At-Risk Children's Metacognitive Growth During Reading Recovery Experience: A Vygotskian Interpretation

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Abstract

Metacognition (i.e., self-appraisal and self-management) implies the process of active control over one's own cognition (Brown, 1980; Jacobs & Paris, 1987). This study described 17 at-risk first graders' metacognitive growth in an early literacy intervention program—Reading Recovery. Each child was encouraged to relate an oral tale based in experience and then asked to dictate that oral monologue as a written-for-others text. Per Vygotsky's (1962) developmental theory which relates speaking and thinking through the regulatory function of language and the internalization of others' discourses, metacognition was observed in the children's spontaneous speech as they engaged in a challenging literacy task such as adapting an oral tale to a literate register text. Data were collected at the entry and exit of the Reading Recovery experience. Linguistic, statistical, and qualitative analyses were performed using Cox's (1994) guidelines. Results revealed that the children exhibited statistically significant and qualitatively distinct growth during the enrichment experience, not only in their knowledge about self, literacy task, and task related strategies, but also in their regulatory capacities to gain control over text content and to accommodate audience needs. Limitations and implications of the study are also discussed.

In recent years, the literacy problems of educationally disadvantaged populations have received added attention (e.g., Smith-Burke, 1989) due to the projected shift in the demographics of school-age children in the coming decades (Pallas, Natriello, & McDill, 1989). One of the more significant developments in addressing the literacy needs of at-risk children has been the introduction and implementation of Reading Recovery. Reading Recovery (RR) is an early literacy intervention program developed by New Zealand educator Marie Clay (Clay, 1993a) to assist at-risk first grade children in developing effective literacy skills typical of successful learners. Research at the local, state, national, and international levels has demonstrated that RR is a viable alternative to traditional

remedial (e.g., Chapter 1) instruction (e.g., Clay, 1990; Hiebert, 1994; Pinnell, Lyons, DeFord, Bryk, & Seltzer, 1994; Schmitt, 1995). For example, Pinnell et al. (1994) compared Reading Recovery with three other instructional models and found that the former was more effective than the latter. Specifically, the study reported the RR children's performance on four measures (sentence dictation, basal-adapted text reading, Gates-MacGinitie, and Woodcock) was statistically significantly better than any other treatment groups (Reading Success, Direct Instruction Skills Plan, Reading/Writing Group) and the control group. Shanahan and Barr (1995) concluded from their meta-analysis that the effects of Reading Recovery are "comparable to those accomplished by the most effective educational interventions" (p. 959).

While RR's contribution to children's developing reading and writing skills is well documented, few studies (e.g., Schmitt, Younts, & Hopkins, 1994) have focused on what and how the RR experience contributes to children's metacognitive development. Because metacognition and literacy skills are closely related (Cox, 1994; Donaldson, 1978; Olson, 1994; Scribner & Cole, 1981; Wood, 1988), it is especially important to examine at-risk children's metacognitive growth during the RR experience.

Theoretical Framework

Metacognitive Theory

Metacognition, in its most general sense, implies the process of active control over one's own cognition (Brown, 1980). According to Flavell (1976), metacognition refers to "one's knowledge concerning one's own cognitive processes and products … " and to "the active monitoring and consequent regulation and orchestration of the processes in relation to the cognitive objectives on which they bear … " (p. 232). In other words, metacognition encompasses two aspects: self-appraisal (i.e., awareness) and self-management (Jacobs & Paris, 1987; Paris, Wasik, & Westhuizen, 1988). The first refers to children's declarative knowledge (knowing what), procedural knowledge (knowing how), and conditional knowledge (knowing when and why). The second aspect, often equated with executive control (Brown, 1983; Cox, 1994; Garner, 1994), refers to children's strategic planning, on-line monitoring, and regulating action. The existence of regulatory action presupposes knowledge of cognition. That is, if there is evidence of cognitive regulation, some level of knowledge about self, task, or strategy must exist, albeit without conscious awareness. In the literacy context (i.e., reading and writing), knowing *what* (declarative knowledge) is realized in aspects such as strategy and metalinguistic awareness. Knowing *how* (procedural knowledge) is realized through regulation of both process and product (e.g., monitoring the choice of more precise words for an audience or applying a word recognition strategy). Without awareness, students may lack a readiness to exercise control over or regulate their learning (Gordon, 1990).

Relative to literacy, metacognition is operationally defined as independent, strategic learning and involves the knowledge of self (e.g., one's strengths/weaknesses, interests, study habits), task (information about the difficulty of various tasks and the different demands of tasks), learning strategy variables (Flavell, Green, Flavell, 1995; Schmitt, Younts, & Hopkins, 1994), and the regulatory functions of planning, monitoring, checking, evaluating, and revising (Baker & Brown, 1984) one's reading comprehension or construction of comprehensible text for a reader.

Metacognition is important in education for at least four reasons. First, effective learning depends on successful orchestration of cognitive operations (Dembo, 1994). Second, numerous studies have reported that metacognition is closely related to being a more proficient reader (e.g., see Haller, Child, & Walberg, 1988; Paris, Wasik, & Westhuizen, 1988 for reviews) and better writer (e.g., Cox, 1994; Flower & Hayes, 1981). Third, metalinguistic comments by young children have been documented in terms of early literacy behaviors (Clay, 1972; Teale & Sulzby, 1986). Fourth, recent research indicates that as young children develop literacy skills, they are already exhibiting signs of emergent procedural metacognitive awareness and control over literacy processes and products (Cox, 1994; Cox & Sulzby, 1982; Dahl, 1993; Gordon, 1990). The present study tracks evidence of RR children's developing emergent metacognitive control over their literacy processes and products during their time in one Reading Recovery program.

Vygotskian Theory

In this study, Russian psychologist Lev S. Vygotsky's (1962) developmental theory, relating speaking and thinking through the regulatory function of language and the internalization of others' discourses, drives our interpretation of metacognition. Vygotsky contends self-regulatory speech is a universal phenomenon through which thought and language unite to exert control over behavior. Specifically, young children talk to themselves and to others as they engage in literate activities. Such "spontaneous utterances" (Dahl, 1993) or "private speech" (Berk & Spuhl, 1995) express(es) inner cognitive processes and serve as a "directing force" for action. For example, children routinely use oral language as a vehicle for discovering and negotiating emergent written language understandings and for getting meaning on paper (Cox, 1994; Dyson, 1983, 1991). Further, the development of higher mental processes such as metacognition originates in social experience and is transferred from the interpersonal to the intrapersonal psychological planes by means of self talk (Vygotsky, 1978). With the aid of such private speech, children's self-regulatory capacity expands over time. Berk and Spuhl (1995) explained,

As children experiment with speech-to-self in order to cope with new tasks, some types of speech may effectively transform behavior, others may be of relatively little consequence, whereas still others may be debilitating. As the coordination of utterances with action becomes increasingly refined, private speech achieves mastery over behavior and is internalized. (p. 147)

Based on Vygotsky's theory, metacognition is observed in children's spontaneous speech as they engage in a challenging literacy activity such as constructing what we call 'a literate register text'(i.e., one for others to read). Particular utterances during and surrounding the literate activity can be distinguished from the story and other dis-

course because of their intonation and their self- and other- regulatory functions to monitor the story's content/form and specifically address planning, monitoring, evaluating, and revising. Further, a subset of these utterances directly suggests internalization of thinking processes through their adoption of another's speech (Bakhtin, 1986; Wertsch, 1980, 1991).

This study differs substantively from earlier psychological research which often measured metacognition through think-alouds, stimulated recalls, or retrospective interviews reporting conscious metacognitive strategies during or after a task (e.g., Flower & Hayes, 1981), an operationalization that is beyond a child's grasp from Vygotsky's perspective (Berk, 1992) and which is suggested as less accurate in capturing thought processes (Nisbett & Wilson, 1977).

Young Children and Metacognition

The issue of whether young children develop metacognition has been a subject of considerable controversy. Psychological literature generally claimed that young children do not have the ability to think about their own thought processes and that they are limited in their ability to do anything about metacognitive knowledge (Baker & Brown, 1984; Dembo, 1994; Flavell, 1985; Garner & Reis, 1981). For example, Flavell (1985) argued that it is not until late childhood or early adolescence that students become capable of assessing a learning problem, devising a strategy to solve the problem, and evaluating their success.

Recent studies of young children using the socio-constructivist framework have, however, offered preliminary evidence to the contrary. Defining metacog-

nition as cognitive self-appraisal and self-management, a growing body of research has documented what young emergent readers and writers know (e.g., Dahl, 1993; Goodman & Altwerger, 1981) and what they do when they engage in literate activities (e.g., Clay & Cazden, 1992; Cox, 1994; Cox & Fang, 1996; Rowe, 1989). For example, Dahl (1993) examined the spontaneous utterances of first-grade inner-city children in two urban sites. She found that these learners did say aloud some of the things they were thinking and that nearly half of the 87 categorized utterances were metacognitive statements indicative of children's engagement in self-monitoring and awareness of written language.

Cox's (1994) recent work blended Vygotsky's developmental theory about the relationship between language and thought with Halliday's systemic and sociolinguistic theory of language development. She found that children as young as preschoolers already used regulatory utterances that implied procedural regulatory thinking relative to producing a comprehensible literate register text. She further reported that many of these preschoolers made explicit self- or other-regulatory utterances that exerted control over (by planning, monitoring, checking, evaluating, and revising) their dictated texts' content, form, and structure for their audience. Along the same vein, Rowe (1989) also reported that as young children developed reading/writing skills, they were already exhibiting signs of emergent metacognitive awareness and control related to writing in their own systems.

One recent study has specifically addressed young at-risk readers' potential for developing diverse forms of metacog-

nition. Schmitt, Younts and Hopkins (1994) examined one Reading Recovery (RR) child's development of metacognitive knowledge related to reading and strategic regulation of the reading process over a span of 25 lessons. They reported noticeable evidence of metacognitive growth during the RR experience. Specifically, they indicated that at the end of lesson 25, the child revealed some new insights about herself as an employer of a variety of sensemaking strategies during reading, demonstrated more knowledge of task and greater use of task-relevant strategies, and had begun to achieve independent, strategic control over the reading process.

While research continues to favor RR as an instructional model for at-risk children's reading and writing development (e.g., Pinnell, et al., 1994), there is still little understanding with respect to RR's contribution to at-risk children's metacognitive growth beyond problem solving reading strategies. Because metacognition and literacy skills are inextricably related (Donaldson, 1978; Scribner & Cole, 1981; Wood, 1988), it is important to investigate what and how RR contributes to children's metacognitive growth. Such investigation can give us a more complete picture of RR's role in children's literacy ontogenesis. Toward this end, systematic analysis and research are needed to help determine and articulate (a) what it is that children have learned and how have they improved; and (b) which of these learnings, though not explicitly taught in the RR program, are implicitly available in the instructional context. As Wood (1988) noted, "By making explicit what is implicit in their [children's] performance, we gain an objective understanding of the tasks,

demands and problems that children have to face when we try to teach them to read and write fluently" (p. 168). Further specifications of RR's contributions promise to yield crucial instructional and research insights that may (a) enhance our understanding of children's literacy and cognitive development, and (b) allow us to better assist other at-risk learners, who do not yet have RR available to them, to become more proficient readers and writers.

The Study

Research Questions

The present study focuses on children's developing emergent literacy related metacognition during the RR experience. It addresses the general question of whether the development of metacognition comprises a part of what the RR experience contributes to literacy development. Specifically, three research questions were raised: (a) Do at-risk children make regulatory utterances to self or other that explicitly regulate the text's content, structure, or an issue of comprehensibility for a reader? (b) Are there quantitative or qualitative differences in these children's metacognitive utterances between the entry and the exit sessions of the RR program? and, if so, (c) Are any metacognitive gains statistically significantly associated with gender, race, and income variables that have been consistently identified as sensitive to the vicissitudes of instruction (Dahl & Freppon, 1995; Delpit, 1986, 1988).

Participants

Twenty-seven first grade children from four suburban schools within one

district of a midwestern city participated in the study. They were selected for Reading Recovery according to their levels of performance on Clay's *An Observation Survey of Early Literacy Achievement* (1993b). Clay's observation survey provides individual information about children's letter knowledge, writing and reading vocabularies, ability to hear and record sounds in words, understandings about concepts of print, and skill in reading continuous text. The selection of the children and their RR instruction were monitored by RR teacher leaders and all 27 children were instructed by certified Reading Recovery teachers.

Ten children were eventually withdrawn from the study because they either moved away with their families before completing the RR program or were referred for psychological testing and placement in special education. In terms of demographic composition, of the remaining seventeen children, there were six girls and eleven boys, seven African Americans and ten European Americans, and five from low income families, and twelve from middle income families. The level of children's family income was indicated by their schools' federal free lunch program.

Administrative Procedures

Each child was interviewed by a familiar adult who had talked informally with groups of children and had established rapport with the target children prior to the data collection sessions. Data were collected at four sessions spanning an average period of approximately six months with a minimum of four months for some children and a maximum of nine months for others: (a) once before the first RR instructional lesson, (b) twice at equal intervals during the program (as each child reached level 5 and level 10), and (c) once shortly after the child's dismissal from (i.e., successful completion of) or at the end of the program. All interviews were audio-taped and transcribed for later analyses. For the purpose of this paper, only data from the entry (session 1) and exit (session 4) were used. At both of these sessions, the child was encouraged to relate a vis-á-vis oral tale about a personal experience. Then the adult commented on the oral monologue tale's interest and suggested he or she knew some other similar-age children who would like to read that story. The adult then invited the child to dictate that oral tale as a story for these other children to read (i.e., a book-like or literate register text). The adult acted only as scribe using a laptop computer, offering no help beyond simply recording the child's words, re-reading the text aloud, and inviting edits. This task has been used successfully in previous studies involving preschool and first grade children (e.g., Cox, 1994; Cox & Dixey, 1994; Cox, Fang, & Otto, 1997; Cox & Sulzby, 1984).

The study's task has several distinct characteristics. First, the dictated text represents what the child is sufficiently familiar with regarding literate register language to use intuitively or independently. Second, the task implicitly requests the child to code-switch from an oral monologue to a literate register one, a challenging undertaking for young children from Vygotsky's perspective. Third, the task maximizes the child's opportunity to use his or her literate register knowledge to control self-sponsored text, because it uses a child-selected memorable experience developed first in oral language. Finally, the use of dictation frees the child of demanding mechanical concerns (e.g., spelling, forming letters, punctuation). Thus, the task can be performed without prompting and intervention of researcher probes. This enhances the reliability and validity of the research data and maximizes the methodological rigor of early childhood research.

In essence, the task provides a situation in which task difficulty was increased (i.e., from an oral tale to a written-for-others text). The increase in task difficulty may, per Vygotsky's theory, force a young child's developing internalized self-regulation outward as audible self or other-regulatory speech. In addition, the only way to control the text was through the scribe. The task requested the child to, intuitively or consciously, take responsibility for constructing a literate register text while also allowing him or her to review, monitor, and edit his or her text by making requests of the scribe.

Scoring Procedures

Linguistic, statistical, and qualitative analyses of the data were conducted. Specifically, linguistic analyses, guided by Cox (1994), were completed independently by two trained scorers. First, all utterances in the dictated stories and surrounding discourse that suggested strategically regulatory metacognitive functions were identified. To ensure accuracy in our judgement, audio tapes were replayed so that the child's dictation intonation became part of the linguistic context in which analyses were done. To be considered an instance, an utterance had to be an implicit or explicit attempt by the child to strategically plan, monitor the composing process, and regulate the comprehensibility of the text for the implied reader. These instances were then classified by two trained scorers into three categories: (I) externalized speech implying inner thinking and general planning; (II) audible self- or other-regulatory speech addressing audience needs; (IIa) audible and explicitly other-regulatory speech specifically directing the scribe to address audience needs; and (III) audible metalinguistic comments. Features and examples of these categories are furnished in Table 1. Interscorer agreement was approximately 81% with 100% resolution achieved through discussion.

All categories of regulatory speech or metalinguistic comments were parsed as T-units, per Cox (1994). A proportion score of metacognitive utterances relative to the dictated story T-units was then calculated. For example, if a child dictated a fifteen T-unit text with five T-units of metacognitive utterances embedded during the composing process, the total metacognitive score would be 0.25, that is, $5/(15+5)$. These proportion scores were then submitted to multiple analysis of variance (MANOVA) for repeated measures. The between-subjects factors are gender, race, and family income. The within subject factor is time. Because repeated measures analysis of variance is for determining the statistical significance of change, the F-ratios for the between-subjects factors (also called main effects) are usually not of interest (Gall, Borg, & Gall, 1996). Of interest instead is the interaction between time of measurement and between-subjects factors. In other words, what the study is primarily interested in is whether the difference between the entry and exit means of one group is significantly different from that

for the other group. Thus, the between-subjects effects were generally not reported unless they reached statistical significance. Significance level was set at 0.05 for all analyses. For all the statistical analyses, the SPSSX advanced software package version 4.0 was used. Finally, cross-case comparisons and contrasts (Miles & Huberman, 1984) were employed to determine if qualitative differences existed in children's metacognitive utterances between the entry and exit sessions of the RR experience.

Results

Quantitative

The means and standard deviations of metacognition scores for both the entry and exit sessions of Reading Recovery are provided in Table 2. For the entry session, fifteen of the seventeen children in this study (88%) used some type of metacognitive speech that indicated a regulatory function. At the exit session, all seventeen participants produced metacognitive speech directed at controlling their literacy products and processes.

Repeated measures MANOVA revealed that there is a statistically significant time effect, F (1, 11)=17.16, p=.002. This means that children showed statistically significant growth in metacognition during their RR experience. There is also a statistically significant family income by time effect, F (1, 11) = 7.95, p=.017. This suggests that children from low and middle income families demonstrated significantly different patterns of metacognitive growth during the RR experience. No other main effects or interaction effects were judged to be statistically significant.

Qualitative

Microanalyses suggest distinct differences in the quality of children's metacognitive utterances between the entry and exit sessions of the RR program. In general, at the entry session most metacognitive utterances tended to indicate some form of general planning (achieved primarily through the use of subvocal utterances such as "um," "uh," or "err") or were metalinguistic comments in nature (primarily served by a story end marker "that's all" or "the end"). Below is an example of an entry session dictated text with embedded metacognitive utterances italicized and categorized:

Ted (African American boy)
(Scribe prompts child to dictate)
Child: (dictates) We get to play every-thing.
Scribe: (repeats) We play everything.
Child: (continues dictation) outside and hot wheels. We get to play slide and monkey bars and the tires.
Scribe: Okay.
Child: (continues) And we play inside.
Scribe: Okay.
Child (continues) Wel-l [I], we hit it and we kick it and we hit it with our hands and we hit it with out feet and … and … [I] … That's all [III].
Scribe: (repeats) and that's all.

Table 1: Characteristics and Examples of Metacognitive Speech Categories

Category	Features	Examples
I	externalized speech implying inner thinking and general planning	* …um … oh, I can't think. * I, uh, I throw his toys. * And … let's see.
II	audible self- or other-regulatory speech addressing audience needs (this category monitors, checks, evaluates, or revises the content and text to meet the audience comprehension needs	* And then I go (corrects himself) get in order * My dog sleeps like him, like my cat. * And my sister said that we gone … . are going to chew gum. * We dropped, we dropped her off.
IIa	audible and explicitly other-regulatory speech specifically directing the scribe to address audience needs (this category monitors, checks, evaluates, or revises the content and text through other regulation to meet the audience's comprehension needs)	* I want to take that off (pointing to the word "grandpa" on the scribe's computer screen) * I want me and my sister (in the title).
III	audible metalinguistic comments (this category signals the writer's monitoring and understanding of some aspects of writing, text, and the writing process)	* That's the end. * (commenting on his own story) If he (trapped dog) didn't get his head out free, it (story) would not be as good. * The first one (letter) is big and the second one's little.

* Adapted from Cox (1994)

Table 2 Means and Standard Deviations (SD) of Metacognition Scores by Gender, Race, and Family Income at Entry and Exit of Reading Recovery Program

	Entry Session Mean	SD	Exit Session Mean	SD	Gains Mean	SD
Overall	0.37	0.22	0.51	0.18	0.14	0.24
Gender						
Male	0.44	0.19	0.53	0.19	0.09	0.25
Female	0.23	0.22	0.47	0.19	0.24	0.20
Race						
African American	0.30	0.21	0.49	0.19	0.19	0.19
European American	0.41	0.23	0.52	0.19	0.11	0.27
Family Income						
Middle Income	0.42	0.21	0.47	0.16	0.05	0.20
Low Income	0.25	0.23	0.61	0.21	0.36	0.18

Child: (continues) and we play blocks and we play, we play … [I] everything inside. We play Duck Duck.

Scribe: Now just a minute. What did you say? "And we play blocks … "

Child: and we play outside in the tire.

Child: (continues) We go back inside and then we sit down and take a break and then they call our name to go pick a station.

Scribe: Okay.

Child: (continues) We have recess inside and outside. And then we go over, get our lunch and lunch money too. We get our lunch money to give it to the one who cooks. We get ready to go outside. And then we sit down in our chairs and practice our numbers.

Scribe: We sit down in our chairs and practice our numbers.

Child: That's all [III].

Although a few of these children did attempt to address text content through on-line monitoring and regulating the scribe (e.g., "Did you say 'knock people off the pit'?" "Go, go back up to the cat thing … "), their self- and other-regulatory capacities were quite limited in both scope and depth. Furthermore, there were only a few metacognitive utterances that suggest evidence of self-correction or elaboration during dictation to address issues of precision and ambiguity, an indication of possible lack of self-appraisal or knowledge of literate register expectations during the composing process. This is reflected in the dearth of category II metacognitive utterances. The two examples below help illuminate the point.

Jeffrey (European American boy)
(Scribe prompts child to dictate)

Child: (dictates) We traveled for two days. Ahh, and … and then [I] we went to Florida.

Scribe: Okay?

Child: (continues) Then we went in a place.

Scribe: Okay.

Child: (continues) Then we rented a place.

Scribe: (repeats) into places?

Child: No, we rented a house [IIa].

Scribe: Oh, I'm sorry, OK. (scribe types "house to replace place" and repeats "Then we rented a house.") Okay?

Child: (continues) Then we went to Disney World. Then we went to go ride rides. Then we went to go eat. Um … (big sigh) I'm trying to think … [I] and back to the place. And then we went back to dinner and then we went on more rides.

Scribe: (repeating child) and then we went back to dinner.

Child: (edits "dinner") to Disney World [IIa].

Scribe: (repeats) "to Disney World and then we ride more rides." Okay?

Child: (continues) Then we went to Myrtle Beach. And then we left. And that's all [III].

Kiran (European American girl)
(Scribe prompts child to dictate)

Child: (dictates) We were at my house. And then we went to my grandma's, (self-corrects) grandpa's [II]. And then me and my broth-

ers went up to get the truck.

Scribe: OK

Child: (continues) to load the truck up with our stuff. An … d (drawn out), and we moved up to Indiana [I]. Errrh … [I]. That's all [III].

(Scribe rereads and invites edits)

Child: Umm … [I]. That's enough.

Scribe: Do you want to change anything?

Child: (shakes head) no.

Scribe: That's just the way you want it.

In sharp contrast, the metacognitive utterances at the exit session as a whole showed marked growth in both self-appraisal and regulatory capacities. For example, although utterances indicating planning functions continued to be common at the exit session, they are both more strategic and purposeful, clearly serving content and audience needs (e.g., "I can tell you three stories," "How long are you going to write," "I will do one [story] about Christmas," "Can I say about my dog?"). In addition, the children appeared to be more cognizant of their planning process (e.g., "Take me a while [to think]," "Oh, let's see," "I can't think any more"). Furthermore, while at the exit session the RR children continued to use end markers (e.g., "the end," "that's it," "that's the last thing," "and that's probably about it," "That's the end of that sentence") to signal the end of the composing process, their repertoire of metalinguistic knowledge had grown considerably. For instance, they more closely monitored the writing process and clearly articulated their concerns relative to text content and format (e.g., "But you forgot to put the other 'C'," "What are you writing?" "Can you write all of it?" "It

almost took up a whole page," "But that's supposed to be a K [child pointing to the computer screen]," "Like him, (spell) H-I-M," "The first one's [letter] big and the other one's [letter] little," " … to my grandma, period").

More remarkably, many children appeared to be acutely cognizant of what a story is or what a good story should be like (e.g., "That part's funny," "I think they [audience] will enjoy it [story]," "We can show that to my teacher," "I guess I made good stories," "It's [story] real long," "I don't know how a story is," "By Linda Nessell," "In the Snow [as story title]," "It's [story] called Lion and My Horse"). Below is an illustrative example.

Greg (a European American boy)
(Scribe prompts child to dictate)

Child: I can tell you three stories [I].

Scribe: Why don't you pick one of them. Which one do you think you like to tell for other boys and girls?

Child: Um, I think I would write like the camping one [I].

Child: (begins dictation) I went to church camp. And when me and my brothers and my grandparents got there we went and find this place where you eat in the morning. And after we went inside the … after we went inside the place [I], we went to our cabin. The next morning, we, I got my orange whistle [II]. And after I got my whistle I went outside to play. And I saw three dogs. And that night everyone at church camp went outside for the camp fire. And we sang a lot of songs and before we roasted marshmal-

lows we sang another songs. And then we got to roast marshmallows and I accidentally put my too close to the fire and it was on fire. And I said, "It needs another one. Throw it off." That's it [III].

Scribe: Okay. That's a good story. Now let me read it back to you in case you want to make any changes or add anything. (Scribe reread)

Child: That part's funny [III]. And I think they will enjoy that [III].

Scribe: I think it's really funny. That's a nice story.

Child: Will everyone in this door, place get one [II]?

Scribe: No, we are going to give it to you.

Not only did the children advance in metacognition categories I and III, they also demonstrated substantive growth in categories II and IIa. Overall, these children were able to monitor closely their dictation (e.g., "Did you really write that?" "I should have said that, right?' "Do you forget to put the other 'C'?") and constantly made self-regulatory utterances (category II) that clarify and elaborate the messages in the text while also attending to audience needs (e.g., "then I go, (self-corrects) get in order," "He, I mean, his name is Franklin … ," "grandma, my grandma," "I think I want to take out 'I forgot'," "My dog sleeps like him, like my cat," "We rode bike around the pool— the swimming pool," "and I like to go ppssh [noise made when diving into water] … but I can't say that on that [referring to story]"). Similarly, the children's other-regulatory speech (Category IIa) communicated clear, explicit directives to the scribe and showed strong concerns for the substance of the text content and audience needs (e.g., "Put 'no girls allowed'[in the story]," "You don't have to cross any more out," "Write it down," "Can you erase that stuff?" "[scribe puts in her side remarks in the story in parenthesis, the child notices that and says] What's that say? … No, [take] that [pointing to the word 'examiner'] out," "I want to take that off (pointing to the word 'grandpa' in the text)," "Take out 'that's all'"). Another example from Ted follows.

(Scribe prompts child to dictate)

Child: (dictates using dictation intonation) It was Christmas. Now, I am … (inaudible)

Scribe: What did you tell me?

Child: Old.

Scribe: Old?

Child: I forgot to tell you [I].

Scribe: OK. You tell me.

Child: (resumes dictation). Now, I'll, I, now I will eat [I].

Scribe: Eat? OK.

Child: (continues) my breakfast and before I can go, (self correct) go [II] …

Scribe: (checking by repeating) before I go, OK.

Child: (continues dictation) to school.

Scribe: to school.

Child: (continues) I like school when it is Christmas. Umm [I] … And (pause) and [I] … we, we, I go to the computer lab [II]. I will type my name first and then make a story for a friend and then I'll, I am done before that all … [II]

Child: (aside) I can hardly see the "b" [III].

Scribe: You can hardly see the "b"? It's there. (pick up the child's last dictated words) before that … .

Child: (continues) I always walk to lunch. I get in …

Child: (aside) You know, I can't see the "i" [III].

Scribe: You're right. I can't see it either. Let's see. Let's see if we can move this over so we can see it. There it is.

Child: (continues) and then I go, (self-corrects) get in the order [II].

Scribe: (checking by repeating) the order

Child: (continues) and then we walk to the lunch room.

Child: (aside) It's almost lunch time.

Scribe: That's right. It is.

Child: Did you put that down [IIa]?

Scribe: No, I didn't. Did you want me to?

Child: Nope.

Scribe: Okay?

Child: (continues) And it was lunch time. And we walked and walked …

Scribe: (repeating) walked and walked, huh …

Child: (continues) and we walked out. Then we ate. And then, then, then it … [I]

Child: (aside, noticing computer screen) "It" [IIa]

Scribe: Um, hmmm. There's "it."

Child: (continues) It was time to leave the lunchroom. At that very moment, we walked at, at the classroom and we had play time. We did the puzzles, (aside to scribe) puzzles [IIa], and legos, and …

Child: (aside, referring to computer screen) What is it doing [III]?

Scribe: It's moving over, that's why.

Child: (continues) and, and … [I] Child: (to scribe) I can't see "a", can you [III]?

Scribe: No, I can't see it either, but it's there. (repeats child's last word) and …

Child: (continues very slowly, each word given separately) and the games and we did the books. We did the computer. And we did combinations …

Scribe: (checking on word) combinations?

Child: (continues) pluses, and the numbers from, (corrects) and the numbers … [II]

Scribe: Um, hmm.

Child: (repeats) and the numbers. (final tone)

Scribe: Okay?

Child: (continues) And we went to art. And we made, made (pause) made people [I], animals, and fishes, and lions, and more fishes, and made … we made paper [II].

Scribe: Paper

Child: (aside) That's a "p" right there [IIa].

Scribe: Yes, that's the "p."

Child: (continues) And we made houses on paper. We was done and when we, we went back to our room [I], we got a drink. And we went to our classroom.

Scribe: (repeats) … went to our classroom. Okay?

Child: (repeats We went to our classroom. And we took our class,our classroom went, and we was getting ready to go home. And we walked and walked and got on the bus and we sat down and we waited to get off the bus. And that's all (III).

(Scribe offers to reread and invites edits)

Child: I don't want to add anything.

To summarize, this study shows that the Reading Recovery participants exhibited statistically significant and qualitatively impressive growth during the enrichment experience, not only in their knowledge about self, task, and task related strategy, but also in their regulatory capacities to gain control over text content and audience needs. Further evidence of such growth is furnished in the Appendix.

Discussion

The study's research questions were all addressed. The first question asked if at-risk children exhibited evidence of regulatory talk indicative of self-appraisal and self-management. The results from this study clearly suggest that the vast majority of the RR children already had developed some early forms of metacognition at entry to the RR program. The finding runs counter to the more traditional view that often associates metacognition only with maturation and more proficient learners (Garner, 1994; Paris, Wasik, & Turner, 1991). It also corroborates Vygotsky's (1962) view that "the child about to enter school possesses, in a fairly mature form, the functions he must next learn to subject to conscious control" (p. 90).

The second question asked if there were quantitative and qualitative differences between the entry and exit sessions in the RR children's metacognitive utterances. This study offered substantive evidence of such growth. Specifically, at the exit session the children developed a much clearer sense of themselves as readers and writers, became more cognizant of the literacy task in which they were engaging, and were more proficient in

using language (i.e., private regulatory speech and other-regulatory speech) to regulate strategic control over text content, structure, and audience needs. It is also worth noting that, by the end of the RR experience, the participants have seemingly developed a clearer sense of what a good story should entail. This suggests that the extensive opportunities to read and talk about interesting stories with a knowledgeable other as provided in the RR lessons may have helped these at-risk children internalize essential features of storybook language.

Vygotsky (1962) observed that "school instruction … plays a decisive role in making the child conscious of his own mental activities." (p. 92). It is reasonable to suggest here that the expanding regulatory capacities of the RR participants may be due, at least in part, to the RR experience. The magnitude of such growth has been interpreted from both Vygotsky's (e.g., Clay & Cazden, 1992; Pinnell, et al, 1994; Schmitt, et al, 1994) and British social theorist Basil Bernstein's (e.g., Cazden, 1995) perspectives. First, RR lessons feature one-on-one instruction that is embedded in a positive, considerate, and encouraging environment. According to Brown (1956), language and literacy development is, in a unique sense, "a process of cognitive socialization" (p. 247). The finely-tuned "scaffolding" (Bruner, 1981) available in RR lessons facilitates growth of higher mental functions within an ever advancing 'zone of proximal development'. Second, as "a mixed system" (Cazden, 1995), RR lessons integrate explicit with holistic instruction in that RR teachers encourage children to notice, explore, borrow, and reflect on critical features of

the written language while immersing them in rich literacy environments.

In recent years, there have been suggestions (Delpit, 1986, 1988) that an instructional model such as RR can be especially fruitful when used with minority populations who are yet to acquire a "secondary" (Gee, 1989) or academic discourse, one that is linguistically and functionally distinct from the children's home discourse. For this reason, a third research question was asked if the magnitude of metacognitive growth was significantly related to factors such as gender, race, and family income. The results from this study indicated that, statistically speaking, girls did not gain significantly more than did boys, that African Americans did not gain significantly more than did European Americans, but that low income did gain significantly more than did middle income categories. Although it is still premature to conclude with certainty, due to small sample size, imbalanced design and lack of a control group, that RR works or does not work better for one group traditionally labeled as most "at-risk" (i.e., the economically disadvantaged), this study appeared to suggest that it might. However, it is also possible that because the measurement of change (gains) is involved in this study, the ceiling effect is at work. The middle income children entered the RR program with much higher metacognition scores than their low income peers.

It is important to note that at the end of the RR program the mean differences of metacognition scores between the various subgroups (male and female, African American and European American, and low income and middle income) have been considerably reduced. This can be observed from Table 2. For example,

while the African American children trailed their European American peers by 0.11 at the entry session of the RR program, both groups were roughly equal at the exit session (i.e., 0.49 for African Americans and 0.52 for European Americans). The magnitude of the differences between male and female was also reduced, almost by half, during the RR experience (i.e., from 0.11 to 0.06). It is interesting to note that although the gap between the low income and middle income remained relatively big at the exit session, the direction of difference was reversed. That is, while the low income group trailed the middle income group by 0.17 at the entry session, the former outscored the latter by 0.14 at the exit session. Taken together, this study suggests that the RR experience may be at least partially responsible for the dramatic reduction in group discrepancies. It also suggests that RR may be especially effective in helping high at-risk children accelerate to or even surpass the level of their peers in terms of gaining metacognitive control.

Limitations and Implications

A number of cautions need be exercised in interpreting the data presented here. First and foremost, the small sample size (17) and imbalanced design (in cell numbers) limit any generalization over and beyond the characteristics of the current population. Second, since no control or comparison groups were used in the study, it could be argued that the reported metacognitive growth may not be due solely to the RR experience, but is possibly also an outcome of natural development, regular school instruction, or some combination. In fact, in late spring in their regular classrooms, some of the RR

children were still receiving reading instruction in the basal primer, others were in the first reader, and one was in a literature-based program. The difference in the children's regular classroom instruction may also have contributed to the differential outcome described in the study. Third, as noted earlier, there exists some potential dangers associated with measurement of change. For example, ceiling effects may be at work in gain scores. That is, there is always a limit to the amount one can gain during the treatment period. When a particular group of participants already have high scores at the entry level, they might gain comparatively less during the treatment period than the one with low entry scores. Examination of the data did reveal that the European American, male, and middle income groups all had higher` metacognitive scores at the entry session to Reading Recovery than the African American, female, or low income groups, respectively (see Table 2).

These limitations suggest directions for future research. Further investigation may use a larger, more varied, and balanced sample and employ control and/or comparison groups. Such studies should contribute to a better understanding of the complex relationships between instruction and learning and between metacognitive/literacy growth and various sociocultural factors. More importantly, they should offer fresh guidelines that will enable teachers to make more informed instructional decisions.

Finally, Vygotsky's theory about children's developmental education (see Davydov, 1995 for an excellent overview) and the supportive finding of this investigation grant schools and teachers a more prominent role in fostering young children's cognitive development. As the Reading Recovery model (Pinnell, et al, 1994; Schmitt, et al, 1994) suggests, it is imperative that teachers involve children in extensive reading and writing while simultaneously engaging them in conversations that range from casual talk to deliberate explanations about features of written language. Teachers should also encourage children to notice, explore, borrow, and reflect on language, and they should foster the development of children's literacy skills using productive examples and in functional, communicative contexts.

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Appendix: Samples of Children's Metacognitive Growth During RR Experience

Karen (African American, female, low income)

Entry Session (Metacognition Score = 0.25)

1. Scribe: Do you want to add anything? Child: Ummm … - - - - - - - - - - - - - - - - - - (I)
2. Scribe: (rereads child's dictated story, missing the phrase "he eats")
   Child: He eats. - (IIa)
3. That's all. - (III)

Exit Session (Metacognition Score = 0.75)

1. My family is (pause) … is nice to me. - (I)
2. Don't spell it with a C, spell it with a K - (IIa)
3. If I would, (rapidly) if I would not (regular pace) act silly. - - - - - - - - - - - - (II)
4. … . to my grandpa (says period). - (III)
5. (fairly fast and normal phrasing) My auntie bought me all kind of stuff.
   (repeats slowly, word by word) My auntie bought me all kind of stuff. - - - - - - - - - (II)
6. Hmm. - (I)
7. That's all I know. - (I)
8. Oooh, one more. - (I)
9. My dog sleeps like him, like my cat. - (II)
10. Scribe: You want "him," OK.
    Child: Like him, (spell) H-I-M. - (IIa)
11. Where is him? - (III)
12. That's all I know. - (I)
13. That's all. - (III)
14. I want to take that off (point to grandpa on computer screen). - - - - - - - - - - - (IIa)
15. And pick Grandma. - (IIa)
16. Grandma, my grandma. - (II)
17. Grandma, (begin to spell) G-R-A-N-D-M-A - - - - - - - - - - - - - - - - - - - (III)
18. That's all. - (III)

Linda (European American, female, middle income)

Entry Session (Metacognition Score = 0.42)

1. Does paper come out of this thing? - (III)
2. Hmmm, I don't know. What else? - (I)
3. Oh, Yeah I got it. - (I)
4. Is that pretty good? - (III)
5. Scribe: (Reread) I have some frogs.
   Child: No, no. I have a yellow bucket. -(IIa)
6. Scribe: And then it started raining and a frog came - - - - - - - - - - - - - - - - -
   Child: a mom frog came hopping along - (IIa)
7. And I asked, keep asking my dad … - (II)
8. Scribe: Anything else you want in your story?
   Child: Umm. (pause, then thoughtfully) Yeah. - - - - - - - - - - - - - - - - - - (I)
9. My, I have a next door neighbour … - (II)
10. that has a cat, a baby kitten. - (II)
11. And the, and that baby kitten is gray - (II)
12. and it has, it has a little bit of white on. - (I)
13. And, and when I hold it, it runs away … . - (I)
14. Scribe: (repeats while writing) "And when I hold it, it runs away"
    Child: If I keep moving - (IIa)

15. And (pause), and, and when I stay real still on holding, he starts falling asleep.   - - - - (I)
16. Scribe: (repeats while writing and with upward end intonation
    inferring accuracy check) "he starts falling asleep?"
    Child: Yeah, kinda shifty, (aside tone) so it won't be Figgly, Piggly. - - - - - - - - - - - (II)
17. Scribe: You want that in your story?
    Child: Yeah. Figgly, Piggly. - (IIa)
18. Type it. - (IIa)
19. I also like … Piggly, um, that it? - (I)
20. Scribe: (reread) I got a horse. Her name (pause)
    Child: Kiwa - (IIa)
21. Scribe: Is there anything you want me to change?
    Child: Ummm … . - (I)
    Scribe: Is that OK?
    Child: Un unh (appearing to be answering the first question because no
    edits were offered)

<u>Exit Session (Metacognition Score = 0.61)</u>
1. It's called, ummm … . - (I)
2. It's called Lion and My Horse. - (III)
3. And I'm just gonna say "And My Turtle " now, because I don't
   want to get anymore animals on it.
4. And (repeats strongly) … and - (I)
5. And my turtle, oops, OK. - (II)
6. Ok, Stop there. - (IIa)
7. By Linda Nessell - (III)
8. Well, I have a horse. - (I)
9. Hmm, Black Beauty, it's a B (referring to screen). - - - - - - - - - - - - - - - - - - - (III)
10. But my puppy is the /thing/ … (to self) is a, the, yeah. (to scribe) /thing/ - - - - - - - - (II)
11. Scribe: Excuse me, let me make a note here. Ok (rereading) but my
    puppy is the …   Child: (repeats more clearly) thing - - - - - - - - - - - - - - - - (IIa)
12. (repeats as scribe corrects text) Is the thing I just want to get rid of. - - - - - - - - - - - (II)
13. Do you bring stories to all the kids? - (II)
14. I guess I made good stories. - (III)
15. Child: But I'm
    Scribe: (clarifying) I'm
    Child: Yeah, am. - (II)
16. He, I mean, his name is Franklin …   - (II)
17. You're typing that in there (means the part about book and Franklin). - - - - - - - - - (III)
18. Oh, let's see. - (I)
19. I tipped up my doll. He is under her head. (aside to scribe: It is true, he was.) - - - - - (II)
20. Do you want me to write more story? - (III)
21. Umm, I really don't have any much stories. - (I)
22. Why are you writing that? - (IIa)
23. Well … . - (I)
24. That's the story. I guess I'm done now. - (I)
25. Did you really write that? - (III)
26. Scribe: (rereads the story) … . I really don't have much stories.
    Child (point to last line): You can erase this - (IIa)
27. Can you erase that stuff? - (IIa)