

An Evaluation of Resident Physician Training and
Implementation of a Pediatric Literacy Intervention

BY

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Abstract

Reach Out and Read (ROR), a pediatric literacy intervention, is widely disseminated, yet there has been a paucity of research on training of intervention agents and no published research on the fidelity of intervention component delivery or identifying the amount of literacy counseling (LC) delivered during an intervention. In this evaluation study, data was collected for four resident physicians after three phases of training, by direct observation during 45 well-child exams. Data was examined to (a) evaluate the fidelity of implementation of the intervention components and (b) report the frequency of occurrence of literacy counseling delivery by 10-second intervals during well-child exams. Other measures included an evaluation of resident knowledge and attitudes pre-training and post-study, and parent report post-intervention. Results demonstrated that: (a) during 93% of well child-visits at least 1 ten-second interval of LC was delivered and books were distributed during 91% of visits, (b) the amount of literacy counseling delivered during a ROR intervention was small; a mean of 49 seconds per well-child visit, (c) resident knowledge and attitudes remained constant pre-training and post-intervention, (d) parents may not have been aware of receiving LC; 7% reported receiving LC, and (e) 85% of parents did recall receiving a book. Future ROR research needs to address fidelity of ROR implementation, amount of literacy counseling delivered, and identify a threshold amount of literacy counseling needed to influence parents to deliver home literacy activities.

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Table of Contents

Acceptance Page.....	ii
Abstract.....	iii
Acknowledgment.....	iv
Table of Contents.....	v
List of Tables.....	viii
List of Figures.....	ix
Introduction.....	1
A brief history of ROR implementation.....	3
ROR intervention components.....	4
Volunteers in the waiting room.....	4
Book distribution.....	4
Literacy Counseling.....	5
Resident training for implementing ROR.....	6
ROR’s physician training options.....	6
Physician training as reported in ROR studies.....	6
ROR related resident training research.....	7
Factors that may influence implementation of ROR.....	8
The historical underpinnings of anticipatory guidance.....	9
Developmental issues as a low priority for physicians.....	10
Physician training.....	12
Purpose and Research Questions.....	13
Methods.....	14
Overview.....	14
Setting.....	15
Participants.....	15
Resident physicians.....	15
Children and family members.....	16
General procedures for the ROR intervention.....	17
Waiting room volunteers.....	18
Clinic nurses.....	18
Resident physicians’ delivery of intervention components.....	19
Measurement.....	19
KUMC ROR resident survey.....	20
The CORPE.....	21
Developing the CORPE.....	21

Literacy counseling and anticipatory guidance measures.....	24
CORPE observers.....	25
Observation procedures.....	25
Inter-observer agreement.....	26
ROR implementation fidelity.....	27
ROR Parent Survey.....	27
Social validity.....	29
Design and Manipulation of the independent Variable.....	29
Standard ROR training (Phase A).....	30
Data collection during Phase A.....	31
Advanced training (Phase B).....	31
Data collection during Phase B.....	32
Intensive training (Phase C).....	32
Data collection during Phase C.....	34
Results.....	34
Did increased levels of ROR training improve residents' fidelity?.....	34
Book distribution fidelity.....	35
Literacy counseling fidelity.....	35
Parental reports of intervention delivery.....	36
Did increased levels of ROR training improve resident-parent interactions about early literacy during well-child visits?.....	37
Occurrence of literacy-related behaviors.....	37
Percentage of time.....	37
Did resident training change knowledge and attitudes of residents?.....	41
Knowledge survey.....	41
Attitude survey.....	42
Did parents receiving ROR report providing more in-home literacy experiences for their children?.....	44
Discussion.....	45
Overview of major findings.....	45
Findings related to research questions.....	46
Research question one.....	46
Research question two.....	50
Research question three.....	51
Research question four.....	54
Limitations.....	54
Future research and directions.....	56
Summary.....	57
References.....	59
Appendices.....	68

Appendix A Intervention agent training as indicated in ROR studies.....	68
Appendix B ROR research study descriptions of intervention component delivery.....	75
Appendix C KUMC Reach Out and Read Resident Survey.....	80
Appendix D Reach Out and Read Parent Survey.....	83
Appendix E CORPE data collectionsheets.....	87

List of Tables

Table 1. CORPE Code Definitions

Table 2. Fidelity of resident's implementation of literacy counseling and book distribution

Table 3. Parent responses to phone survey questions related to fidelity of ROR Delivery

Table 4. Duration and Percentage of Anticipatory Guidance and Literacy Counseling During Visits

Table 5. Results of resident "attitude" survey

Table 6. Parental response to ROR Parent Survey Questions pertaining to literacy

List of Figures

Figure 1. Descriptive data for training phases A, B, and C for Residents 1, 2, 3, and 4.

Data are presented as 10-second intervals for anticipatory guidance delivered, and literacy counseling delivered by Residents 1, 2, 3, and 4.

Figure 2. Descriptive data for training phases A, B, and C for Residents 1, 2, 3, and 4.

Data are presented as percentages of total well-child visit minutes for (a) anticipatory guidance and (b) literacy counseling.

Figure 3. Number of Correct Responses on Resident Survey of Knowledge

An Evaluation of Resident Physician Training and
Implementation of a Pediatric Literacy Intervention

INTRODUCTION

The rationale behind pediatric literacy interventions is that parents, when influenced by health care providers, will take steps to improve their home literacy environment; and thereby, positively affect their child's language development and subsequent readiness for school (Needlman & Silverstein, 2004). Reach Out and Read (ROR), a pediatric literacy intervention, was developed for implementation in medical clinics serving low-income minority families during routine well-child exams with children, six to sixty months (Needlman, Fried, Morley, Taylor, & Zuckerman, 1991). While Latino and African American children have particularly low reading skills (Lee, Grigg, & Donahue, 2007), children living in poverty bear a disproportionate burden of language delay and reading disability (National Center for Education Statistics, 2005). Shared-reading has been identified as the single most important strategy in promoting emergent literacy skills with young children (Lonigan, Shanahan, Cunningham, 2008). The U.S. Department of Health and Human Services (2005) reported that 47.2 % of parents read to their children daily; however, only 30.6% of young children were being read to daily in homes with lower income and lower educated parents. Parents are more likely to read to their child when their physician encourages them to do so (Golova, Alaio, Vivier, Rodriguez, & High, 1999). Given that parents typically have contact with physicians through pregnancy, delivery, and at least ten scheduled well-child visits and examinations with each

child, before the age of five years, these well-child visits are opportunities to discuss shared-book reading. In fact, well-child visits are considered to be the main source of preventive care for children in the United States and are intended to assess biomedical health as well as provide discussion to address age-appropriate topics, determine what families know, reinforce practices, and provide new information (Dinkevich & Ozuah, 2002). Age-appropriate recommendations for the content of these well-child visits, including encouraging literacy activities in the home, have been established by the American Academy of Pediatrics (1997/2002). One study that identified predictive factors of shared reading in the home of low-income families recommended that pediatric providers could model (a) the choice of developmentally-appropriate books, and (b) engaging techniques for oral story reading (Celano, McFadden-Garden, & Swaby-Ellis, 1998).

A review of the 16 ROR research studies, 1991-2008, found that each study was conducted in a hospital setting associated with a university (Estes, 2008) and resident physicians were often identified as the intervention agents for ROR. A resident physician was defined as an individual who had received a doctorate in medicine and enrolled in a three-or four-year hospital based training program. In each of the aforementioned studies, there was a paucity of information provided regarding the training procedures provided to resident physicians preparing them to implement the ROR intervention components. Given that the intent of ROR is for physicians to influence parents to read to their children and provide literacy related activities in the home, it is critical to identify the training that affects the desired outcomes. The

purpose of this study was to describe the way specific types of training delivered to resident physicians influenced the fidelity with which they implemented ROR and the extent to which they engaged in literacy counseling with parents/caregivers during children's well-child visits.

A Brief History of ROR Implementation

Since the inception of ROR in 1989, 50,000 physicians, resident physicians, and nurses have been trained to implement the ROR model in 3,800 hospitals and health centers; 20 million books have been distributed; and 25% of low-income families, with children five and under, have participated in an ROR intervention (ROR National Center, retrieved 5/17/09). The ROR model has a 20-year-history and an established infrastructure for support of wide-scale implementation. Programs exist in all 50 of the United States (including the District of Columbia), as well as Guam, Puerto Rico, the Virgin Islands, Africa, Italy, Israel, the Philippines, England, and Canada (ROR National Center, retrieved 12/28/08). Since 2000, the Department of Education has appropriated \$36.9 million for continued national expansion and the Department of Defense has appropriated \$1.1 million to establish ROR programs on military bases around the world (ROR National Center, retrieved 6/16/09). Yet, little is known about how this program actually influences the delivery of ROR components by physicians to parents and whether the ROR intervention makes a difference in what parents do in terms of supporting their children's early literacy at home. Before discussing the issue of ROR intervention training, the intervention components will be reviewed.

ROR Intervention Components

ROR is designed to be implemented, during the well-child visit, in three components: (a) volunteers modeling reading to children in the clinic waiting room, (b) physicians distributing free books to families, and (c) physicians providing literacy counseling to parents. The amount of time spent in the well-child exam varies; each exam is responsive to the individual family.

Volunteers in the Waiting Room.

The first component of ROR is modeling of shared book reading in the waiting room by a trained volunteer. Typically, a section of the waiting room is set up as a reading area. For example, there may be a child-sized table and chairs and a book rack with children's books. As children enter the waiting room, a volunteer invites them to listen to a story. The idea is for the volunteer to involve the children in reciprocal interactions with the book and providing a model for parents/ caregivers in how to promote young children's literacy through reading with expression, pointing to pictures, asking questions, and otherwise engaging the child in shared book reading. Delivery of this intervention component is not influenced by resident physicians but is arranged by the ROR site director and thus will not be discussed related to this study of resident delivery of ROR intervention components.

Book Distribution

The second component of ROR involves distribution of a new, free, age-appropriate book. For example, a six-month old would be given a book with only pictures and no words, whereas a five-year-old would be given a book with pictures

and a basic story line. The book is delivered to the family by the physician during the well-child exam. Emphasis has been placed on providing books reflecting the diversity of the demographics of the clinic and the primary language of the families being served; books are available in twelve languages (Willis, Kabler-Babbitt, & Zuckerman 2007). The rationale for distributing books is that typically children of low-income families may not have books in their home and thus opportunities for parents to share books with their children may be limited; books received during these clinic visits may be the only books in the home or add to the family's collection of books (Needlman et al., 1991).

Literacy Counseling

Literacy counseling is the third intervention component of ROR and one of several topics discussed by physicians, with parents, during a well-child exam; anticipatory guidance is the umbrella term used to encompass all topics discussed by a physician during an exam. The ROR National Center, in its on-line training for physicians, defines *literacy counseling*: "Literacy counseling is developmentally appropriate to the age of the child and is part of the more general primary care conversation about development, speech and language, bedtime and sleep issues, and parenting practices" (ROR-Continuing Medical Education Course, retrieved 12/28/08). The distinction between anticipatory guidance, as an umbrella term for all topics that a physician discusses, and literacy counseling as one of these topics, is an important clarification because studies on ROR often substitute the term "anticipatory

guidance” for the term “literacy counseling.” Problems created by this practice will be discussed later in this paper.

Resident Training for Implementing ROR

ROR’s Physician Training Options

The ROR Program Manual (Klass, Needleman, & Zuckerman, 1999) suggests three methods of physician training for implementation of the ROR components, with an emphasis on the importance of emphasizing shared-book reading and literacy activities in the home. These methods include: (a) a free one-hour on-line ROR Continuing Medical Education course (www.bu.edu/cme/ror), (b) ROR National Center staff or regional trainers presenting to a large group of physicians at Grand Rounds, and (c) separate workshops for small groups of faculty, clinic staff, or participating nurses. As a point of clarification, Grand Rounds, an integral component of medical education, is a formal presentation by an expert on a medical issue for the purpose of presenting new information and enhancing clinical reasoning skills.

Physician Training as Reported in ROR Studies

The frequency, duration, and content of physician training were described either briefly or not at all in the previously mentioned ROR research studies (see Appendix A). Only 10 (63%) of 16 published ROR studies reported that physicians received training (Estes, 2008). Eight of the 16 studies (50%) provided a brief description of the training delivered; descriptions ranged from one sentence to a paragraph. One of the studies described the content of the ROR training; Sanders, Gershon, Huffman, and Mendoza (2000) explained that physicians were trained in

dialogic reading, a well-researched shared-book reading technique. In addition, only two studies, Jones et al. (2000) and Mendelsohn et al. (2005), referred to training that included references to the previously mentioned AAP (1997/2002) well-child visit guidelines including the delivery of literacy counseling. Three studies (19 %) identified the duration of the physician training in the ROR intervention; the range of duration was 30 minutes (Sanders et al., 2000) to 4 hours (High, Hopmann, LaGasse, & Linn, 1998). However, when considering duration, frequency, and content of training, it is important to note that it is not just more training, but the right training that greatly impacts the quality of patient care (Hall & Roter, 1988).

ROR Related Resident Training Research

From 1991 to 2000, there were no published evaluations of the training physicians received to implement the ROR program. Hazzard, Dubrow, Celano, McFadden-Garden, and Melhado (2000) were the first to test the hypothesis that training in emergent literacy would enhance residents' literacy-related knowledge, attitudes, and intervention practices as measured by self-reported surveys. In a quasi-experimental design study, Hazzard et al. (2000) found that 48 residents in the intervention group, who received 30-45 minutes of literacy training, did not improve in knowledge or attitudes relative to 18 residents in a comparison group who received no training. It is important to note that additional training opportunities were made available (readings, Grand Rounds, and faculty modeling) on a volunteer attendance basis. Hazzard et al. noted two findings: (a) as residents self-reported positive attitudes toward literacy they also self-reported higher frequency in delivering literacy

counseling (b) those residents who self-reported meeting one-on-one with a faculty member also reported higher frequency in delivering literacy counseling. The authors concluded that longer training and receiving different types of training may allow more of a focus on building knowledge and changing attitudes of resident physicians.

In a second study involving resident training, Rosenthal, Werner, and Dublin (2004) investigated whether presenting ROR training would improve family medicine resident's knowledge, attitudes, and practices in a family medicine program serving low-income families. Rosenthal et al. (2004) administered a pre-post questionnaire to 24 residents to assess the effect of a four-hour educational training focused on teaching residents to counsel adults and children about literacy. Residents self-reported increases in literacy knowledge and practices, as well as improvements in attitudes toward the ROR intervention. It is noteworthy that 67% of the 24 participating residents identified time as a major barrier to delivering literacy support to families.

These two studies provide evidence that there has been a paucity of research on physician training to implement ROR, specifically to determine how much and what kind of training is most effective in demonstrating desired outcomes. Additionally, neither study included direct observation in order to establish a relationship between training and delivery of intervention components.

Factors that May Influence Implementation of ROR

There are three factors in the medical literature that may influence physician training and implementation of ROR intervention components: (a) lack of consistent

definition for anticipatory guidance and subsequently a definition for literacy counseling (b) evidence of developmental issues as a low priority for physician discussions with parents, (c) lack of evidence for a link between physician training and practice.

The Historical Underpinnings of Anticipatory Guidance

Since 1913, anticipatory guidance has been an umbrella term for topics of discussion physicians initiate with families during a well-child exam and anticipatory guidance has been called the “cornerstone” of the well-child exam (Foster, 1963). Two early definitions of anticipatory guidance were (a) “teaching the mother what to expect before she begins to worry or makes a mistake” (American Public Health Association, 1955, p. 47) and (b) “provision of information to parents or children with the expected outcome being a change in parent attitude, knowledge, or behavior” (Telzrow, 1978, p. 14). A historical issue in medical literature is that the term *anticipatory guidance* has been used to convey different meanings. Pridham, Hansen, and Conrad (1977) identified this as a problem, “Anticipatory care is not well delineated either conceptually or technically, making rigorous study and practice difficult. The anticipatory care process must be more precisely specified if outcomes within the clinical encounter are to be evaluated” (p. 1077). From a behavior analytic point of view Pridham and colleagues identified an important research problem, “without explicit, well-written-definitions of target behaviors, researchers would be unable to accurately and reliably measure the same response classes within and across

studies; or to aggregate, compare, and interpret their data” (Cooper, Heron, & Heward, 2007, p. 65).

In the seminal ROR study by Needleman and colleagues (1991), “Anticipatory guidance” was the term used to describe the literacy counseling component of ROR. In doing so, the stage was set for physicians being trained in implementation of ROR to deliver anticipatory guidance and distribute a book. Using the term “anticipatory guidance” took the focus off of the actual intervention components of delivering literacy counseling and a book. Furthermore, Needleman et al. set the stage for ambiguity by stating “No set content for anticipatory guidance was established, and in practice the counseling varied depending on the particular practitioner and family” (p. 882). In fact, a review of the 16 published ROR research studies to date (Estes, 2008) found no study operationally defined anticipatory guidance. Instead, in these studies anticipatory guidance is described only briefly in the context of the delivery of all intervention components (see Appendix B). Only 1 of the 16 studies (Sanders et al. 2000) identified literacy counseling as the ROR intervention component; all others identified the intervention component as anticipatory guidance.

Developmental Issues as a Low Priority for Physicians

An additional factor that may influence ROR research is that historically anticipatory guidance and its sub-topics of developmental issues (e.g., literacy) have been a low priority for physicians. For example, while sixty-percent of a pediatrician’s in-office time is spent on well-child exams (Reisinger & Bires, 1980),

physicians spend most of that time carrying out physical examinations and updating children's immunizations and only 1% to 8% of their time on communication (Korsch, Negrete, Mercer & Freeman, 1971). Similarly, Resinger and Bires reported that pediatricians in private practice were found to spend an average of less than 8.4% of total visit time on anticipatory guidance during an average 10.3 minute visit. In addition, another study found that opportunities to discuss psychosocial issues arose in 88% of well-child visits with pediatric or family practice residents, but residents responded with information, reassurance, guidance, or a referral only 40% of the time (Sharp, Pantell, Murphy, & Lewis, 1992). It is important to note that a low rate of delivery of anticipatory guidance is a contemporary discussion in the literature and continues to be viewed as problematic (Galuska et al., 2002; Magar, Dabova-Missova, & Gjerdingen, 2006; Nelson, Wissow & Cheng, 2003).

In response to the early concern about the lack of attention to developmental and behavioral issues during the well child exam, the American Academy of Pediatrics (AAP) reported that "preventive pediatrics is the core of quality medical care for children" (1977); subsequently training programs were developed to address increasing discussion of developmental issues during well-child exams. Nonetheless, a recent study demonstrated (a) large variations in the delivery of anticipatory guidance, (b) a paucity of studies examining the specific topics covered during the delivery of anticipatory guidance, and (c) 23% of parents reporting a lack of discussions with their physician regarding developmental issues (Schuster et al., 2000). Thus, implementing a pediatric literacy intervention within the well-child visit,

wherein time and attention to children's development has been minimized, presents considerable challenges. In relation to the ROR intervention, a low rate of physician attention to developmental issues is problematic because opportunities for delivery of literacy counseling, a developmental issue, may be minimized

Physician Training

Physician training is a third historical factor that may influence ROR research. Early efforts to enhance physicians' skills in delivering anticipatory guidance occurred in the context of training curriculum in behavioral and developmental pediatrics (BDP) (Friedman, Phillips, & Parrish, 1983). BDP training arose to address parental concerns about learning and behavioral issues and a desire by parents for guidance from physicians (Hickson, Altemeler, & O'Connor, 1983). In one study, 81% of parental questions to pediatricians concerned learning and behavioral issues (McCune, Richardson, & Powell, 1984). Yet, Costello (1986) reported that pediatricians believed they lacked the qualifications and time to adequately address parents' learning and behavioral concerns.

The BDP training programs focused primarily on the perceived barriers to delivering anticipatory guidance on topics of BDP, specifically knowledge and attitudes, rather than on actual delivery. Some training programs demonstrated that specialized training in BDP during residency could produce short-term increases in BDP knowledge (Bennett, Guralnic, Richardson, & Heiser, 1984; Guralnick, Heiser, Richardson, & Shibley, 1987; Phillips, Friedan, Zebal, & Parrish, 1985). However, in two studies of BDP training, residents self-reported a lack of competence in

addressing BDP concerns (Trent, Hock, & Yancy, 1982; Camp, Leff, Berman, & Gitterman, 1991).

BDP training did not resolve the discrepancy between parents wanting physician guidance pertaining to learning and behavioral issues of children and physician reluctance to providing such guidance. For example, Young, Davis, Schoen, and Parker (1998) conducted a national phone survey and reported that the most frequent parental child-rearing concern was “how to encourage learning.” Yet, when 556 pediatricians responded to a survey regarding their primary goal in health supervision, biomedical issues were listed first, not learning or behavioral issues (Cheng, DeWitt, Savageau, & Connor, 1999). However, 63% of the pediatricians from the Cheng et al. (1999) study did report that residency training was an important factor in determining the content and emphasis of health supervision visits.

Purpose and Research Questions

The purpose of the current research is to provide a descriptive evaluation of the effects of resident physician training on the delivery of ROR. To date, research related to ROR physician training is minimal and no direct observations of ROR implementation have been published. Thus, this research sought to evaluate the effects of training on resident physician delivery of ROR.

1. Does an increased level of ROR training improve residents’ fidelity of implementation as defined by residents’ (a) distribution of a free book to parents and (b) delivery of literacy counseling to them during well-child visits as measured by direct observation and parent report?

2. Does an increased level of ROR training in the intervention improve resident-parent interactions about early literacy during well-child visits as measured by direct observations of the time spent in literacy counseling, literacy talk, and anticipatory guidance as measured by direct observation?
3. Does resident training in the ROR intervention change the knowledge and attitudes of residents about early literacy as measured by a survey administered pre-training and post-study?
4. Do parents receiving ROR report providing more in-home early literacy experiences for their children?

METHODS

Overview

A University of Kansas Medical Center (KUMC) physician secured a start-up grant from the ROR National Office to establish the first ROR program in the metropolitan area of Kansas City. This physician took responsibility for the programmatic aspects of organizing ROR implementation. Another physician took responsibility for the ROR evaluation and invited the Juniper Garden Children's Project (JGCP) to assist with the evaluation component. The author of this study, a graduate student at JGCP, served as the evaluation coordinator. Thus, an opportunity to evaluate the effects of a ROR implementation arose. Of particular interest were the effects of resident training and the extent to which that training lead to changes in (a) fidelity of ROR implementation, (b) resident interactions with families in well-child visits, (c) resident knowledge and attitude about literacy, and (d) parents' reports of

the outcomes of their experiences. Resident training consisted of a planned package of experiences spaced approximately 18 weeks apart as discussed below. The entire study lasted one calendar year.

Setting

The setting for this study was the Children's Ambulatory Unit of KUMC located in the urban core of Kansas City, Kansas. Implementation of the ROR intervention occurred during four mornings and three afternoons, each in a three-hour block of time during which well-child exams occurred. Within KUMC, each three-hour block of time is referred to as a "clinic." The remaining morning and afternoons were each designated for Spanish-speaking clients. The exam rooms typically contained an exam table, two chairs, and a cabinet with a sink.

Participants

Participants in this study included: (a) resident physicians and (b) children and their accompanying family members.

Resident Physicians

A resident physician was defined as an individual who had received a doctorate in medicine and currently working in a three-or four-year hospital based training program at KUMC. Residents were eligible for participation if they: (a) provided regularly scheduled pediatric health care supervision visits at the hospital; (b) anticipated remaining in the pediatric program through the end of the study; and (c) were not currently distributing books or providing literacy training to families.

All residents who were on-duty in the ambulatory unit were trained to implement ROR. In the first phase of training, 35 of the 41 residents provided written consent to be observed, thereby beginning participation in this study as intervention agents and eligible to contribute data to the study. Seventeen (49%) of the enrolled residents were male, 18 (51%) were female; ages ranged from 26 to 49 years. Fourteen (40%) of the residents were in their first year, 11 (31%) were second year residents, 6 (17%) were third year residents, and 4 (11%) were fourth year residents.

From this group of residents who completed initial training (A), 21 were eligible and able to completed Phase B training. Of this group experiencing both A + B training, four residents of seven eligible were able to complete the C training phase. These four residents had experienced all three conditions (A+B+C) by the end of the study. Resident 1 was a 29-year-old female in her second year of residency, Resident 2 was a 32-year-old male in his second year, Resident 3 was a 27-year-old male in his first year, and Resident 4 was a 43-year-old resident in her third year of residency.

The decline in the number of residents receiving additional training at B and C was a result of several factors including criteria of at least 3 observations during Phase A and having attended Phase B training; and thereafter, paternity leave, rotation out of the clinic, and extended medical leave prior to Phase C training. Thus, these 4 A+B+C residents played a major role in this report given that comparisons between training conditions were possible.

Children and Family Members

Eventually, 150 eligible families were enrolled in the study. Children and their accompanying family members were recruited for the study if the child met the following criteria: (a) the child was 6 months to 60 months-of-age, (b) the adult(s) accompanying the child to the clinic lived in the same home as the child, (c) the child was scheduled to be seen by a resident physician and not a faculty physician. Given these criteria, all eligible children whose parent or accompanying caregiver provided consent to participate were enrolled in the study.

The children were evenly distributed by gender. The distribution of age among the children was: less than 12 months (8%), one-year-of-age (38%), two-years-of-age (15%), three-years-of-age (11%), four-years-of-age (15%), and five-years-of-age (11%). The mean age of participating children was 28.8 months, with a standard deviation of 20.09. The distribution of mother-reported race was: African-American (47%), Caucasian (37%), Latino (8%), Asian Pacific (2%), Multi-racial (2%), other (1%), and unknown (3%).

General Procedures for the ROR Intervention

This study took place in the context of well-child visits. In this context: (a) volunteers read to children as they and their family were in the waiting room, (b) clinic nurses identified eligible families after check-in, and (c) well-child exam observers gained parent consent to observe and then record the verbal and non-verbal behavior of the parent and resident physicians, (d) resident physicians delivered the ROR intervention components of literacy counseling and free book distribution, and (e) phone surveyors conducted the ROR Parent Survey one to two weeks after the

well-child exam.

Waiting Room Volunteers

The families' first contact with the ROR intervention was in the waiting room. Waiting room volunteers were recruited by the University of Kansas Medical Center's Volunteer office. The Volunteer Coordinator scheduled volunteers to read to the children, at one-hour intervals, in a designated reading area in the waiting room, which featured a child-size table, two chairs, a book shelf, and a carpet. Volunteers were eligible for participation if they met the following criteria: (a) spoke English fluently, (b) could commit to at least three hours of volunteer time each week, and (c) agreed to attend volunteer training. All persons who met these eligibility criteria received a two-hour training in the procedures of reading books to children from infancy through school-age. Because this intervention component did not address any of the remaining research questions, and was not related to the focus on residents and training, data for volunteers in the waiting room was not considered beyond fidelity of the intervention.

Clinic Nurses

The three clinic nurses employed in the KUMC Children's Ambulatory Clinic were responsible for (a) identifying eligible families, (b) notifying the well-child exam observer who was waiting in the nurse's station, and (c) placing an age-appropriate book with the child's chart in a holder outside of the exam room. It is important to note that as a result of this process, opportunities to observe were randomly distributed across residents. Thus, the frequency of observing individual

residents and the determination of which resident was observed was controlled by (a) the nurses' identification of eligible families and assignment to a resident, and (b) the family giving consent to be observed.

Resident Physicians' Delivery of Intervention Components

Residents were responsible for providing the intervention components of (a) literacy counseling provided to parents during the well-child exam and (b) distributing a free age-appropriate book to the family. Typically, the parents entered the exam room before the resident physician. Shortly after arriving in the exam room, the resident would begin the process of giving a physical examination to the child. Residents varied with regard to the style they used in communicating with parents, but generally each resident would talk with the parents prior to and while conducting the exam. It was during this time that residents would engage generally in talk about children's development (i.e., anticipatory guidance) and would embed discussion about how to promote literacy with their children (i.e., literacy counseling). At some time prior to leaving the exam room, the resident would hand a book to either the child or parent.

Measurement

To address the research questions, three measures were used. These included: (a) the KUMC ROR Resident Survey, (b) the Code for Observational Recording of Pediatric Examinations (CORPE), a direct observational measure of physician-parent verbal and non-verbal behavior during well-child exams, and (c) the ROR Parent Survey. Information from the CORPE and the Parent Survey were used to address

Question 1. Information from the CORPE was used to address Question 2.

Information from the Resident Survey was used to address Question 3. And,

information from the Parent Survey was used to address question 4.

KUMC ROR Resident Survey

An 18-item KUMC ROR Resident Survey was developed by the JGCP evaluation coordinator and reviewed by the ROR co-directors (see Appendix C). The purpose of this measure was to assess changes in physician's knowledge and attitude of their role in promoting literacy during clinic visits. The Knowledge portion of the survey consisted of 10 questions pertaining to early literacy using a multiple-choice format. The questions came from information presented in the basic training and were intended to measure training outcomes. For example, "Many factors influence a child's early literacy. Which of the following is the most important factor? (a) # of books in the home, (b) bedtime routine of reading, (c) going to the library, or (d) none of those mentioned is critical." The mean number of correct responses on the survey was calculated separately for each resident.

The Attitude portion of the survey consisted of eight statements to be rated with a five-point Likert-type scale with one being "do not agree" and five being "strongly agree." For example, "Physicians can play an important role in supporting family literacy" was designed to reflect the resident's attitude toward their ability to influence parents to provide literacy opportunities in the home. The Resident Survey was administered to the initial 41 residents prior to their receiving standard training as a pre-training measure. Each resident completed the survey and returned it. The same

instrument was administered as a post-test measure 12 to 13 months after initial training.

In sum, the ROR Resident Survey used two separate scales; (a) a survey of knowledge of early literacy and (b) a survey of attitudes toward delivering literacy counseling during well-child exams. A composite knowledge score (mean correct of the knowledge questions) was calculated and attitude score was examined. Attrition was problematic for three reasons: (a) completing the survey was not mandatory, (b) complex resident schedules made it difficult to personally contact each resident who had completed a pre-survey, and (c) the study ended at a time when residents were rotating out of the clinic.

The CORPE

The CORPE is a direct observation system designed specifically for this study to characterize the verbal and non-verbal interactions that occur between physician, children, and parents during a well-child exam. The CORPE uses a 10-s partial interval (Repp, Roberts, Slack, Repp, Berkler, 1976) sampling system used to observe each resident's delivery of anticipatory guidance and the specific topics of the anticipatory guidance. Thus, literacy counseling, as one topic of anticipatory guidance, was directly observed and measured.

Developing the CORPE. Development of the CORPE was a three-part process: (1) observing during well-child exams scripting the verbal and non-verbal behavior of resident and family members in order to identify the categories and subcategories of verbal and non-verbal interactions that occur between the doctor,

family member, and child; (2) establishing behavioral definitions for each of these observable behaviors; and (3) establishing that definitions were clear enough so that observers could attain recommended standards of interobserver agreement.

To begin the process of developing the CORPE, ten well-child exams were observed by the JGCP evaluation coordinator. Descriptions of all non-verbal behavior and scripts of all verbal behavior of residents and family members were captured in writing during the time that the resident, child, and adults were in the exam room. These interactions were grouped into representative categories: resident verbal and nonverbal behaviors, focus of resident behavior, mom behavior, and dad behavior. From these initial observations a coding system was developed. This coding system was used by the same observer for ten additional observations. While the coding system captured a majority of the observed interactions, there were some interactions for which a code had not yet been identified. These were added to the system. When the JGCP evaluation coordinator could consistently code each observed interaction, a training manual was developed. Then an individual who had just finished medical school was asked to observe and begin the process of establishing reliability.

Use of the CORPE facilitated recording of resident verbal behavior, resident non-verbal behavior, focus of resident verbal behavior, as well as mother's verbal behavior, and father's verbal behavior. The verbal behavior of the resident, mother, and father were coded in eight categories and operational definitions were developed for each of the subcategories of verbal behavior (see Table 1).

Table 1

CORPE Code Definitions

CORPE code	Code definition
H=Health	Statements or questions related to health issues: any discussion of feeding, including breast-feeding, formula, types or amounts of foods; sleeping (as a process, not as related to specific problems getting the child to stay in bed); allergies; immunizations, illness related behaviors
GD=Growth & Development	Statements related to growth & development: height, length, developmental milestones; discussion of items on the Denver Developmental checklist
PAR=Parenting	Comments related to parenting: bed-time routines, discipline; any questions parents asks that pertain to requesting guidance on parenting issues; any techniques or strategies for working wit children to gain cooperation that resident's provide
SAF=Safety	Comments related to safety: ideas on childproofing the home using child safety seats, seat belts, etc.
RP=Rapport	Rapport building examples: How are you doing?; verbal exchanges during exam; any comment that help child or parents feel comfortable
LIT=Literacy	Comments related to receptive or expressive language, vocabulary, listening, reading, writing, music; references to books or specifically the book that is handed to the child or parents
OT=Other talk	Any talk that does not fall under one of the other six categories of behavior
NT=No talk	When resident or parent is not talking

The non-verbal behavior of the resident was coded in five categories which are not provided because the non-verbal behavior of residents is beyond the scope of this study given that the focus of the evaluation is on delivery of literacy counseling. Data generated by the CORPE were used to determine the extent to which residents' implemented the ROR intervention components with fidelity (Research question #1) and the extent to which resident engaged in literacy counseling and anticipatory guidance (Research question #2).

Literacy counseling and anticipatory guidance measures. The variables recorded on the CORPE that are relevant to the present study were literacy counseling and anticipatory guidance. Literacy counseling was defined as the portion of anticipatory guidance specific to the topic of literacy as defined in Table 1: "Comments related to receptive or expressive language, vocabulary, listening, reading, writing, music; references to books or specifically the book that is handed to the child or parents." The term anticipatory guidance was defined as resident verbal behavior coded for topics including: literacy, safety, parenting, growth & development, and health. Data were summarized using the total frequency of intervals in each well-child visits as well as the percent of intervals each of the key variables occurred. First, the total number of minutes was calculated for each well-child exam, as well as literacy counseling and anticipatory guidance delivered during the exam. Second, the total number of 10-s intervals per well-child exam were calculated, as well as the number of 10-s intervals of number of literacy counseling and anticipatory guidance intervals for residents and parents. Third, the percentage of each visit that

anticipatory guidance and literacy counseling were delivered was calculated. Lastly, the percentage of anticipatory guidance that was literacy counseling was calculated.

CORPE observers. Medical students at KUMC and graduate students at Juniper Gardens Children's Project were recruited to collect CORPE data during well-child exams. Eight individuals eventually met the criteria and served as observers. Observers were volunteers and did not receive compensation for their participation. Four criteria were met in order for an individual to become a well-child exam observer: (a) availability to observe during a morning or afternoon clinic at least twice a week for at least a semester, (b) willingness to attend individual training sessions, (c) ability to pass a written training test, and (d) ability to meet observation reliability criteria of 85% for three consecutive observations. All observers received individual training for the CORPE and established reliability prior to having contact with parents in the clinic.

Observation procedures. After being introduced to the family, the well-child exam observer: (a) accompanied the family to an individual family exam room prior to the doctor's arrival, (b) explained the purpose of the study, (c) requested permission to observe during the exam and permission to conduct a follow-up phone survey, (d) gained written parent permission, and (e) gave the parent a copy of the parent permission and a brochure explaining the study. The parent permission form was a user-friendly version of the form required by the KUMC's Internal Review Board. Observers stood in a corner of the room directly opposite where the exam table was located. Each observer held a clipboard with a copy of the ROR Parent

Survey (see Appendix D), the CORPE cover sheet and numerous record sheets (see Appendix E). The moment the resident physician entered the room, the observer pushed the start button on a cassette recorder to listen to an audio tape signaling 10 second intervals.

Inter-observer agreement. Inter-observer agreement was defined as marking the same target behavior code for the same 10-s interval. Inter-observer agreement was assessed by having two observers independently and concurrently record during the well-child exam, while present in the exam room, using the CORPE. The interval-by-interval method of agreement was used for each subcategory of the CORPE to determine reliability (Kazdin, 1982). The number of agreements was divided by the number of agreements plus disagreements. These quotients were then multiplied by 100.

Inter-observer reliability reported for this study was for data collected for resident verbal behavior only (not the non-verbal behavior) because this paper focused only on the anticipatory guidance and literacy counseling provided by the resident. Two observers collected data during 36 (35%) of 102 observations across all phases of the study (i.e., phase A, B, and C). Inter-observer agreement for anticipatory guidance delivered by residents for all topics was found to have a mean of 83% (range = 80%-90%). Inter-observer agreement for resident verbal behavior for the topic of literacy counseling was found to have a mean of 82% (range = 80%-90%). Inter-observer reliability was also calculated for the four residents that completed all three phases of training (i.e., phases A, B, and C). Eleven observations

were completed on Resident 1, inter-observer agreement was evaluated four times (36%), mean = 80% (range = 80%-86%). For Resident 2, inter-observer agreement was evaluated during three of the nine observations (33%); mean = 83% (range = 80%-85%). For Resident 3, inter-observer agreement was evaluated during three (33%) of nine observations; mean = 83% (range=82% to 87%). Sixteen observations were conducted with Resident 4, and during four of these, inter-observer agreement was evaluated (25%); mean = 80% (range = 80% to 81%).

ROR implementation fidelity. The fidelity of ROR implementation was assessed using data from the CORPE (Wolery, 1994) reflecting the three key intervention components: (a) “Was a ROR volunteer in the waiting room when the family was there?,” (b) “Was a child’s book given to the family?,” (c) “Was literacy counseling provided?” Literacy counseling was considered delivered if there was at least one 10-s interval coded. Fidelity measures for each component was measured in a “yes” or “no” manner.

ROR Parent Survey

The ROR Parent Survey provided a third measure of outcomes addressing the research questions. The purpose of the ROR Parent Survey was to (a) obtain information regarding the home literacy environment and (b) assess parents recall of receiving the intervention components. Additional questions were asked for the purpose of blinding parents to the aforementioned purposes and reduce the possibility of answers influenced by social desirability. The measure was heavily based on a similar survey developed by Needleman et al. (1991) which is widely used by ROR

researchers; modified versions of the survey are a primary tool for measuring outcomes of ROR interventions (Needlman, Klass, & Zuckerman, 2006). For this study, modifications to the original survey were suggested by the co-directors of the KUMC-ROR program to address some specific issues germane to the evaluation of their program.

The ROR Parent Survey consisted of 35 items. A coding system was developed to score the answers to the items which were a combination of demographic questions, “yes”-“no” questions, and open-ended questions. Nine questions pertaining to literacy were embedded in the survey. When questioned by the phone surveyor, parents could answer “yes” or “no” to all questions except for two questions. The first question, “How many books does the child have at home?” could be awarded as many as four points depending on the number of books indicated by the parents. Another question asked the parent to name two books that had been read in the past week; one point was scored for each book named. Each answer from the remaining seven questions was awarded one point if answered, “yes.”

The Parent Survey was administered by three female volunteers recruited for this purpose from the Wyandotte County United Way in Kansas City, Kansas. These volunteers attended a two-hour training that included an overview of the ROR program, a review of the phone volunteer job description and duties, phone volunteer procedures, practice sessions, and signing of a confidentiality statement. Phone surveyors were trained to contact parents as many as five times if needed to acquire a complete assessment for each occasion.

Social validity. Social validity is the extent to which an intervention has value to the consumers of services and those around them (Horner et al., 2005; Schwartz & Baer, 1991; Wolf, 1978). There were two questions on the ROR Parent Survey that provided an opportunity for family satisfaction with the ROR experience to be rated as “not satisfied,” “somewhat satisfied,” or “very satisfied.” For example: “Did you have a good experience at the clinic visit? and “Did your child seem to have a good experience at the clinic visit?”

Design and Manipulation of the Independent Variable

At the start, an experimental study of the effects of resident training in ROR, using a multiple-base line design, was planned but proved not possible. As a result, a descriptive evaluation was conducted. The event most obviating the experimental design was a desire by the ROR co-directors and medical center personnel to implement the ROR program immediately, thus eliminating the opportunity for baseline data prior to introductory ROR training provided residents.

In the absence of a pre-ROR training baseline in the design, a descriptive, sequential comparison of three training components (ABC) provided to residents was conducted using features of the non-concurrent, multiple probe design (Kennedy, 2005). Thus the conditions in this design were A, B, C; where A, the baseline was = to the standard ROR one-hour training, B = advanced training lecture provided by Dr. Perry Klass, an expert in the implementation of ROR, and C = a one-time, one-on-one training provided by a faculty advisor. The goal was to identify how increased levels

of training influenced the amount of literacy counseling delivered to parents.

Standard ROR training (Phase A)

Previously, ROR had not been implemented at KUMC, thus residents had not been distributing books previous to this study and volunteers had not been modeling reading in the waiting room; it was unlikely that residents had been delivering anticipatory guidance that included literacy counseling. In Phase A, Residents were introduced to the ROR program and this research project during a one-hour training session, following the standard practice guidelines recommended by the ROR National Office. The training was conducted in a training room at KUMC, by a Co-director of the ROR Program, a physician, and the JGCP evaluation coordinator. The standard one-hour resident training included: (a) a knowledge and attitude survey to be completed by each resident; (b) a brief overview of the project; (c) a 40-minute presentation defining and providing examples of literacy counseling, the importance of early literacy to a child's overall development and the role that a pediatrician can play in encouraging parents to read to their children; (d) distribution of a published article on the importance of pediatricians encouraging parents to read to children that was authored by a physician and co-creator of the ROR program; (e) clinic procedures for the availability of books and their distribution to the child; and (f) request for informed consent for the physicians' involvement in the study and permission to observe them. This standard one-hour training was provided to residents in two groups.

Data collection during Phase A

The data collection for Phase A spanned 17 weeks. After standard training was completed, data collection began during 5 of the 7 previously identified clinics, a period of three hours each clinic for a total of fifteen hours each week. The five clinics, three morning and two afternoon, were selected because they were fully staffed by residents eligible to be observed. Given that nurses were identifying eligible families to be observed, observations were conducted randomly across residents and control over the frequency of observation for individual residents could not be established. At the end of Phase A, total observations for the 35 residents was distributed as follows: 0 observations for 4 (11%) residents, one observation for 9 (26%) residents, two observations for 14 (40%) residents, and three observations for 5 (14%) residents, four observations for 2 (6%) residents, and five (3%) observations for 1 resident.

Advanced training (Phase B)

The director of the KUMC-ROR program decided that the advanced training would be provided by Dr. Perry Klass, a physician and well-known speaker for ROR. Dr. Klass provided a two-hour presentation on the ROR program as a speaker for the Department of Pediatrics' Grand Rounds. Grand Rounds is a common teaching hospital term that refers to a formal presentation by an expert on a specific topic often accompanied by discussion. During the two-hour training Dr. Klass provided provided an overview of (a) the importance of physicians being intervention agents for literacy, (b) the development and dissemination of ROR and the resources of the

National ROR office, (c) research that had been conducted to date on ROR, and an invitation to participate in the successful implementation of ROR at KUMC.

Residents were eligible to be observed following the Grand Rounds training if they met the following criteria: (a) they had originally given permission to be observed; (b) they had been observed on at least 3 occasions during Phase A; and (c) they had attended the Grand Rounds session with Dr. Klass (as verified by a sign-in sheet). Of the 35 residents eligible to participate in Phase A data collection, 21 attended the Grand Rounds training. Of these 21 residents, seven had received three or more observations and were thus eligible to be observed and have data collected for Phase B.

Data collection during Phase B

Data collection for phase B lasted a total of 19 weeks. Toward the end of phase B, one of the seven participating residents went on paternity leave, one was rotated out of the ambulatory clinic, and a third resident was eliminated due to an upcoming extended medical leave. Thus, as Phase B ended there were four residents out of the original 7 who received both Phases A and B of training. These residents will heretofore be referred to as Resident 1, Resident 2, Resident 3, and Resident 4.

Intensive training (Phase C)

The Intensive training consisted of a one-on-one meeting with a faculty advisor for approximately one hour. Faculty members had been assigned to each of the original 35 residents when they arrived at KUMC with each faculty member being assigned several residents. All faculty had received the ROR standard training,

attended Perry Klass' Grand Rounds and had agreed to participate in the Phase C training. The two faculty participating in Phase C were given a three-page script, prepared by the JGCP evaluation coordinator, to use as the basis of discussion with the target resident to emphasize the importance of literacy counseling and book distribution. Included in this discussion were six specific suggestions for each well-child exam: (1) hand the book directly to the child, (2) make a comment related to the child's reception of the book, such as "You turned the book right-side-up when I handed it to you upside-down," (3) hand the parent a *prescription sheet* containing age-specific suggestions for literacy activities in the home, (4) make a verbal recommendation about reading, either using the prescription sheet as a guide, or offering one of their own, (5) sign the prescription sheet, and (6) write a personal prescription, that the parent read to the child everyday, or another literacy related prescription. Residents were given a 4 inch by 5 ½ inch sheet of paper with these printed suggestions to use as prompts during the well-child visit to support delivery of the intervention components. On the other side were age-appropriate literacy tips for parents. Residents were encouraged to give this paper to parents at the end of the visit.

The criteria for Residents 1, 2, 3, & 4 to be included in Phase C was that (a) they had consented to being observed, (b) they had attended the Phase B Grand Rounds training, (c) they had been observed at least three times for Phases A and B, (d) all indications were that they would be present until the end of the spring

semester. Residents 1, 3, and 4 had the same faculty member and Resident 2 had a different faculty identified for the one-on-one intensive training.

Data collection for Phase C

Data collection for Phase C data was collected over a period of eleven weeks. A multiple baseline design was implemented for Phase C. At the time that phase C was implemented it was mid-spring semester and time was becoming a consideration. Two observations were collected for Resident 1 during the four weeks following intensive training. While there was a desire to have a third observation before beginning Phase C with Resident 2, it was determined that time was of the essence and thus, Resident 2 received the Intensive Training. Intensive training for Resident 2 was immediately followed by two observations occurring within one week. As soon as the second observation occurred the faculty for Resident 3 was notified and Resident 3 received Intensive training. By the time data collection began for Resident 3, he was scheduled to rotate out of the clinic. Fortunately, two observations were made during a one week period before he left the Ambulatory Unit. Resident 4 received Intensive training exactly two months after Resident 1; five observations were conducted over a three week period. Data pertaining to Residents 1, 2, 3, & 4 will be the primary data used in addressing the research questions.

RESULTS

Did increased levels of ROR training improve residents' fidelity of (a) distribution of a free book and (b) delivery of literacy counseling during well-child visits?

Book distribution fidelity. Fidelity of book distribution in each phase was determined by calculating the percentage of well-child visits during which resident physicians had distributed a book. Overall, book distribution occurred 63% to 100% for any resident in any phases for all residents. All 4 residents distributed books with 100% fidelity during Phase C, after one-to-one faculty training. Fidelity of book distribution was lowest in Phase B after Grand Rounds training. Resident 4 had 100% fidelity for distributing books during all phases of implementation. (See Table 2.)

Table 2

Fidelity of Resident's Implementation of Literacy Counseling and Book Distribution

	Phase A			Phase B			Phase C		
	n	Percentage	Percentage	n	Percentage	Percentage	n	Percentage	Percentage
Resident	n	LC	BD	n	LC	BD	n	LC	BD
1	5	100	100	4	100	75	2	100	100
2	4	75	75	3	100	66.3	2	100	100
3	4	100	100	3	63.3	63.3	2	100	100
4	3	100	100	8	88	100	5	100	100
All	16	94	94	18	88	75	11	100	100

Notes. Percentage = Percentage of well-child visit in which Residents implemented literacy counseling and book distribution, n = Number of observations, LC = Literacy counseling intervention component, BD = Book distribution intervention component.

Literacy counseling fidelity. Fidelity of literacy counseling was fairly high ranging from 63% to 100% across residents and phases. Because no minimum

amount of literacy counseling has been identified by ROR, resident physicians were considered to have implemented the literacy counseling component if they were observed to carry out literacy counseling during at least one 10-s interval. With this loose criterion, three of four residents had 100% in Phase A, 2 of two of four had 100% in Phase B, and four of four had 100% in Phase C. The best performance for this group was after one-to-one faculty training (Phase C). Their worst group performance followed Grand Rounds training (Phase B).

Parental reports of intervention delivery. Another perspective on fidelity of intervention was provided by 79 responses to the ROR Parent Survey (see Table 3.)

Table 3

Percentage of Responses to Survey Questions Related to Fidelity of Intervention.

Survey Questions	Percentage	
	Yes	No
Was a volunteer in the waiting room?	37%	63%
Did the doctor give you suggestions related to books?	7%	93%
Did the doctor give you a free book at your clinic visit?	83%	17%

Note: Response percentage based on 79 participants who were also observed.

As was mentioned earlier, parents were surveyed post-intervention regarding their recall of receiving the three intervention components: (a) 7% of parents reported that the resident gave a suggestion related to books, (b) 83% of parents reported receiving a book, and (c) 37% of parents reported seeing a volunteer in the waiting room.

Did increased levels of ROR training in the intervention improve resident-parent interactions about early literacy during well-child visits?

Occurrence of literacy-related behaviors. The occurrence of literacy counseling remained relatively constant within a narrow range of variation regardless of Phase (see Figure 1). For Residents 1, 2, and 3, the occurrence of literacy counseling was greatest in Phase A; and for Resident 4 in Phase C. Resident 1 delivered considerably less literacy counseling in Phase C than in Phase A. The amount of anticipatory guidance delivered increased from Phase A to Phase C for Residents 2 and 3 and decreased for Residents 1 and 4 (see Figure 1). The occurrence of anticipatory guidance was also rather constant across Phases. Across residents and over time within resident phases, anticipatory guidance was the most frequently occurring, followed by literacy counseling. A minor exception was Resident 1; in Phase A anticipatory guidance was much higher compared to the other Residents and declined in Phases B and C (see Table 4).

Percentage of Time. The same results, in terms of percentage of time spent in anticipatory guidance and literacy counseling, are displayed in Figure 2 for individual residents with mean values provided in Table 4. All residents appeared to be more stable in provision of anticipatory guidance across phases. Residents spent 28 to 61% of well-child visit time on anticipatory guidance compared to 3 to 12% on literacy counseling. An exception was Resident 4. Resident 4 doubled her time spent in Phase C compared to the others who declined in literacy counseling after Phase B and maintained in Phase C (see Figure 2).

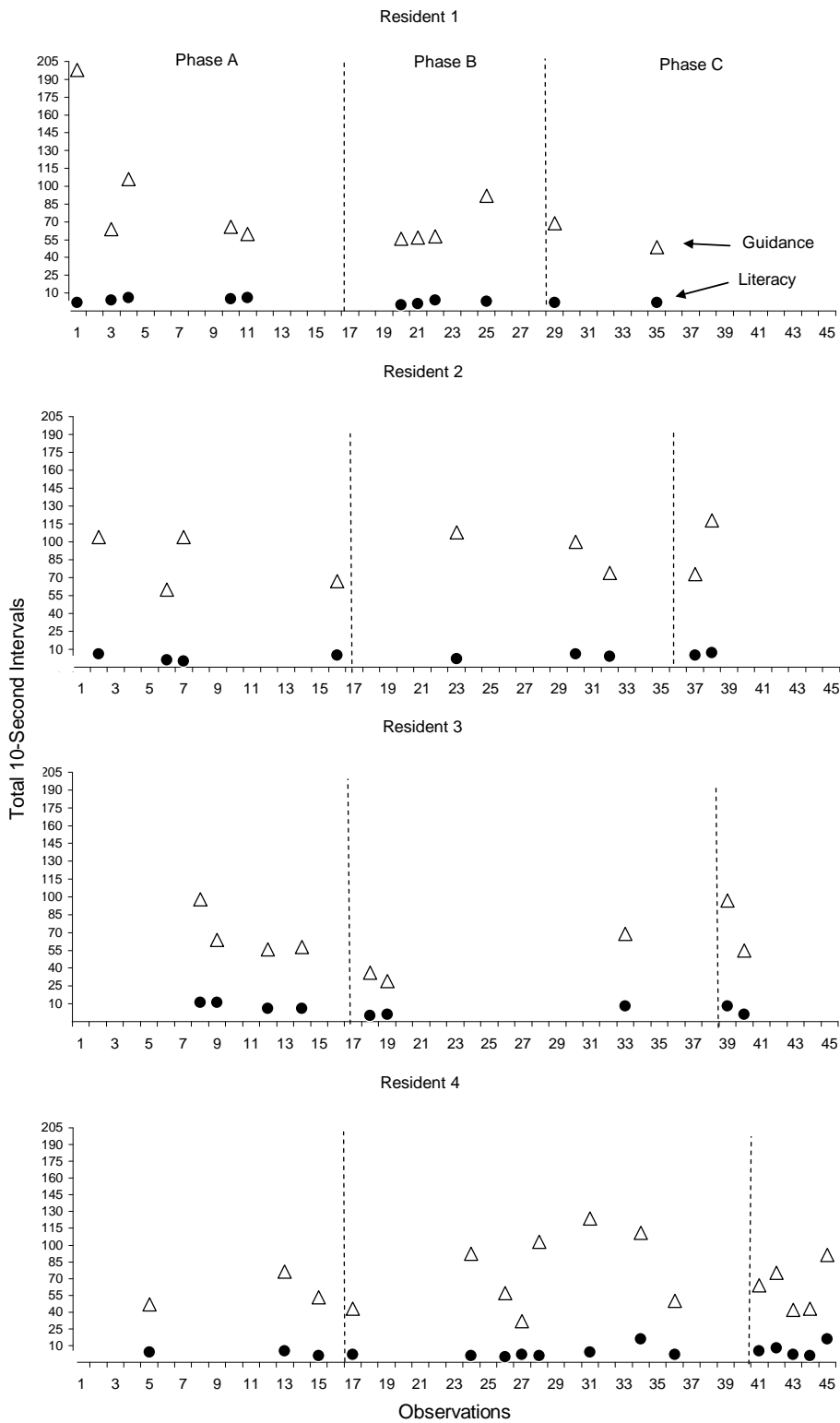


Figure 1. Data for training phases A, B, and C for Residents 1, 2, 3, and 4.

Table 4

Duration and Percentage of Anticipatory Guidance and Literacy Counseling During Visits

Resident	Variable	Phase A				Phase B				Phase C			
		Total Minutes		Percentage		Total Minutes		Percentage		Total Minutes		Percentage	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
1	AG	16	10	40	8	11	3	38	15	10	2	28	13
	LC	.7	.3	6.1	3.2	.4	.2	3.4	2.4	.3	0	3.5	.8
2	AG	14	4	51	11	16	3	56	23	16	5	55	8
	LC	.4	.5	7.5	3.0	.7	.3	4.4	2.2	1	.2	6.4	.6
3	AG	11	3	49	20	7	4	42	28	13	5	61	1
	LC	1.4	.5	12	3.2	.5	.7	5.0	6	.8	.8	5.0	4.5
4	AG	9	3	4	6	13	6	53	10	11	4	33	8
	LC	.6	.7	5.7	3.4	.6	.9	4.3	4.6	1.1	.6	8.6	5.9

Note. AG=Anticipatory guidance, LC=Literacy counseling, M = Mean, SD =Standard deviation, AG reported in rounded-off whole numbers except when < than 1.0

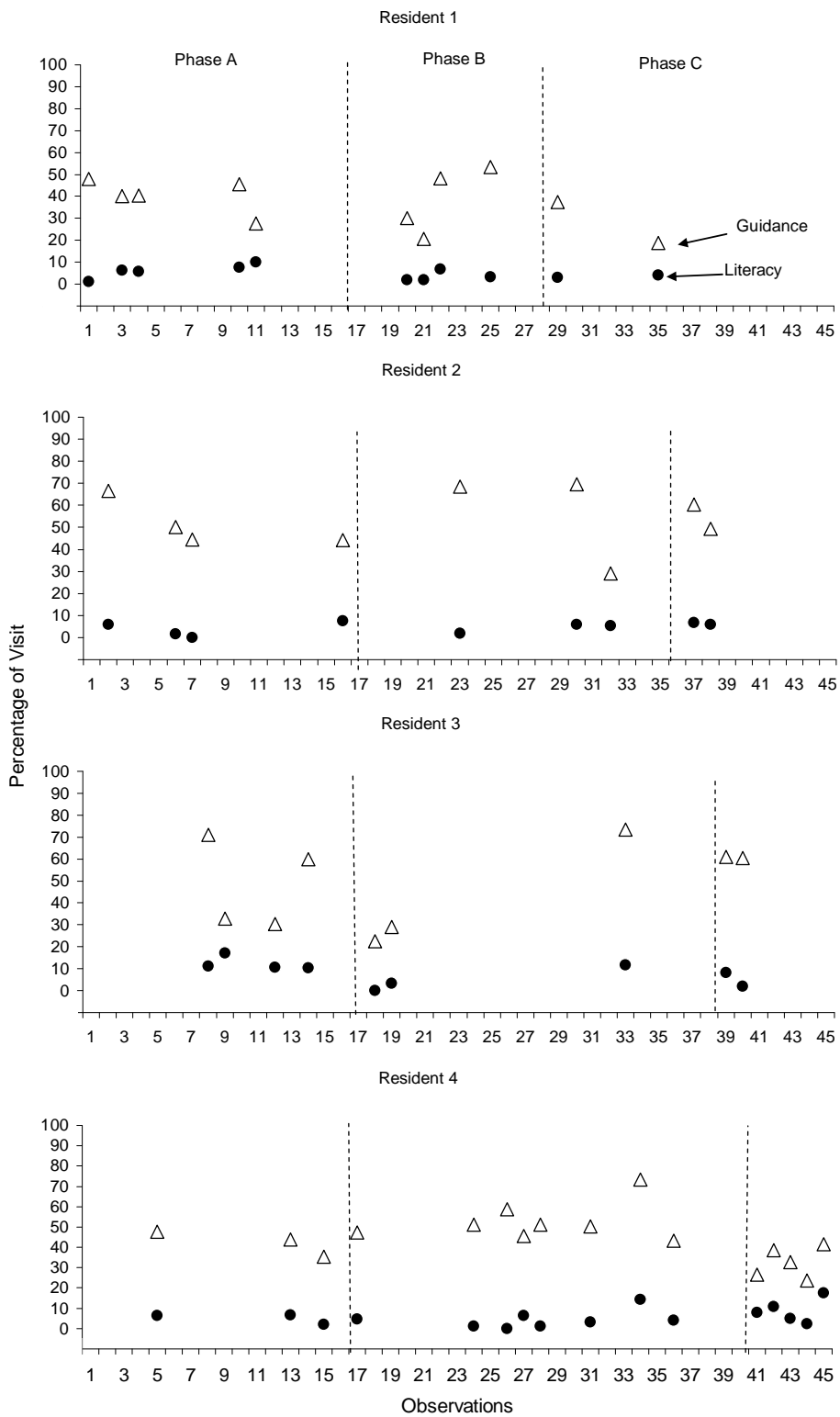


Figure 2. Data for training phases A, B, C as percentages of total visit minutes.

Did resident training in the ROR intervention change the knowledge and attitudes of residents about early literacy as measured by a survey administered pre-training and post-study?

Knowledge survey. Three of the four residents, who received all phases of training, demonstrated gains in the number of correct answers on the Knowledge portion of the pretest-posttest survey (see Figure 3). Resident 3 did not make a gain. Resident 2 produced the largest gain of six items correct. None achieved 100% correct. There were 16 residents of the original 35 (46%) who completed both a pre-training and post-study survey. For these 16 residents, the mean pre-training knowledge score was 50% or 5 out of 10 possible correct answers.

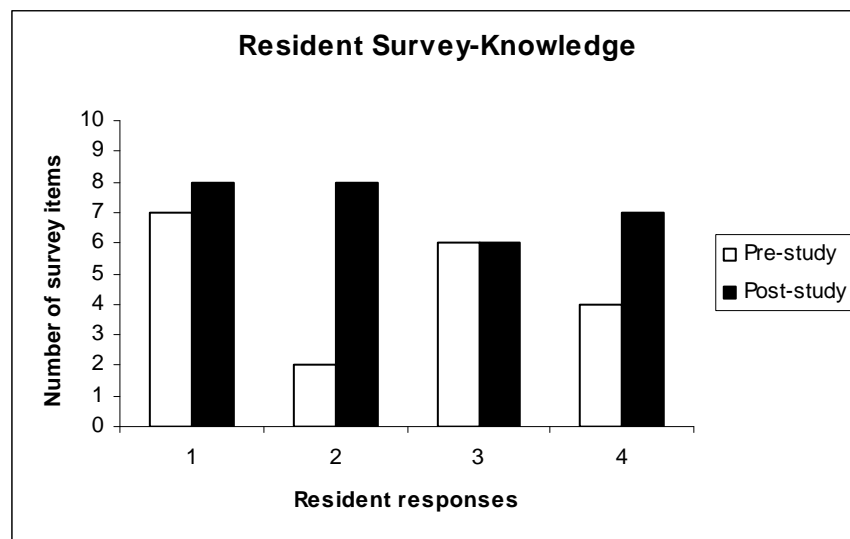


Figure 3. Number of Correct Responses on Resident Survey of Knowledge

Residents' knowledge was most accurate in areas related to the importance of shared book reading in children's acquisition of emergent literacy skills and parent

responsiveness to children while looking at books together. Resident's knowledge was least accurate regarding the importance of the number of books in the home to children's emergent literacy skills. Results of knowledge scores increased to 60% or 6 out of 10 for the 16 residents who completed the post-survey.

Attitude survey. Residents remained rather constant in the pre-training and post-study attitude ratings, with no more than a one point change on any item between or among residents except for one item, "The amount of time spent discussing literacy depends on the parents' literacy levels." Resident 3 and 4 each made a two point change; Resident 3 moving toward disagreeing with this statement and Resident 4 moving toward agreeing with the statement. Examining the post-study ratings with respect to positive statements about literacy, the following items most highly rated in the affirmative were: (a) physicians can play an important role in supporting family literacy, and (b) handing a book to a child is a clinic intervention, like immunizations are an intervention, and (c) physicians can play an important role in supporting family literacy. Residents seemed to disagree with the statement that a main concern about discussing literacy in clinic visits is the short time and numerous topics. With respect to negative statements about literacy, the following items were also highly rated in the affirmative were: (a) the amount of time spent discussing literacy depends on the parent's literacy levels; (b) a main concern about discussing literacy in the clinic is the short time and numerous topics, and (c) there isn't time during clinic visits to discuss strategies supporting literacy (see Table 5).

Table 5

Results of “Attitude” Section of the Resident Survey

“Attitude” statement	Residents							
	1		2		3		4	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Physicians can play an important role in supporting family literacy.	5	4	5	5	4	5	5	5
The amount of time spent discussing literacy depends on the parents’ literacy levels.	1	1	3	4	3	1	2	4
It is important for the doctor to gain an awareness of parental literacy.	3	4	4	4	4	5	4	4
Physicians have a role in literacy because of their influential role with families.	5	5	5	4	4	4	4	4
A main concern about discussing literacy in clinic visits is the short time & numerous topics.	4	5	4	4	4	4	5	5
Reading is as vital to the health and well-being to children as regular checkups.	5	5	5	4	3	3	5	4
There isn’t time during clinic visits to discuss strategies for supporting literacy.	2	1	1	2	2	2	3	4
Handing a book to a child is an intervention, like immunizations are an intervention.	4	5	5	4	4	5	4	4
Cross Items Mean	3.6	3.8	4.0	3.9	3.5	3.6	4.0	4.4
SD	1.5	1.8	1.4	0.8	0.8	1.5	1.1	0.5
Min	1	1	1	2	2	1	2	4
Max	5	5	5	5	4	5	5	5

Note. Numbers indicate the score of residents on a five point Likert scale with one representing “do not agree” and five representing “strongly agree.”

Did parents receiving ROR report providing more in-home early literacy experiences for their children?

The ROR Parent Survey asked questions related to “outcomes” of the visits that provided social validity of intervention for participating parents (see Table 6).

Table 6

Parental Response to ROR Parent Survey Questions Pertaining to Literacy

Question from survey	Survey question	Percentage “yes” parent responses
Are books listed in child’s favorite things to do?	11	35%
Are books listed in parent’s favorite thing to do with their child?	12	51%
Are books listed in things to do to get child ready for school?	13	57%
How often are stories told to the child?	14	20%
Are books included in a bedtime routine?	16	80%
How many books does the child have at home?	19	63% have >10 15% have 6-10 17% have 2-5 3% have 1 2% have 0
Can the parent give the names of two of these books?	21	81%
Does the parent have a library card?	22	50%
Has the parent taken the child to the library?	23	30%

Note: Response percentages based of 79 respondents who were also observed.

Results indicated that a high percentage of parents (80%) were reading to their children as part of a bedtime routine. It was important to note that 35% of parents reported that their children chose book related activities as a favorite and that 51% stated that book activities was a their favorite choice. With respect to parent satisfaction, “How satisfied were you with the clinic visits?” was answered by 84% of parents as “very satisfied.” “How satisfied was your child with the clinic visit?” was answered by 90% of parents as a good experience. “Did you share the book you received with your child?” was reported by 67% of parents as “yes.” When asked, “How often did you share the book with your child?” 46% of parents reported sharing a book four to six times, 33% reported sharing two to three times and 9% reported sharing the book once.

DISCUSSION

Overview of Significant Findings

While pediatric literacy interventions such as ROR have been carried out for several years, no study has yet used direct observation as well as parent report to investigate how well key components are actually implemented and whether training improved physicians’ fidelity of implementing those components to a measurable degree. With the methodological constraints of a non-experimental evaluation noted, this study provided description of impact, comparison of original training to more intensive levels of training, and relationships between implementation and outcomes.

The current study was the first to report delivery of literacy counseling as distinguished from anticipatory guidance. This was a major distinction given that

anticipatory guidance is an umbrella term for all topics that physicians discuss during well-child exams and literacy counseling is one of those topics. While there is a long-history of research and discussion in the medical literature on the topic of anticipatory guidance, there has been a paucity of research on delivery of literacy counseling and what has been investigated has been from measures of physician self-report.

Findings Related to the Research Questions

Research questions one. Four research questions organized this study. The first question was to examine whether increased levels of training on ROR would influence residents' fidelity of implementation as defined by delivery of literacy counseling and a free book. Results indicated that it did.

Direct observation in this study indicated that all four residents provided at least a minimum amount of literacy counseling during all three phases in terms of both occurrence and percentage of visit. Comparing the intensive trainings B and B+C to the baseline level of original ROR training indicated the best results for all four residents occurred with the addition of training C, one-to-one faculty mentoring. Phase C resulted in the best adherence to the ROR protocol with 100% implementation of both literacy counseling and book distribution for all 4 residents delivery during all 11 observations conducted during Phase C.

These results were important because there have been on-going questions regarding the success of physicians delivering literacy counseling during well-child exams (Bailey & Louis Rhee, 2005). In addition, ROR is based on the belief that children will have at least 10 opportunities to receive an ROR intervention prior to

entering school if they follow the recommended schedule of well-child visits during their infancy and early childhood years (Needlman et al., 1991). However, one study of 150,000 children whose families were enrolled in privately and publicly funded managed care found that only 46% of privately insured and 35% of publicly funded children received all the recommended visits over a two-year study period (Byrd, Hoekelman, & Auinger, 1999). Thus, every resident must be trained to provide the optimum intervention at every well-child visit; any given child may experience only one visit to gain exposure to this intervention.

A survey conducted by the ROR National Office in 2004 and reported by Bailey and Louis Rhee (2005), provided results from 856 physicians self-reports of compliance with ROR intervention protocol as defined by delivery of literacy counseling and a free book. In this survey, 67% of the 856 physicians self-reported that they provided literacy counseling and books in more than 80% of health supervision visits, 18% reported 60-80% compliance, 10% reported 40-60% compliance, and 5% reported that they gave literacy counseling and books in 20-40% of health supervision visits. It is important to note that in the ROR National Center survey, delivery of literacy counseling and distribution of books were not examined separately.

An examination of the distribution of books by the four residents who received trainings in Phases A, B, and C revealed that only one resident, Resident 4, distributed a free book in 100% of well-child visits during each phase. Resident 4 received the most observations (16); demonstrating through multiple probes that book

distribution compliance was sustained over the course of the 13-month study. Phase B, Grand Rounds training, showed the least resident book distribution for the total 35 residents observed. The treatment fidelity for book distribution was highest in Phase C, with 100% distribution for Residents 1, 2, and 3 across 11 observations. In Phase B there were four observations during which books were not distributed and lack of book distribution occurred once in Phase A. While this study did not demonstrate a functional relation between levels of training and book distribution it is important to note that levels of book distribution during Phase A were very high (100%) for 3 of the 4 residents. There was no baseline from direct observation to examine the frequency of book distribution prior to the first round of training, though the ROR co-directors reported there had been none.

While there was little change overall in resident knowledge and attitudes from pre-training to post-study, (a) the importance of numbers of books in the home was the most frequently missed question in the pre-training knowledge survey and (b) handing a book to a child during a clinic visit was the area of most growth post-study attitude survey. It may be that standard ROR training is all that is necessary to promote physicians' distribution of books during well-child visits. During Phase A, residents delivered a free book to families in 95% of observed well-child exams and in Phase B, in 65% of well-child exams. While resident physicians in this study were not surveyed regarding reasons for lack of book distribution, Hazzard et al. (2000) did pose this question to 48 resident physicians who had received ROR training. The most frequent reasons given by physicians for not providing a book were forgetting

(94%), depleted supply of books (25%) and other pressing clinical issues (19%); the most frequent perceived barrier to delivering literacy counseling was time (67%) and limited knowledge (28%). Orr et al. (2000) also reported inconsistencies in distribution of books. Thus, there is evidence in ROR literature that book distribution lacks consistency which was also found in this study.

It is not clear whether parents understood that a purpose of the visit was to encourage them to read to their child and provide literacy opportunities within the home. Perhaps not, given that only 7% of surveyed parents reported that the resident discussed books or reading with them during the visit. It is not surprising that few parents could remember the delivery of literacy counseling when, in fact, there were so few 10-s intervals observed as evidenced from the data provided for Residents 1, 2, 3, and 4. Admittedly there were many uncontrolled variables. The difference between delivery and recall is of particular importance given that ROR literature to date has not identified a threshold amount of literacy counseling needed to influence a parent to increase the home literacy environment. However, these results do suggest that delivering a minimal number of 10-s intervals of literacy counseling is not memorable for parents and raises the question: How many 10-s intervals are necessary for parents to self-report on a follow-up survey that they did indeed receive literacy counseling?

Given that a premise of the ROR intervention is that physicians will influence parents to increase their home literacy environment as a result of the delivery of a free book and literacy counseling, then addressing satisfaction of both the parent and physicians is critical to ROR research in order to determine the social impact of this

intervention. A national survey documented the pediatric health care experience of 2,017 parents with children ages birth to 3 years of age and found that parents reported having a greater likelihood of reading to their child, if encouraged by their physician or nurse (Young et al., 1998).

Research question two. The second research question was to determine whether increased levels of training in the ROR intervention would impact resident-parent interactions about literacy as measured by time spent in literacy counseling, anticipatory guidance and parent talk. Results indicated that anticipatory guidance was delivered at a mean of 75.1, 10-s intervals and literacy counseling was a mean of 4.9, 10-s intervals, or 49 seconds. Residents' mean number of 10-s intervals of literacy counseling was highest during Phase C after one-one-one training.

Similarly, Rosenthal et al. (2004) reported that modeling by a supervising physician was the training activity specifically related to demonstrated increases in residents' frequency of delivering anticipatory guidance. In the Rosenthal et al. study the amount of anticipatory guidance was a mean of 44% of each clinic visit and literacy counseling was a mean of 5%. As was discussed in the introduction of this paper, the low rate of delivery of anticipatory guidance continues to be discussed in the literature and viewed as problematic (Galuska et al. 2002; Magar, Dabova-Missova, & Gjerdingen, 2006; Wissow, & Cheng, 2003). As rates of delivery of anticipatory guidance are lower, the opportunities for delivery of literacy counseling diminish. Of all anticipatory guidance delivered in the 45 observations of the 4 residents in this study, the topic of literacy counseling represented only 2% of the

time. This scant amount of literacy counseling delivered is a concern. The concern brings into question how much time is needed to provide an amount of literacy counseling that influences a parent to provide a high quality home literacy environment. In sum, the multiple probes of the four residents over the course of this thirteen month study demonstrated that regardless of the training received by residents or the amount of anticipatory guidance delivered, the literacy counseling delivered remained nearly the same: across visits, across residents, and across families.

Research question three. The third research question was to determine whether resident training in the ROR intervention would impact the knowledge and attitudes of residents about early literacy as measured by the ROR resident survey pre-training and post- study. Results indicated that the post-intervention scores on the 10-point knowledge questionnaire increased from a mean of 5.4 to a mean of 6.8 for all residents; post-intervention follow-up scores increased most for third year residents, from 52% to 70%. Residents' knowledge was poorest in terms of understanding that the number of books in a child's home could affect the child's emergent literacy skills.

Based on the results of the attitude portion of the ROR Resident Survey, pre-intervention residents believed that (a) physicians can play an important role in supporting family literacy and (b) physicians have a role in literacy because of their influential role with families. However, residents' survey data revealed their concern that discussing literacy may be difficult due to (a) availability of time during the well-

child visit and (b) numerous topics to discuss during the clinic visit. On post-intervention surveys, residents indicated that handing a book to a child is a clinic intervention, like immunizations are an intervention. Physician responses to this item changed the most between pre-training and follow-up of any attitude measured; from a mean of 3.7 to a mean of 4.5 among all residents on a five-point scale. Responses indicating concerns regarding the amount of time available for carrying out this intervention remained as indicated by change scores on this item of only.

In this current study which approximated four hours of training across all three phases, neither resident knowledge nor attitudes changed extensively. These results were consistent with two studies that examined knowledge and attitudes of residents implementing ROR. While Rosenthal et al. (2004) hypothesized that training longer than the standard ROR one-hour training and multi-stage training may allow more of a focus on building knowledge and changing attitudes of resident physicians, Hazzard et al. reported that after four hours of ROR training residents in the intervention group did not improve in knowledge or attitudes.

Training as a critical factor to ROR intervention protocol adherence is a current issue. In analyzing telephone surveys of 2,068 parents of children ages 4 to 35 months, Kuo, Franke, Regalado, and Halfon (2004) determined that there is a link between what health care providers are or aren't saying to parents about the importance of shared book reading, and parent literacy activities in the home. "Although pediatricians may recognize the importance of discussing literacy development during well child visits, they may not be equipped to incorporate

literacy messages efficiently into their practice” (Kuo et al. 2004, p. 1949). Physician training is critical to the successful implementation of ROR and evidence strongly suggests that the one-hour standard ROR training is not sufficient for preparing physicians to consistently implement the ROR intervention components of literacy counseling and book distribution. However, addressing this issue is embedded in the training needs that have been identified in pediatric physician training in general.

In a review of the literature examining evidence-based primary care services that promote optimal child development from birth to age three, Regalado and Halfon (2001) reported that there is a gap between the knowledge and skills required by physicians to provide guidance to parents and the limited training that many clinicians receive. Furthermore, pediatricians have reported a need for additional training to address parental concerns (Carnegie Task Force, 1994). In fact, the Society for Behavioral Pediatrics addressed this need for residency training in developmental and behavioral pediatrics through designing a curriculum (Coury, Berger, Stancin, & Tanner, 1999); this need for training was included in recommendations from the American Academy of Pediatrics Task Force on Pediatric Education (2000). Even though the need for training is recognized and has been addressed through recommendations, actual incorporation of those guidelines is complex and may involve a restructuring of resident training programs away from an acute care and disease model orientation (Regalado & Halfon, 2001). Thus, any ROR intervention implementation is influenced by the medical culture in which it is delivered.

Research question four. The fourth research question was to determine if parents reported providing in-home early literacy experiences for their children. Results of the 79 parents who were observed and completed a ROR parent Survey indicated a number of highly rated items indicating that they were reading to their child routinely. A more moderate rating was noted for children in the home choosing book related activities. On another note, only 67% of parents reported sharing the book they received at the visit with their child. Parents also reported high satisfaction with their visits. While not intervention specific, 90% of the 79 parents reported they had a “very good” experience with their clinic visit and 84% reported that their child had a good experience. Administering a post-intervention only ROR Parent Survey is a primary tool used in the ROR literature to measure outcomes of the effectiveness of the ROR intervention related to both home literacy environment and child language and thus was included in the design of this study. In this study, a scant amount of literacy counseling was delivered by Residents 1, 2, 3 and 4 and book distribution was consistent. Thus, the question arises as to how parents will be affected by the intervention to the degree that they will increase home literacy offerings and subsequently positively impact child language and readiness for school.

Limitations

The inability to conduct the original experimental analysis for the effects of increased levels of ROR training and implementation for practical reasons of control of the salient variables, prevented making causal inferences. Because the ROR co-directors insisted that the intervention begin immediately, time was not available to

carry out baseline to assess pre ROR events and outcomes prevented a look at what we presume was large changes in the variables of interest (e.g., time proved literacy counseling). Thus, it was impossible to tell whether the standard training offered at the beginning of the study changed the fidelity with which residents implemented the intervention and the amount of time they spent in literacy counseling and anticipatory guidance. Furthermore, the advanced training that was to begin Phase B was replaced with Grand Rounds training by a prominent ROR National Center speaker when the opportunity arose. Thus, residents participating in that training event became the study participants for Phase B.

A second limitation was attrition of residents across the later two phases of the study that limited the number of residents experiencing each condition. Attrition was a function of the number of observations that could be feasibly conducted and residents who could and did attend the Phase B intervention. Future research needs to create a more proactive plan of involvement and commitment of residents to these events.

A third limitation was the inability to untangle the effects of resident training levels on both the measures of resident knowledge/attitude and parent report. This limitation arose because the timing of these measures was such that they occurred months later regardless of training experienced, or in the case of parents, shortly after visits were completed with residents who had experienced different levels of training. Both timing and numbers of participants in all conditions prevented a more sensitive analysis of training impacts on these outcomes.

A potential limitation, as well as strength, was that the CORPE was developed specifically as a measurement tool for this study. It did not have pre-established reliability or validity prior to being used here. While reliability in terms of inter-observer agreement was established in this study, more research on the CORPE is needed to establish its validity for measuring the key events and behaviors it taps. Also, future research might profitably use it in other projects situated in the context of well-child visits and related issues during provision of anticipatory guidance to address similar issues and advanced training. Similarly, the Resident Knowledge and Attitude Survey was developed specifically for this study and its technical adequacy remains to be demonstrated.

Future Research and Directions

First and foremost, there is a need to conduct future ROR research with an appropriate baseline to provide a comparison of initial effect of the program. This study demonstrated a rigorous approach using independent observations of the intervention to determine how much of the intended intervention actually occurred rather than relying on physician self-report or parent recall of the ROR intervention component implementation. This approach should be used in future studies. While there may be concerns about physicians and patients somehow being less open due to the presence of an observer, this does not seem to be the case (Roter & Hall, 2006).

Second, future research should address the amount of literacy counseling (as distinguished from anticipatory guidance) needed to change parental behavior related to the home literacy environment. This research could be composed of three parts: (a)

pre-post observations in the home using a home literacy environment coding system, (b) directly measuring the amount of literacy counseling delivered during the families' well-child visit, and (c) establishing whether or not there is a functional relationship between the amount of literacy counseling delivered and the number of home literacy environment indicators present in the home after intervention. Including a control group that did not receive the intervention would provide additional efficacy for this research.

Third, research must identify the amount and intensity of physician training needed in order for the threshold amount of literacy counseling to be delivered. While identifying and establishing a threshold was beyond the scope of this study, it is critical that this issue be investigated in future ROR research.

Finally, families and physicians must be given an opportunity to provide their subjective evaluation of the intervention with questions developed in a way that does not predispose respondents toward a favorable answer; a possible limitation of social validity measured by subjective evaluations, as pointed out by Kennedy (2005). Given the widespread implementation of ROR, addressing these issues could establish an empirical foundation in which to develop a technology of the ROR intervention and impact millions of children and families.

Summary

In summary, this study was an evaluation of the effects of training on resident physician delivery of ROR, a pediatric literacy intervention. As such, not only were independent and reliable data collected and examined to measure the implementation

of the independent variable, but the study was conducted within the medical culture of a university teaching hospital setting; possible medical cultural influences were discussed throughout the paper. While the focus of previous ROR research studies has been to demonstrate effectiveness of the ROR intervention only through parental self-report measures of increases in child language and home literacy environment, the focus of this study has been on the direct observation of the intervention components and the impact of resident training on their delivery.

This study offered several original contributions to the literature. First, this study demonstrated, through multiple probes over time, that only a scant amount of literacy counseling was delivered actually by 4 residents as observed in 45 well-child exams over a 13-month period. A second contribution was the observation that one-to-one training with a faculty member may best influence delivery of both literacy counseling and book distribution and therefore may be a viable training strategy worthy of future research. Additionally, treatment fidelity measures were collected independently to provide internal and external validity information which to date not been reported in ROR research literature. Lastly, this study adds to the ROR literature by specifying literacy counseling as an ROR intervention component, distinguished from general anticipatory guidance. In sum, it was found that (a) resident physicians provided a limited amount of literacy counseling during observed ROR intervention implementation and (b) the phase of resident training that showed some evidence for affecting delivery of intervention components was one-on-one faculty training.

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Appendix A

Intervention Agent Training as Indicated in ROR Studies

Study	Frequency	Duration	Description of training
Golova et al. (1999)	–	–	<p>“The pediatric providers participated in a training session in which we described the study design and objectives as well as the importance of their participation in the project. We did not structure a standardized scenario for them to deliver but rather encouraged them to briefly provide guidance on the benefits of reading aloud to children, reinforcing the information contained in the handouts. Statements such as ‘this is a book for you to take home. It would be wonderful if you could read with your child at least a few minutes every day’ or ‘children learn a lot of words from being read to. Here is a book for you to enjoy with your baby’ were offered to the pediatric provider as guidelines” (p. 994).</p>

Intervention Agent Training as Indicated in ROR Studies (continued)

Study	Frequency	Duration	Description of training
High et al. (1998)	–	Residents received a mean of 2.2 hours of a possible 4 hours of training.	“Residents attended training sessions on literacy promotion in young children, the use of children’s books as developmental assessment tools, the prevention of sleep disturbances in infants and toddlers, and language promotion in infancy” (p. 461).
High et al. (2000)	–	–	–
Jones et al. (2000)	–	–	“Before the start of the study attending faculty, residents, and nursing staff received training on early literacy development through lectures and demonstrations of ways to incorporate this information into the WCV. Incoming interns also received similar training” (p. 537).

Intervention Agent Training as Indicated in ROR Studies (continued)

Study	Frequency	Duration	Description of training
Mendelsohn et al. (2001)	These seminars were repeated for the incoming house staff each year, along with annual follow-up sessions with all clinic providers.	One hour seminars	“All pediatric clinic providers, including pediatric house staff, attendings, and nurse practitioners, were trained and participated in the program...that provided background about parent-child interaction, language and literacy development, selection of developmentally appropriate books for children of different ages and developmental levels, and strategies for the incorporation of anticipatory guidance about literacy into the delivery of well-child care” (p. 131).
Mendelsohn et al. (2005)	–	–	–

Intervention Agent Training as Indicated in ROR Studies (continued)

Study	Frequency	Duration	Description of training
Mendelsohn et al. (2007)	–	–	
Needlman et al. (1991)	–	–	“Pediatricians, residents, and nurse-practitioners were trained via a combination of lectures on literacy development and workshops. The workshops focused on ways to support parents’ appropriate desire to perceive their children as ‘smart’ without encouraging undue pressure to ‘learn to read’ too early.” (p. 882).
Needlman et al. (2005)	–	–	“All of the sites met the standards of the ROR National Center for training and program infrastructure as outlined in the ROR manual” (p. 210).

Intervention Agent Training as Indicated in ROR Studies (continued)

Study	Frequency	Duration	Description of training
Rieber et al. (2002)	–	–	–
Sanders et al. (2000)	–	One hour didactic session and a 30 minute interactive session coinciding with the introduction of the program.	“First pediatric residents were educated about ‘dialogic reading’ ...Second, pediatric residents gave a book to each child, along with a positive verbal message about dialogic reading to the family at each well-child visit from children aged 2 months to 5 years...Third, pediatric residents presented the parent with a signed ‘prescription to read 10 minutes every day with your child’ a formalized recommendation from the physician” (p. 772).

Intervention Agent Training as Indicated in ROR Studies (continued)

Study	Frequency	Duration	Description of training
Sharif et al. (2002)	-	-	-
Silverstein et al. (2002)	-	-	-
Theriot et al. (2003)	Yearly	-	“Training for physicians on early literacy development and on advocacy of early literacy practices such as book sharing and reading aloud to children was conducted yearly. Our physicians were expected to include early literacy promotion in their routine anticipatory guidance and to document such activity in age-specific encounter forms” (p. 167).

Intervention Agent Training (continued)

Study	Frequency	Duration	Description of training
Tomopoulos et al. (2006)	–	–	–
Weitzman et al. (2004)	–	–	–

Appendix B

ROR Research Study Descriptions of Intervention Component Delivery

Study	Description of intervention component delivery
Golova et al. (1999)	<p>“...pediatricians gave children in the intervention group 1) an age-appropriate bilingual children’s board book), an age-specific bilingual handout explaining how children can benefit from, enjoy and interact with books; and 3) literacy-related anticipatory guidance...The providers were asked to continue with their usual anticipatory guidance practices and were not made aware of which families were control families, thereby decreasing the likelihood of extraordinary practices” (p. 994).</p>
High et al. (1998)	<p>“Residents and nurse practitioners were asked to mention 1 or 2 points on the educational materials when they gave the materials and books to the parents” (p. 461).</p>
High et al. (2000)	<p>“At this initial visit and all subsequent well child visits, pediatricians gave children in the intervention group an age-appropriate children’s board book; an age-specific handout explaining how children can benefit from, enjoy, and interact with books; and literacy promoting anticipatory guidance” (p. 928).</p>

ROR Research Study Descriptions of Intervention Component Delivery (continued)

Study	Description of intervention component delivery
Jones et al. (2000)	<p>“Structured age-appropriate encounter forms were used for well child visits. These forms utilized cues to prompt the physician to ask questions on development, safety, and other anticipatory guidance issues as outlined in the American Academy of Pediatrics Guidelines for Health Supervision. Physicians suggested to parents early literacy practices such as reading aloud to their children at least once a day or to share books by pointing, identifying, describing, or counting the pictures and colors depicted on the pages and to tell stories about them. Physicians also described age-appropriate behaviors that parents could expect during book sharing such as infants putting the book in the mouth toddlers wanting to hold the book by himself/herself, and toddlers and preschoolers wanting a favorite book read many times. In the treatment group physicians were encouraged to read to the infant or child in the examination room, using an age and culturally appropriate book to visually demonstrate to the mother the responses of their child to this effort. The physicians gave the child the book used for demonstration at the end of the guidance session...” (p. 536- 537).</p>

ROR Research Study Descriptions of Intervention Component Delivery (continued)

Study	Description of intervention component delivery
Mendelsohn et al. (2001)	<p>“We included early literacy promotion in the anticipatory guidance given at well-child visits...At the end of each visit an age-appropriate book was handed out by the physician for the parent to take home. Suggestions for how, when, and where to share the book with their children were given...” (p. 167).</p>
Mendelsohn et al. (2005)	<p>“Intervention and control families received the same well-child care by the same primary care pediatricians and including the same anticipatory guidance and periodic routine screening according to the guidelines of the American Academy of Pediatrics” (p. 35).</p>
Mendelsohn et al. (2007)	<p>“Intervention and control families received the same well-child care by the same primary care pediatricians including the same anticipatory guidance and period routine screening according to the guidelines of the American Academy of Pediatrics” (p. 207).</p>
Needlman et al. (1991)	<p>“No set content for the anticipatory guidance was established, and in practice the counseling varied depending on the particular practitioner and family” (P. 882).</p>

ROR Research Study Descriptions of Intervention Component Delivery (continued)

Study	Description of intervention component delivery
Needlman et al. (2005)	“Study leaders also described the extent to which the ROR model was implemented at their sites, in terms of provision of anticipatory guidance...” (p. 211).
Rieber et al. (2002)	–
Sanders et al. (2000)	“...pediatric residents gave a book to each child, along with a positive verbal message about dialogic reading to the family... pediatric residents presented the parent with a signed ‘prescription to read 10 minutes every day with your child’ a formalized recommendation from the physician” (p. 772).
Sharif et al. (2002)	–
Silverstein et al. (2002)	“...during health supervision visits, families were given age-appropriate literacy counseling by their primary provider a part of the anticipatory guidance aspect of the visit” (p.1).

ROR Research Study Descriptions of Intervention Component Delivery (continued)

Study	Description of intervention component delivery
Theriot et al. (2003)	–
Tomopoulos et al. (2006)	–
Weitzman et al. (2004)	–

Appendix C

KUMC Reach Out and Read Resident Survey

KUMC Reach Out and Read Resident Survey

Date of Birth _____ Date of Training _____ Residency Year _____

On the space in front of each question, indicate the answer that you believe is correct.

- _____ 1. Literacy begins:
- | | |
|-----------------------------------|-----------------------------------|
| a. when a child begins preschool | c. when a child first sees a book |
| b. whenever a child learn to read | d. at birth |
- _____ 2. The factor that most clearly correlates with learning to read is:
- | | |
|----------------------------|------------------------|
| a. having literate parents | c. being read to |
| b. intelligence | d. socioeconomic level |
- _____ 3. One myth about illiterate parents' influence on their children is:
- | | |
|----------------------------------|--|
| a. they cannot promote literacy | c. their story-telling is as good as reading |
| b. the parent may be embarrassed | d. they can have literate children |
- _____ 4. An open-ended question is a question that:
- | | |
|--|------------------------------------|
| a. leads to another question | c. has neither a yes nor no answer |
| b. invites the child to ask a question | d. Neither a, b, or c |
- _____ 5. The following characteristics of early book stages are typical of what age:
Tears paper pages, discovers how to open books, points to and names pictures, enjoys cardboard and paper books with simple pictures
- | | |
|-----------------------------|---------------------|
| a. birth to one year of age | c. 2-3 years of age |
| b. 1-2 years of age | d. 3-5 years of age |
- _____ 6. The most critical factor in children's acquisition of pre-literacy and literacy skills is:
- | | |
|--------------------------------|----------------------------|
| a. socioeconomic level | c. articulation abilities |
| b. shared picture book reading | d. mom's educational level |
- _____ 7. The following characteristics of early book stages are typical of what age:
Recognizes books by title, holds books upside down, turns several pages at once, hands books to adult to read, enjoys books about things familiar to them
- | | |
|-----------------------------|---------------------|
| a. birth to one year of age | c. 2-3 years of age |
| b. 1-2 years of age | d. 3-5 years of age |
- _____ 8. Which examples of parental techniques have consistently been liked with research in language development?
- | | |
|-----------------------------------|------------------------------|
| a. prompts, feedback change | c. guided television viewing |
| b. use of educational video games | d. correct, model, reinforce |
- _____ 9. Parents are most responsive to their children's verbal communication while:
- | | |
|---------------------------|-------------------------------|
| a. feeding them | c. jointly playing with a toy |
| b. in the doctor's office | d. looking at books together |
- _____ 10. Many factors influence a child's early literacy. Which of the following is the most important factor?
- | | |
|---------------------------|---|
| a. # of books in the home | c. bedtime routine of reading |
| b. going to the library | d. none of those mentioned are critical |

Read the following statements and rate each on a continuum of 1 to 5.

11. Physicians can play an important role in supporting family literacy:

1 _____ 2 _____ 3 _____ 4 _____ 5
do not agree strongly agree

12. The amount of time spent discussing literacy depends on the parents literacy level.

1 _____ 2 _____ 3 _____ 4 _____ 5
do not agree strongly agree

13. It is important for the physician to gain an awareness of parental literacy limitations.

1 _____ 2 _____ 3 _____ 4 _____ 5
do not agree strongly agree

14. Physicians have a role in literacy because of their influential role with families.

1 _____ 2 _____ 3 _____ 4 _____ 5
do not agree strongly agree

15. A main concern about discussing literacy in clinic visits is the short time & numerous topics.

1 _____ 2 _____ 3 _____ 4 _____ 5
do not agree strongly agree

16. Reading is as vital to the health and well-being of children as regular check-ups.

1 _____ 2 _____ 3 _____ 4 _____ 5
do not agree strongly agree

17. There isn't time during clinic visits to discuss strategies for supporting literacy.

1 _____ 2 _____ 3 _____ 4 _____ 5
do not agree strongly agree

18. Handing a book to a child is a clinic intervention, like immunizations are an intervention.

1 _____ 2 _____ 3 _____ 4 _____ 5
do not agree strongly agree

Appendix D

Juniper Garden's Children's Project &
University of Kansas Medical Center
Reach Out and Read Parent Survey

Page 2-Parent Survey continued

(6.) Sometimes parents/care providers especially enjoy certain activities that they do together with their children. What are your three favorite things to do with [child's name] right now?

- 1.) _____ Includes books
- 2.) _____ No books
- 3.) _____

(7.) (Many parents believe it is important for their children to do well in school. Tell me three things you do that will help [child's name] be a good student when he/she goes to school?

- 1.) _____ Includes books
- 2.) _____ No books
- 3.) _____

(8.) How often do you or another family member tell stories to [child's name]?

Never, very rarely
About every week
Most days

(9.) Who usually reads to your child? _____

(10.) Do you have a bedtime routine for [child's name]? YES NO

If yes, please describe: _____
_____ Books mentioned

Books not mentioned

The next few questions are about things you have at home for [child's name] to play with. Does [child's name] have any....

- (11.) Trucks, cars, planes none 1 2-5 6-10 more than 10
- (12.) Blocks none 1 2-5 6-10 more than 10

Page 3-Parent Survey continued

Appendix E

CORPE Data Collection Sheets

Code for the Observational Recording of Pediatric Examinations

Date of Exam _____	Recorder _____	Start Time(hr/min/sec) _____	Stop Time (hr/min/sec) _____
Resident's Name _____	Child's Name _____	Medical # _____	
Child's Date of Birth _____	Female ___ Male ___	Ethnicity of Child _____	
Adult's Present 1) _____	2) _____	Number of children attending _____	
1. Was a ROR volunteer in the waiting room when family was there?	Yes	No	
2. Were parents given the Denver Developmental Checklist to score?	Yes	No	
3. Were parents given any written material (ie. developmental, TIPP sheets, etc.)?	Yes	No	
4. Was a child's book given to the family?	Yes	No	
5. Was a "Literacy Activity Tip Sheet" given to the family?	Yes	No	

<u>.00</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT
<u>.10</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT
<u>.20</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT
<u>.30</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT
<u>.40</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT
<u>.50</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT
<u>1.00</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT
<u>.10</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT
<u>.20</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT
<u>.30</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT
<u>.40</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT
<u>.50</u>	<u>Resident Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Focus of Res Beh</u> M F OPC TC OC OP	<u>Mom Behavior</u> H GD PAR SAF LIT INT OT NT	<u>Dad Behavior</u> H GD PAR SAF LIT INT OT NT

