



**A Summative Evaluation of the Impact and
Appeal of
Super WHY! Reading Camp**

Stephanie E. Meyer, Ph.D.
Iris Sroka, Ph.D.

Paradigm Research & Consulting

Correspondence to:

Dr. Iris Sroka

President, Paradigm Research & Consulting

35-06 88th Street, Suite 6B

Jackson Heights, NY 11372

Phone: 718-424-5147

Email: isroka@paradigmrc.com

Website: www.paradigmrc.com

Acknowledgement

The authors wish to thank the outstanding camp facilitators and PBS station outreach coordinators for their dedication and support. In addition, we are extremely grateful to our campers and their families, without whom this project would not have been possible.

Table of Contents

Abstract	4
Introduction	5
Research Objectives	6
Method	6
Study Design	6
Measures	8
Analytical Approach	10
Results	10
Participants	10
Objective 1	13
Objective 2	15
Objective 3	17
Discussion	18
Limitations	19
Implications for Future Studies	20
References	21

Abstract

Numerous studies over the past four decades have provided empirical support for the potential of television to serve as a powerful educational tool (Yotive & Fisch, 2001), particularly with regard to enhancing pre-academic skills (Wright, Huston, Scantlin, & Kotler, 2001). A recent addition to the field of educational television is *Super WHY!*, a series geared toward preschool-age children that focuses on the development of emergent literacy skills. Early studies have been extremely promising in showing that consistent in-home viewing of *Super WHY!* has a pronounced impact on the development of critical early literacy skills (Linebarger, McMenamin, & Wainwright, 2009).

In the present study, the authors examined the impact of a 5-day *Super WHY!* Reading Camp designed to teach literacy skills outside the home, using characters and adventures from the *Super WHY!* television series as the basis for learning. Results showed that children who attended *Super WHY!* Reading Camp demonstrated significant increases in program-specific knowledge. Moreover, their newly acquired skills generalized into meaningful gains on a standardized index of overall reading readiness. These findings were significant even when statistically controlling for age, household income, English-language ability, English as primary language, daily reading with a caregiver, and in-home exposure to *Super WHY!* programming. Children in the control camp condition did not exhibit equivalent gains. *Super WHY!* campers also appeared to enjoy their camp experience, with 94% indicating that they would like to return next year. Enrichment programs with more direct and personal instruction, like the *Super WHY!* Reading Camp evaluated here, utilizing the *Super WHY!* characters and content that have proven so effective within the context of the present and prior research studies will help maximize the impact of the empirically-supported *Super WHY!* curriculum. These results have significant implications for educational television programming for preschoolers, and establish a foundation for future studies to examine the long-term durability of performance gains, impact on school performance, potential moderator variables, and the "active ingredients" of *Super WHY!* Reading Camp that make it such a potent learning tool.

INTRODUCTION

Numerous studies over the past four decades have provided empirical support for the potential of television to serve as a powerful educational tool (Yotive & Fisch, 2001), particularly with regard to enhancing pre-academic skills (Wright, et al., 2001). While Sesame Street was the first television show to address specific educational goals with preschool-age children, several others have followed suit. A recent addition to the field of educational television is *Super WHY!*, a series geared toward preschool-age children that focuses on the development of emergent literacy abilities. Viewers are exposed to the skills of letter identification, decoding, encoding, vocabulary and reading comprehension through the adventures of a team of "Super Readers", each with a specific literacy skill. Early studies have been extremely promising, showing that consistent in-home viewing of *Super WHY!* has a pronounced impact on the development of critical early literacy skills (Linebarger, et al., 2009). Enrichment programs with more direct and personal instruction, utilizing the *Super WHY!* characters and content that have proven so effective within the context of this and prior research studies, may help maximize the impact of the empirically-supported *Super WHY!* curriculum.

In 2007, *Out of the Blue* received a grant for the *Super WHY!* Reading Camps, funded by a cooperative agreement of the U.S. Department of Education and the Corporation for Public Broadcasting as part of the Ready to Learn (RTL) initiative. The program began with 5 pilot camps, which were used to inform the curriculum that was implemented in subsequent years. In 2008, the *Super WHY!* Reading Camp program was extended to 33 *Super WHY!* Reading Camps, and 69 camps in 2009. Enrollment has increased each year. These 5-day camps are designed to teach literacy skills using characters and adventures from the *Super WHY!* television series as the basis for learning. Each day of camp focuses on an individual literacy skill using art, movement, and interactive activities to extend and reinforce program-based content. Camps serve up to 20 children, and are led by local teachers at schools, day care, and Head Start centers, in partnership with local PBS member stations. Children range in age from 3-7 years old, and represent a range of income (skewing to low income levels) and ethnic backgrounds. The same recruitment, curriculum, and data collection procedures have been utilized each year. The impact of *Super WHY!* Reading Camp has been measured using program-specific pre- and post-tests, evaluating children's performance on all literacy skills taught over the course of the week (Marshall, et al., 2010). Findings from 2008 and 2009 indicate that children, across ages and ethnicities, who

participated in *Super WHY!* Reading Camp achieved broad-ranging gains in targeted pre-literacy skills. Most promising is the finding that *Super WHY!* campers were able to apply their understanding of program-specific content to less familiar material presented during the camp week (Marshall, et al., 2010). In 2010, Out of the Blue received the Supplemental Technology Add On grant, funded by a cooperative agreement of the U.S. Department of Education and the Corporation for Public Broadcasting, which funded a fourth year of the *Super WHY!* Reading Camp program, increasing the number of camps to 83, and reaching nearly 2000 low-income children and their families across the United States. Building on the promising results from the first two years of camp, a technology component was added to the previous years' curriculum, to make this a true 360 degree experience (on air, off air, and on-line). Data collection efforts were also expanded to include a comparison sample of children who were not exposed to the *Super WHY!* curriculum.

RESEARCH OBJECTIVES

The overarching goal of the present research was to evaluate the impact of the 2010 *Super WHY!* Reading Camp program on the acquisition of emergent literacy skills presented within its 5-day curriculum. The research program was designed to determine whether children who participated in the *Super WHY!* Reading Camp demonstrated more substantial gains on program-specific measures of emergent literacy skills, as compared to a control sample of children who were not exposed to the *Super WHY!* curriculum. The study also examined whether children who participated in the *Super WHY!* Reading Camp were able to transfer the skills learned through program-specific content to a broader index of reading readiness. Finally, we assessed participants' level of enjoyment of *Super WHY!* Reading Camp, as previous research has shown that children are more likely to pay attention to educational content if they find the activities, characters, and stories appealing (Fisch & Truglio, 2001).

Specific objectives were as follows:

- 1. Did children who attended the 2010 *Super WHY!* Reading Camp exhibit a significant increase in knowledge of program-specific content, including letter naming, letter identification, decoding, letter sounds, encoding, reading words, and identifying opposites, as compared to children in the control group?**

2. Did children who attended the 2010 *Super WHY!* Reading Camp show greater gains on a standardized measure of reading readiness, as compared to children in the control condition?
3. Did *Super WHY!* campers enjoy their camp experience?

Method

Study Design

A quasi-experimental research design was utilized in order to address study objectives. Ready to Learn stations partnered with local organizations to identify *Super WHY!* Reading Camp and control groups for participation in this evaluation study. Control camps were non-literacy-based summer day camps. Similar to the *Super WHY!* camps, control camps targeted high-risk youth and were housed in comparable settings, for the same number of hours each day. A non-literacy-based control condition was selected for the present study in order to determine whether differences in performance gains could be detected between children who attended *Super WHY!* Reading Camp versus those who attended a "generic" summer camp. Once such differences have been established, the long-range research agenda can include multiple comparison groups, including a control (no-literacy) group, literacy camp (alternate literacy curriculum), and *Super WHY!* camp condition. All study campers came from one of 11 participating camps (6 experimental and 5 control). An additional experimental camp was required in order to render equal numbers of children in each condition. Children were eligible for study participation if they were between the ages of 3 and 7, and were scheduled to complete camp by July, 2010. Only one child per family could participate, in order to avoid family clustering of data, which violates assumptions of independence. Parental consent was obtained prior to study entry.

Children in the experimental condition attended the 5-day *Super WHY!* Reading Camp for 3.5 hours per day. Each day focused on one of the 4 *Super WHY!* characters (Alpha Pig, Wonder Red, Princess Presto, and Super WHY). The fifth day was "Super You" day.

Baseline: Baseline measures were administered before commencement of camp activities. As part of the baseline assessment, caregivers completed a demographic questionnaire, and children were administered a battery of program-specific measures of letter naming, letter identification, decoding, letter sounds, encoding, and reading words/identifying opposites identical to those that

were utilized in the first two years of *Super WHY!* camp. This ensured the comparability of "cohort" groups for future aggregate studies.

A standardized reading measure, the *Get Ready to Read!* (GRTR!) Screening Tool, was also administered at baseline, to assess the degree to which content-specific abilities acquired through camp participation were translated into broader early literacy skills that are predictive of real-world reading success.

Follow-up: Program-specific subtests were re-administered individually at the end of each camp day, in keeping with the content covered on a given day. For example, the "Day 1" subtest, which covered content presented during the first day of the Reading camp, was administered at the conclusion of the first day. A daily engagement scale was also completed at the end of each day. The GRTR! and an overall engagement scale were completed on the last day of camp. The assessment protocol was identical for experimental and control groups, with the exception of daily and overall engagement scales. These latter measures were only administered to *Super WHY!* campers, given that the study objective of determining whether *Super WHY!* campers enjoyed their camp experience did not require collection of comparable information from children in the control condition.

The following chart summarizes the schedule of research measures:

Schedule of *Super WHY!* Reading Camp Research Measures

		Parent	Child		
			Program-Specific measures	Standardized measure	Engagement scales
Baseline	Demographic form		Full battery of subtests	GRTR! Screening Tool	
	mp Days 1 - 4		Individual daily subtests		Daily engagement scale
Camp Day 5				GRTR! Screening Tool	Overall engagement scale

Schedule of Control Camp Research Measures

		Parent	Child		
			Program-Specific measures	Standardized measure	
Baseline	Demographic form		Full battery of subtests	GRTR! Screening Tool	
	mp Days 1 - 4		Individual daily subtests		
Camp Day 5				GRTR! Screening Tool	

Measures

All study tasks and measures were administered by lead camp facilitators. All lead facilitators in the experimental camps were credentialed teachers, while lead facilitators in the control condition had an Associates Degree in Child Development. Camp facilitators were committed to implementing research tasks in a standardized manner, according to explicit guidelines. Prior to initiating data collection, facilitators received detailed instructions regarding administration of study measures, and viewed a training DVD for the standardized Get Ready to Read! Screening

Tool. A member of the research team visited 33% (2 out of 6) of experimental and 40% (2 out of 5) of control camps, in order to sample the quality of assessment procedures. Completed record forms were compiled and delivered to the research team at *Paradigm Research & Consulting*, at which point they were entered into an Excel spreadsheet, transferred to Stata version 11, and analyzed according to a data analysis plan.

Child and Family Characteristics: Parents/Guardians completed a detailed demographic form when registering their child for camp. This measure was created for purposes of the present study, and included basic identifying information including birthdate, gender, and home address, as well as information regarding variables associated with literacy development, including English-speaking ability, birth order, history of ear infections, speech and language delays, and literacy-promoting activities in the home.

Program-Specific Assessment Measures: *Out of the Blue* developed a battery of subtests measuring children's knowledge of program-specific content. As per Marshall et al (2010), no off-the-shelf, validated instrument covering the concepts of interest, relative to the *Super WHY!* program, was available, thus necessitating the development of an appropriate measurement tool. Four different subtests were created to evaluate children's attainment of literacy skills associated with each of the main *Super WHY!* characters. These subtests were previously administered during the 2008 and 2009 camp years, and have been found to have excellent internal reliability (Marshall, et al., 2010). Individual subtests and their associated characters are listed below.

1. **Alpha Pig:** Letter identification
2. **Wonder Red:** Decoding
3. **Princess Presto:** Letter sounds and encoding
4. **Super Why:** Reading words and identifying opposites

Get Ready to Read!-Revised Screening Tool (GRTR!): The GRTR! ("Get Ready to Read!-Revised Early Literacy Manual," 2009) is a 25-question screening tool designed to assess how a child is progressing toward acquisition of knowledge and skills that lead to successful reading. The GRTR! specifically samples print knowledge (a child's understanding of books, printed letters, and words) and phonological awareness (a child's understanding of the relationship between letters and speech sounds and how sounds can combine to form words), the two key skill areas that form the foundation for learning to read. Children who develop stronger

skills in these areas have greater success in learning to read ("Get Ready to Read!-Revised Early Literacy Manual," 2009). The GRTR! was administered as part of the baseline assessment, and again on the last day of camp. For each item on the GRTR!, the examiner reads a question while the child is presented with a set of four pictures, one of which is the correct response. The child selects an answer by pointing to one of the four pictures. Correct responses are summed to obtain a Number Correct score. In addition, for purposes of the present study, Number Correct scores were converted to Performance Levels, which describe a child's performance in relation to same-aged children in the GRTR! normative sample. The publisher provides Performance Level definitions for children up through age 5 years, 11 months. Because a minority of children in the present sample were older than this, we utilized Performance Level definitions for 5-year, 11-month old children for campers in the upper age ranges of our sample. The three Performance Levels are described as follows ("Get Ready to Read!-Revised Early Literacy Manual," 2009, page 9):

- **Below Average:** comparable to the lowest 25% of children in the norm-referenced sample
- **Average:** comparable to the middle 50% of children in the norm-referenced sample
- **Above Average:** comparable to the highest 25% of children in the norm-referenced sample

Engagement Scales: The appeal of the *Super WHY!* Reading Camp was measured in two ways. First, at the end of each camp day, *Super WHY!* campers were asked to rate their experience by answering the question, "How was camp today?". Response was indicated on a pictorial scale comprised of five faces representing a full range of reactions from "Terrible" to "Great!" (see below). Second, on the final day of camp, children completed an overall engagement scale on which they were asked about a) their experience at camp, b) their perception as to whether camp was fun, c) whether or not they "learned a lot about reading", and d) whether or not they would like to return to *Super WHY!* Reading Camp the following year. Again, pictorial scales were used. Children were also asked to name their favorite and least favorite element of camp.



GREAT!



GOOD



OK



NOT SO GOOD



TERRIBLE!

Analytical Approach

Basic descriptive statistics were used to examine demographic details of the sample. Additional t-tests and chi-square tests were employed to explore group differences in child and family characteristics. Household income data were log transformed to resemble a normal distribution. Where group differences were detected, relevant variables were included in further statistical analyses as co-variates, to minimize the effects of child and family variables on outcomes of interest.

Random effects Poisson regression was used to evaluate time (baseline, follow-up) and group membership (*Super WHY!* vs. control) effects on performance on program-specific subtests, where the outcome variable was an item count (i.e. the number correct), and age and initial group differences were held constant. Random effects linear regression was employed to assess the effects of time (baseline, follow-up) and group membership (*Super WHY!* vs. control) on GRTR! performance, where the outcome variable was normally distributed, and age and initial group differences were held constant.

Results

Participants

A total of 155 children attended the camp sites included in the present study, with 93 children in the *Super WHY!* Reading Camp condition and 62 children in the control sample. Of these, 64% (n=99) of participating families completed the demographic form as part of baseline procedures (59 children in the *Super WHY!* condition, and 40 controls). Information from the demographic form was used to statistically control for group differences in child- and family- characteristics that could potentially impact children's literacy development. Therefore, children who were missing these data were excluded from subsequent data analytic procedures. Children in the final study sample ranged in age from 3.33 to 7.35 years, and came from a broad range of ethnic backgrounds, with 53% of children being Caucasian, 26% African-

American, 19% Hispanic, and 2% Asian. Table 1 describes the sample in more detail. There were no group differences in age, gender, or birth order among children who participated in the *Super WHY!* (experimental) versus control camps. Parents of children who participated in the *Super WHY!* camps were less likely to list English as their child's primary language, and rated their child's English language abilities at a lower level than did parents of control children. Although family composition appeared to differ across groups, this was not statistically significant. There was a marked difference in total household income, with the mean household income of control campers being markedly higher than that of *Super WHY!* campers. Parent-reported literacy-promoting activities also differed by group, with 59% of control parents reporting daily reading with their child, as compared to 35% of *Super WHY!* parents. Finally, at baseline, parents of *Super WHY!* campers reported significantly more exposure to *Super WHY!* programming in the home, as compared to control families, despite equal rates of television viewing overall.

Table 1. Child and Family Demographic Characteristics, by Group

	<i>Super WHY!</i>	Control	Total
Sample Size	59	40	99
Child Characteristics			Significance
Gender (girls)	54%	51%	N.S.
Age (years)	5.42	5.22	N.S.
Birth order	1.71	1.69	N.S.
Primary language is English	76%	100%	X ² =11.05, p=.001
English language skills "Very Good"	59%	78%	X ² =3.78, p=.05
Frequent ear infections	5%	10%	N.S.
Treatment for speech/language Issues	10%	8%	N.S.
Family Characteristics			Significance
Two-parent family	59%	74%	N.S.
Family size	4.03	3.75	N.S.
Household income, Mean/Median	\$22K/\$16K	\$54K/\$56K	T=7.44, p=.000
Primary caregivers' highest level of education			
College degree	20%	30%	N.S.
Some college/vocational	34%	45%	N.S.
High school graduate	38%	23%	N.S.
GED/high school equivalency test	4%	0%	N.S.
Some high school	5%	3%	N.S.
Literacy-Promoting Activities in the Home			Significance
Daily reading with a caregiver	35%	59%	X ² =4.91, p=.027
Daily reading alone	72%	69%	N.S.
Child's Media Consumption			Significance
Total amount of TV per day (hrs)	2.75	2.29	N.S.
Watches <i>Super WHY!</i> on TV at home	56%	34%	X ² =3.86, p=.049

Objective 1: Did children who attended the 2010 *Super WHY!* Reading Camp exhibit a significant increase in knowledge of program-specific content, including letter naming, letter identification, decoding, letter sounds, encoding, reading words, and identifying opposites, as compared to children in the control group?

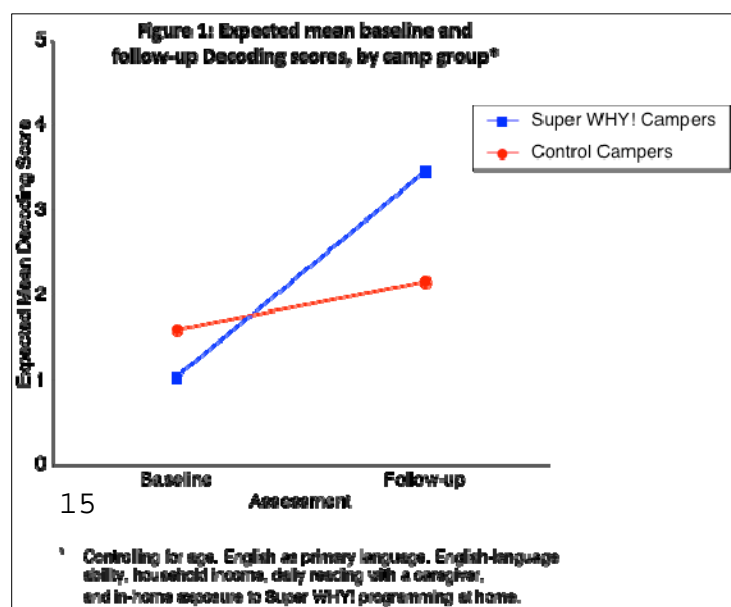
Random effects Poisson regression was the approach used to address Objective 1.

It is important to note that all analyses statistically controlled for age, as well as demographic variables that were significantly different across groups, including household income, English language ability, English as primary language, daily reading with caregiver, and in-home exposure to *Super WHY!* programming.

Letter Recognition

At baseline and follow-up, children were administered a Letter Pointing task evaluating their ability to correctly point to a series of target letters when presented with a visual representation of the entire alphabet. Campers' performance on this task did not differ by group (*Super WHY!* vs. control campers) ($z = -.75$, $p < .455$), and there was not a significant improvement in scores over time (baseline vs. follow-up) ($z = .38$, $p < .705$). Further analysis indicates that, prior to starting camp, 56% of children in the sample achieved the maximum score (10) on the Letter Pointing task. It is likely that the ease with which the majority of campers in this study completed this task limited its utility for detecting performance gains among children functioning at higher ability levels. Children were also administered a Letter Naming task, during which they were asked to name a series of letters when presented with a visual representation of each letter. Again, scores were skewed toward the upper range, with 57% of campers having achieved the maximum score of 10 at baseline. There were no significant differences in performance across groups ($z = -.59$, $p < .556$), or across time ($z = .11$, $p < .912$), again likely due to the simplicity of the task for this sample.

Decoding



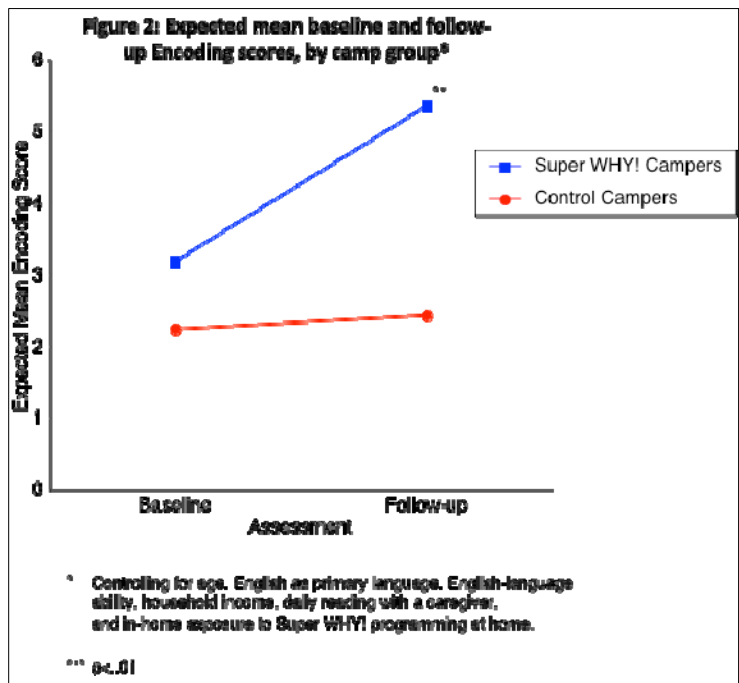
Children were administered a Decoding task at baseline and follow-up to evaluate their ability to sound out words within the -ALL rime family. Results revealed a significant interaction effect between group membership (*Super WHY!* vs. control campers) and time (baseline vs. follow-up) ($z=2.99$, $p<.003$), indicating that children who participated in the *Super WHY!* camp showed measurable improvement between baseline and follow-up, whereas children in the control sample did not. See Figure 1. Age ($z=4.18$, $p<.000$) and household income ($z=2.55$, $p<.01$) were also significant predictors of performance on the Decoding task, with increased age and household income being associated with higher follow-up scores.

Letter Sounds

At baseline and follow-up, children completed a Letter Sounds task, during which they were asked to name a series of letters when presented with the letters' sounds (e.g. "What makes the |l| sound as in ladder?"). Children's performance on this task was not found to differ by group (*Super WHY!* vs. control campers) ($z=-.24$, $p<.811$), nor did scores improve over time ($z=-.07$, $p<.94$), when controlling for age, household income, English language ability, English as primary language, daily reading with a caregiver, and in-home exposure to *Super WHY!* programming.

Encoding

Children were administered an Encoding task at baseline and follow-up designed to measure their ability to spell words within the -IG rime family (e.g. PIG and BIG). Results revealed a significant interaction effect between group membership (*Super WHY!* vs. control campers) and time (baseline vs. follow-up) ($z=2.02$, $p<.043$), indicating that *Super WHY!* campers achieved a measurable increase in Encoding score over time, while the control group did not. See Figure 2.



Other variables that contributed to the prediction of Encoding score were age ($z=5.18$, $p<.000$), household income ($z=2.33$, $p<.02$), English-speaking ability ($z=2.04$, $p<.04$) and English as primary language ($z=2.49$, $p<.043$), with increased age, income, and English-language abilities predicting higher Encoding scores at follow-up.

Reading words and identifying opposites

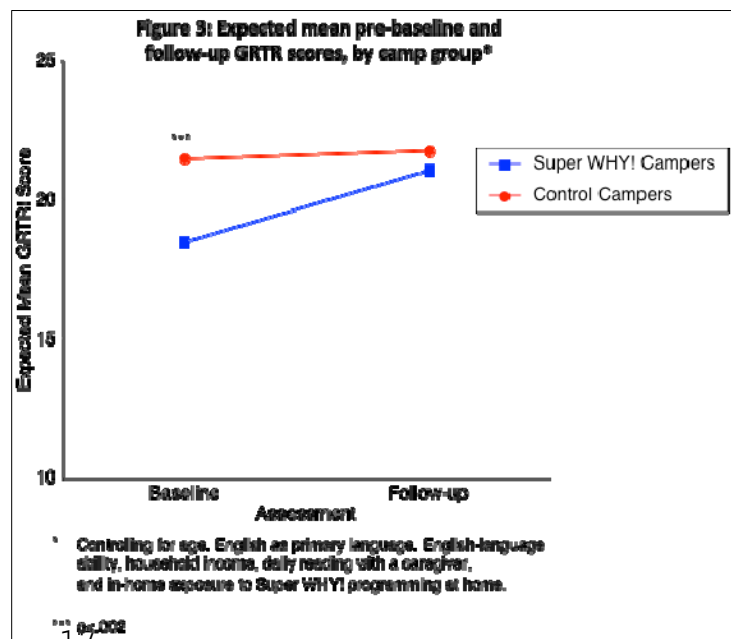
The Reading and Opposites subtest was designed to measure children's capacity to name and visually identify spoken words and their opposites. Performance was not found to differ by group ($z=-.74$, $p<.462$), or change over time ($z=.72$, $p<.471$), when controlling for the effects of age, household income, English-language ability, English as primary language, daily reading with a caregiver, and in-home exposure to *Super WHY!* programming.

Objective 2: Did children who attended the 2010 *Super WHY!* Reading Camp show greater gains on a standardized measure of reading readiness, as compared to children in the control condition?

Random effects linear regression was used to address Objective 2. Again, all analyses statistically controlled for age, household income, English-language ability, English as primary language, daily reading with a caregiver, and in-home exposure to *Super WHY!* programming.

Get Ready to Read! Screening Tool

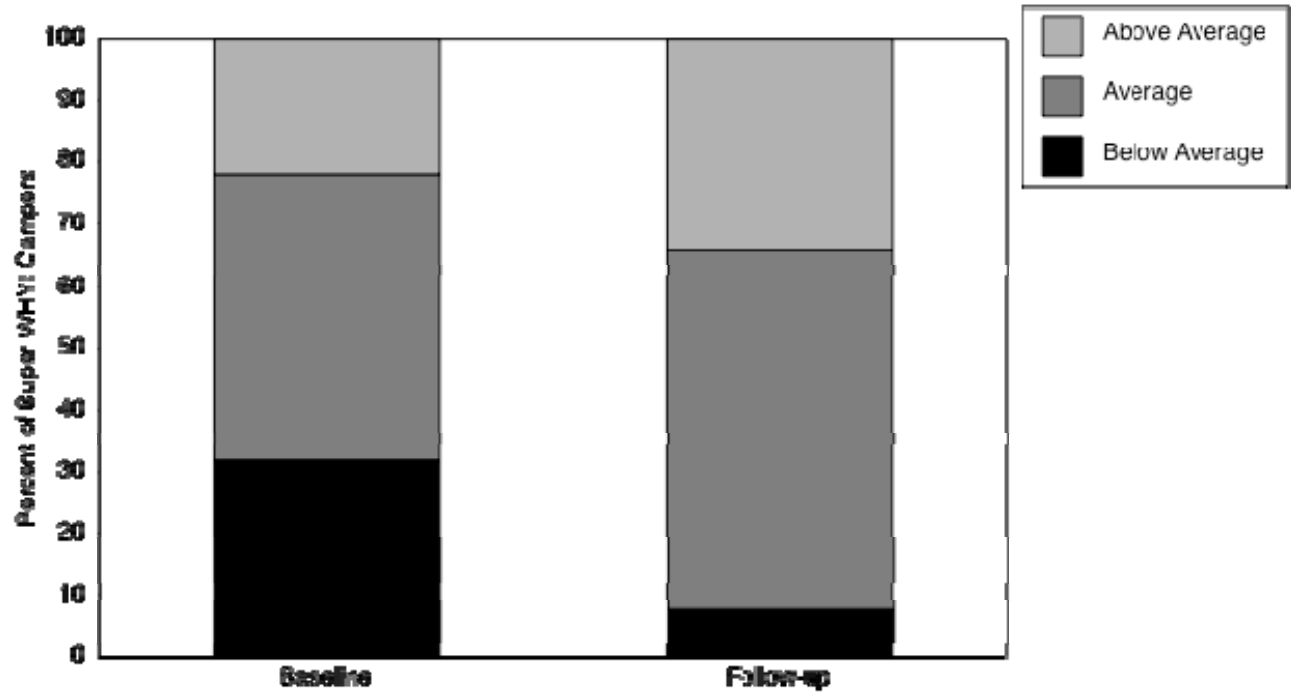
The Get Ready to Read! (GRTR!) Screening Tool was administered at baseline and follow-up as a standardized measure of overall reading readiness. At baseline, *Super WHY!* campers' mean GRTR! score was significantly lower than that of control campers ($z=-3.08$, $p<.002$). The *Super WHY!* group showed marked improvement over the course of camp, while the control sample did not ($z=3.43$,



$p < .001$), such that performance differences were no longer significant at follow-up. See Figure 3. Age ($z = 4.47$, $p < .000$), English as primary language ($z = 2.21$, $p < .027$), and increased exposure to *Super WHY!* programming at home ($z = 2.01$, $p < .044$) also made significant contributions to GRTR! performance at follow-up.

The real-world significance of performance improvements on the GRTR! among *Super WHY!* campers is brought into stark relief when scores are converted to norm-referenced Performance Levels ("Get Ready to Read!-Revised Early Literacy Manual," 2009). Performance Levels describe each child's total GRTR! score in relation to the scores of other children the same age. According to the GRTR! Early Literacy Manual, "if a child is in the below average range, he or she would benefit from extra help and attention" ("Get Ready to Read!-Revised Early Literacy Manual," 2009, page 8). At baseline, 32% of *Super WHY!* campers fell within the Below Average range on GRTR! scores, but by follow-up, all but 8% had achieved scores within the Average range or above. See Figure 4.

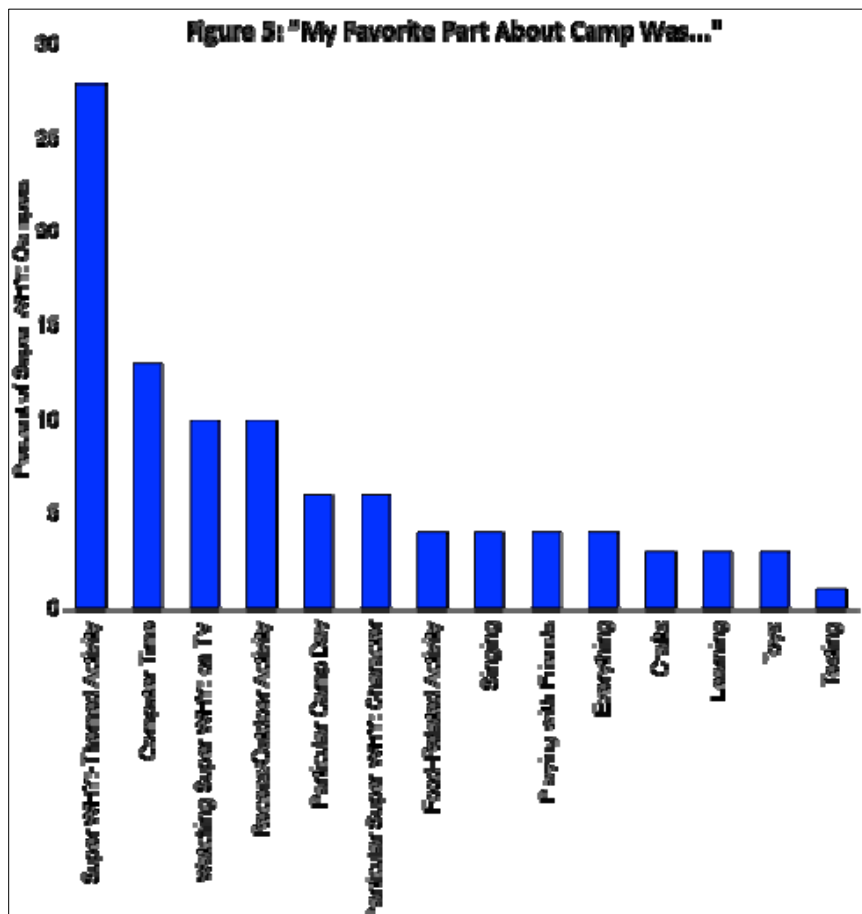
Figure 4: Percent of Super WHY! Campers whose GRTM Scores fell within the Below Average, Average, and Above Average Range at baseline and follow-up



Objective 3: Did *Super WHY!* campers enjoy their camp experience?

At the end of each day, *Super WHY!* campers were administered a single-item scale asking "How was camp today?" accompanied by a pictorial scale of 5 faces representing varying responses ranging from "Terrible" to "Great!". On this measure, 55% of children had a mean score of "Good" or "Great!". Observational data suggest that children's response to this question was impacted by non-camp-related variables, including the weather (i.e. one child said that it was a "Terrible" day at camp because it was raining and so they were unable to engage in outdoor activities). Given the vague nature of this item, and its openness-to-interpretation, responses likely represent an underestimation of daily engagement. The overall engagement scale that was administered on the last day of camp also included items that allowed for broad interpretation. The item, "Would you like to return next year to *Super WHY!* Reading Camp?" represents the most accurate measure of appeal, given its clear and concrete intent. Responses were overwhelmingly positive (94% of *Super WHY!* campers said Yes).

Children were also administered the item, "My favorite part of camp was...". Twenty-eight percent of children identified specific *Super WHY!*-themed program activities as their favorite aspect of camp (details below), another 13% indicated that they most enjoyed spending time on the computer (which may have also included themed content), 10% said that they most enjoyed watching *Super*



WHY! on television (also a component of the *Super WHY!* camp day), and 10% preferred recess or outdoor activity. See Figure 5. Of those children who listed *Super WHY!*-themed activities as their favorite element of camp, 32% specifically enjoyed "letters basketball", 26% listed the *Super Why* character visit at the end of the last day of camp, and 21% enjoyed *Super-WHY!*-themed activity centers.

Discussion

In the present study, program-specific content scales and a standardized reading readiness screener were employed to assess the impact of *Super WHY!* Reading Camp on the development of emergent literacy skills in a sample of high-risk preschool-age children, versus a group of comparison children who participated in a non-literacy camp condition. Results showed that children who attended *Super WHY!* Reading Camp demonstrated significant increases in decoding and encoding knowledge, and were able to apply their newly acquired skills to achieve meaningful gains on a standardized index of overall reading readiness. These findings were significant even when statistically controlling for age, household income, English-language ability, English as primary language, daily reading with a caregiver, and in-home exposure to *Super WHY!* programming. Children in the control camp condition did not exhibit equivalent gains.

Results from the present study represent a partial replication of Marshall et al's (2010) analysis of data from the second and third year of *Super WHY!* Reading Camp. Marshall et al (2010) showed that camp attendance led to statistically significant gains across all domains of program-specific content, and that children were able to transfer their knowledge to less familiar items. In the present study, significant gains in program-specific knowledge were detected in the domains of decoding and encoding, but not letter identification, letter sounds, or reading words/identification of opposites. It is likely that differences in research design, particularly the inclusion of a comparison sample, differences in sample size, and control for potential confounds, contributed to discrepant findings between these two studies. The present study builds on Marshall et al's (2010) findings by showing that the transfer of program-specific knowledge led to significant performance gains on a standardized measure of reading readiness. Most notably, by the end of camp, 92% of *Super WHY!* campers were meeting age expectations for pre-reading skills, as compared to 68% at the start of camp. Again, the comparison sample did not exhibit equivalent gains.

The acquisition of early literacy skills is known to be a complex and lengthy process (Linebarger, et al., 2009); therefore, it is particularly impressive that significant growth was detected after only 5 days (17.5 hours) of *Super WHY!* Reading Camp. Similar findings come from a recent study of in-home viewing of the *Super WHY!* television series. Results showed that meaningful change was found on program-specific and standardized assessment measures after just 2 to 3 viewing sessions, and "huge" effect sizes regarding alphabet knowledge were found with just under 20 hours of exposure (Linebarger, et al., 2009). Future studies should examine the specific features of *Super WHY!* that contribute to its effectiveness. In the meantime, clues can be found in previous studies that have identified the key "active ingredients" of educational programming. Several of these elements are central to the *Super WHY!* television show and Reading Camp, including a detailed educational curriculum, appealing characters and stories, characters with whom children can easily identify, multiple repetitions of the same segments, and viewer involvement and participation (Fisch & Truglio, 2001).

Super WHY! Reading Camp employs similar teaching strategies to those that were found to be effective within the Sesame Street Preschool Education Program (PEP). In particular, the *Super WHY!* Reading Camp program engages children by using active television viewing as part of the curriculum, and employs developmentally appropriate activities and instructional strategies to reinforce and broaden educational teachings (Yotive & Fisch, 2001). Anecdotal evidence suggests that *Super WHY!* facilitators similarly felt extremely positively about the program. When asked about the most effective elements of *Super WHY!* Reading Camp, one lead camp facilitator remarked, "The program in general works. It is kid friendly. It is fun. The kids are familiar with the characters...the curriculum gets a big WOW." Children also appeared to enjoy their participation in *Super WHY!* Reading Camp, with 94% of campers saying that they would like to return next year.

Limitations

While the present findings are very promising, several factors limit the conclusions that may be drawn. Most importantly, the sample size is small, and therefore it is unclear whether they would generalize to a larger and more representative sample. However, findings from Marshall and colleagues (2010), suggest that a larger sample size would allow for the detection of broader program-specific performance gains, rather than weakening the results. Given the high rate of missing demographic forms within

the sample, it was important to assess for performance differences among children whose parents *did* and *did not* return their demographic form, in order to determine whether non-response contributed to sample bias within the final study sample. Indeed, results indicated that children whose parents returned their demographic form performed at a significantly higher level on baseline program-specific and standardized assessments, and showed greater improvement in scores over time, suggesting that the children whose parents completed the demographic form may not be entirely representative of the sampled population. Rather, it appears that parental completion of this form was positively associated with children's reading readiness skills and capacity to benefit from a literacy-promoting reading camp experience.

Because it was important to maintain consistency with previous years' data collection efforts, no significant changes were made to program-specific subtests. While previous investigations have established the internal consistency of these subtests, it is unclear to what degree they are capturing the constructs they were designed to measure (Marshall, et al., 2010). Also, due to the relatively abbreviated nature of program-specific subtests, they may not have captured partial gains in skills and abilities. Additionally, findings regarding program-specific Letter Identification subtests suggest the presence of a ceiling effect, thus limiting their capacity to detect growth among members of the sample functioning at higher ability levels. In other words, for those children who achieved the maximum score at pre-test, post-test scores could only decrease or remain the same. This was the case for more than half the sample, thus limiting its utility for showing significant improvement in performance over time in this study.

Members of the research team did not have the opportunity to directly train camp facilitators on the administration of camp measures, and therefore were unable to ensure standardized administration of assessment tools. However, the research team did visit four camps (2 *Super WHY!* and 2 control camps) that were underway, and data collection procedures were observed and found to be adequately conducted. These visits also yielded first-hand exposure to facilitators' enthusiasm for the *Super WHY!* program, as well as campers' high level of engagement. Site visits also drew attention to campers' idiosyncratic responses on engagement scale items, thus allowing for a more informed interpretation of findings.

Finally, the present study employed only one standardized assessment measure that targeted overall reading readiness. Ideally, it would have been possible to corroborate findings on the GRTR! with a broad range of standardized reading measures, in order to ensure that the camp curriculum was not unintentionally aligned with the GRTR!.

Implications for Future Studies

In closing, despite the above methodological limitations, findings from the present study clearly show that the *Super WHY!* Reading Camp curriculum has a significant and meaningful impact on children's acquisition of emergent literacy skills, particularly with regard to decoding and encoding. Now that it has been established, through the inclusion of a control group, that performance gains can be traced to *Super WHY!* camp participation, future studies should focus on the long-term durability of acquired skills, and whether growth translates into increased enthusiasm for learning and school performance. Moreover, it will be important to determine whether there is a dose-response effect with regard to program participation, such that longer camp sessions would result in greater gains, or conversely maximal benefits may be achieved within 5 days. Additionally, a larger sample size would allow for the assessment of the potentially moderating effects of age, socio-economic status, baseline literacy skills, and gender on children's response to camp. Finally, future studies should focus on identifying the "active ingredients" that make *Super WHY!* such a potent learning tool, and whether these same elements could be translated into a *Super WHY!* curriculum designed for implementation within year-round preschool settings.

References

- Fisch, S. M., & Truglio, R. T. (2001). Why children learn from Sesame Street. In S. M. Fisch & R. T. Truglio (Eds.), *"G" is for Growing: Thirty Years of Research on Children and Sesame Street* (pp. 233-244). Mahwah, NJ: Erlbaum.
- Get Ready to Read!-Revised Early Literacy Manual (2009). National Center for Learning Disabilities.
- Linebarger, D. L., McMenamin, K., & Wainwright, D. K. (2009). *Summative evaluation of Super WHY!: outcomes, dose, and appeal*. Philadelphia: Annenberg School for Communication, University of Pennsylvania.
- Marshall, J., Lapp, D., & Cavoto, K. (2010). *Super WHY! Reading camp: an analysis of participant learning in 2008 and 2009 Reading camps*. San Diego: San Diego State University.
- Wright, J. C., Huston, A. C., Scantlin, R., & Kotler, J. (2001). The Early Window Project: Sesame Street prepares children for school. In S. M. Fisch & R. T. Truglio (Eds.), *"G" is for Growing: Thirty Years of Research on Children and Sesame Street* (pp. 97-114). Mahwah, NJ: Erlbaum.
- Yotive, W., & Fisch, S. M. (2001). The role of Sesame Street-based materials in child-care settings. In S. M. Fisch & R. T. Truglio (Eds.), *"G" is for Growing: Thirty Years of Research on Children and Sesame Street* (pp. 181-196). Mahwah, NJ: Erlbaum.