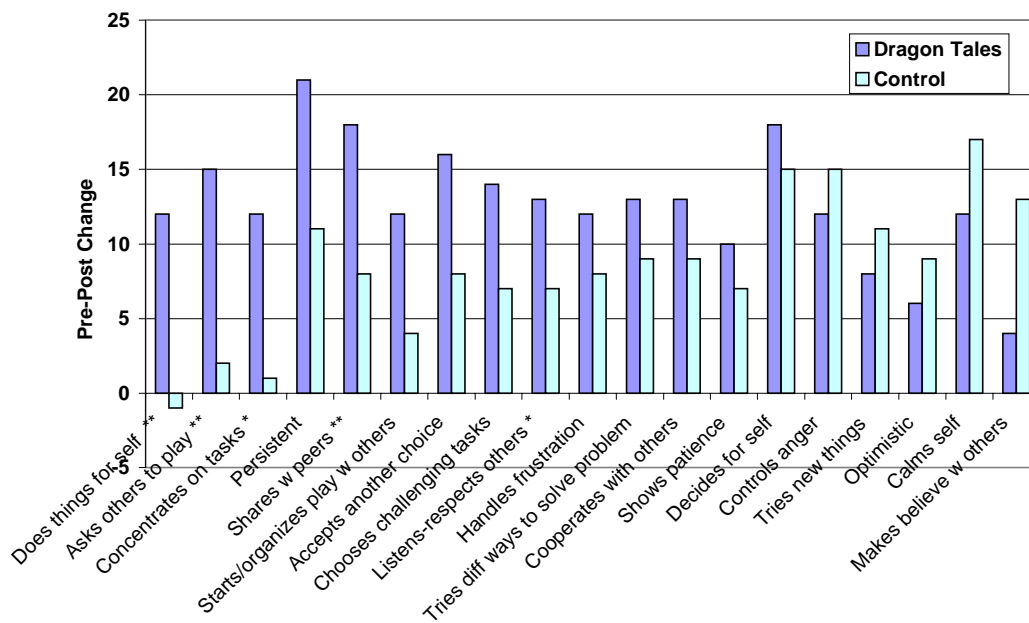
Each group of raters (teachers, parents and researchers) had a different knowledge base from which to draw from. In addition to the different interpersonal dynamics occurring in school and at home, the amount of time each group of raters spent with the children varied considerably. Consequently, we will look at each context separately.

### Teacher Devereux Ratings

Teachers get to see children in a context with a lot of peers and a lot of tasks. The classroom context and the amount of time they spend with the children puts them in a unique position to reflect upon the issues of most interest to this study, namely the social and task-oriented behaviors of children.

Out of 19 different items, the relative change from pre to post was greater for *Dragon Tales* viewers on 14 items. Change on the remaining 5 items favored the control group.

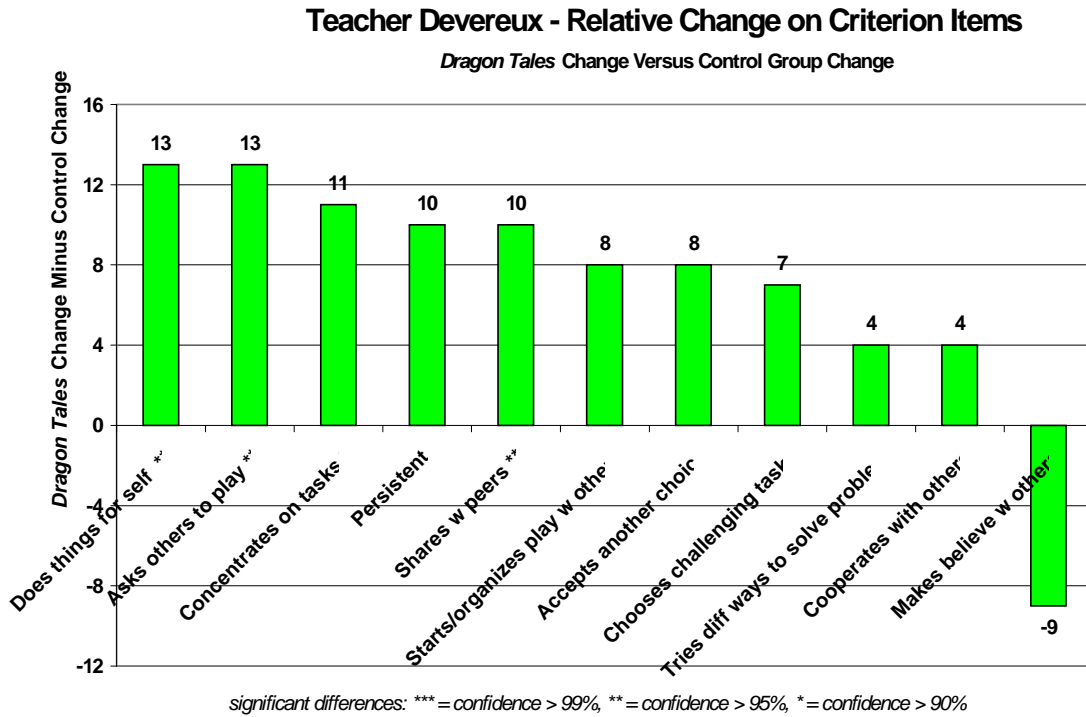
Teacher Devereux - Pre/Post Changes



significant differences: \*\*\* = confidence > 99%, \*\* = confidence > 95%, \* = confidence > 90%

Teachers' ratings indicated that *Dragon Tales* viewers improved significantly on several items dealing with social and task-oriented behaviors relative to the control subjects. First, they were significantly more likely to "Do Things for Self," "Ask Others to Play," and "Share with Other Children." Second, *Dragon Tales* viewers were more likely (at a marginal level of significance) to "Concentrate on a Task or Activity" and "Listen to/Respect Others." Similar but less pronounced trends were found on other variables, related to the content of *Dragon Tales*, such as, being "Persistent," "Starts or Organizes Play with Others," "Accepts Another Choice," and "Chooses Challenging Tasks."

Four of the five items that were found to be significant or marginally significant were included among the eleven criterion items (“Does Things for Self,” “Asks Others to Play,” “Concentrates on Tasks,” and “Shares with Other Children”) that were most directly related to the goals of *Dragon Tales*.





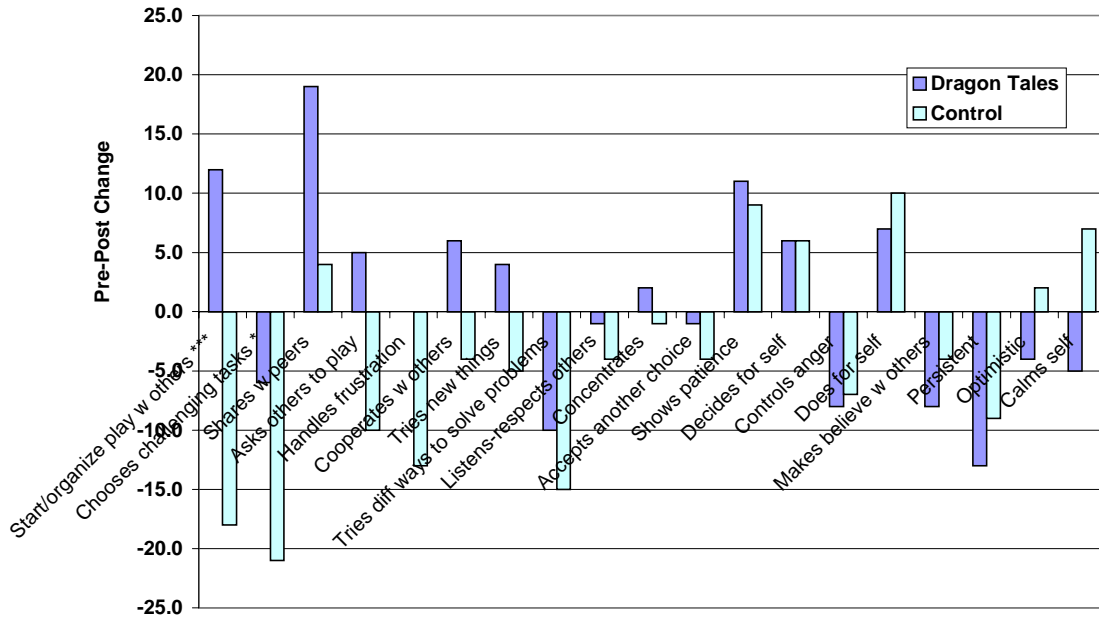
### **Researcher Devereux Ratings**

On each day of free play observation, the field researchers filled out a Devereux form on the children they had just been watching. Their perspective differs from that of the teachers and parents for a few reasons. On the one hand, their judgments were unencumbered by prior knowledge of the children, and their ratings were less subjective because researchers' exposure to the child was under a rigorously objective behavioral rating protocol. Furthermore, they were generally removed from the custodial and management concerns that teachers and parents must focus on. On the other hand, they only got to observe the children in a few brief, 4-minute bursts, and thereby were unable to see the origin and development of many of the tasks or social interactions they witnessed, and they explicitly focused their attention to the children's performance of physical tasks.

Out of 19 different items, the relative change from pre to post was greater for *Dragon Tales* viewers on 12 items. The trends on two of these items ("Starts or Organizes Play with Others" and "Chooses Challenging Tasks") were strong enough to produce statistically significant or marginally significant effects.

The biggest impact of *Dragon Tales* on viewers, according to researchers' ratings, had to do with starting and organizing play with other children. The 12-point gain in the *Dragon Tales* group translated into a relative difference of 30-points when compared to the control group that was highly significant. A thorough search through the raw data showed the control group's low post-test score was real. Why it occurred is a mystery.

### Researcher Devereux - Pre/Post Changes

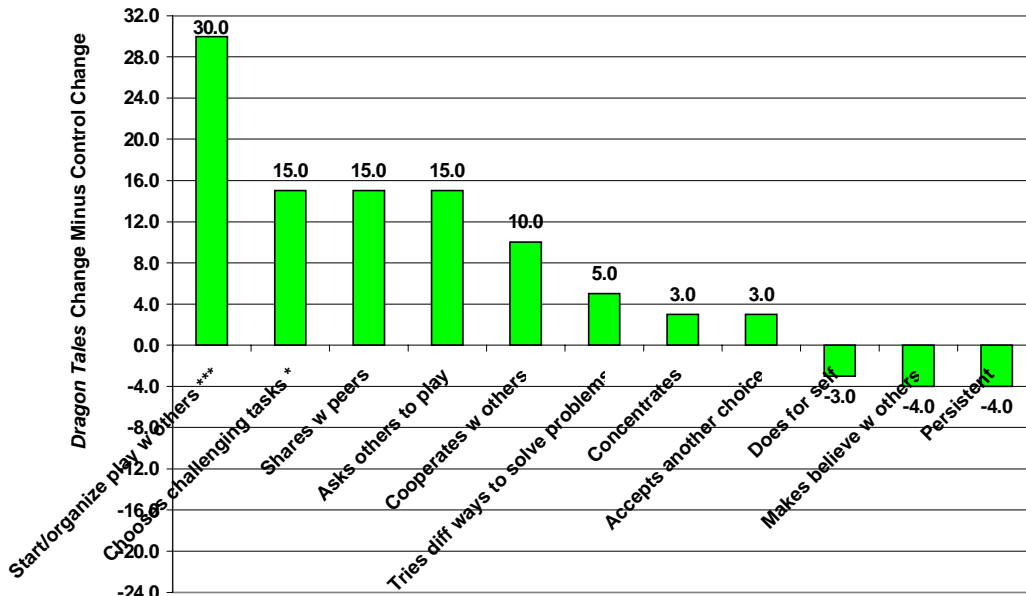


significant differences: \*\*\* = confidence > 99%, \*\* = confidence > 95%, \* = confidence > 90%

While researchers' ratings of how often children chose challenging tasks decreased in both the experimental and control group from the pre- to post-test, the decrease among *Dragon Tales* viewers was noticeably smaller (at a marginal level of significance) resulting in a relative difference of 15 points in favor of *Dragon Tales* viewers.

### Researcher Devereux - Relative Changes on Criterion Items

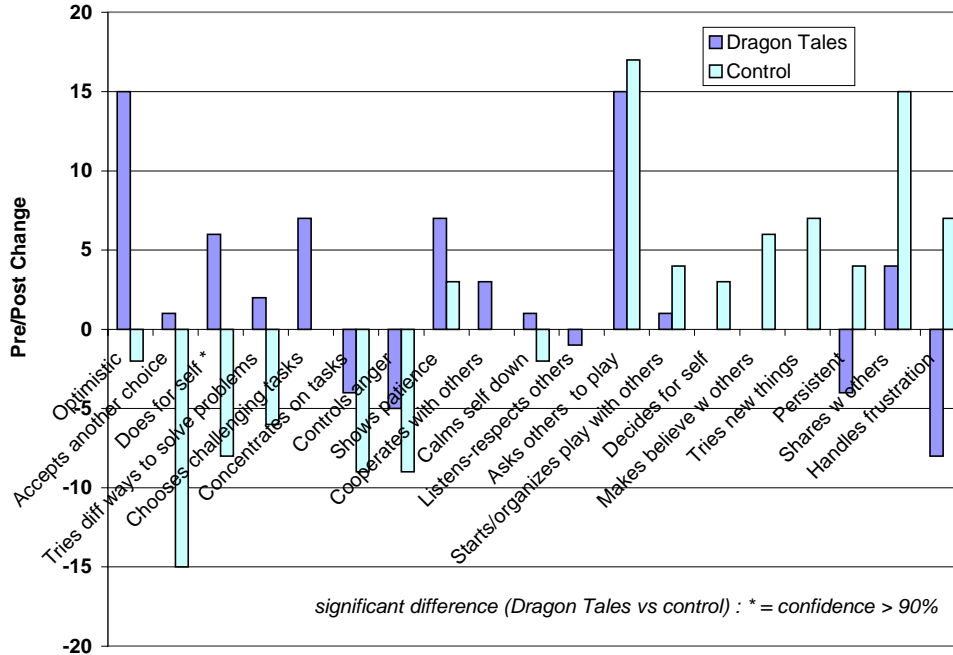
*Dragon Tales* Change Versus Control Group Change



significant differences: \*\*\* = confidence > 99%, \*\* = confidence > 95%, \* = confidence > 90%

## Parent Devereux Ratings

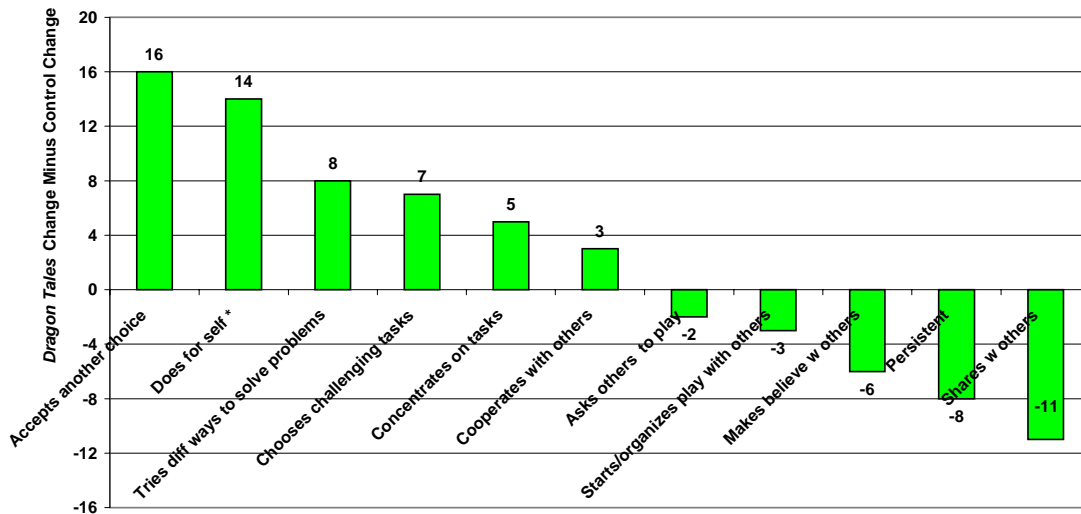
Parent Devereux - Pre/Post Changes



Out of 19 different items, the relative change from pre to post was greater for *Dragon Tales* viewers on 10 items. Although none of the independent t-tests on specific items met the threshold level of 95% confidence, the overall trend in the data was strong enough that a multivariate analysis of variance showed exposure to *Dragon Tales* to have a significant overall effect upon the Devereux criterion scores ( $F = 1.94$ ,  $p = .04$ , with 11 and 129 degrees of freedom). Independent means tests revealed a marginally significant effect for viewing *Dragon Tales* on the frequency with which a child "Does Things for Self."

### Parent Devereux - Relative Changes on Criterion Items

*Dragon Tales* Change Versus Control Group Change



significant difference (*Dragon Tales* vs. control): \* = confidence > 90%

### Comparison of Teacher, Researcher, and Parent Ratings

As might be expected, somewhat different findings emerged depending on whether the ratings were made by teachers, researchers, or parents. Although significant effects emerged in each set of ratings, different items reached criterion levels of significance within each group of raters.

Nevertheless, when we looked for overall trends across the data, we found several important similarities among the ratings from teachers, researchers, and parents. There were six items that showed positive gains for *Dragon Tales* viewers relative to the control group across all three groups of raters (“Accepts Another Choice,” “Tries Different Ways to Solve Problem,” “Chooses Challenging Tasks,” “Concentrates on Task or Activity,” “Shows Patience,” and “Cooperates with Others”). It is noteworthy that these six items were directly linked to the goals of *Dragon Tales*.

In places where the three groups of raters diverged, teachers and researchers tended to agree with each other more than with parents. For example, consider the items that measure social collaboration. Parents' ratings agreed with teachers' and researchers' on two of these items (“Cooperates with Others” and “Makes Believe with Others”). However, on other items measuring social collaboration (“Shares with Other Children,” “Starts or Organizes Play with Others,” “Asks Others to Play”), parents’ ratings were noticeably different from those made by teachers and researchers. Ratings from teachers and researchers showed greater gains for *Dragon Tales* viewers on each of these items. In fact, these trends were powerful enough to produce significant effects when data from all

three groups of raters were combined. Yet parent trends were in the opposite direction, although none of them were strong enough to reach significance.

The differences between teachers and researchers on the one hand and parents on the other hand, may be due to the fact that school and home environments provide very different contexts for evaluating interactions among children. In the classroom, there are many more children interacting at once and the age range is more homogeneous. In the home setting, there are smaller numbers of children and typically a greater range of ages. The differences between the social environments of home and school may underlay the divergence of parent ratings from those made by teachers and researchers on items related to social collaboration.

The divergence between home and school based ratings may also have been a function of the fact that children viewed the test and control programs at school. Transfer of viewing effects from school to home may have been neither uniform nor complete. That being said, the fact that there were significant differences between the experimental and control groups across all three types of raters is evidence that these effects are robust.

## Individual Child Interviews

Children were interviewed one at a time in a private space (typically an office) where other children would not be a distraction to them. They sat in a child-sized chair at a low table opposite the interviewer. The interviews lasted from 5 to 10 minutes, depending on the persistence shown by the child in the tasks that were involved.

The interview originally consisted of two parts. The first was a structured building task, the second was a dramatic play building task. Both had been extensively tested and refined in pilot work prior to the start of formal data collection. They both appeared to be engaging to the children and to discriminate between individuals in a way that was consistent with what the teachers had told us about their general levels of task persistence and helpfulness.

From an operational standpoint, both components worked well during the pretest phase of the project. But when the post-test began, it became clear to our field researchers that the second component, a projective measure involving fantasy play, was no longer working as hoped, and it was dropped from the study. The first component, however, continued to function on the post-test with no obvious shifts in how children related to the task, and it was retained.

### Pre-Post Structured Building Task Interview Results

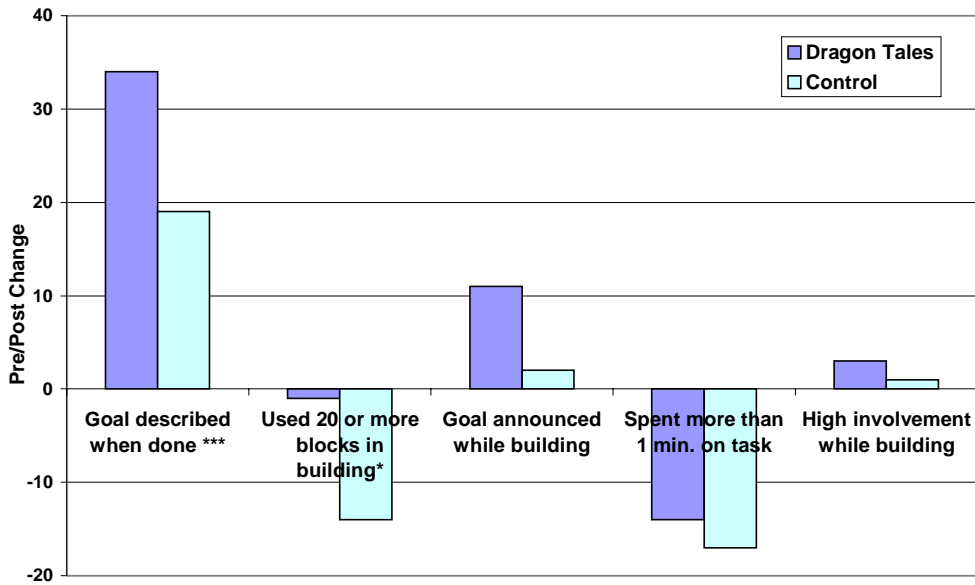
*Dragon Tales* viewers showed significantly greater gains in their tendency to describe or label what it was they had built as a single, integrated object or scene as opposed to a collection of discrete and separate pieces. They also were more likely to describe their goal while involved in the building, although the difference did not reach our criterion level for significance.

The time children spent on the building task declined for both groups on the post-test and the control group used fewer blocks. There was no decline in the number of blocks used by the *Dragon Tales* group. This difference was marginally significant.

The declines in time spent on task may be explained by the fact that children were doing the same task they had done 5 weeks previously during the pre-test. They may have been more relaxed and perhaps no longer needed so much time to figure out what to do.

The fact that the control group used fewer blocks while there was no decline in the number of blocks used by *Dragon Tales* viewers may reflect that *Dragon Tales* viewers were more goal-focused than the children who had not watched the show.

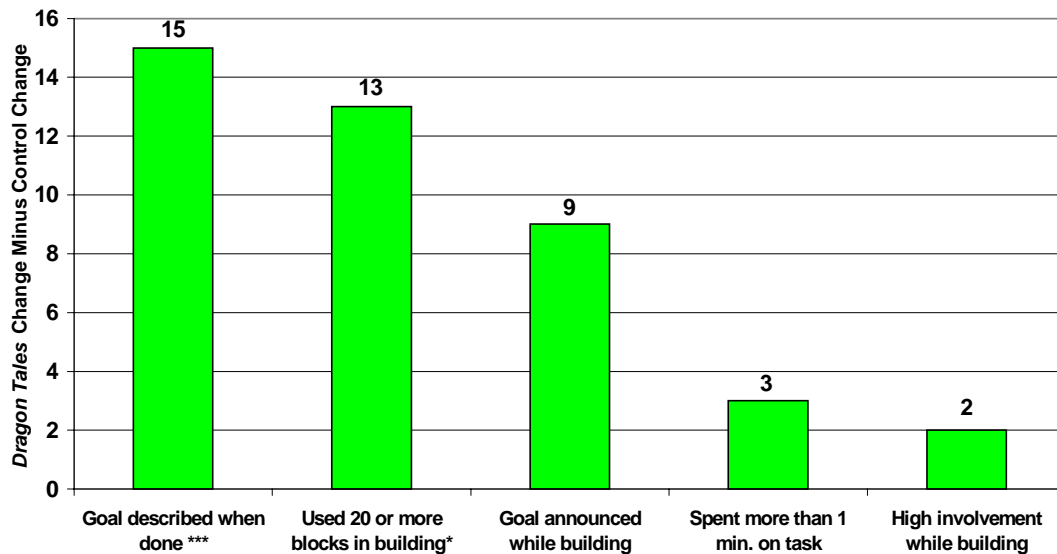
### Child Interview - Pre/Post Changes on Criterion Measures



significant differences: \*\*\* = confidence > 99%, \*\* = confidence > 95%, \* = confidence > 90%

As the following chart illustrates, the *Dragon Tales* viewers did not lose ground on any criterion measures relative to the control group from pre to post.

### Child Interview - Building Task - Relative Changes on Criterion Scores



significant differences: \*\*\* = confidence > 99%, \*\* = confidence > 95%, \* = confidence > 90%

## Free Play Observations

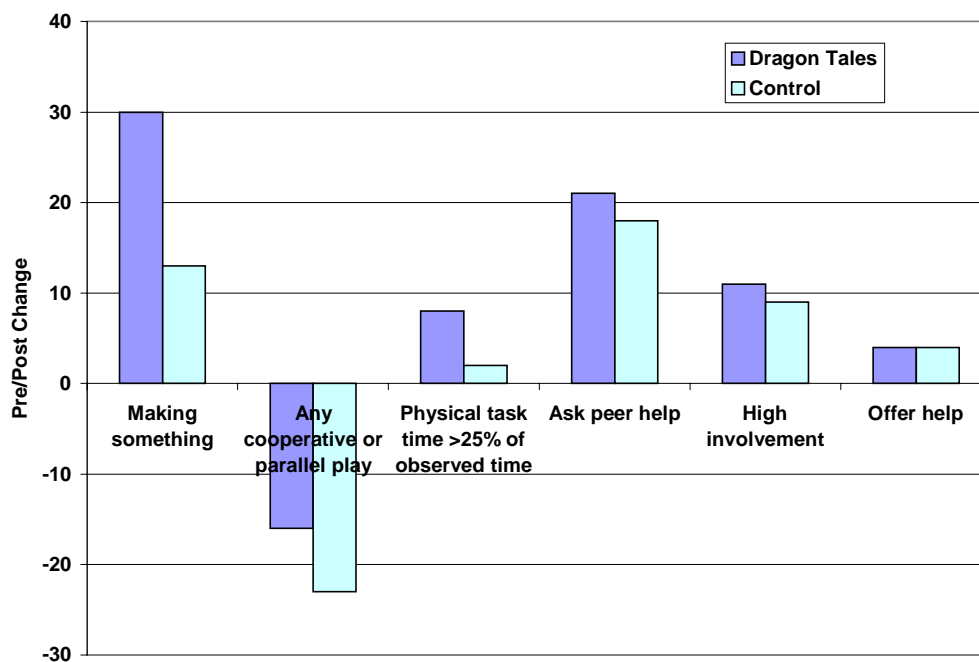
The first judgment to be made by an observer when seeing a child engaged in a task was whether the task consisted of making something, of playing or doodling with some material, of practicing some action or skill, or performing some job or role-based task as a good citizen of the classroom.

The second judgment was whether the child was doing the task in a solitary fashion, in parallel with other children (where each was working on their own, but in proximity to other children doing the same thing), or cooperatively (where they were working closely with each other towards a shared goal or product).

*Dragon Tales* viewers registered a substantial gain versus the control in terms of how often they got involved in making things. In fact, both groups of children were more likely to be making things at the time of the post-test, but the gain was much greater among those who had been watching *Dragon Tales*.

Both groups showed an absolute decline in the amount of cooperative/parallel play, probably as a result of teachers encouraging children to do independent work in the classrooms.

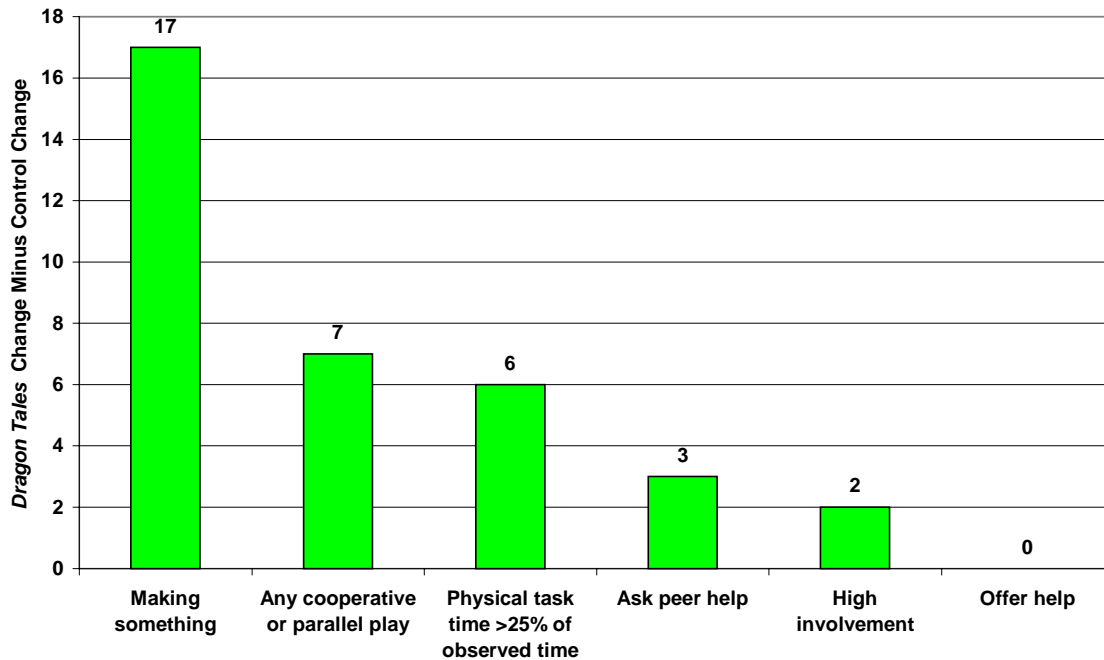
Play Observation - Pre/Post Changes on Criterion Measures



On none of the criterion items did the *Dragon Tales* viewers lose ground to the control group.



### Play Observation - *Dragon Tales* Changes Versus Control



## Section Summary

*Dragon Tales* had a significant impact on many of the criterion measures of children's goal orientation and social relationships, relative to the control children.

The assessments by parents, teachers and researchers showed that *Dragon Tales* viewers improved, relative to the control group, in the frequency with which they chose challenging tasks, started or organized play with others, shared with others, and cooperated with others.

The child interviews showed that *Dragon Tales* had a positive impact on the frequency with which children focused their building activity towards a singular goal.

The free-play observations showed that *Dragon Tales* viewers became more likely to make things, as opposed to doodling with materials, practicing physical skills or performing classroom jobs.

In no case did *Dragon Tales* exposure lead to a significant pre-post loss, relative to the control group, on any of the study's criterion measures.

# SCHOOL VIEWING - EPISODE STUDY

## Background

**Purpose.** The reactions of children to specific program episodes was measured to determine whether *Dragon Tales* was succeeding at eliciting children's attention to its content, and whether children were comprehending the material related to its curricular objectives, namely the emotions and goals of the characters in specific dramatic situations and their persistence in seeking a resolution to a problem.

**Sample.** The episode sample was restricted to half of the children in the in-school viewing sample. Episode measurement was done on both *Dragon Tales* and the control program for two reasons: 1) to keep teachers and field staff from figuring out that there was something more special about *Dragon Tales* exposure which might lead to a biased treatment of the kids and 2) to provide another benchmark for assessing the effects that the mid-course interviewing might have on children's post-test performance. There is always the possibility that the children's behavior on criterion behaviors might be affected by being interviewed repeatedly during the period in which they are viewing the shows. The analysis of results showed that there were no significant effects from the interviewing upon the study criteria and no significant effects of the interaction between interviewing and program viewed. See Appendix G.

**Episode coverage.** For each series, episode-specific measurements were made on 10 episodes. Half the classes in the study were used for episode measurement. In any single class, we studied 5 episodes. The following episodes were used from each series:

### *Dragon Tales* Episodes

- The Big Sleepover
- Dragon Sails
- Liking to Biking
- Blowin' in the Wind
- Zak Takes a Dive
- Baby Troubles
- Roller Coaster Dragon
- Don't Bug Me
- My Way or Snow Way
- Talent Pool

### Control Program Episodes

- Boy Who Cried Wolf
- BeBop
- Popcorn Popper
- Lionel's Great Escape Trick
- Lionel's Antlers
- Hug Hug Hug
- Hopping Hen
- Farmer Ken's Puzzle

## Chap With Caps Pecos Bill Cleans Up the West

Two aspects of children's responses to the episodes were measured: visual attention to the whole episode and comprehension of characters' emotions and goals. Given that the educational content of *Between the Lions* was different from that of *Dragon Tales*, and that the primary reason for interviewing viewers of the control program was to control for interviewing effects and to keep teachers and researchers blind as to the research purpose of this study, it is not appropriate to compare comprehension scores obtained for both series directly. The questions that were used to assess comprehension of *Between the Lions* did not focus on the primary educational content of the series that dealt with reading. Therefore, comprehension results will only be presented on *Dragon Tales*. However, since the target age groups for the two series overlapped, it was considered appropriate to compare the attention data for both shows.

### Section Summary

*Dragon Tales* scored significantly higher than the control program in terms of children's spontaneous attention to the shows while they watched.

On average, 79% of *Dragon Tales* viewers paid close visual attention across 10 *Dragon Tales* episodes, while only 46% of the children who watched the control program paid close visual attention across the same number of episodes.

On average, 67% of the responses to questions that were designed to measure viewers' comprehension of goals and emotions in selected *Dragon Tales* shows were fully or partially accurate.

### Attention to the Episodes

Although the principle purpose for doing attention measurement was to provide Sesame Workshop with data on specific *Dragon Tales* episodes, it was done for the control program, too. One reason was to maintain the camouflage of the study. It was critical that none of the supervisors, field researchers or teachers believe that the study concerned one program more than the other. Another reason was for experimental control. If the experience of being videotaped and interviewed influenced how children were affected by a series, it was important that both the experimental and control groups have the same experience.

#### Method

On the days when the episodes selected for analysis were being played, researchers visited the class and set up a camera to record the children's faces while they watched. The videos of the children's faces were subsequently rated at 3 second intervals,

recording each child's eye contact with the TV screen throughout the duration of the show.

The behavioral approach to measuring preschool children's involvement with program material by observing their eye contact was first applied by Dr. Ed Palmer at Sesame Workshop (previously called the Children's Television Workshop) during the formative research phases of *Sesame Street* and *The Electric Company*.

From these attention data, two sets of scores were produced.

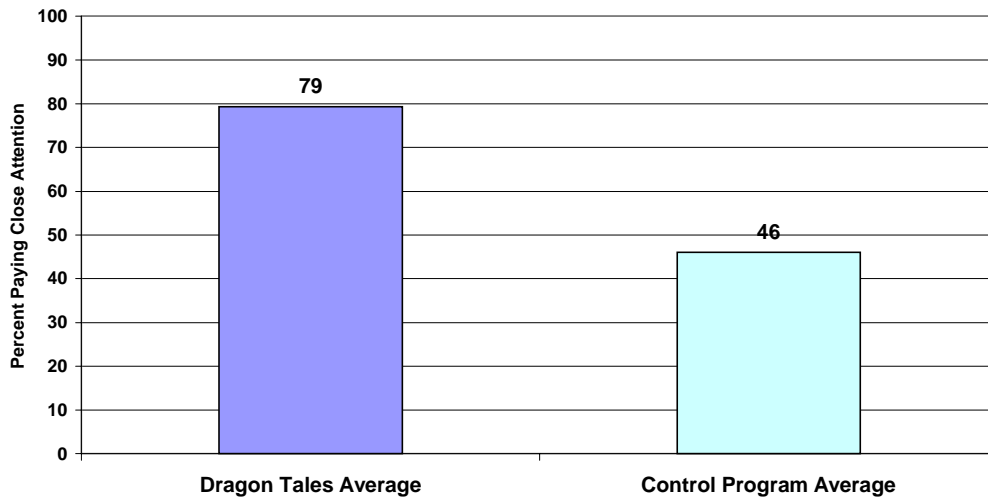
Child attention scores. One score reflected children's attentiveness to the test episode as a whole. If they paid attention to more than 80% of the sampled points, they were classified as "High Attenders." If they attended to less than 60% they were "Low Attenders."

Frame scores. The other type of score pooled attention ratings across children in order to show what percent of the sample was looking at the program at a single point in time. Strung together in a timeline, these frame scores enable one to identify the precise point at which audiences built or lost involvement in what they were watching. Moment by moment graphs of these attention scores for each of the tested episodes can be found in Appendix H.

## **Results**

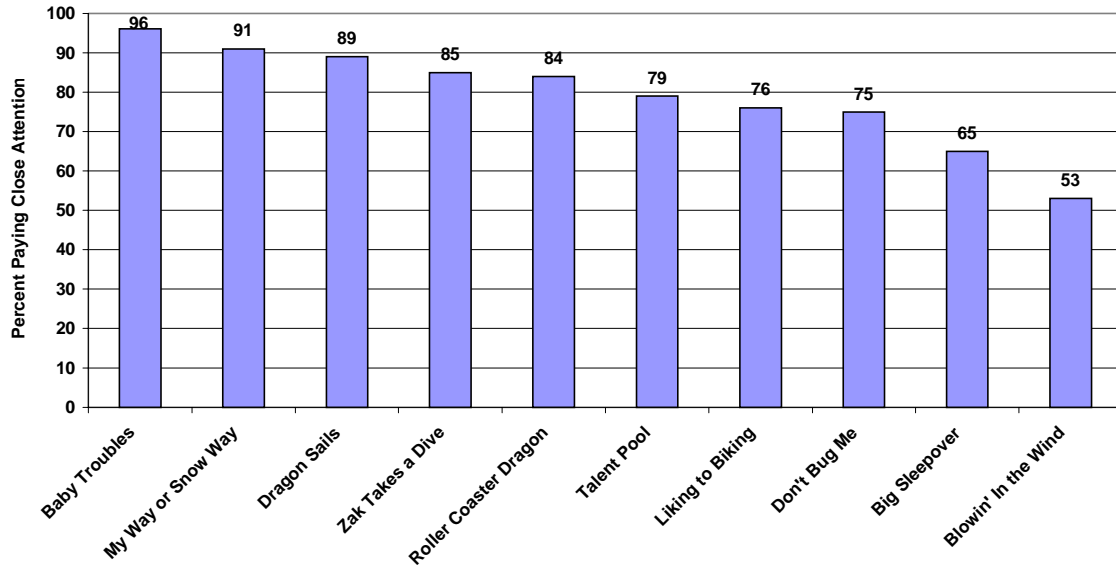
*Dragon Tales* got dramatically higher levels of attention from the children; 79% of them were close attenders (defining "close attenders" as children who maintained eye contact with the screen for 80% or more of the time the episode played). The *Between the Lions* episodes held close attention of 46% of its viewers. The difference was highly significant:  $t = 7.53$  with 18 df,  $p < .001$ .

### Dragon Tales vs. Control -- Overall Attention



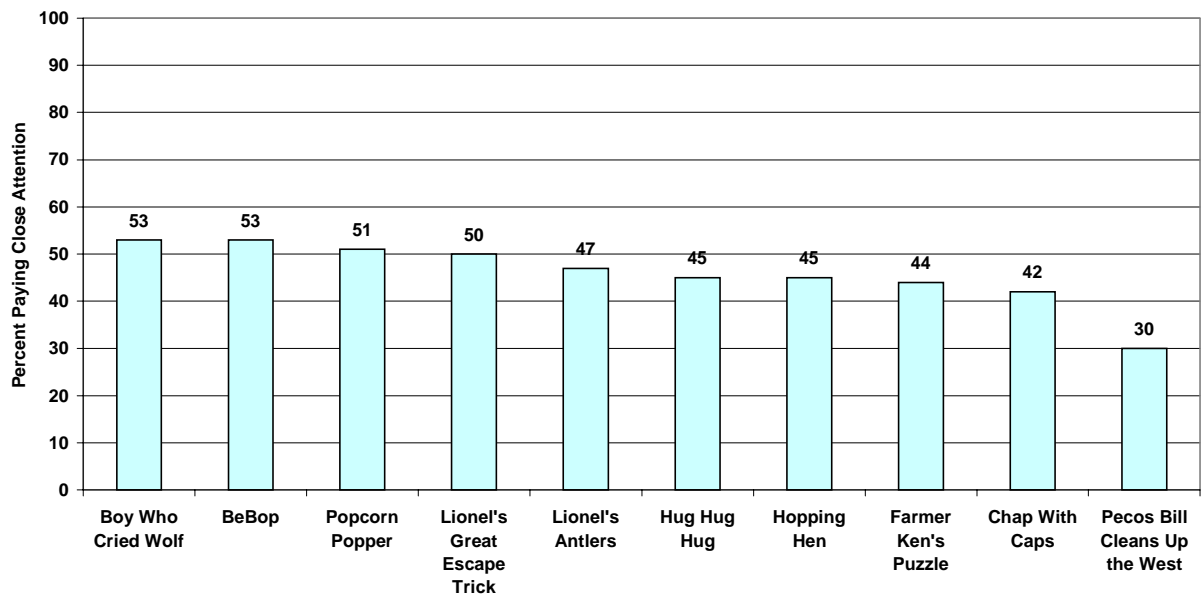
Note: close attention means a child was watching for at least 80% of the show

Attention Scores - *Dragon Tales* Episodes



There was considerable variation between the episodes. They ranged from 96% close-attenders for *Baby Troubles* down to 53% for *Blowin' in the Wind*. Most clustered between the mid 80's and the mid 70's.

Control Program Episode Attention Scores



The best-watched control episode tied with the least-watched *Dragon Tales*. The rest ranged down to 30%.

## Comprehension of Goals, Emotions, and Persistence

### Method

Immediately after children viewed each episode that had been selected for this part of the study, researchers conducted comprehension interviews. Each interview was different, tailored to the characters and plot of the tested episode. The interview consisted of a series of structured questions, using color pictures of different scenes from the episode as prompts. Questions focused on children's understanding of what characters were trying to do and what they were feeling.

For example, an emotion-themed question for "The Big Sleepover" was:

(Researcher shows picture of Cassie looking sad) What is happening in this picture? What is Cassie feeling? Why does she feel \_\_\_\_?

A goal-themed question from the same interview was:

(Show picture #5 of Cassie on the phone) What is happening in this picture? What is Cassie doing? Why is she \_\_\_\_\_? (Probe: Who is Cassie talking to? What is she saying? What does her Dad say? Did this help Cassie to feel better?)

A persistence-oriented question from "Baby Troubles" was:

(Show picture #10) of Zak looking panicky) In this picture Zak is saying they should get Cassie's Mom. What did Emmy say when Zak said this? (Question was coded as fully accurate if child mentioned that Emmy told Zak they should not give up.)

Appendix E contains the text of all the episode comprehension questionnaires.

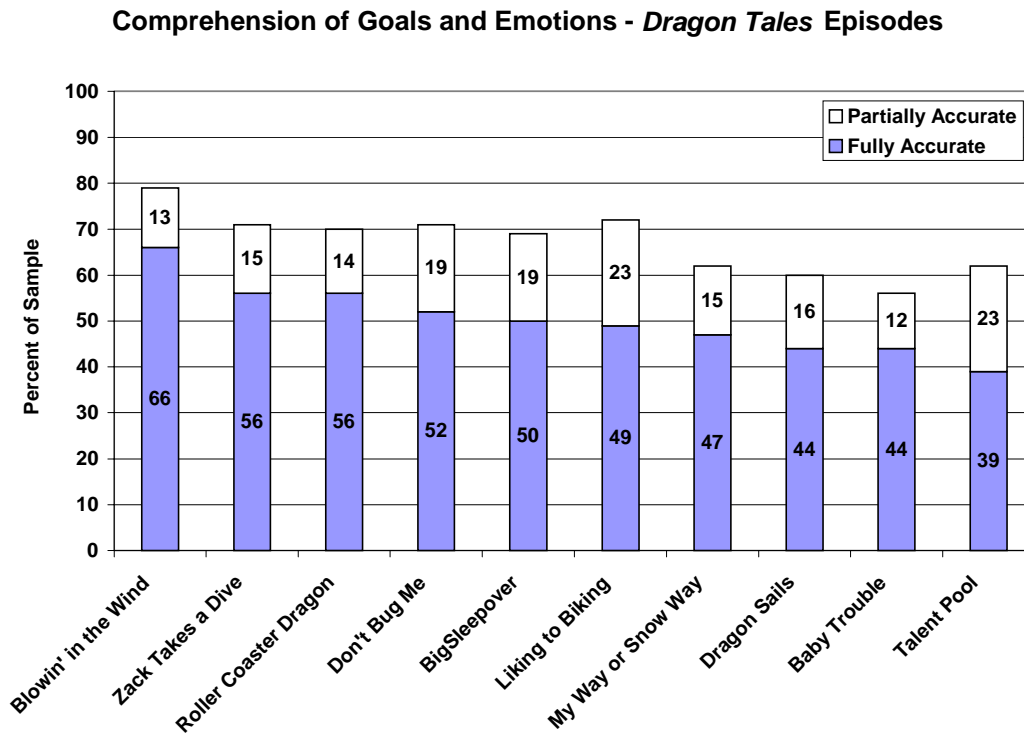
In a few instances, the *Dragon Tales* questions were derived from ones previously developed by Sesame Workshop staff for their internal comprehension studies. If a particular episode had not been tested before, a new protocol was developed that used the same types of questions that had been previously used to test other stories. The limited time available in the field dictated that some of the original interviews be edited down. They had to be made short enough to allow all the test children to be interviewed before the end of a school day. The questions used to test comprehension of *Between the Lions* were patterned after the ones used for *Dragon Tales*.

As the children responded to each question, the researcher wrote down the replies verbatim and then coded the response as either fully accurate, partially accurate, misplaced (i.e., it reflected something that happened in the story but did not answer the question), plausible but wrong, or inaccurate.

Questions were scored as the percent of the sample to be rated at each level of accuracy (X% "fully accurate", Y% "partially accurate, etc.). Episodes scores represent the averages over all the questions in the interview. Only data on fully and partially accurate responses are summarized in this report.

## Results

On average, 67% of the responses were at least partially accurate in recounting the content of each episode and 52% were fully accurate.



Fully-accurate-comprehension of goals and emotions ranged from a high of 66% to a low of 39%, but by and large, the episode scores were quite consistent: 8 of them fell within a 12 point range of 56% to 44%. Fully-accurate and partially-accurate scores together ranged from a high of 79% to a low of 56% with 8 episodes falling in a range of 79% to 62%.

Although there was a low-grade positive correlation between episodes' attention scores and their comprehension scores, (Pearson  $r = .31$ ), there were clear discrepancies between the measures. For example, the *Dragon Tales* episode that got the lowest attention score (Blowin' in the Wind) was the one that got the highest comprehension score and conversely, the episode that had the highest attention score had one of the lowest levels of comprehension. Although attention is critical to getting an audience to watch in the first place and comprehension is critical for achieving the desired impact, these discrepancies are reminders that the relationship between attention and comprehension is complex. Numerous factors can contribute to divergent findings for attention and comprehension. To fully explore the complex relationship between attention and comprehension we would need to employ a different research approach specifically tailored to examining this issue.



# HOME-VIEWING STUDY

## Purpose

The Home-Viewing Study was conducted to find out how *Dragon Tales* may (or may not) be integrated into children's lives and how it impacts parent-child interactions when children are exposed to it under real-life, voluntary conditions. This data was gathered to supplement the school viewing study. Although data from parents had been included in the school-viewing study, the children in that study only watched *Dragon Tales* at school. It did not offer an opportunity to examine the impact of *Dragon Tales* on children when they view the show at home nor did it allow us to investigate its impact on parent-child interactions. The Home-Viewing Study was conducted to investigate these issues.

## Section Summary

Significantly more parents and children watched *Dragon Tales* together than the other children's programs. In addition, *Dragon Tales* was more likely to be mentioned as a child's favorite program than other children's programs.

Parents said they especially liked the overall tone of *Dragon Tales*, its life lessons and its pro-social quality. They perceived it as having a very positive effect on their children's moods and said that it stimulated significantly more conversation on the topic of "trying" and (at a marginal level of significance) on emotions, sharing, and the use of Spanish than other programs did.

*Dragon Tales* appears to be successful at reaching out beyond the viewing experience into other parts of children's lives - away from the TV. Compared to other programs, it led to significantly more singing of its songs and significantly more pretending, during fantasy play, to be in its dramatic universe.

## Method

### Sample

300 diaries were circulated. 103 completed diaries were returned. Telephone follow-up interviews were completed with 86 parents. In 47 of the homes (referred to as "*Dragon Tales* homes"), the child had been recorded as watching *Dragon Tales* during the previous week. In 39 of the homes ("*non-Dragon Tales* homes") the child had not watched it.

The composition of the final sample was a function of considerable self-selection. Although diaries were distributed to a population that closely approximated the school-

viewing sample in terms of age, sex, and income composition, due to relatively low completion rates, the home-view sample is much younger (75% under age 5) and more middle-class than the school-viewing sample. The sex composition was balanced (50% male/50% female). Age and sex crosstabs of the home-viewing samples can be found in Appendix F - Main Tabs - items #1 & 3.

For the extra effort being asked of the parents, they were each given a small book for their child at the completion of their post-diary interviews.

### **Timing**

The home-viewing data collection was scheduled after the end of the in-school research, to reduce the risk of contaminating the in-school study's camouflage by word of mouth.

### **Instruments**

The study used two instruments: home-viewing diaries and follow-up telephone interviews with parents.

*Home-Viewing Diaries* were used to record children's TV viewing over a period of one week. The diary entries covered what the children were watching, when they watched it and who else was watching at the same time. The diaries were closely modeled on the Nielsen diary, and were distributed in both English and Spanish. A copy is included in Appendix D.

The key data extracted from the diaries were whether or not *Dragon Tales* had been viewed, whether or not the parent had been a co-viewer, how much TV the child had watched, how much the adult had co-viewed with the child, and what programs the adult and child had co-viewed.

*Parent Interviews* were conducted by telephone, one to five days after the diaries had been returned. It took between five and eight minutes to complete (although some parents warmed to the topic and kept the conversation going longer).

For children who had watched *Dragon Tales* during the diary week, the focus of the parent interview was on *Dragon Tales*. For others, the interview focused on their child's favorite program, or for the few children who had not seen their favorite during the week, then some other children's program they had watched when the adult was present.

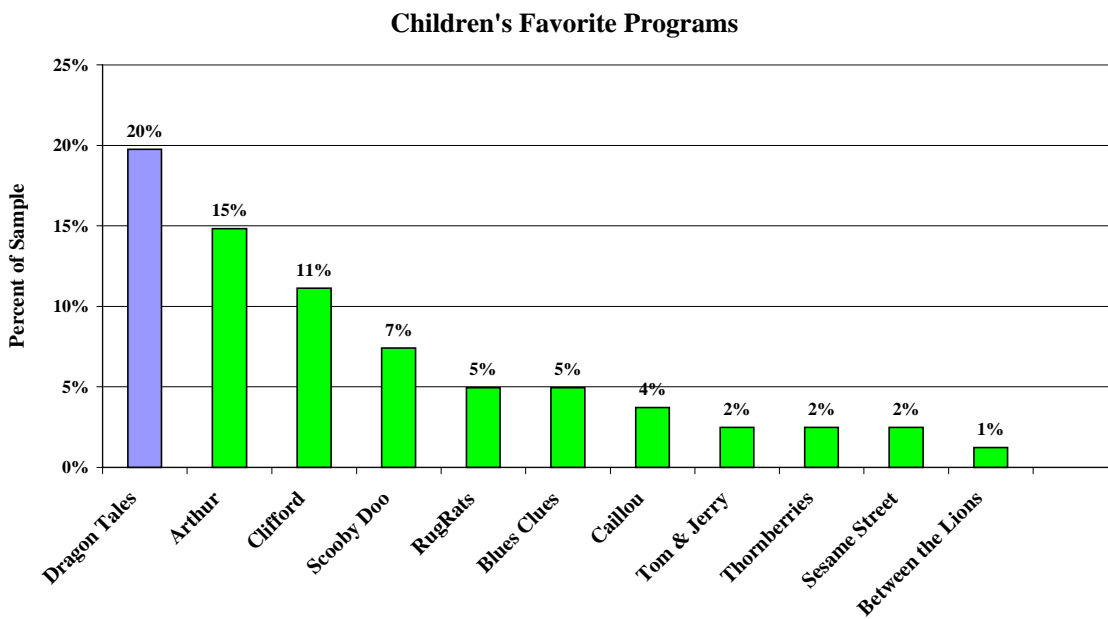
The interviews inquired about the last co-viewed occasion of the program (what else was going on, where the viewing occurred), and then explored the adult's perceptions and evaluation of the program and its effects (if any) on the child. A copy of the instrument is included in Appendix D.

# Results

## Favorite Programs

Parents were asked, unaided, what their child's favorite program was. *Dragon Tales* got more mentions than any other show.

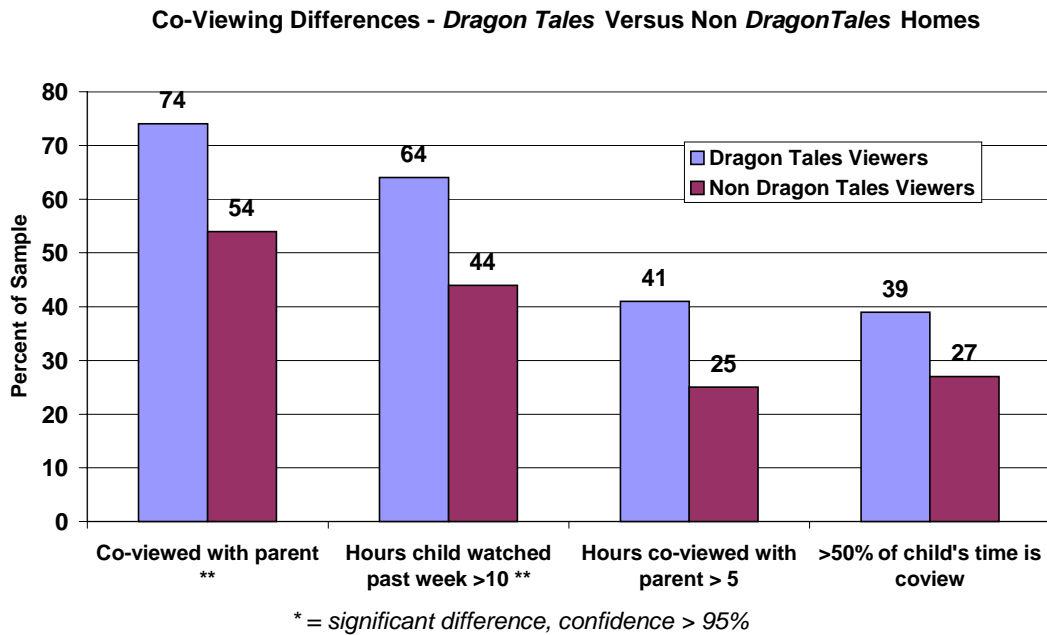
The great discrepancy between *Dragon Tales* and *Between the Lions* scores is consistent with the spontaneous attention levels that were observed for these two series in the School-Viewing data. In addition, these rankings are generally congruent with recent Nielsen ratings of the viewing patterns of 2 to 5 year olds.



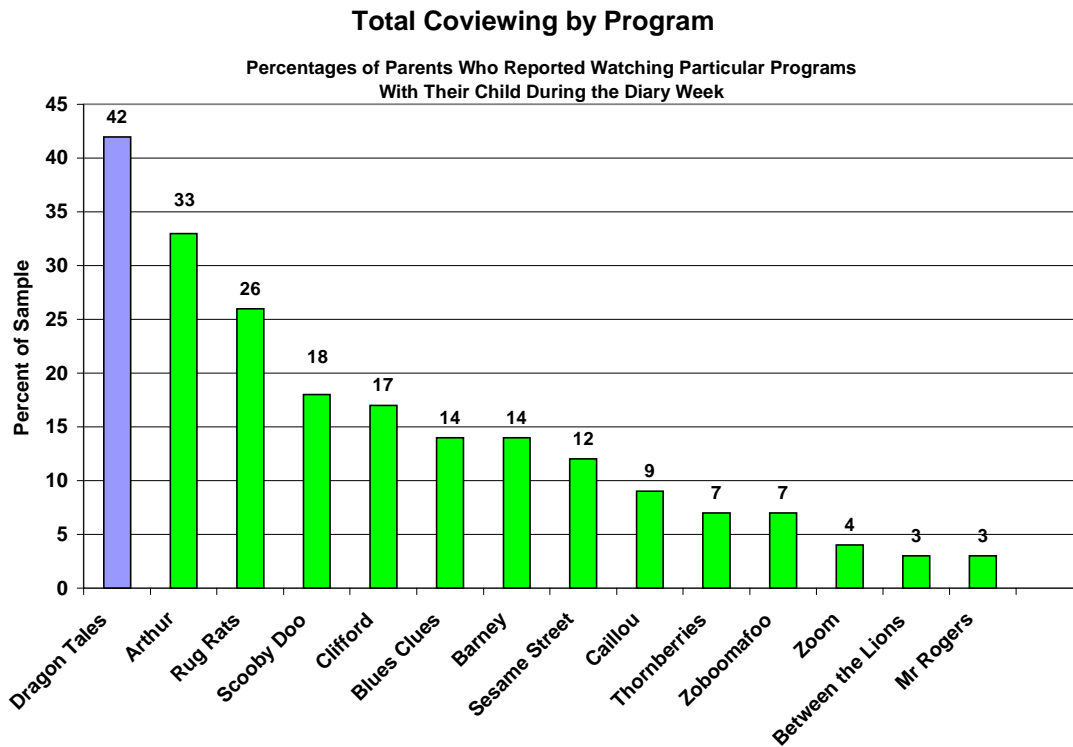
## Co-Viewing

According to the diaries, parent-child co-viewing occurred frequently. Two thirds of the sample reported co-viewing at least once during the week the diaries were kept, and one-third of the sample watched TV with the child for more than half the time the child was at the TV.

Children who watched *Dragon Tales* were significantly more likely to co-view with their parent and they watched more TV during the diary week than did the non-*Dragon Tales* viewers.



## Co-viewing Rates Per Program.

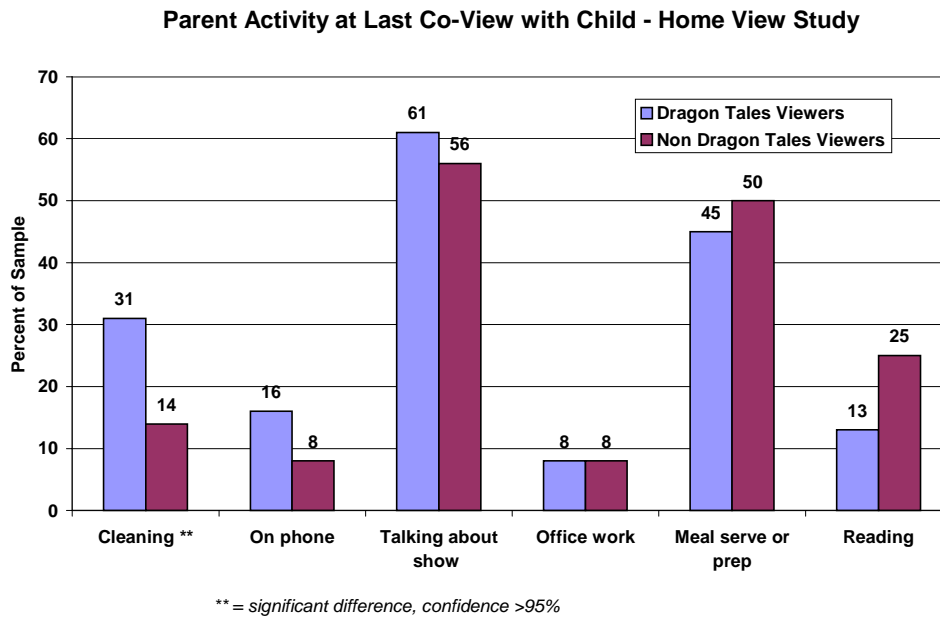


More parents co-viewed *Dragon Tales* with their children than any other show. It is likely that these overall co-viewing rates are heavily influenced by two factors: how many children are viewing a particular show and how often children are watching it. The co-viewing figures correlate with the percentage of children who chose a particular show as their favorite (reported earlier) at a Pearson  $r = .887$ , and with rankings based on national Nielsen ratings (Spearman  $\rho = .65$ ). This suggests that co-viewing rates are determined in part by the percentage of children who are watching a particular show. In other words, the more children there are that watch a particular show the higher the co-viewing rate is for that show. In addition, the more often a child watches, the more opportunities there are for co-viewing to take place. Since *Dragon Tales* attracts a large number of children compared to other shows and is on everyday (from 1-3 times a day) co-viewing is likely to be higher for *Dragon Tales* than for other shows.

## Adult Co-Viewer Involvement

Asked about the last time they watched TV with their child, adults described what they were doing on that occasion besides watching TV.

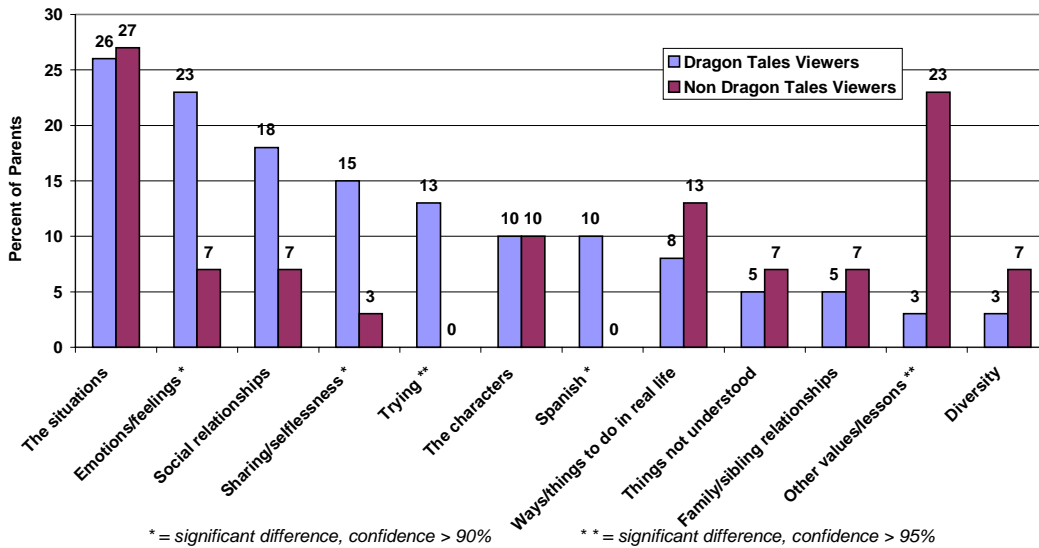
The key finding here is that co-viewing adults were frequently engaged in talking with their children: 61% of them in the case of *Dragon Tales* viewing homes.



## What Parents and Children Talk About

Parents were asked if *Dragon Tales* or another program that was their child's favorite (if *Dragon Tales* was not being watched in the home) gave them and their children things to talk about and if so to give examples. The following table is based on a content analysis of their responses.

### Content Analysis of Topics Talked About (Open Ended)

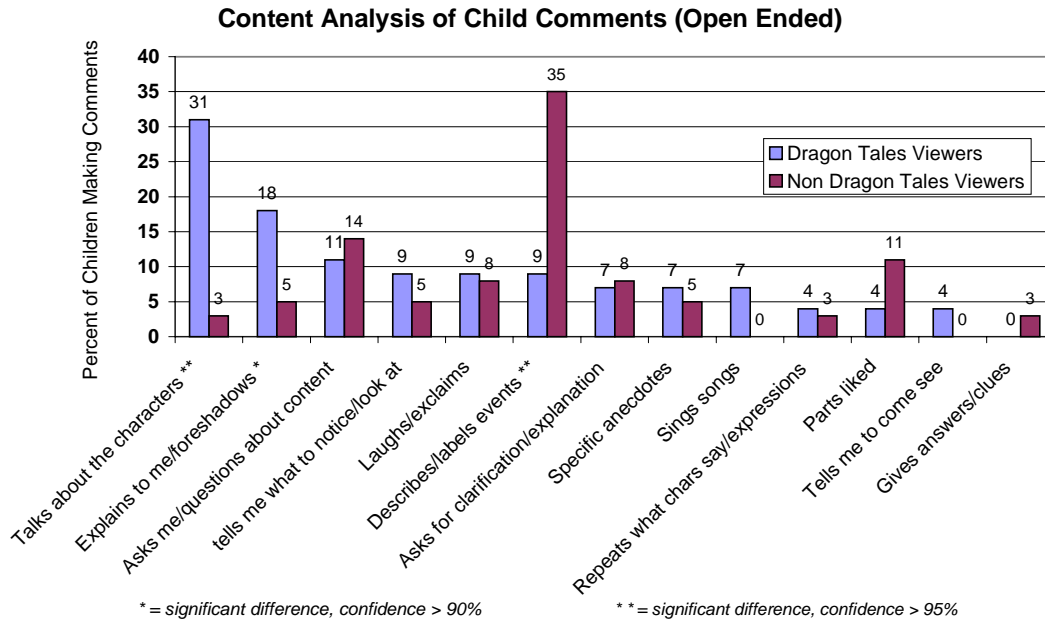


For both *Dragon Tales* and non-*Dragon Tales* shows, parents and their children were most likely to talk about situations in the shows they were watching. But topics differed in a number of other ways. *Dragon Tales* viewers were significantly more likely to talk about trying things and (at a 90% confidence level) about feelings, emotions, sharing, and the use of Spanish. Similar but less pronounced trends were found for other content, related to the goals of *Dragon Tales*, such as social relationships. As one might expect, because the non-*Dragon Tales* families watched a variety of programs, their conversations involved a wide variety of topics specific to those programs (e.g., adoption, importance of sleep) none of which was mentioned by more than one or two parents. These topics are combined into the “other values/lessons” bar above.

### Comments Made While Watching

Parents were asked what comments they had heard their children make while watching the show. A content analysis of their replies showed that *Dragon Tales* viewers were most likely to talk about the characters, explain things to the adult or tell the adult what was going to be happening next. Children made significantly more comments like these about *Dragon Tales* than they did about other programs.

This suggests that *Dragon Tales* characters, and the situations they are in, are well-matched to the viewing audience and pivotal to children's experience of the show.



*Dragon Tales* viewers made significantly fewer comments that were simply labeling or describing concrete things on the screen, which may happen when they are not grasping the larger elements of the drama (plot, character, what-happens next) and focus instead on searching for concrete items they can simply recognize.



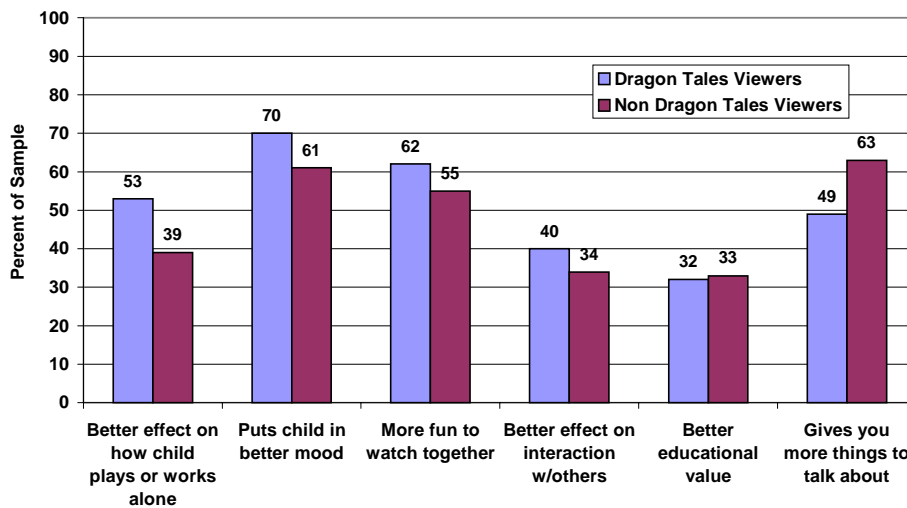
### Perceived effects of viewing: *Dragon Tales* vs. other favorites

In *Dragon Tales* homes, (homes where the diary showed the child had watched *Dragon Tales* in the previous week) the interview asked a number of question about *Dragon Tales*. In non-*Dragon Tales* homes, it asked about the child's favorite program (if it had been viewed during the past week) or the one that had been watched most frequently (if the child's favorite program had not been watched during the past week).

The programs asked about in non-*Dragon Tales* homes included Arthur (12%), Clifford (12%), Rugrats (9%), Scooby Doo (9%), and an assortment of other children's programs mentioned by one or two respondents each. See Appendix F "Target Programs - Non-*Dragon Tales* viewers" for the complete list.

*Dragon Tales* tended to get higher ratings on how well it affected the way children play or work alone and the mood it put them in, but the differences were not statistically significant.

Perceived Effects - Home View study



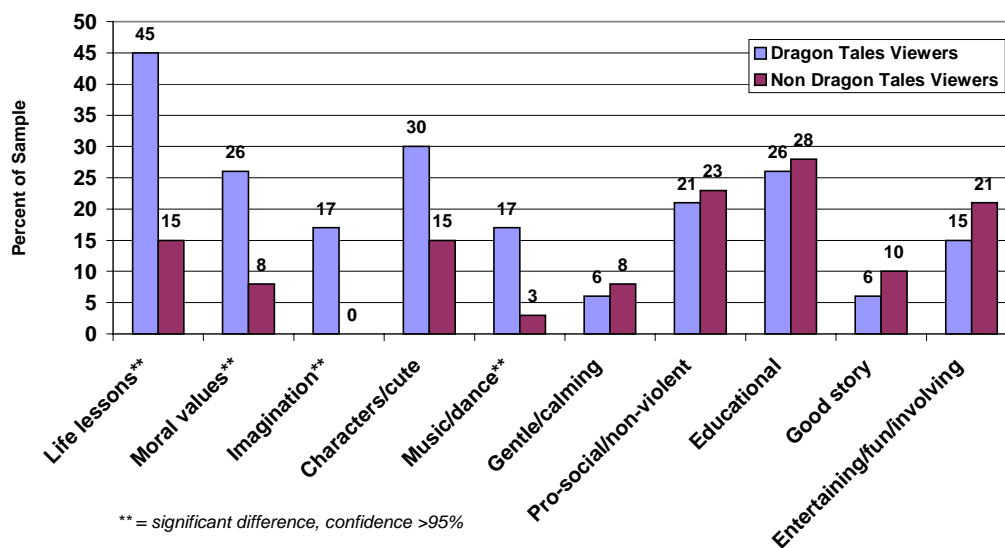
When the analysis focused only on parents who had co-viewed programs with their children, some differences reached criterion levels of significance. In this smaller sample, *Dragon Tales* got significantly higher ratings on "Would you say it puts him/her in a good mood?" (100% to 71% - See the Main Tab Book - Appendix F).

## Attributes of Children's Programs That Parents Like

Parents were also asked what, if anything, they liked about the target program. Their open-ended replies were coded by the interviewer, and the results are summarized here.

Parents especially liked *Dragon Tales* for its life lessons, moral values, imagination and its music and dance. While many liked that it is educational, this quality did not differentiate it from the other shows children were watching.

**Content Analysis: Parent Likes About Program (Open Ended)**



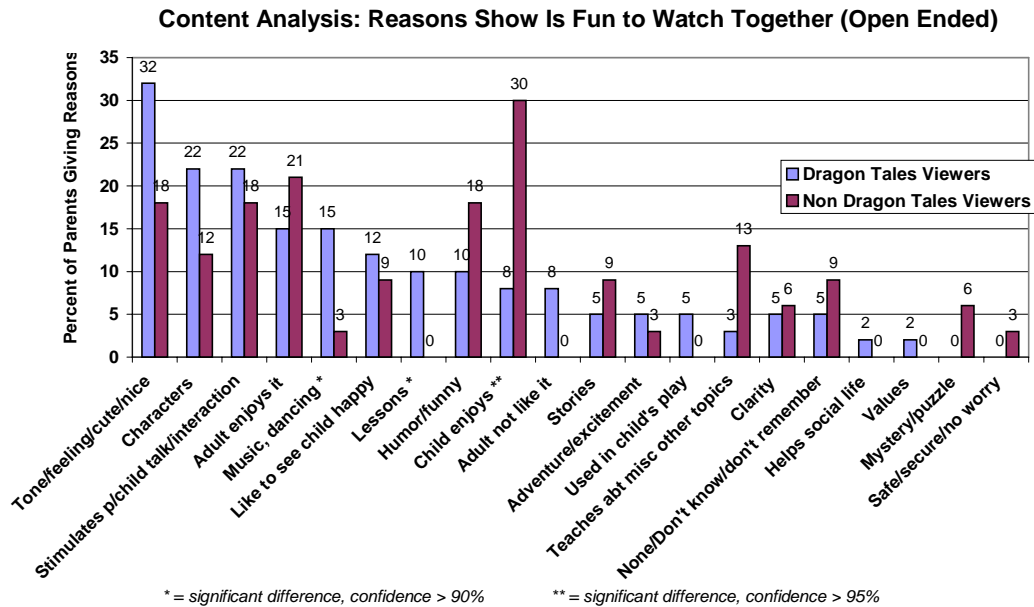
## Reasons Shows Are Fun to Watch Together

Parents were also asked whether the target program was fun to watch together with their child, and if so, in what ways. The content of their replies was coded and the content analysis tabs are presented in the Main Tab Book -Appendix F.

For *Dragon Tales*, their unaided replies show that parent especially liked the show's tone or feeling (as "nice" and "cute"), the interaction it stimulated with their child, the characters, their own pleasure in viewing it, and the music and dancing.

Although parents who watched other shows with their children were significantly more likely to mention that their child enjoys that show as a reason why it was fun to watch together, this does not imply that children who watched *Dragon Tales* did not enjoy the show. Other data in this report clearly suggest that children found *Dragon Tales* highly appealing (e.g., it was mentioned more often as being a child's favorite show and children who watched other shows were less likely to pretend to be in that program's world than

children who watched *Dragon Tales*). The fact that this reason was offered more often by non-*Dragon Tales* households may well be the result of its being an easy "default" answer from a parent who has no better justification for having said the show was fun in the first place. All of the parents who gave responses to this question had already said the show was fun. *Dragon Tales* parents demonstrably had more specific reasons to give, perhaps because *Dragon Tales* was co-viewed more often by parents and children together. Non-*Dragon Tales* parents, on the other hand, may have simply repeated what the question already implied.



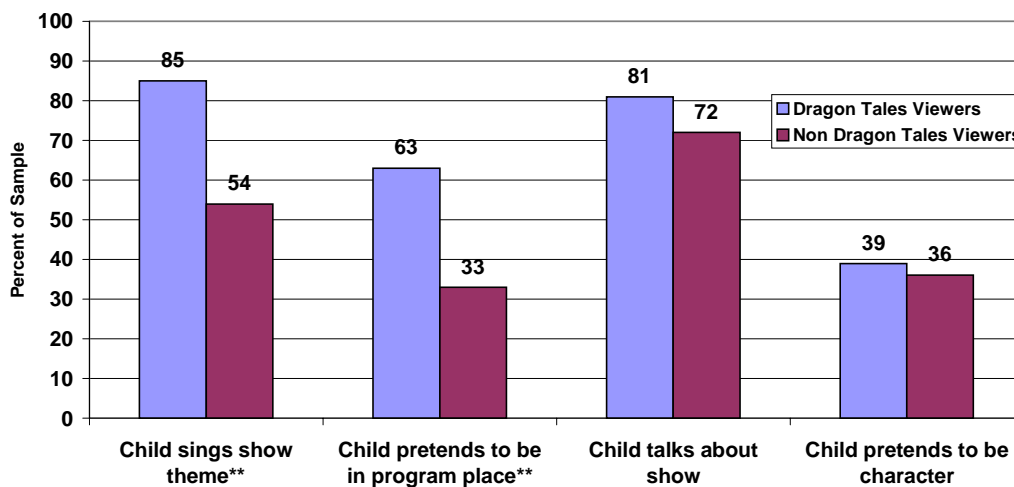
## Program Echoes

One index of a program's impact on children is the degree to which its elements get picked up and incorporated in other spheres of their life. For *Dragon Tales*, whose explicit objective is to make an impact in how children face life outside of television, its ability to penetrate into everyday life is an important factor.

According to parents, *Dragon Tales* has become a presence in most of their children's lives. They talk about it, sing its song, pretend to be in Dragon Land, and pretend to be one of the characters.

*Dragon Tales* was significantly more likely to have children sing its song and pretend to be in Dragon Land than in the places portrayed in other programs.

Program Echoes - Home View Study



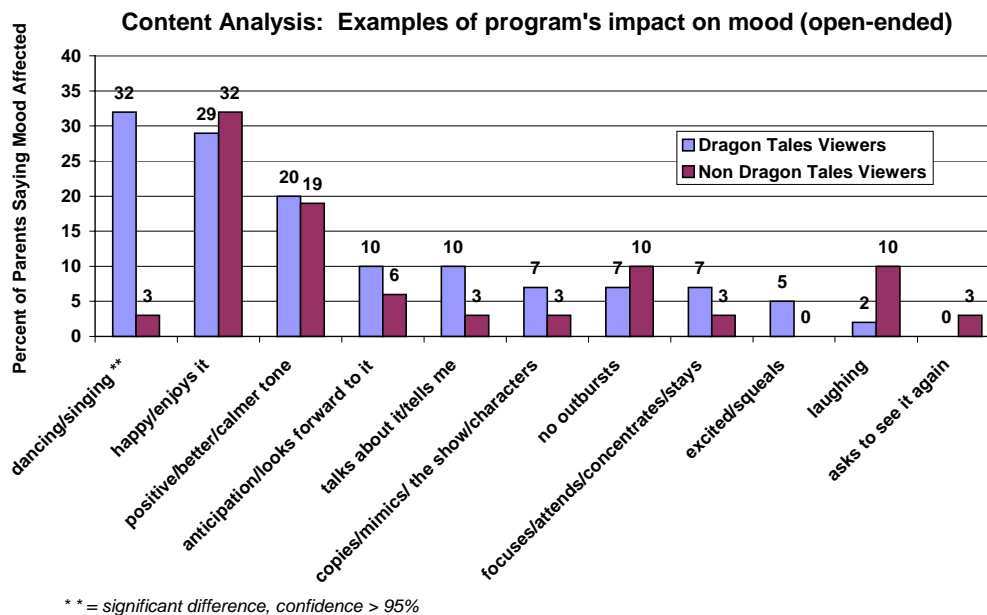
\*\*= significant difference, confidence >95%

## Impact on Mood

Parents were asked if the program they were being asked about put their child in a good mood and if it had to provide examples of how they knew it. A content analysis of their verbatim replies produced the following data.

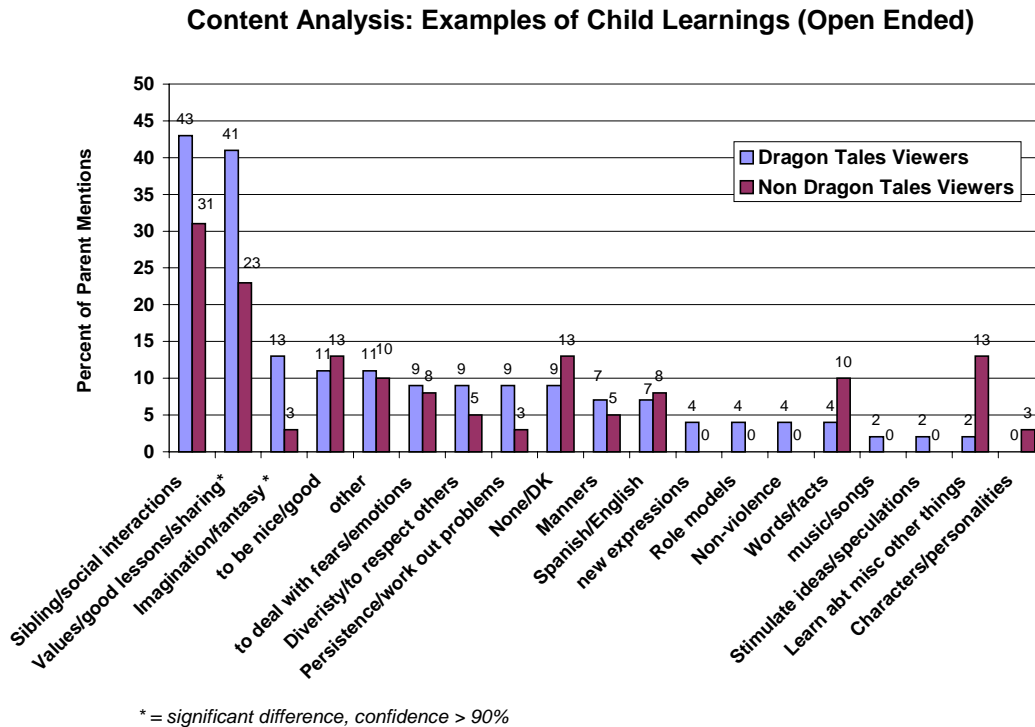
When speaking about *Dragon Tales*, parents were significantly more likely to mention their child's dancing and singing as a sign that they were in a good mood than was the case with parents who talked about other shows. Other kinds of mood indicators did not show significant differences between programs.

Although the singing and dancing are embodied primarily in the *Dragon Tales* theme song and the interstitial period between the two stories featured in each broadcast, they seem to be making an important contribution to children's emotional response to the show. Four and five year old children are extremely physical. Their bodies are closely bound to all their feelings. They also tend not to differentiate the various parts of anything they perceive as a whole. *Dragon Tales*, by providing ways for children to involve their bodies in the viewing experience may have found a powerful way to impact their feelings, thus enhancing their receptiveness to the story elements and coloring their image of the show as a whole. It is also likely that parents are more likely to perceive a program's effect on their child when the child gives inescapable, physical and vocal evidence of responding to it.



## Child Learnings

Parents were asked what their child was learning from watching the target program. The results of content-coding their verbatim replies are presented in the Main Tab Book and are summarized in the chart below.



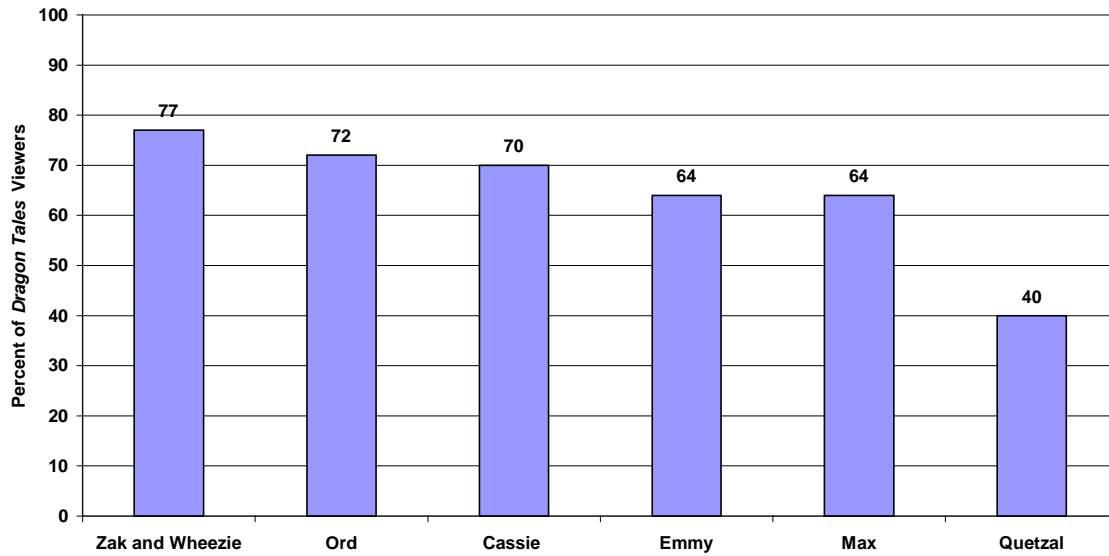
The lessons most often mentioned, for *Dragon Tales* or other favorite children's programs, had to do with how to get along with other people: friends and siblings in particular, with a particular emphasis on sharing. *Dragon Tales* tended to score higher than other programs on these lessons, but the differences were not significant.

Two things differentiated *Dragon Tales* from other favorites (at a marginal level of significance): "Values/good lessons/sharing" (41% for *Dragon Tales*, 23% for others) and "Imagination/fantasy" (13% for *Dragon Tales*, 3% for others).

### ***Dragon Tales* Character Mentions**

Parents often heard their children mention the *Dragon Tales* characters. The young dragon characters were mentioned most often (70-77%), especially the two-headed pair, Zak and Wheezie (77%). The real kids, Max and Emmy were mentioned by 64%. Quetzal, the grandfatherly dragon, was mentioned by 40%.

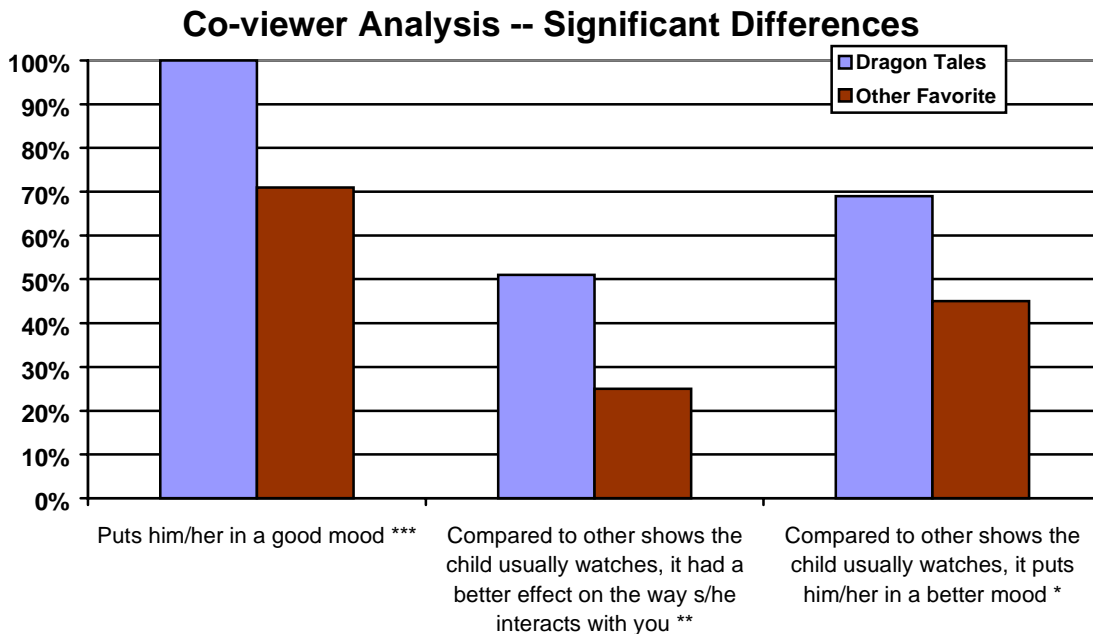
***Dragon Tales* Characters Mentioned Away from Show - Home View Study**



### Co-Viewer Only Analysis

To control for the possibility that comparisons of *Dragon Tales* viewers with non-*Dragon Tales* viewers might be muddled by the fact that the parents of *Dragon Tales* viewers were more likely to co-view, (thereby weighting the non-*Dragon Tales* scores more heavily with parents who did not co-view) the contrasts were examined again, looking only at the parents who had co-viewed the target program with their children. Although the resulting sample sizes were smaller (35 *Dragon Tales* co-viewers and 21 non-*Dragon Tales* co-viewers), rendering any conclusions more tentative, the results were suggestive. A number of the contrasts became substantially sharper, and do seem to make sense in the context of findings from the rest of the study.

Co-viewers of *Dragon Tales*, when compared to co-viewers of other programs, rated *Dragon Tales* significantly higher on the following questions:



significant difference between programs: \*\*\* = confidence > 99%, \*\* = confidence > 95%, \* = confidence > 90%



## PROJECT CONCLUSIONS

The primary objective of the current study was to find out whether regular watching of *Dragon Tales* has a positive effect on 4-5 year old children's pursuit of challenges in their everyday lives and on their establishment of collaborative relationships with others. Secondary objectives were to determine whether the show is appealing, involving and comprehensible, whether it stimulates interaction between parents and children, and whether it gets integrated into children's lives, beyond the immediate context of the TV viewing situation. This section takes the objectives one at a time and evaluates the evidence on whether or not it was achieved.

### *Does Dragon Tales have a positive effect on children's pursuit of challenges?*

Yes. The effect on how they pursue challenges was significant and was reflected throughout the study.

The strongest evidence comes from the pre/post Devereux assessment questionnaire which showed that *Dragon Tales* viewers gained significantly, versus the control group on "How often did you see the child choose to do a task that was challenging for him/her?" This item provides a direct assessment of a core educational objective of the series which focuses on encouraging young children to pursue challenging experiences.

The other Devereux items which directly explored children's pursuit of challenges showed trends in the same direction. These included "Tries different ways to solve a problem," "Concentrates on a task or activity," and "Accepts another choice when the first choice is unavailable." *Dragon Tales* viewers gained on these items, relative to the control, and although the differences did not reach the .05 criterion for statistical significance, the consistent direction of the findings adds confidence to the general conclusion.

The fact that the Devereux assessments were filled out by teachers and researchers, who knew the children in school, and by parents who knew them at home, contributes to the conclusion that these effects are quite general ones, not confined to a single place or context.

Additional evidence of *Dragon Tales'* impact on children's tendency to approach challenges comes from the pre/post changes in the Child Interview. Here children were observed as they worked on an un-directed block-building task. *Dragon Tales* viewers showed clear signs of becoming more focused on a goal. This showed up significantly in their description of what they put together as a coherent entity. Other measures, individually below the threshold for significance, collectively converged to point in the same direction. These included announcing what they were making during the building process, and using most or all of the blocks available to them.

The findings from the free play observations were consistent with this conclusion, too. Although the overall analysis of variance was not significant, so statistical tests were not run on specific ratings, *Dragon Tales* viewers spent considerably more time making things than children in the control group.

***Does Dragon Tales have a positive effect on their establishment of collaborative relationships with others?***

Yes. The effect of *Dragon Tales* on social relationships was strong and it showed up in a variety of contexts.

Four Devereux questions which measured this effect each showed *Dragon Tales* to have a significant impact on children's social development in the following areas: "Starts or Organizes Play with Others", "Asks Others to Play", "Shares with Other Children," and "Cooperates with Others."

As explained previously, no significance tests were run on specific scales that were used in conjunction with the free-play observations. Nonetheless, the trends that were recorded gave modest support to the overall conclusion that *Dragon Tales* had an effect on children's collaborative play. There were three ratings that relate to this objective. While *Dragon Tales* had no effect on the observed frequencies of "Offers Help to Peers," there were positive changes on "Asks Peer for Help" and "Cooperative or Parallel Play" relative to the control group.

The relevance of *Dragon Tales* to children's relationships with others was not lost on parents in the Home-Viewing Study. Those viewing *Dragon Tales* with their children were significantly more likely than co-viewers of other programs to say they talked about issues of sharing and selflessness and to mention examples of sharing and selflessness by their children in response to the show. Parents of *Dragon Tales* viewers also tended to say the show stimulated talk about social relationships in general and that it had a better effect on their child's interaction with others.

***Is Dragon Tales appealing and involving?***

Unquestionably. The evidence came from direct observation of the children while they were watching, from the home-view diaries and from the interviews with parents of children in the Home-Viewing Study.

Videotapes of the children while they watched showed *Dragon Tales* to be highly involving. It got dramatically higher levels of attention than the control.

At home, the appeal of *Dragon Tales* was shown by the fact that children watched it more frequently than any other program, and according to parents it was most often their child's favorite, by a clear margin.

Parents who watched *Dragon Tales* with their child were more likely to say that it put their child in a good mood than parents who co-viewed other programs with their child. In addition, a significantly higher percentage of parents in *Dragon Tales* homes mentioned singing and dancing as a sign that their child was in a good mood when watching *Dragon Tales* than was the case when parents in non-*Dragon Tales* homes talked about other children's program.

Finally, parents reported that *Dragon Tales* viewers were significantly more likely to sing its theme song and to pretend to be in Dragon Land than in the places portrayed in other programs.

***Is Dragon Tales comprehensible?***

In the key areas of understanding characters' goals, emotions, and persistence, it appears to have been successful. Comprehension of other elements was not measured.

***Does it stimulate interactions between parents and children?***

Yes.

Many of the home-viewing parents (who said they particularly liked the life lessons and morals they perceived in *Dragon Tales*) did report following up on the programs lessons. Moreover, the program stimulated significantly more parent-child talk about "trying" than did the favorite shows of non-*Dragon Tales* viewers, as well as more discussion (at marginal levels of significance) about emotions, feelings, sharing, and the use of Spanish.

These findings clearly suggest that *Dragon Tales* has an important impact on parent-child relationships which is one of the primary foundations for children's later success.

***Does it get integrated into children's lives?***

Yes. The fact that similar patterns of change were revealed through different kinds of ratings from different kinds of observers in different kinds of settings makes it clear that the impact *Dragon Tales* had generalized throughout these children's lives.

The cumulative data from these studies indicate that *Dragon Tales* is achieving its objectives. Moreover, they are consistent with the framework that has been established by the National Institute of Early Childhood Development and Education within the U.S. Department of Education which emphasizes the 3 R's of Early Childhood Education: Resilience, Relationships, and Readiness. Consequently, this summative evaluation suggests that *Dragon Tales* is making an important contribution to improving children's readiness as part of the Ready To Learn block of preschool programs on PBS.

## LOOKING TO THE FUTURE

While extensive, this project was not exhaustive. There are several critical issues yet to be resolved about the impacts of *Dragon Tales* on young children. The current study gives strong evidence that *Dragon Tales* is succeeding at encouraging young children to pursue the challenging experiences that support their growth and development, particularly in the areas of setting goals and developing collaborative relationships with peers. This is an extremely important achievement. But it relates to only one of the three educational goals of the series (albeit the most general one).

Although the other two educational goals were not evaluated as extensively, some support for the second goal (which focuses on helping young children recognize that there are many ways to approach a problem) can be found in data obtained with the Devereux Early Childhood Assessment Scale. Ratings made by teachers, researchers, and parents indicated that *Dragon Tales* viewers increased more on the “Tries Different Ways to Solve Problem” item from pre to post than the control group. Although this trend is not significant, the fact that the direction of the trend was the same across all three types of raters suggests that this is an area worthy of deeper investigation.

While there were many significant findings with regard to children’s goal-oriented behaviors and social collaboration, none of the ratings on items dealing with the self-regulation of emotions was significant. One reason may be that only a few of the episodes included in this study focused on self-regulation issues. A closer examination of the series’ impact on children’s self-regulation of emotions, using a different selection of episodes warrants closer attention.

It is interesting to note that parents of *Dragon Tales* viewers who participated in the Home-Viewing Study reported that the show stimulated more talk (at a marginal level of significance) about emotions and feelings than the parents of non-*Dragon Tales* viewers. Since the families that participated in the home study were not asked to rate their children using the Devereux Early Childhood Assessment Scale, we were not able to look at the impact that these discussions might have had on children’s behavior. Nonetheless, this is another area worthy of further investigation.

Finally, although the teacher-child relationship was not examined in this study, we have anecdotal reports that many teachers asked during the course of the study if they could follow up in class on episode themes with their children. Moreover, all of the schools requested a set of the *Dragon Tales* tapes so they could continue to show them to their classes. These educators were eager to help their children build upon the lessons featured in *Dragon Tales*. It would be helpful to explore how teachers might best build upon the programs’ lessons and to evaluate the impact of teacher-mediated programming upon children’s development.