

# Reading Recovery and Complex Adaptive Systems: Widening Circles for Sustainable Implementation

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## Introduction

Just as a child's series of lessons requires attention to the unique patterns of an individual child's learning, successful and sustainable implementations in schools invite us to learn more about the unique complexities of systems within schools (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; Kaye, 2013). This study sought to investigate what contributes to successful Reading Recovery® implementation by using a theoretical frame from complexity science — *complex adaptive systems* (CAS). Dooley (1996) defines CAS as a “collection of agents (people, groups, and ideas) that interact so that system-wide patterns emerge, and those patterns subsequently act on and influence the interactions among the agents” (p. 2). That definition clearly can be applied to schools in general, and to Reading Recovery schools specifically. This definition also implies that leaders in such a system can observe those emerging patterns and make appropriate decisions as they adapt to changing patterns in the system. When leaders both understand the dynamics of the CAS and respond to changing conditions to influence the individual and collective development or learning, they are said to have *adaptive capacity* (Eoyang & Holladay, 2013). For this study, CAS

provided a lens to examine whether and how people, patterns, and actions within the system reflect adaptive capacity as they work to make a positive difference in the outcomes for children served in Reading Recovery.

This multiple case study research included four Reading Recovery sites across four states. For this research, a site is defined as all the schools where Reading Recovery teachers are working that are the assigned responsibility of the teacher leader. In some cases, all of these schools are in one district, but in other cases these schools can be spread across districts. Teacher leaders from these four sites participated in a self-study. Teacher leaders from three of the four sites chose two schools to focus on within their site based on at least 3 years of successful implementation (met or exceeded the national average for successfully completing a series of lessons), and the teacher leader from one site chose one focus school with strong initial year data. These teacher leaders gathered survey data from their focus schools and discussed findings with colleagues and researchers involved in the study through a series of four virtual meetings. As part of the self-study, teacher leaders and researchers together explored how adaptive capacity

(responsive flexibility) builds by seeing, understanding, and influencing patterns of interaction and decision making. What follows describes how an understanding of CAS can help leaders understand the differences that make a difference in successful implementations.

## Theoretical Framework

Marie Clay understood that human learning is complex and unpredictable. Through her extensive research, Clay discovered that literacy learning (and teaching) involves the reciprocal relationships among reading and writing, and oral language, and the complex, adaptive teaching and learning of self-extending systems (Watson & Askew, 2009). She also understood that this learning requires adaptive problem solving at the individual level that cannot be micromanaged. For that reason, the design of Reading Recovery systems acknowledges individual diversity to facilitate adaptation to the unpredictable. Further, Clay (2013) described Reading Recovery professionals' ability to solve problems from the systemic view of “three concentric circles: implementing, teaching, and learning” (p. 230), understanding that specialization in these areas of problem solving were important for the intervention to be

effective. These concentric circles consist of the outer circle (implementing in school systems), the second circle (training teachers for problem solving which includes Reading Recovery teachers, teacher leaders, and university trainers), and the inner circle (the learning of children). She emphasized the importance of “tentativeness, flexibility, and problem-solving principles” as critical to the success of Reading Recovery at each of these levels (p. 246).

Scientists who study complex systems would agree that tentativeness, flexibility, and problem-solving principles are ways to influence complex systems. For example, Eoyang and Holladay (2013) argue that four essential characteristics of complex systems call for close observation and responsive adaptation, or adaptive capacity:

- **Open**—The whole and parts of complex systems are susceptible to influences like public pressure, availability of resources, changing demographics, and so on.
- **Diverse**—Participants in the system are different across many dimensions — age, gender, language, ethnicity, race, sexual preference, and socio-economic status, just to name a few.
- **Connected**—Parts of the system interact in nonlinear or interdependent ways; each response to an interaction influences ongoing interactions.
- **Unpredictable**—Particular actions are not predictable, although patterns emerge over time.

These features of complex learning systems (Davis & Sumara, 2006; Ricca, 2012; Patterson, Holladay, & Eoyang, 2013) reflect the characteristics of Reading Recovery implementations. Reading Recovery sites are open to information and influence; diverse in terms of learners and contexts, connected and interdependent; with particular responses of individual teachers and students essentially unique and unpredictable. In this article, we draw heavily on the emerging field of *human systems dynamics* (Eoyang, 2002; Eoyang & Holladay, 2013), a particular set of methods and models relevant to human systems. Briefly, the goal of human systems dynamics (HSD) is to help people see the patterns in the complex systems where they live, work, and play; make sense of those patterns; and take action that will be responsive, adaptive, and generative—actions that will sustain the system into the future. In a constantly moving system, the only way to navigate and, perhaps, to influence the path of the system is to observe the emerging patterns, to take action to shift those patterns, and to watch closely to see what happens next.

This approach resonates with Reading Recovery implementation, where leaders strive to be observant and responsive so that they might adapt appropriately to changing realities in the local context. Questions remain, however, about what to observe and specifically how to adapt in ways that can ensure sustainability. The Year 2 i3 scale-up report affirms this difficulty:

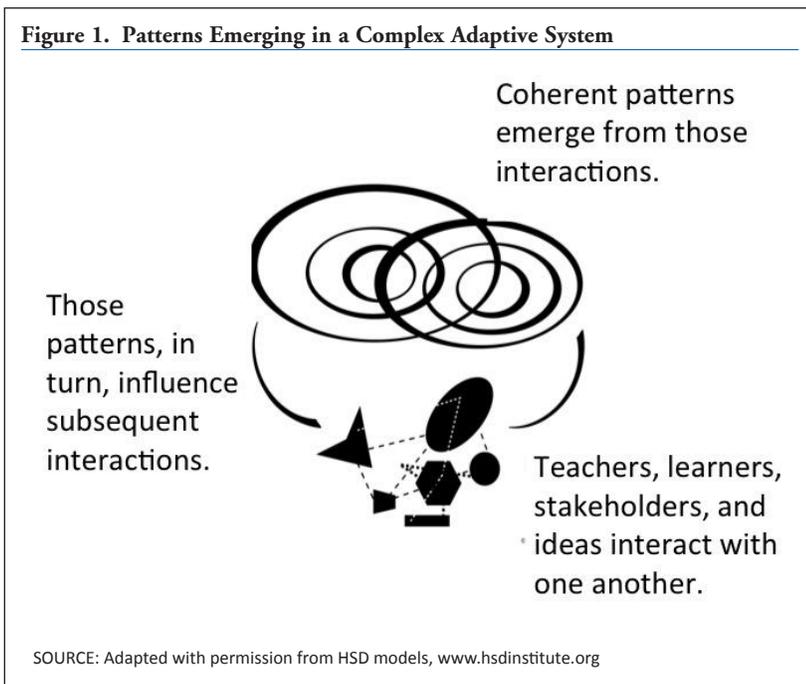
Because Reading Recovery’s implementation requires the involvement of multiple players performing a range of nuanced

tasks—some quite removed from the program priorities of lesson delivery and teacher training—there are important aspects of implementation that are not easily codified as Standards and are not captured by our measures of fidelity. (May et al., 2014, p. 14)

The final evaluation report of the i3 scale-up (May, Sirinides, Gray, & Goldsworthy, 2016) analyzed 23 schools through case studies to examine school-level implementation of Reading Recovery, focusing primarily on agents in each school such as Reading Recovery teachers, classroom teachers, and administrators. The teacher leader responsible for the school was also included to gain their perspective of the school’s implementation, however their role in the research was integrated with the agents within the school, so was not the primary focus of the research. In our study, in order to examine these multiple players and their diverse and nuanced tasks, we need to “zoom out” to include the teacher leader, to think of these individual actors and actions as a complex and adaptive system of interdependent parts. We can then see that the whole is significantly different from the sum of its parts. It is useful to think of Reading Recovery schools and districts as complex ecosystems (particular examples of CAS), ever-evolving networks of relationships through which people, materials, and environment interact in nonlinear and unpredictable ways (Patterson, Holladay, & Eoyang, 2013).

Patterns of behavior and discourse emerge from these ecosystems. We argue that noticing and naming these patterns are essential to successful and sustainable implementa-

**Figure 1. Patterns Emerging in a Complex Adaptive System**



tion. Reading Recovery leaders clearly notice and name patterns as they make decisions. For example, after watching a school at work, they may say that the Reading Recovery teachers collaborate with classroom teachers on a daily basis to make decisions about individual students. Or they may say that everyone at the school keeps their decisions private because they are afraid of being “in trouble” for not complying with expectations. Patterns like these become entrenched over time (Stewart, 2016; Stewart & Patterson, 2016). They are usually difficult to shift, and these entrenched patterns constrain future interactions. In other words, we tend to continue acting in familiar ways — even when we are dissatisfied with our results. Figure 1 represents this dynamic process through which system patterns emerge.

As these patterns of thought, behavior, and communication emerge and become stronger over time, they

begin to constrain the subsequent interactions in a recursive cycle (Patterson, Holladay, & Eoyang, 2013).

This perspective suggests that the role of the leader is to watch the learning ecosystem closely, interpret observations to identify patterns, and take action to support learners at partic-

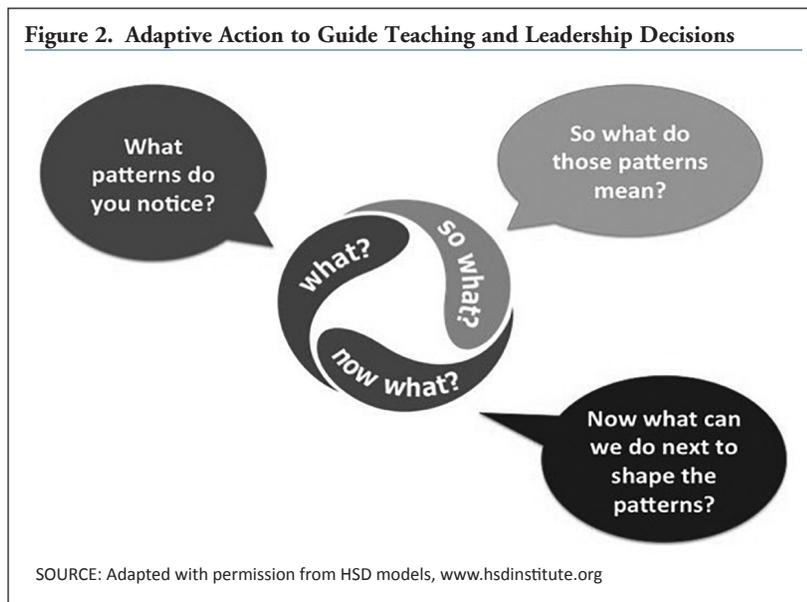
ular moments. What is the learner ready to do next? What moves will provide ‘just enough’ support? In other words, what is the next wise action? That is true for the Reading Recovery teacher; it is also true for leaders at the school, district, and site levels. Responsive leadership is, in fact, an ongoing cycle of inquiry, reflection, and action that might be called *adaptive action* (Eoyang & Holladay, 2013; see Figure 2).

In a complex learning ecosystem, the leader (as a part of that system) is responsible for zeroing in on the patterns that make the most difference to the dynamics of the system.

Eoyang (2002) conducted a qualitative analysis of research on CAS in many diverse disciplines, and her findings and subsequent work across many contexts suggest four patterns that seem to be directly related to the underlying dynamics in learning ecologies:

1. **Shared Identity**—In this system, who are we as teachers and/or learners?

**Figure 2. Adaptive Action to Guide Teaching and Leadership Decisions**



2. **Shared Focus**—What is our shared focus at this time?
3. **Significant Issues**—What matters most to our work?
4. **Shared Practices**—In this system, how do we work together to facilitate inquiry, reflection, and adaptation?

We used these four patterns to guide our study of successful Reading Recovery implementations and also used Figure 3 to help us analyze and understand the dynamic process through which Reading Recovery system implementation patterns emerge.

### Statement of the Problem and Research Question

There are similarities and differences across Reading Recovery sites and schools — even successful ones. If successful Reading Recovery implementation is an example of a healthy learning ecology (or CAS) at work, then what are the underlying condi-

tions? In order to understand what contributes to successful school implementations from the perspective of the teacher leader, this was our overarching research question: What patterns do we see in the reports of teacher leaders about schools within their site with successful implementations (defined by measures of student progress)? To address this inquiry, we asked ourselves four big questions:

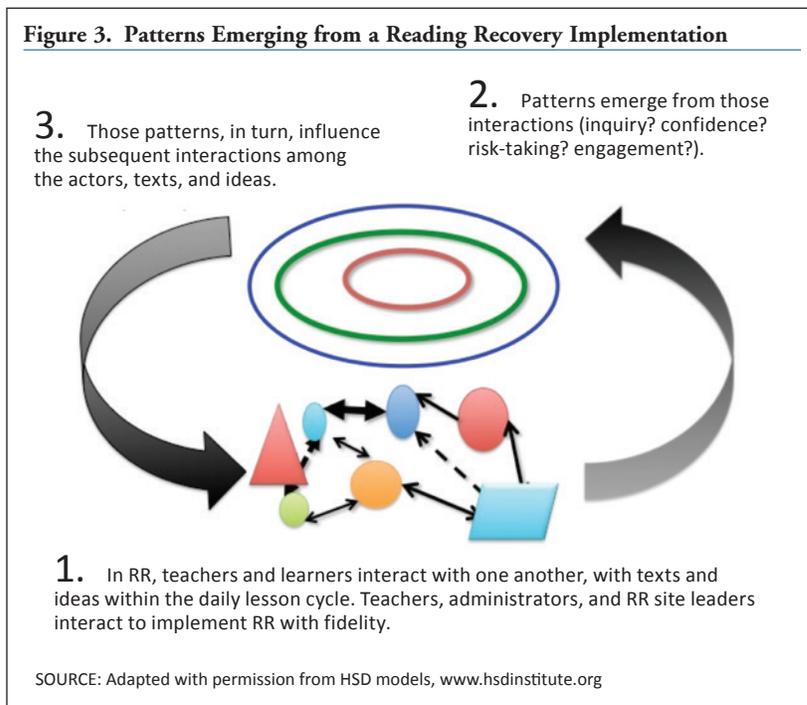
1. What patterns relate to shared identity among teachers and administrators in the school?
2. What patterns relate to individual and collective or shared foci for Reading Recovery work?
3. What are patterns in the issues that these teacher leaders see as significant (differences that make a difference)?
4. What shared practices do teacher leaders report, or how do the teacher leaders describe

how the teachers, administrators, and others in the school work together?

### Methods

The four-person research team consisted of two researchers familiar with Reading Recovery; one researcher familiar with complexity and HSD principles; and one researcher familiar with complexity, HSD principles, and Reading Recovery. This team met with teacher leaders from the four participating sites for four weekly online meetings. One of the four sites had two teacher leaders, so there were five teacher leaders as part of the study. One teacher leader's site responsibilities included schools within her own district and schools outside of her district. She chose one focus school from within her district and one from outside her district. The other teacher leaders chose focus schools within their district. Our initial meeting consisted of brief background readings as a refresher from a previous teacher leader training (e.g. [complexsystemsandreadingrecovery.wordpress.com](http://complexsystemsandreadingrecovery.wordpress.com)) and discussion about CAS as a rationale for future conversations and surveys. The teacher leaders subsequently facilitated completion of a variety of surveys between meetings and read additional readings on complex systems related to the topic of the week. Each online meeting focused on sharing insights from the readings and the completed surveys. Table 1 shows the timeline for the study.

The research team also met before each of the four online meetings to discuss specific concepts included in the background readings for the week, to finalize the details of the survey(s), and to address any other topics for the agenda. This team



**Table 1. Timeline for the Study**

Meeting with Teacher Leaders	Focus/Topic: Completed Survey	Research Question	Who Completed the Survey
April 19 Online	Introduction to Study		
April 26 Online	Shared Identity & Focus: Survey 1 (Appendix A)	1&2	Teacher leaders: 7 (1 per school) Administrators: 5 School teachers: 68
May 3 Online	Shared Content (Differences that make a difference): Survey 2 (Appendix B)	3	Teacher leaders: 7 (1 per school)
May 10 Online	Shared Practices: Survey 3 (Appendix C)	4	Teacher leaders: 7 (1 per school) RR teachers: 7
June	Individual Follow-up	Overall	Teacher leaders: 7 (1 per school)

also met between each online meeting and three additional times across the 6 weeks following the online meetings to analyze the data. During these discussions, we created a list of questions to ask each teacher leader during our follow-up interview to provide us with a context for each school. These questions asked how long the school had Reading Recovery and how long each Reading Recovery teacher had been a part of that school. Additional questions asked about the current principal and how many principals the school had in the past 5 years as well as how many classroom teachers were in the school and how many classes per grade level. Lastly, we wanted to know about the teacher leader's roles at the school and/or in the district and approximately how many times they were at that school each month. Our data consisted of the completed surveys, researcher notes from each online discussion, and any informational documents created for each online meeting including reading assignments. We also gathered

researcher notes from follow-up interviews with each teacher leader and notes from all research team meetings. Between each research team meeting we individually coded the data from the previous meeting, beginning with Survey 1 (Appendix A) and notes from the online meeting about the survey, using inductive analysis (Creswell, 2013). This analysis was designed to identify themes and patterns of themes within schools and then within the four sites. We then came together and discussed what codes each saw in these surveys and in the discussion notes that helped us answer the research question for the particular survey in order to come to a consensus. For example, based on responses from administrators and classroom teachers in each school from Survey 1, we created a map (Figure 4) showing the process of our mapping of effective Reading Recovery schools.

This was part of our process as we discussed these codes and identified common themes across schools and

sites for this set of surveys identifying shared identity and shared focus. We then coded Survey 1 responses from the teacher leaders, looked for patterns that emerged, created a table of possible patterns, and added quotes from the surveys. This process guided our discussion of the teacher leader perspective of shared identity and shared focus. We repeated a similar process with Survey 2 (Appendix B) isolating each question for discussion based on codes noticed for that question across all schools. For example, Question 1 asks about the principal's leadership, so we created a table with codes from this question with quotes that fit the pattern noting which survey this quote came from. Using this initial analysis, we then looked over all of the Survey 2 data looking for differences that made a difference in these schools for each question. For Survey 3 (Appendix C), we analyzed these surveys by school, coding for shared practices at each of these schools and then looked at them as a whole. In subsequent meetings, we continued our inductive analysis using all data sources until we identified themes and supporting evidence across the data.

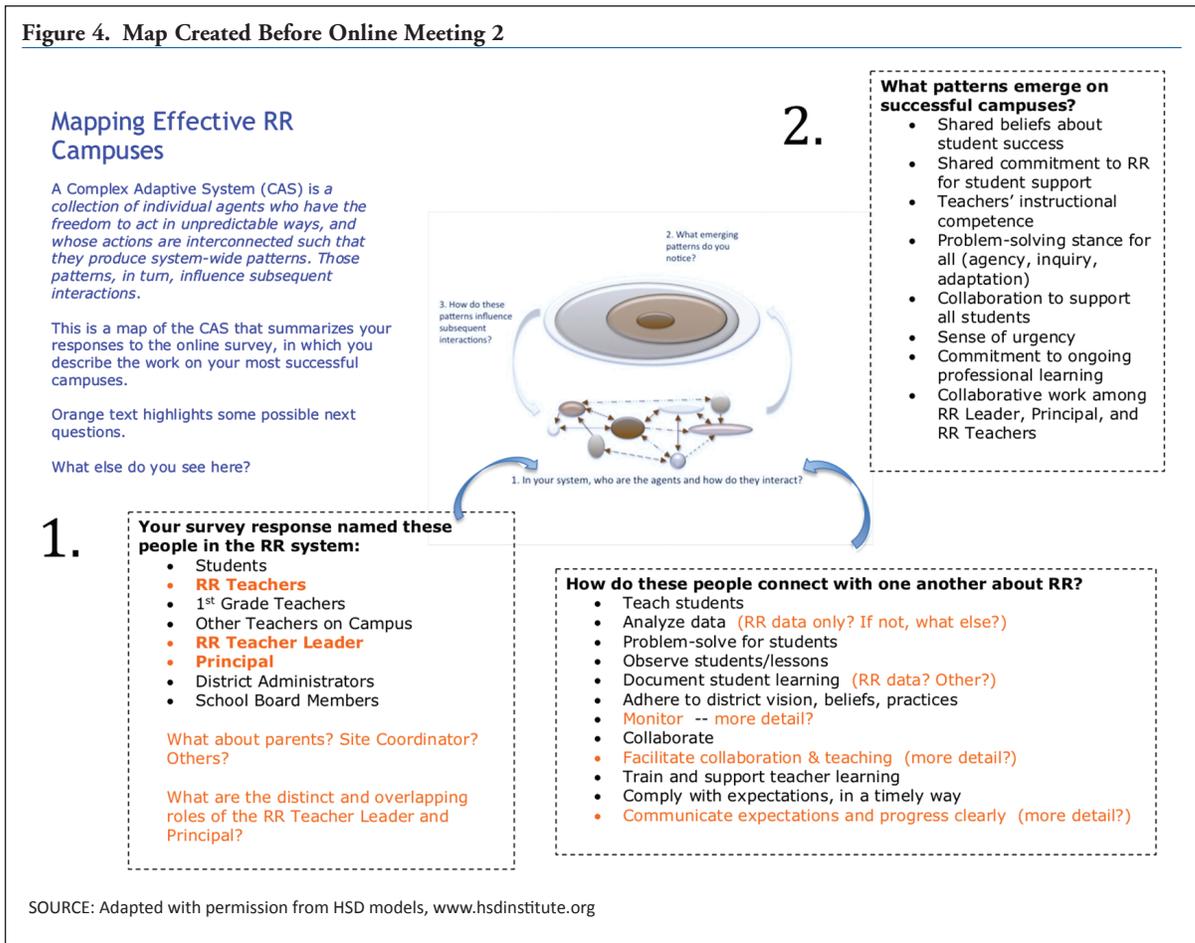
## Findings

From our analysis of these schools and sites, we discovered four themes: (a) similarities and differences, (b) collaborative learning, (c) adaptive action (responsive and disciplined inquiry-to-action), and (d) deep theory-to-practice connections.

### *Similarities and Differences*

In our analysis of these complex school systems, we noted similarities and differences across and within each school and site. Even though the schools in these four sites all met

Figure 4. Map Created Before Online Meeting 2



the criteria for participation in the study, they varied widely in their contexts, constraints, and approaches. Our data, however, indicated that elements of site history, in particular, and some school and site contextual factors matter in these successful Reading Recovery implementations.

**Site history.** As an example of site history, all teacher leaders in this study had some previous experience in their district or schools — either as a leader or teacher. For example, one teacher leader worked alongside the classroom teachers or as a Reading Recovery teacher previously.

I trained for Reading Recovery in 1995–96 and the first 2 RR

teachers trained (here), trained with me. I maintained a relationship with one of those teachers through the years and remained aware of what was going on in that district. . . . I trained the 2 current teachers . . . I have been able to observe the changes in the school's approach to balanced literacy and attitude towards RR. (TL Survey #1)

Another teacher leader worked with teachers previously as the Title I coordinator for the district. Another taught K–2 literacy professional development in the district. After their teacher leader training, each had a different role that provided them

visibility and credibility within the district(s). So, even though none of these teacher leaders worked in this role very long, this previous experience within their district or with the schools in their site seemed to help each one understand the context of the school district(s) where they worked, including knowledge of the teachers, administration, and/or common pedagogical practices, etc. We also learned that even though these teacher leaders did not have an official decision-making role in their district, they did have influence with decision makers in the district through their roles as district leaders, and they seemed to be respected within their districts for their literacy

expertise. Thus, their personal work history with the school or district mattered in implementing Reading Recovery in these schools.

#### **School and site contextual factors.**

There were similarities and differences across contexts of these successful schools; however, some contextual differences seemed to matter and some did not. Some differences that did not seem to matter include the demographics of the schools. These schools ranged from Title I schools with high needs students to non-Title I schools. The length of Reading Recovery implementation varied from new schools in their initial year to schools that had 20-plus years of implementation. The role of the principal varied, but in all cases, the principal supported Reading Recovery and he/she “protect[ed] time in the schedule” for students to receive lessons. The size of schools varied from small to large. All teacher leaders served in additional roles in their districts. These roles ranged from facilitating staff development and training for the district in K–12 reading/writing instruction to overseeing small-group literacy instruction for Grades K–5, in addition to their teacher leader responsibilities. The Reading Recovery teachers years in this position varied from new teachers to those who had been teaching Reading Recovery for 10-plus years, and the teacher leaders’ experience with Reading Recovery varied. In some cases, the teacher leader had no experience with Reading Recovery before their teacher leader training, and others trained in Reading Recovery prior to their leadership training. There was also wide variation in external influences at the state level for each school. For example, two of the states involved were in the middle of policy

changes regarding literacy standards and practices in the state. Even with these differences, the schools included in this study met the criteria as successful in their Reading Recovery implementation.

There were, however, contextual factors among these schools and sites that seemed to matter. In six of the seven schools, either a Reading Recovery teacher had been a classroom teacher at the school previously or the teacher leader had taught in the school previously as a Reading Recovery teacher or classroom

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teacher. Teacher leaders for these schools stated that this indicated a level of respect in the school for either themselves or the Reading Recovery teacher. In the seven successful implementation schools, school faculty that responded to our surveys seemed to value the relationship with Reading Recovery in the school. For example, all schools had more than one Reading Recovery teacher. There were indications that the Reading Recovery teacher and classrooms teachers

worked at building relationships, to varying degrees. Classroom teachers remarked that Reading Recovery teachers “work together in tandem” with them, “value collaboration and teamwork,” and that teachers consider themselves in a “partnership” with their Reading Recovery teacher. “We work together to make sure our students are getting what they need. We discuss what we see our students doing and not doing. Then we make a plan to help.” The teacher leaders and Reading Recovery teachers also seemed to work at their relationships, and these relationships seemed to matter. However, this relationship-building looked different with each teacher leader and ranged from monthly to weekly meetings face-to-face to emails with questions, with a different goal or focus, depending on the teacher leader. Relationships at all levels seemed to matter (past and present) and the teacher leader’s work at relationship-building also made a difference in these sites and schools.

#### *Collaborative Learning*

Relationships also played into another theme we noticed across these schools regarding the importance of collaboration. Data show that the teacher leader and one or more key people learned with and from one another in a range of contexts across the site. According to one principal, “The relationship between Reading Recovery teachers and classroom teachers is very important on my campus.” Teacher leaders seemed to learn with and from one another, and also from administrators, classroom teachers, and Reading Recovery teachers. For example, one teacher leader stated, “I think I have a close relationship with the classroom teachers and administration and knowing the curriculum

that they teach and the expectations that are required from both teachers and students is important to Reading Recovery on my campus.” In some cases, the relationship focused on the curriculum components, and in others the relationship focused on human relationships on behalf of students. As one classroom teacher stated, “I have the pleasure of collaborating with the RR team to ensure my students are getting exactly what they need.”

These relationships were developed and maintained using collaboration for a variety of purposes. For example, classroom teachers, Reading Recovery teachers, and teacher leaders commented on the opportunity to collaborate in monitoring student data. One classroom teacher stated, “It is important we work together as a team to monitor student progress. We all work together to the student’s benefit in maintaining their reading levels.” One principal also mentioned data monitoring: “I see that Reading Recovery helps give us the additional data that supports the data we gather in our comprehensive literacy plan.” Classroom teachers and Reading Recovery teachers noted this collaborative effort to assist students through monitoring of Reading Recovery data as well as assistance with other types of data monitoring for all students.

We also noticed patterns of collaborative learning around problem solving and aligning practice. For example, one classroom teacher stated, “The Reading Recovery teachers communicate their strategies with teachers so that we can reinforce what the students have been taught in Reading Recovery. The Reading Recovery teachers have helped me tremendously as a first year (new to Grade 1)

teacher to implement strategies and answer questions as I have them.”

Another classroom teacher noted, “Our Reading Recovery teachers also support our classroom teachers by helping new teachers understand balanced literacy and supporting seasoned teachers by answering questions or giving ideas to try when students are not being successful in the classroom environment.”

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Although each school had its own literacy focus, the teacher leaders and Reading Recovery teachers in these schools seemed to work within that framework to try to provide cohesiveness in the school between Reading Recovery and the schools’ curriculum and practices.

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Many other Survey 1 responses from school teachers noted this type of collaboration between Reading Recovery teachers and other teachers in their schools. One Reading Recovery teacher stated, “This program would not be successful in our school without the support and cooperation of our administrators, teachers, assistants, parents, and school board. We bring ideas from the literacy conference we attend each year and use them to help teachers target areas we can all improve in order to advance student achievement. Many of the ideas are presented by us [Reading

Recovery teachers] in PLCs to all teachers on our campus.”

Classroom teachers mentioned collaborating on a variety of topics such as which students might benefit from small-group literacy instruction; coordinating scheduling, homework, parent communication and conferences; writing; RTI; and reading and comprehension. Although each school had its own literacy focus, the teacher leaders and Reading Recovery teachers in these schools seemed to work within that framework to try to provide cohesiveness in the school between Reading Recovery and the schools’ curriculum and practices. Also, a particular focus for some of the teacher leaders at these schools seemed to be to help the Reading Recovery teachers become leaders within their schools and to promote independent problem solving at the Reading Recovery teacher level.

#### *Adaptive Action Focused on Student Learning*

Relationships and collaboration both integrate with a pattern of disciplined inquiry-to-action cycles we call adaptive action: What is happening? So what does that mean? Now what shall we do next? (Eoyang & Holladay, 2013). Responses to the surveys and interviews clearly indicate that these Reading Recovery teachers and leaders are constantly engaging in individual and collective cycles of inquiry, reflection, and action:

- Reading Recovery teachers systematically examine student data to look for patterns to inform their decisions about what students need to learn next and what texts would be most supportive of each individual.

- Teacher leaders observe lessons and talk with Reading Recovery teachers to look for patterns in what kinds of support individual teachers need in their work with students, or what kinds of support they can offer groups of classroom teachers. The ultimate focus, however, is on evidence of students' learning (not on data about the school, district, or teachers).

For example, one classroom teacher stated, "Our coaches [Reading Recovery teachers] have really helped me learn how to interpret and analyze the data while observing our students reading. We all work together to support our literacy development of our students." A teacher leader indicated that "[c]onversation [is] focused on close observation of [the] child and not family life, obstacles, or other issue[s] not controlled by the teacher. Data are used to guide all conversations and an inquiry stance is taken." Even at the Reading Recovery teacher level, we found comments showing this type of interaction, stating that "[t]he weekly meetings allow us to collaborate as a team with support from our teacher leader. These meetings help ensure the reliability of testing or other procedures. Meetings that focus on student needs help us address those needs so that students may progress." These are just a few examples of excerpts from our surveys that support our finding that student learning was at the heart of adaptive actions at all levels in these schools.

This type of adaptive action is the way Reading Recovery teachers train to teach lessons to children. However, looking at this from a CAS perspective, teacher leaders also follow

the same adaptive action cycle with the Reading Recovery teachers and schools in their site.

Our data show, however, that in successful implementations, the focus of inquiry varies by teacher leader and by Reading Recovery teacher. Shared practices in each school vary based on priorities determined between the teacher leader and the Reading Recovery teacher and based on each

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### Shared practices in each school vary based on priorities determined between the teacher leader and the Reading Recovery teacher and based on each individual's interpretation of patterns they see in their school or site.

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individual's interpretation of patterns they see in their school or site. For teacher leaders, not all Reading Recovery teachers and others in their site need the same focus or training, just like not all students need the same content in their daily lessons. The guidelines are the principles of Reading Recovery implementation and Clay's theories of literacy processing, but within those parameters, teacher leaders monitor and adapt their interactions with each teacher in the school within their responsibility based on the patterns they see within each school.

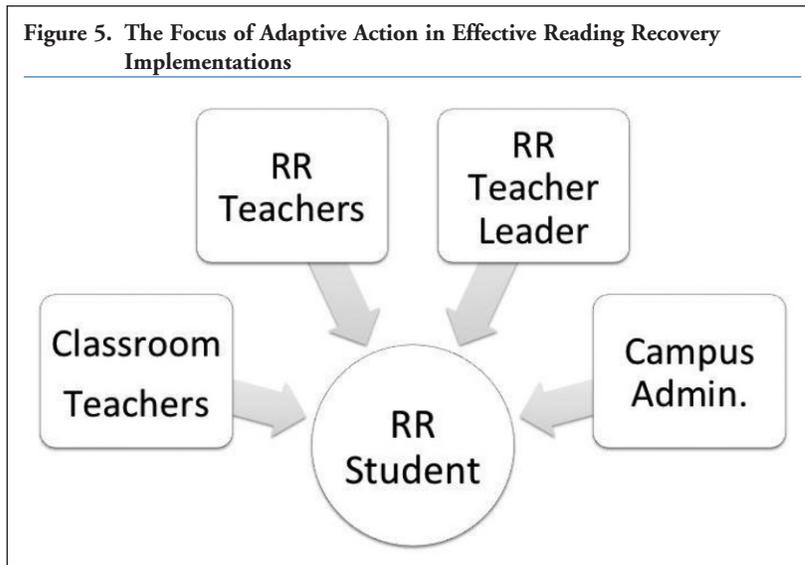
For example, one teacher leader identified a focus on attendance in one school based on a pattern of student

absences seen within that particular school that was influencing Reading Recovery lessons. Another teacher leader focused on building the Reading Recovery teachers' knowledge of literacy processing theory based on a focus in the school on skills-based literacy instruction. Another teacher leader focused on building independent problem solving in her Reading Recovery teachers so they could take a greater leadership role in their schools. In discussions and through surveys, each teacher leader identified how they addressed specific needs they perceived for each Reading Recovery teacher and school in this study with the ultimate goal of student learning (see Figure 5). In other words, in these successful implementations, decisions at all levels (school and site) focus on the support of student literacy learning.

#### *Theory-to-Practice Connections*

A fourth pattern noticed in our analysis of the data was a theory-to-practice connection. We noted coherence in each school's commitment to Reading Recovery practices, but similarities and differences in their connections to theory. An overall pattern found noted that Reading Recovery teachers focused on student progress with some indication of theories, and teacher leaders focused on student progress and on theoretical rationales. Reading Recovery teacher comments such as daily lessons, reflection, share strategies, align practices, monitor growth, flexible problem solving, and monitor data showed up across the data sources. These comments aligned with student progress highlighting principles such as acceleration, lift, challenge, and independence. Classroom teachers seemed to focus on the individual lessons or instructional practices shown with

**Figure 5. The Focus of Adaptive Action in Effective Reading Recovery Implementations**



comments such as daily lessons, word work, writing, interpret and analyze data, daily reading — wide variety of literature, believe you can, and catch up. Teacher leaders, however, seemed to focus more heavily on individual practices and the theory underpinning those practices noted through comments such as understand concepts related to growth in literacy, reading is complex, expand oral language, deeper understanding of learning theory, self-extending system, and not isolated skills. Ultimately, teachers in these successful schools focused on positive outcomes for students even in the face of conditions that were sometimes not coherent with Reading Recovery. The teacher leader and one or more key people demonstrated both deep knowledge of literacy processing and the commitment to take action in support of student learning. Teacher leaders in particular were confident and committed to a theoretical perspective consistent with Reading Recovery philosophies.

### Discussion

Ultimately, our study shows that patterns found in schools with successful implementations from the perspective of the teacher leader responsible for the school include collaboration, adaptive action, and theory-to-practice connections. Similar to May et al. (2016), we found that each school we studied had similarities and differences, and that some of those characteristics seemed to affect how Reading Recovery was implemented in the school, while others did not. May et al. also found that frequent communication between Reading Recovery teachers and classroom teachers was a factor. In our study, we include the collaboration with the teacher leader in that category. Similar to our theme of adaptive action, May et al. found that active problem solving to ensure fidelity contributed to successful school implementations. Using complexity theories and HSD, our analysis shows that Reading Recovery systems are designed to acknowledge the individual diversity of sites and schools (as well as student learners). Teacher leaders are

given enough flexibility to deal with schools within their site in ways that support each schools' needs, often providing varying degrees of support that look different across schools. The guidelines for implementation of Reading Recovery provide enough structure for coherence to the standards and guidelines of Reading Recovery without strict requirements for consistency across sites and schools.

Our findings show that agents in these successful schools (classroom teachers, Reading Recovery teachers, teacher leaders) use inquiry and then follow up with adaptive actions at all levels (school and site) that are purposefully designed to improve student learning. Similarities and differences across schools are the expectation, and guidelines are in place to build responsiveness in the interactions within the schools and with the teacher leader in order to be able to adapt to the individual needs of the school. Our research, similar to May et al. (2016), shows that dialogue between agents in the implementation of Reading Recovery in a school matters, especially as a way to build relationships that work for the benefit of students. We also found that theory is present in the discussion between agents in the system, at least through the Reading Recovery teacher and the teacher leader. Our inquiry was similar to recommendations made by Bryk, Gomez, Grunow, and LeMahieu (2015), in that we analyzed our learning ecosystems to learn what works in successful implementations of Reading Recovery in order to be able to improve what works at those sites and schools as well as share what we learned in order to improve similar implementations.

### Implications

Ultimately, we found that the teacher leaders in this study all had past experience in the district where they served and that this seemed to make a difference in their effectiveness in implementing Reading Recovery in their sites. Similar to Fullan and Quinn (2016) and May et al. (2016), our data show the decision about who fills the role of teacher leader matters. This is also consistent with Marie Clay's insight into the teacher leader's role in a "redirecting system" where the implementation of Reading Recovery has a complex relationship with existing or established educational practices in schools or districts (Clay, 2013, p. 240). Our findings may indicate that sites choose a teacher leader who has an established reputation, is respected and trusted, and already has experience with the district or assigned schools prior to their position as teacher leader. Their familiarity with the people, groups, and ideas (Dooley, 1996) within the existing district and/or schools in their site seems to be an important factor.

Also, we found that collaboration seems to be important in these successful implementations. Not just dialogue, but purposeful relationship building, targeted conversations based on school and student needs, and in the case of teacher leaders and Reading Recovery teachers, based on relevant learning theories. Each of the teacher leaders in the study seemed to understand how to look for patterns in the interactions with these successful schools, make theory-based decisions, engage in some type of adaptive action to address the pattern, and stand ready to address what happened next, always ready to step in and make the next wise adaptive action.

This study shows that in effective implementations we see patterns of collaboration, adaptive action focused on student learning, and theory-to-practice connections within the system. Some differences matter and some don't. When thinking of complex systems, differences are what drive change in the system. Similar to May et al. (2016), we found differences among these successful implementation schools and sites. However, the differences that seemed to matter in these implementations revolved around the past experience the teacher leader had with the school, the

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**How we as teachers and leaders respond to the patterns we see in our systems and what decisions we make to change the patterns to be more productive and to align with our goals or standards is how we shift the patterns.**

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partnership relationships between Reading Recovery teachers and classroom teachers at the school, the focus on relationships between the teacher leader and the Reading Recovery teacher(s), and the teacher leader's influence in the school.

If other sites and schools are interested in learning more about how their system is working around shared identity, shared focus, significant issues, and shared practices, the appendices can help agents in the system engage in inquiry about how the system is currently working and possibly

identify changes to improve the Reading Recovery implementation within the system. Patterns are not inherently good or bad; patterns are what is seen. How we as teachers and leaders respond to the patterns we see in our systems and what decisions we make to change the patterns to be more productive and to align with our goals or standards is how we shift the patterns. Looking at successful Reading Recovery implementations through a CAS lens helped us examine whether and how people, patterns, and actions within the system reflect adaptive capacity. Our findings confirm that agents in these sites and schools (classroom teachers, Reading Recovery teachers, and teacher leaders) develop adaptive capacity as they work to make a positive difference in the outcomes for children served in Reading Recovery.

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## Appendix A

### Reading Recovery Teacher Leader Survey #1 Shared Identity and Shared Focus

1. Describe your role with the RR work on this campus.
2. What do you see as your contributions over time?
3. What is your history with the campus?
4. How do you interact with the teachers, administrators, and other staff there?
5. What values or commitments do you notice on that campus?
6. What cultural practices on that campus may have contributed to how RR works there?
7. What cultural practices may have been influenced as by RR work on that campus?
8. Considering the “map” of a CAS, think of one of your target campuses. Who are the people or groups of people who work together to make RR successful on that campus?
9. Considering the responses to the RR survey from your campus, do you see evidence that the answers to the previous questions contribute to a the campus’s “shared identity” as a RR campus? Explain.
10. What else have you noticed about the campus faculty’s “shared identity/focus” relevant to RR?
11. Do you see evidence that this campuses identity/focus influences how they work together as a RR campus? Explain.
12. Repeat this process with your other target campus.

#### Campus Faculty/Staff Survey (link to online survey)

1. What is your role on campus? (administrator, staff, teacher, grade level)
2. What is your role or your involvement with RR on your campus? (open-ended)
3. What do you see as important to Reading Recovery on your campus? (open-ended)
4. What do you see as the relationship between RR and other elements of your comprehensive literacy plan? (open-ended)

## Appendix B

### "Differences that Make a Difference" Teacher Leader Survey #2

Your name:

Campus:

The answers to the following questions can be based on your knowledge of the campus, and you may want to invite the perspectives of one or more of your colleagues. If you talk to others to answer these questions, please tell us who and what their campus role is.

- I. Which of the characteristics or issues below might be relevant to the success of RR on this campus? For each one you mark as relevant, please answer two questions: 1) Describe this issue/characteristic on this campus and 2) Explain how this characteristic supports or hinders RR success on this campus.

Questions 1-10 have the following options:

- A. Is this significant? Yes or No
- B. If yes, describe the details on this campus.
- C. If yes, explain how or why it supports or hinders RR success on this campus.

1. Principal's leadership (with RR and beyond RR)
2. Teacher leader's leadership (with RR and beyond RR)
3. RR teacher's roles/attitudes/contributions
4. Classroom teacher's roles/attitudes/contributions
5. Similarities & Differences between RR and classroom instruction (theory, practice, assessments, instructional materials, etc.)
6. District's role/attitudes/contributions to RR
7. RR relationship with special programs (special education, bilingual/ESL, etc.)
8. Teacher & staff attitudes toward students
9. Community culture/attitudes toward students
10. Student characteristics, demographics, etc.
11. Others?
  - a. What else is significant? (List, describe, and explain as many as you notice.)
  - b. Describe the details on this campus.
  - c. Explain how or why it supports or hinders RR success on this campus.

- II. We know that the differences between these issues or characteristics and the differences within each one hold the energy that drives system-wide implementation. We are curious about how the integration of these "differences" make a difference for the implementation on this campus.

Please take a few minutes to synthesize your insights from the previous questions and write a response to this question: *In your view, how do these different characteristics or issues work together on this particular campus system in relation to the implementation of Reading Recovery?*

## Appendix C

### Shared Practices Survey Teacher Leader Survey #3

Name:

Role: Reading Recovery Teacher/Teacher Leader (circle one)

Campus/District:

**Thank you for helping us with this investigation of successful RR campuses to inform our implementation efforts here and elsewhere. We are interested in the shared practices among teachers and staff on these campuses--practices that may be directly or indirectly related to all students' literacy success across the whole campus. Using the table below, please list and briefly describe shared practices on this campus. By "practices," we mean the following:**

- **Actions, meetings, procedures, processes, messages, etc.;**
- **Which are repeated at least monthly; and**
- **Which you judge to be influential or significant to student literacy success on this campus.**

One hypothetical example is provided below as an illustration. We have provided 2-3 rows for each set of participants under "Who is involved." You may leave some rows blank, and you may want to add additional rows for the sets of people who have a great deal of interaction.

*NOTE: The complete table in the original survey has been modified for purposes of this illustration.*

Who is involved?	What are they doing?	How often?	For what purpose?	With what effect?
<i>Example</i>				
RR Teachers	Debriefing—collaboratively reviewing student data and sharing observations and hypotheses	Weekly	To interpret data related to each child's progress and next steps	RR teachers come to know all the students and build shared understandings

*Other sets of participants:*

- Teacher leader(s) & Reading Recovery teachers
- Reading Recovery teachers with each other
- Reading Recovery teachers with first-grade classroom teachers
- Reading Recovery teachers with other classroom teachers
- Teacher leader(s) and classroom teachers
- Other individuals or groups