Enhancing Reach Out and Read With a Video and Text Messages: A Randomized Trial in a Low-Income Predominantly Latino Sample

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Abstract

Objective: To determine the effect of adding a video and text messages to Reach Out and Read (ROR) on parent-reported literacy activities compared to the standard version.

Study Design: We conducted a mixed methods hybrid type I effectiveness-implementation randomized trial in a community health center that serves low-income Latino families. We assessed shared reading frequency and the StimQ Reading subscale, at enrollment and 6-month follow-up and the StimQ Parent Verbal Responsivity subscale, Parent Reading Belief Inventory, and Survey of Wellbeing of Young Children-Milestones at follow-up. We randomized 160 parent-child dyads to ROR or ROR plus video and text messages (enhanced ROR). We collected process data on ROR and engagement with texts. We interviewed 15 enhanced ROR participants. We analyzed quantitative data using regression and qualitative data using immersion/crystallization.

Results: One hundred thirty-seven parent-child dyads completed the study (87% Latino, mean child age 9 months). We found differences in the StimQ Reading subscale (B = 0.32; P = .034) and marginal differences in attitudes about reading favoring enhanced ROR. Between-group differences for shared reading frequency, verbal responsivity, and developmental delay were not significant. Qualitative themes provided insight into the enhanced ROR including how it encouraged parents, remaining barriers like competing priorities and lack of social support, and unanticipated benefits (ie, parent appreciation for attention on their families' wellbeing).

Conclusions: A video and text message enhancement to ROR resulted in modest improvements in the home literacy environment over ROR alone. Additional strategies are needed to overcome potent barriers faced by low-income families.

Keywords: early childhood; Latino; literacy promotion; primary care; text messages

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What's New

In an effectiveness-implementation hybrid randomized trial, we found the addition of a video and text messages to Reach Out and Read modestly enhanced the home literacy environment compared to the standard version among a sample of mostly low-income Latino families.

Low-income Latino children face persistent inequities in school readiness.[1] Such pervasive inequities underscore the need for interventions that can reach children who are at the greatest risk for poor outcomes. Shared reading enhances language and social-emotional skill acquisition,[2,3] which are critical precursors for school readiness. However, low-income Latino parents are less likely to report shared reading compared to higher-income white families.[4] Pediatricians have a unique opportunity to implement interventions that promote shared reading given their frequent, near-universal contact with families and trusted status.[5] Strategies that optimize pediatric interventions to promote shared reading for low-income Latino families may help promote equity in school readiness and subsequent wellbeing.

Literacy promotion is a pediatric standard of care.[6] Reach Out and Read (ROR) is a well-established, evidence-based model for primary care literacy promotion during well child visits for children 6 months to 5 years.[5] Currently, ROR reaches ~4.5 million children, including 25% of children age 0 to 5 years within twice the poverty level.[5] Nearly three quarters of patients served by ROR live in at-risk, low-income, and/or ethnically diverse homes.[5] The ROR model includes literacy-rich clinical environments, clinicians distributing age and language appropriate children's books to families, and anticipatory guidance promoting shared reading.[7] Several studies demonstrate that ROR increases shared reading frequency and improves child language outcomes.[8–10] However, there are opportunities to strengthen ROR even further. Latino parents are more likely to receive advice regarding shared reading but are less likely to follow this advice.[11] During qualitative interviews, Latino parents viewed shared reading as important and felt they should be reading with their children but were not.[12] Furthermore, despite ROR's impact, recipients' language scores remained almost one standard deviation (SD) below typical norms in two studies with samples that were majority Latino.[9,10] Another study suggests that the participants, who were all Latino, remained at elevated risk for reading problems at kindergarten entry.[13] These findings reflect the magnitude of current inequities faced by low-income Latino children and serve as a rationale for seeking strategies that can amplify ROR's impact.

Strategies that reach beyond clinic settings are necessary to help address pervasive racial/ethnic and income-based inequities in wellbeing.[14] Outreach strategies like videos and text messages hold promise given societal trends in technology use and their dissemination potential. There are multiple reasons to expect that such approaches could enhance ROR specifically. First, cell phones are nearly ubiquitous and Latinos are more likely to use text messages to communicate than other groups.[15] Second, a text message intervention decreased ER utilization and promoted immunization completion among Latinos in a pediatric setting.[16] Third, work in education settings support that text messages can encourage parent literacy-promoting behaviors.[17] However, to date published work has largely focused on testing the efficacy of ROR and has not tested outreach strategies such as texting and provision of videos that could enhance its impact.

This mixed methods study seeks to address this gap by testing the effect of adding a video and text messages to ROR on parent-reports of shared reading, the home literacy environment, attitudes toward reading, and developmental delays. We hypothesized that adding a video and text messages to ROR would improve parent-reported outcomes compared to the standard version. We used an effectiveness-implementation hybrid design to test intervention effects and gather implementation data concurrently. We also conducted qualitative follow-up interviews to gain deeper insight into the quantitative findings.[18]

METHODS

STUDY POPULATION

The study was conducted at a Federally Qualified Health Center (FQHC) in New Brunswick, New Jersey from January 24, 2018 to August 31, 2019. Nearly all patients served at the FQHC come from low-income backgrounds, with 98% of patients at or below 200% of the Federal Poverty Guideline. Seventy-one percent of patients identify as Hispanic/Latino. The FQHC has an active ROR program that only purchases bilingual (English-Spanish) books based on the patients served and has a literacy-rich waiting area that includes children's books and space for reading. All clinicians receive ROR training. The FQHC has 3-pediatricians and is a pediatric residency continuity clinic site. Clinicians are either proficient in Spanish or use an interpreter.

Parents were eligible to participate if they were the primary caregiver (referred to as parent) of a child age 6 to 15 months presenting for a well-child care visit, identified English or Spanish as their primary language, owned a cell phone, were age ≥18 years, willing to receive text messages, and willing to accept randomization and were recruited consecutively.

The study was approved by the Institutional Review Board at Rutgers Biomedical Health Sciences. We obtained written consent from all participants and registered the trial prior to enrollment of the first participant at Clinicaltrials.gov, Identifier NCT03242850.

STUDY DESIGN

We used an effectiveness-implementation hybrid type I randomized controlled trial design testing intervention effects while gathering data on implementation.[19] Parent-child dyads were enrolled and randomized 1:1 to standard ROR or enhanced ROR by trained research assistants. Participants were not blinded but clinicians and outcome assessors were not aware of assignment. We used a computer-generated random number sequence (Y.L.) and sealed opaque envelopes for allocation concealment. We also conducted follow-up, in-depth interviews.[20] Participants in both arms received a $25 retail gift card at enrollment and 6-month follow-up. Interview participants received an additional $25 gift card.

STUDY CONDITIONS

Standard ROR: All participants received ROR as part of usual care. The ROR model includes literacy-rich clinics, distribution of an age and language appropriate children's book, and clinician guidance on shared reading.

Enhanced ROR: The enhanced ROR arm consisted of standard ROR plus a video demonstrating dialogic reading viewed on a tablet during the visit and text messages for 6 months after the enrollment. We developed the video and text messages in English and Spanish based on themes identified during preliminary qualitative work engaging parents and community members.[12,21] We sought parent feedback on preliminary

drafts of the video and text messages by conducting 3 focus groups (n = 23 parents) and user testing (n = 8 parents). We then revised the video and text messages based on their feedback. Text message frequency and timing were also informed by this qualitative work with families. The final video was under 3 minutes long and included local parents reflecting on their experiences reading with their young children and directly addressing attitudes and barriers we identified during preliminary work (eg, children are too young). The video included footage of the parents reading with their children. The video was shown immediately after the clinician visit often when children were waiting for vaccines. Parents then received 9 text messages per month for 6 months after enrollment. Text messages included 1-way reminders, motivational messages, and strategies to overcome barriers that were sent twice per week. The messages were drawn from a bank of 52 messages that directly addressed the home literacy environment and attitudes about reading. Once per month, parents received a message that requested a response (Fig. 1; online).

Process Measures

Receipt of ROR: Parents were asked 3 questions to understand how ROR was implemented: 1) "Did you receive instructions on how to read with your child today?"; 2) "Did you see an example of how to read with your child today?"; and 3) "Did you receive a book at today's visit?"

Text Message Engagement: To assess text message engagement we monitored how many parents remained enrolled in messages and how often parents responded to texts as a percentage of bidirectional messages sent.

Outcome Measures

Shared Reading Frequency: The primary outcome was parent-reported shared reading frequency, which we assessed at enrollment and the 6-month follow-up visit. We asked parents, "In the past week, how many times did you read to your child?" and the response was treated as a count variable. Similar questions are widely used to assess shared reading frequency.[2,4]

StimQ Reading and Parent Verbal Responsivity (PVR) Subscales: Parents completed the StimQ Reading subscale at enrollment and the 6-month visit as well as the StimQ PVR at the 6-month visit. The StimQ is a parent-reported measure of the home cognitive environment that includes subscales on the home literacy environment (Reading subscale) and verbal responsivity (PVR subscale).[22] It is available in English and Spanish. The StimQ has high internal consistency (α = 0.88−0.93), high test-retest reliability (intraclass correlation coefficient = 0.93) and moderate correlation with the Bayley Scales of Infant Development (r = 0.52, $P < .001$). We calculated z-scores for both subscales.

Parent Attitudes About Reading: The Parent Reading Belief Inventory (PRBI) is a 42-item survey that is available in English and Spanish.[23,24] The PRBI is organized into 7 subscales, 5 of which demonstrate good internal consistency (teaching efficacy, positive affect, verbal participation, knowledge base, and resources).[23,24] Since children were in their second year of life at the follow-up visit, we omitted 5 questions that do not align with typical developmental expectations at that chronological age.

Risk for Developmental Delay: We assessed risk for developmental delay, in an exploratory way, using the Survey of Wellbeing of Children milestones, a parent-reported developmental screening tool.[25] We dichotomized scores

Message conveyed	Example text message
Reminders	Turn reading together into a habit. Try reading a book together every night.
Motivation and encouragement	Babies may push the book away when you read together. Although they may seem uninterested this is how they explore.
Simple strategies to overcome barriers (e.g., no time)	Going somewhere with your baby? Bring a small book with you.
Bi-directional messages	Have you spent some time reading stories to your [son/daughter] this week? (Please reply Yes or No) If response is "yes": Excellent, keep it up! Continue enriching your child's life. If response is "no": That's okay! Find some time in the next few days for a couple minutes. Remember to make it fun!

Figure 1. *Sample of text messages sent to enhanced ROR arm. ROR indicates Reach Out and Read.*

into at risk versus typical range based on instructions for chronological age.

DEMOGRAPHIC INFORMATION

At enrollment, parents completed measures of demographics (child age, sex, race/ethnicity, maternal age, and maternal education level) and health literacy measured by the Newest Vital Sign.[26]

QUALITATIVE INTERVIEWS

After the 6-month follow-up visit, we purposively sampled parents who received the enhanced ROR for qualitative interviews to gain insight into their experiences and remaining barriers. We used an explanatory sequential mixed methods design, in which we collected qualitative data to help explain quantitative findings from the randomized controlled trial.[18] We refined our sampling strategy to ensure representation of parents who read more by the end of the study and those who did not. All of the interview participants identified as Latino. Interviews followed an interview guide that consisted of open-ended questions and planned probes. Research assistants trained in qualitative research conducted the interviews, which generally followed the guide but the interviewer changed the order of questions and added unplanned probes based on interview flow. Interviews were transcribed verbatim in the language in which they were conducted (7 in English and 8 in Spanish). On average interviews lasted 37.8 minutes and occurred on average 2 months after the 6-month follow-up visit. We achieved thematic saturation (when no new themes were identified) after 15 interviews.[27]

DATA ANALYSIS

We used descriptive statistics to summarize demographic information and process measures. We compared demographic characteristics across arms. Participants were analyzed in the group to which they were initially assigned upon randomization. Those lost to follow-up were omitted from analyses. To determine the effect of the enhanced ROR intervention on parent literacy activities compared to standard ROR, we examined between-group differences for primary and secondary outcomes using regression analyses. We used negative binomial regression for shared reading frequency, which is useful to account for over-dispersed variation for count outcome variables, and included the baseline value as a covariate. We used linear regression for the StimQ Reading subscale z-score also including the baseline value as covariate. We used linear regression to examine the between-group difference in the StimQ PVR and PRBI scores and logistic regression for at-risk status on the Survey of Wellbeing of Children-Milestones but did not include a baseline covariate since these were assessed at the 6-month visit only. A priori power calculations demonstrated that the study had 80% power to identify a 0.5 SD difference in shared reading frequency at a significance level of 0.05 for 2-tailed tests. Additional analyses examined the subgroup of parent-child dyads who identified as Latino as well as the PRBI subscales and StimQ Reading subdimensions (quantity, diversity, and quality) among the whole sample. We used Stata version 15 (StataCorp, College Station, Tex) and considered a 2-sided P value $< .05$ statistically significant for all analyses.

We analyzed qualitative data iteratively as it was collected listening to recordings and reading transcripts repeatedly to identify preliminary themes and develop an initial coding scheme. Two bilingual team members then coded each transcript, refining the coding scheme, and resolving disagreements through consensus during frequent team meetings. This process was followed by an immersion-crystallization approach in which we identified and finalized the themes through extensive reading of transcripts and the coded text, reflection, and team discussion.[28,29]

RESULTS

During the study period, 291 parent-child dyads were screened for eligibility. Among those, 115 declined participation and 16 did not meet inclusion criteria. The most common reasons for declining participation were a lack of interest in the research study and insufficient time to participate in it. We enrolled and randomized 160 parent-child dyads (Fig. 2). Parent and child characteristics are summarized in Table 1. Children were 9.2 months old at enrollment on average. Eighty-seven percent of parents identified as Latino and 77% preferred Spanish. Half had less than a 12th grade education. Only the distribution of ethnicity differed significantly across arms with more participants identifying as Latino in the standard ROR arm. Twenty-three participants were lost to follow-up (14 enhanced ROR vs 9 standard ROR; $P = .23$). Parents who did not complete the study were younger than parents who did (26.8 years old vs 29.9 years old; $P = .029$).

Eighty-seven percent of participants reported receiving a children's book and 61% reported receiving instructions on how to read with their child. Only 39% reported seeing an example of how to read with their child. Among parents in the enhanced ROR arm, 77% responded to the bidirectional message at least once. On average, parents in the enhanced ROR arm responded to 46% of the messages sent during the 6-month study. Both groups reported more shared reading at the 6-month follow-up visit compared to enrollment. On average, parents in the enhanced ROR arm reported reading 1.8 more times per week (from 1.5 reading occurrences per week to 3.3 reading occurrences) while parents in the standard ROR arm reported reading 1 more time per week (1.9 reading occurrences per week to 2.9 reading occurrences per week).

Results of regression analyses are presented in Table 2. The between-group difference in shared reading frequency was not statistically significant. However, we found that participants in the enhanced ROR arm reported richer home literacy environments as measured by the StimQ Reading subscale z-scores (B = 0.32; $P = .034$) with the regression coefficient representing a modest 0.32 SD difference favoring the enhanced arm. We also found

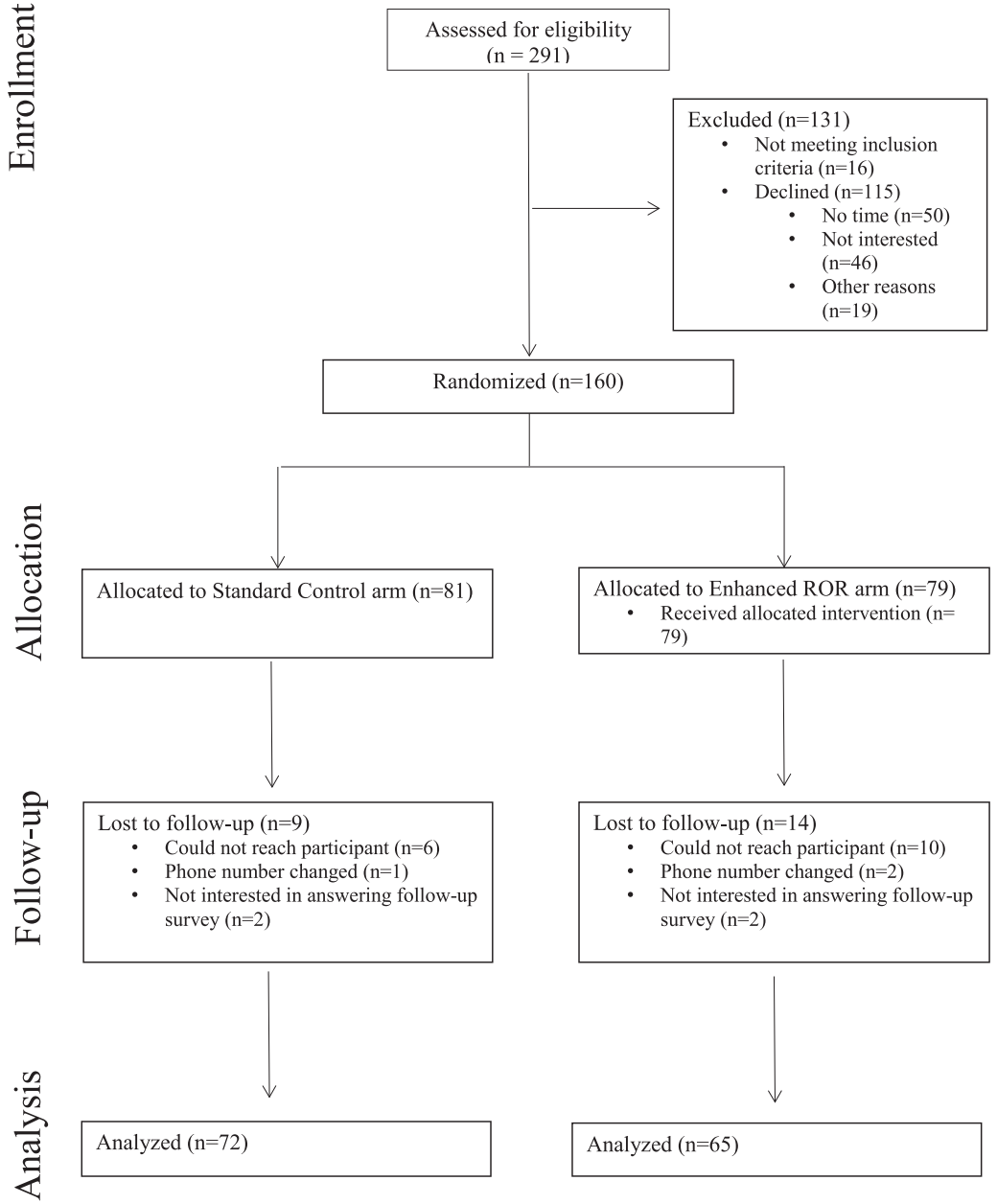

Figure 2. *Study CONSORT diagram.*

marginally more favorable attitudes (B = 3.47; *P* = .074) as measured by the PRBI with the regression coefficient representing the difference in PRBI scores favoring the enhanced arm. The enhanced ROR arm participants had higher scores on positive affect (B = 1.58; *P* = .017) and marginally higher scores on knowledge base (B = 0.61; *P* = .058) and resources (B = 0.60; 0.066) subscales of the PRBI (Table 3; online). The difference on the StimQ PVR also favored the enhanced ROR but was not significant (B = 0.25; *P* = .138). There was no difference in parent-reported developmental delays (odds ratio = 1.27; 95% confidence interval: 0.59−2.70; *P* = .540). Subgroup analyses of Latino parent-child dyads resulted in very similar estimates (Table 4; online). Results of exploratory analyses all favored the enhanced arm for the StimQ Reading scale quantity (B = 0.25; *P* = .106), diversity (B = 0.32; *P* = .057), and quality (B = 0.22; *P* = .165) subdimensions, with the diversity subdimension having the largest magnitude but none achieving statistical significance.

Qualitative Interviews

We identified 3 major themes. As expected, the text messages reinforced the ROR message and encouraged shared reading (Theme 1). The texts were especially useful when parents were just beginning to engage in shared reading or when the experience differed from their expectations. Still, competing priorities and interactions with other family members prevented some parents from reading regularly with their children despite the additional encouragement (Theme 2). For these parents, the messages could not overcome such barriers, which occurred in the context of poverty. However, unexpectedly, the

Table 1. Demographic Information of Study Participants at Enrollment

	Total Participants n = 160	Standard Arm n = 81	Enhanced Arm n = 79
Mean child's age, months (standard deviation [SD])	9.2 (2.9)	9.2 (2.8)	9.2 (3.1)
Child sex			
Male	82 (51%)	43 (53%)	39 (49%)
Female	78 (49%)	38 (47%)	40 (51%)
Parent's age (years)			
18–20	14 (9%)	8 (10%)	6 (8%)
21–25	32 (20%)	13 (16%)	19 (24%)
26–30	44 (28%)	23 (28%)	21 (27%)
31–40	61 (38%)	34 (42%)	27 (34%)
≥41	9 (6%)	3 (4%)	6 (8%)
Parent's ethnicity			
Latino	139 (87%)	77 (95%)	62 (78%)
Non-Latino	21 (13%)	4 (5%)	17 (22%)
Parent's preferred language			
Spanish	123 (77%)	66 (81%)	57 (72%)
English	37 (23%)	15 (19%)	22 (28%)
Parent's country of birth			
United States	28 (18%)	11 (14%)	17 (22%)
México	59 (37%)	34 (42%)	25 (32%)
Honduras	34 (21%)	15 (19%)	19 (24%)
Latin American Other	31 (19%)	18 (22%)	13 (16%)
Non-Latin American Other	8 (5%)	3 (4%)	5 (6%)
Parent's highest level of education			
Less than 8th grade	33 (21%)	16 (20%)	17 (22%)
9th–12th grade (no diploma)	49 (31%)	25 (31%)	24 (30%)
H.S. diploma or greater	78 (49%)	40 (49%)	38 (48%)
Parent's health literacy*			
High likelihood of limited literacy	95 (59%)	48 (59%)	47 (59%)
Possibility of limited literacy	43 (27%)	23 (28%)	20 (25%)
Adequate literacy	22 (14%)	10 (12%)	12 (15%)

*Based on newest vital sign results.

Table 2. Effects of Enhanced Reach Out and Read Compared to Standard Version

Outcome	B (95% CI)	*P* Value
Shared reading frequency*	0.17 (−0.09 to 0.42)	.201
StimQ reading subscale z-score†	0.32 (0.02 to 0.62)	.034
StimQ parent verbal responsivity subscale z-score‡	0.25 (−0.08 to 0.59)	.138
Parent reading belief inventory‡	3.47 (−0.34 to 7.28)	.074

CI indicates confidence interval.
*Negative binomial regression adjusting for baseline shared reading frequency.
†Linear regression adjusting for baseline StimQ Reading subscale z-score.
‡Linear regression.

benefits of the messages extended beyond shared reading (Theme 3). Parents appreciated the enhanced ROR because of the additional attention on their families' well-being. Table 5 provides illustrative quotations.

Table 3. Linear Regression Models Examining Effects of Enhanced Reach Out and Read Compared to Standard Version on Parent Reading Belief Inventory (PRBI) Subscales

PRBI Subscale	B (95% CI)	*P* Value
Teaching efficacy	0.62 (−0.65 to 1.89)	.335
Positive affect	1.58 (0.29 to 2.88)	.017
Verbal participation	0.25 (−0.43 to 0.93)	.465
Knowledge base	0.61 (−0.02 to 1.24)	.058
Resources	0.60 (−0.04 to 1.24)	.066

CI indicates confidence interval; PRBI, Parent Reading Belief Inventory.

Table 4. Subgroup Analyses: Effects of Enhanced Reach Out and Read Compared to Standard Version Among Latino Parent-Child Dyads Only

Outcome	B (95% CI)	*P* Value
Shared reading frequency*	0.13 (−0.14 to 0.41)	.342
StimQ reading subscale z-score†	0.35 (0.01 to 0.68)	.041
StimQ parent verbal responsivity subscale z-score‡	0.32 (−0.05 to 0.68)	.086
Parent reading belief inventory z-score‡	2.22 (−1.66 to 6.10)	.26

CI indicates confidence interval.
*Negative binomial regression adjusting for baseline shared reading frequency.
†Linear regression adjusting for baseline StimQ Reading subscale score.
‡Linear regression.

Table 5. Themes and Representative Quotations Identified During Interviews With Enhanced Reach Out and Read Arm Participants

Theme	Representative Quotes
The text messages reinforced the ROR message and encouraged shared reading	"It was like a pleasant surprise when I got the text. Sometimes, I was having like a rough day and it just so happened to be what I would consider. . . like a motivation . . . there were days, you know in the beginning it was a little rough because I would read and she would fall asleep, I'm like, 'okay like what do I do?' and then I would get the texts and. . . I don't know how to describe it, just it made me feel a little better I think." P97 "I liked getting them I guess in a way to like help. . . push me to like read with her more and to keep on track with that cause I was just starting to read with her so I wasn't used to like reading with her every day and stuff like that so it helped me do so." P50 "They helped me connect with my child and helped me focus on more about [my] child" P93 "Because it encourages you to read more with him, spend more, like, time with him. It helps to get to know him." P130
Competing priorities and interactions with family members prevented some parents from reading regularly with their children despite the messages	"I did read the messages and I. . .I knew that it was good to sit down and read with your kids or do activities with your kids. If I had a lot of time I would do it. I would do everything that it says we should; reading to kids is very good, spending time together with the kids is also very important as is doing activities with them. Or when you're doing chores around the house, you should tell the baby what it is your doing or what this is and what that is. Yeah, I don't know. To me it's very interesting. Well, yeah, if I had the time during the week, I would do it. I would do everything that it says. I do whatever I can. But to try and spend time to read, in reality no. I can't spend too much time there." P63 "Well, being a mom is not easy. It's a bit complicated, right. Doing all the chores around the house and when I'm done doing everything I have to spend time with him and be with him. So, sometimes it's not possible. . .to devote more time with him." P80 "A few weeks ago, I'll be honest. They changed my work schedule, I sleep less, I have a lot of things that I have to take care of on my own. Honestly, it's been a few weeks that I haven't read." P84 "I hoped to make a schedule. But the circumstances didn't allow me to, because where he sleeps, in his crib, is in our room. It's next to our bed, so when my husband is watching TV that doesn't allow me to sit and read with him. I would have to read with him in a different spot, and then take him to bed, so it would be uncomfortable because if it would be in his crib I would show him the book and he would be able to fall asleep there, but since it's somewhere else it's really not as easy as the doctor tells me, as she suggests. And I have not been able to create that habit." P123
The benefits of the messages extended beyond shared reading	"Because I would learn. Every message had some content that would help me to read to my son." P103 "Because it kind of shows that, even though it was a study and stuff like that, people still kind of care and this is a helpful thing that you guys are doing as well." P107 ". . .it gave me the incentive or the push that I needed to begin with book activities with my son, and I am pleased, satisfied, thankful, I love it." P117 "I really liked, I liked it a lot, the messages. And that you have an interest in us learning and the fact that you would be checking in, I liked that a lot. I thank you for that." P95

ROR indicates Reach Out and Read.

DISCUSSION

We found that adding a video and text messages to ROR resulted in a modest increase in the home literacy environment compared to the standard version. When combined with the themes identified during interviews, our findings suggest that these strategies are a promising approach to amplify ROR's message but not sufficient to overcome other potent barriers to shared reading encountered by low-income families. The current study has implications for literacy promotion and the use of videos and text messages to promote health-related behaviors more broadly.

The process evaluation in this study highlights opportunities to optimize ROR implementation. Our findings indicate that while nearly all families received a children's book and the majority received guidance from their pediatrician on shared reading, fewer reported that someone modeled reading, which may be especially important for effective literacy promotion.[30] These numbers likely vary across ROR sites. Past work highlights how quality improvement initiatives can enhance ROR implementation[31] and our findings reinforce the need for this work.

Our findings raise 2 important issues and potential directions for future research. First, given the acceptability of the messages, it is worth asking why the effects on parent-reported literacy activities were not larger. One potential explanation, suggested by our qualitative data, is that videos and text messages alone cannot overcome the competing priorities faced by many low-income families. Future work that examines the effect of aligning primary care literacy promotion to community-based efforts that address poverty-related stress (eg, Help Me Grow) on parenting and child outcomes can address this gap. Second, it

is also possible that these strategies have unexpected effects that are not easily measured but are nonetheless important. For example, parents in our study expressed appreciation for the messages and some parents even expressed that the messages were an indication that the clinic cared about them. Strengthening parent-clinician relationships through feelings of connection suggested in past work[16] or feelings of appreciation identified in this one may influence other family health behaviors. Future studies that examine similar interventions should include formal measures of the parent-clinician relationship and engagement with the health system.

Our study had a number of strengths. While much of the literature on literacy promotion has focused on evaluating the efficacy of ROR, only a few studies have examined enhancements to this model.[32,33] We also achieved a retention rate of 86%, which is high given that the study sample came from an underserved population. The concurrent process evaluation and follow-up interviews also enriched our understanding of our findings. However, our study is subject to limitations. The study occurred in one FQHC with families from largely low-income Latino backgrounds, so our findings may not generalize to all settings. Future work, at multiple sites should examine to what extent the effect of such enhancements differs based on fidelity to ROR. While beyond the scope of this study, examining heterogeneity of outcomes based on country of origin can also provide important insight. Our study was powered to identify an effect size of 0.5 SD and thus was underpowered to detect smaller effect sizes that are considered meaningful by the American Academy of Pediatrics and commonly found in more costly, intensive early childhood interventions.[34] Future studies with larger sample sizes are needed. We used parent-reported measures, which introduce the possibility of social desirability and recall bias. Additionally, participation in a study focused on shared reading may have itself influenced this behavior. Further, we only assessed home literacy activities among the primary caregiver and it is possible that others within the home engage in these activities. We also did not examine to what extent the primary caregiver or others in the home engage in reading themselves. Such an emotional connection could be an important determinant of shared reading and warrants future study. We also did not use observational measures of child development but given the age of the children enrolled and the brief follow-up period, there was likely insufficient time to observe differences. Future longitudinal work can address this limitation. Future work should also tease apart the effects of the different intervention components (ie, video vs text).

CONCLUSIONS

A video and text messages combined with ROR resulted in a modest increase in the home literacy environment and fostered parent appreciation for the additional attention on their families' wellbeing. The findings suggest that a time-efficient and relatively inexpensive enhancement to ROR resulted in some beneficial effects for a high-risk group but are also a reminder that such strategies in isolation are limited in their ability to address more potent barriers associated with poverty. Additional research is needed to further build on evidence-based interventions like ROR and identify innovative strategies to leverage primary care to promote equity in school readiness.

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