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“I just need to draw”:

Here are helpful ideas for teachers who want to make multiple sign systems a part of the reading and writing curriculum.

Responding to literature across multiple sign systems

One day, as Gloria Kauffman’s students left the class read-aloud, Ramon said in a heartfelt voice, “Oh, I just need to draw.” Ramon’s comment reminded us that while talk plays a significant role in students’ interpretations of literature, they need many ways of thinking and responding available to them. We decided to explore the potential for understanding that becomes available when students respond to literature through multiple sign systems. In their lives outside school, learners naturally move between art, music, movement, mathematics, drama, and language as ways to think about the world. They talk and write, but they also sketch, sing, play, solve problems, and dance their way to new insights. It is only in schools that students are restricted to using one sign system at a time to think.

When we first used literature in our curriculum, students were assigned retellings, wrote book summaries, filled out worksheets on literary elements and story structures, and answered comprehension questions to “prove” they had read the book. We quickly realized that students were focusing on details and extracting information from text instead of having a “lived-through” experience within the story world (Rosenblatt, 1978). We wanted students to actively construct understandings as they entered the world of literature to learn about life and to make sense of their experiences and feelings. Rosenblatt’s transactional theories connected

with our own experiences as readers, and so we incorporated literature discussion groups and written response into the curriculum. While these engagements provided opportunities for students to think critically about literature, it became clear that we needed to expand these opportunities for response beyond talking and writing.

We have explored the integration of sign systems within an inquiry curriculum at a broad level (Kahn, Fisher, & Pitt, 1994; Short et al., 1996). In this article we focus on one aspect of our work, responding to literature through multiple sign systems. By sign systems we mean multiple ways of knowing—the ways in which humans share and make meaning, specifically through music, art, mathematics, drama, and language (Short & Harste, with Burke, 1996). We will focus particularly on transmediation, the process of taking understandings from one system and moving them into another sign system (Siegel, 1995). In this case, we are interested in how students take what they understand through language as they read and talk about literature and transform those understandings by expressing their ideas in art, drama, music, or math. Because each sign system has a different potential for meaning (Eisner, 1994), students do not transfer the same meaning, but create new ideas, and so their understandings of a book become more complex. They are not simply doing an activity or presentation from a book, but instead use these sign systems as tools for thinking.

The examples we share of responding to literature through multiple sign systems are organized according to the type of response they support—initial aesthetic responses, reflection and critical analysis, intertextual connections, presentations, and responses to texts in other sign systems. While we highlight art, drama, music, and math because of the focus of this article, students continuously responded through talk and writing as well. The article ends with a brief discussion of the theory of sign systems and transmediation that supports our work.

Examples from Leslie Kahn's and Gloria's classrooms are woven throughout our discussion. Both Leslie and Gloria teach in multiage fourth- and fifth-grade classrooms in diverse classroom settings in Tucson, Arizona, USA. Leslie previously taught fourth, fifth, and sixth grade, and Gloria has taught first through fifth grade and primary multiage classes. They involve their students in read-aloud experiences and provide many books and reading materials for independent reading and research. Their students also engage in small-group literature circles where they choose the group they would like to join to discuss a particular book or text set. The discussions always occur within the context of a broader classroom inquiry, and the books are never read as an isolated experience. These literature circles encourage students to share their connections and to engage in collaborative thinking through their understandings about literature and life (Short & Harste, with Burke, 1996).

Exploring the initial aesthetic response

Rosenblatt (1978) argued that students need to share their initial aesthetic responses to a book so they can attend to their inner state—the feelings and connections they experience as they live within a book. Everyone has a right to his or her own experience, and so there is no right or wrong response. Later, they critically examine those responses, but first they share their personal, unexamined, tentative thinking about a book.

In literature circles, students usually begin with conversations that meander from topic to topic before moving to focused dialogue. These conversations can be facilitated by encouraging students to explore their initial responses

through other sign systems. We've sat in literature circles with students, especially young children, who obviously had connections and feelings that they couldn't yet put into words. Responding in other sign systems gives them a way to think about and share their feelings and images.

While we often use literature logs to encourage children to respond through writing, we find that many children need to incorporate sketching and diagramming into their responses. Mardell, age 9, wrote long, boring retellings in her log until Gloria invited children to use webs, charts, sketches, and diagrams. Mardell's logs immediately took on a different quality as she combined words and images to think in more complex ways (see Figure 1).

Many of these initial responses occur so quickly that we don't even see them. We decided to build opportunities for this response into the daily class read-aloud of a chapter book. One day after reading a particularly poignant chapter in *Star Fisher* (Yep, 1991), Leslie invited students to respond, saying "Before we talk about this, what do you need to do to think about this book? To express yourself? To figure out the book?" Students moved into a variety of responses. Because her students had worked with a drama expert, they felt comfortable with this sign system and several created dramas of scenes from the book. Others sketched images, and several created music using glasses and water because instruments were not available.

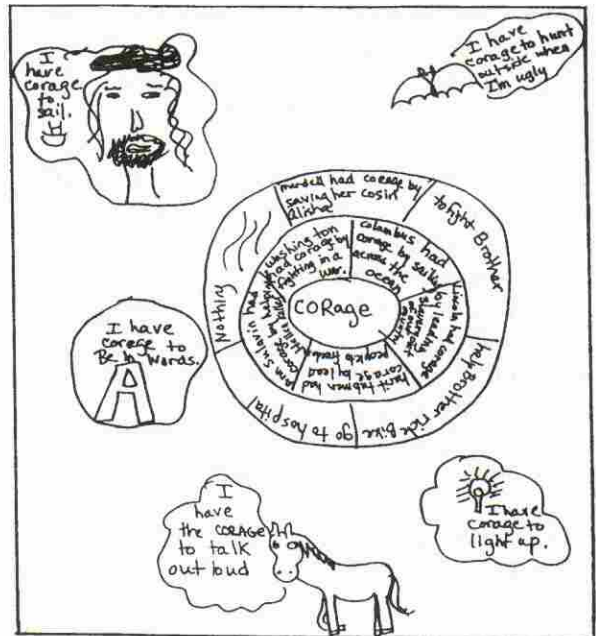
As Leslie continued reading the book aloud the next day, she noticed that this experience gave her students permission to think more broadly. They had considered the story from different perspectives and had thought about their own feelings and thoughts with others. They made a wider range of connections in their talk about the chapters after each read-aloud.

Gloria issued the same invitation when she finished reading aloud *The Barn* (Avi, 1994) as part of a family focus. She mentioned that art materials and other tools were available and brought out various music tapes. Cynthia took out her log and wrote about her personal connections. Rueben, Tito, and Adam looked through the music and played a pastoral piece by Beethoven as they discussed scenes within the book that were important to them. They then made pen-and-ink drawings of these scenes. Other children used

Figure 1
Literature log entries (Mardell, age 9)

Cristopher Columbus was born in 1451. as he grew older he would often go to the sea shore and talk to the sailors that came back from journeys that some sailors would talk about what they saw like sea monsters that were Christopher. When he was 5 Christopher was out on a ship with a crew of other men pirates attacked the ship and it sank but Christopher clung to a board and survived.

Christopher's dad was a wool weaver. Christopher's grand father was a wool weaver too and the wool weaving went down generation after generation and Christopher can't do it and he wanted to be totally different.



tempera, pastels, watercolors, chalk, charcoal, and pencil to visually portray images from the book that reflected their emotional responses. After sharing these responses informally, students came together in a class meeting to talk about the book.

Gloria and Kathy Short interviewed the students several weeks later and asked them whether responding first in many different ways affected their thinking. Children felt that these responses allowed them to express their feelings, to try out ideas they had in their minds about the book, to learn more about the book, to understand how it felt to live during that period, to make more connections, and to experience the emotions of children in the story. They stated they could try out ideas they had in their minds, and that helped them talk more deeply about the book when they met for discussion.

These initial responses don't have to be this involved. We find that simply giving students a few minutes to quietly sketch or write about a book before gathering for a group discussion changes the talk. They have time to prepare for the discussion by thinking about personal connections, and so the talk moves beyond retellings to broader connections and issues.

Math is the one sign system that many teachers don't believe is connected to literature response. When Leslie taped her students' discussions of literature, she found many examples of the use of mathematics to understand books (Kahn, 1994). (Pseudonyms are used for all of Leslie's students.) Students constantly referred to concepts such as money, probability, directionality, and time. They used logical conditionals—"If they never would have gotten stuck in there, [then] he never would have wished for his father" (William, age 12). They discussed how characters used visual markers to solve problems and find their way. They made comparisons to weigh decisions that characters were making—"Why can't they keep the farm, because the farm is worth a lot of money? That way, they'd get more money" (James, age 12). They posed problems, such as when Tony struggled with the concepts of atomic bombs and why people in Japan could not outrun the radiation. Mathematical thinking was an important tool for children to talk through their understandings.

Art is another important tool for thinking. Sketch to Stretch (Short & Harste, with Burke, 1996) encourages children to move their responses from language into art by inviting them

to sketch what the book means to them. They are not drawing an illustration of the book's plot, but a quick sketch of the connections and images the book raises in their minds. Kathy introduced this engagement to Leslie's students during a study of war by showing them sketches she had collected from another group. She then read aloud *Bang, Bang, You're Dead* (Fitzhugh, 1969) and invited them to sketch their meanings to share in small groups. In this picture book, a group of children learn the difference between playing war and having a real war when their play turns into actual fighting on the playground. Students' sketches included messages about sports and competition, gangs, and wars in which both sides kill each other. Creating and talking through their drawings gave them a chance to explore connections to their lives and the world in interpreting the book (see Figure 2).

Sketching also plays a role in graffiti or sounding boards (Short & Harste, with Burke, 1996). Gloria often uses graffiti boards when her students are discussing text sets, sets of conceptually related books. A large sheet of paper is placed on the table, and as the group reads through the books each child takes one area of the paper and jots down words, sketches images, and notes connections. There's no effort to work together or to organize the ideas. The board captures children's in-process thinking and becomes a source of ideas once they begin to search for connections across the books.

When Gloria interviewed her students, they said that these boards help them express their feelings and are a safe place to put anything

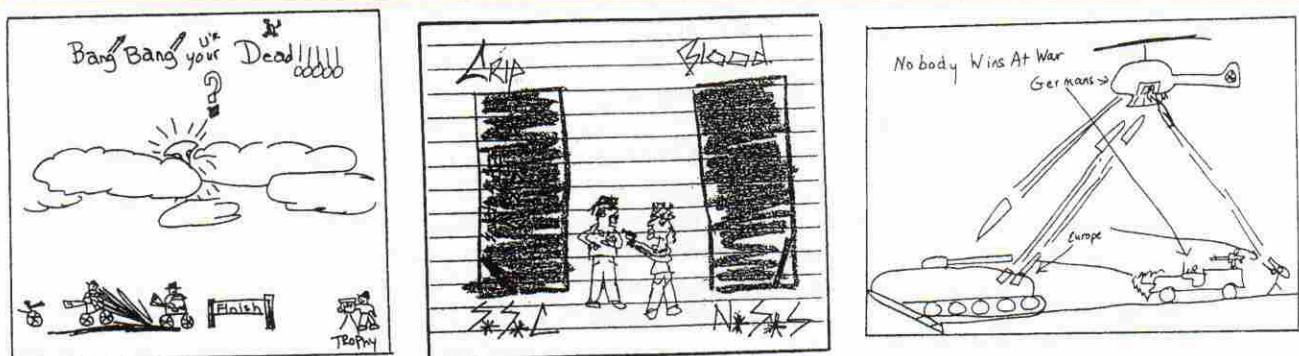
down in whatever way they want. They can draw to get out feelings; write to explain what they are doing; use charts, flow charts, and webs to sort out ideas as well as to gather more ideas; and make diagrams to explain their thinking.

Because initial aesthetic responses focus on personal connections and tentative thinking about a book, students' responses are often not the ones we would predict. When we encourage students to think about a book across other sign systems, their responses are even further from what we expect. We have learned not only to listen carefully and accept student responses without judgment, but also to ask questions that allow us to understand their connections.

Extending response through reflection and analysis

While free response is necessary, it is not sufficient for students to become critical thinkers who consider alternative perspectives (Rosenblatt, 1978). They need to be encouraged to reflect on and analyze their responses and take intellectual responsibility for their views. In literature circles, this talk is often characterized as dialogue where students coproduce meaning through critique and inquiry into their thinking about literature (Peterson, 1992). They search for questions and issues that really matter to them as learners and then pursue these through critique, "storying," and thoughtful listening and responding to one another. They move from sharing a wide range of connections in conversations to intensively considering several focused issues

Figure 2
Sketch to Stretch (Thomas, Ramon, William, age 12)



through dialogue to extend and critique their response. Taking time to think and reflect carefully is essential to dialogue.

In our work with students, we found that this time of reflective analysis can involve students in thoughtful and productive transmediations across sign systems when they take their understandings from reading and consider them in another system. These transmediations provide students with alternative perspectives and so support them in more complex thinking.

There is obviously a close relationship between exploring initial responses and reflecting on those responses. Students do not neatly divide their thinking but move back and forth. They can also use the same engagement at different times for different purposes. While Sketch to Stretch can support initial responses, students can use it to think about a particular issue. A group of Gloria's students wanted to think about the issue of the children being caught between Jacob and Sarah as they worked out their relationship in *Sarah, Plain and Tall* (MacLachlan, 1985). The group decided to discuss this issue, and so members created individual sketches about their thinking that they brought to the group.

Group members held up their sketches for others to examine and discuss before talking about why they had drawn that particular sketch. One child drew Jacob and Sarah having a tug-of-war on a rope that represented the children. Another drew Sarah as a hermit crab trying on a new shell, and still another drew her as a treasure chest opening to reveal the treasures inside. In this case, the sketches supported a critical analysis of an issue, instead of facilitating the sharing of many connections and feelings.

As part of a broad focus on communication, a group of third-grade boys in Gloria's classroom worked with a text set on art as a way of seeing the world. *Animalia* (Base, 1986) was in this set, and the boys spent several days intently examining the illustrations. They talked about the illustrator's use of detail, color, size, perspective, and repetition; the relationships between the objects and the letter of the alphabet; and the artist's signature on each page. After several days, they chose their favorite picture and went over to the keyboard. Several boys had taken piano lessons, and they began to strike the keys to find a tune that fit their thinking about the painting. They tried different melodies and kept adding, repeat-

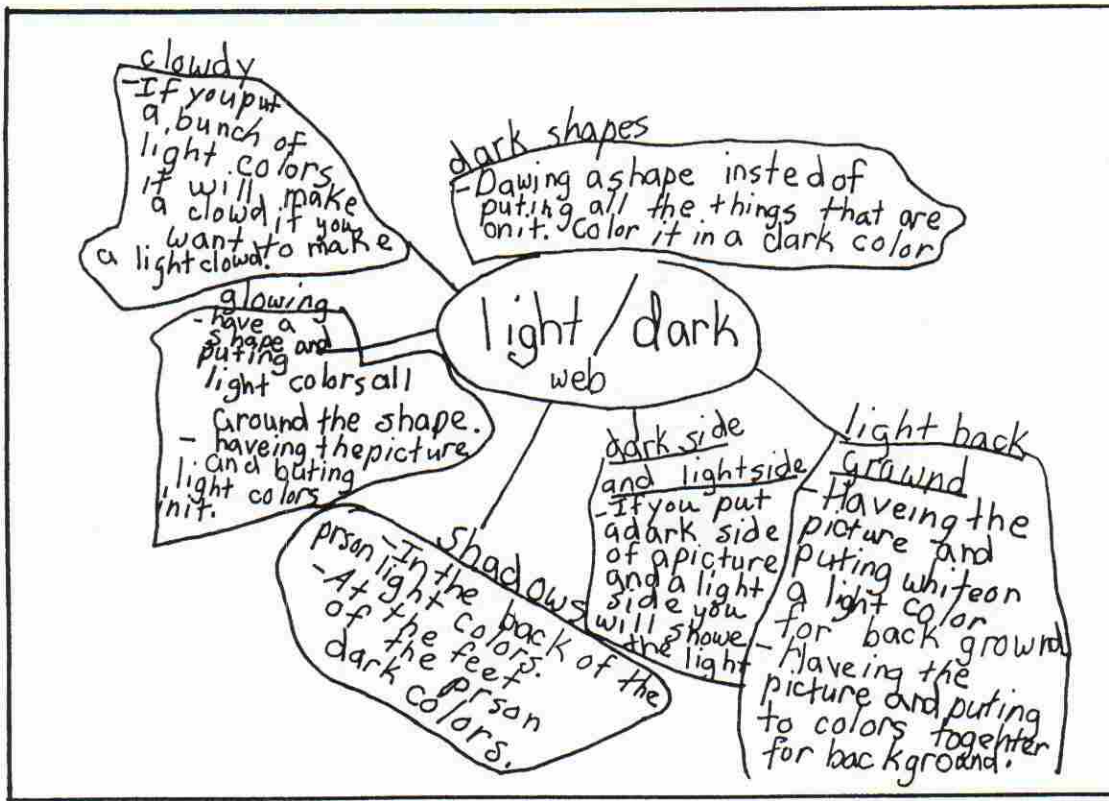
ing, and revising the notes they were playing. The music was not a presentation for classmates, but it was created to help them reflect on and analyze one particular illustration.

Michelle was in a text-set group looking at the use of light and dark in illustrations. This group was part of a broader focus on visual literacy and nature in Gloria's classroom in which students engaged in illustrator studies. Out of this initial exploration, an inquiry group on light and dark emerged. Michelle looked through the books and sketched ways illustrators use light and dark in her log and on a graffiti board. To think more about what she was seeing, she created a web in her log where she noted the variations of light and dark and where to find these in pictures. Organizing her observations into a web pulled together her thinking. She shared her web with her literature circle, and the group used it to move to a more in-depth examination and discussion of light and dark images in illustrations. Similarly, a group reading *The Cay* (Taylor, 1969) created a story map of the island with the events and characters, which gave them a visual picture they could use to think through the plot and recreate the story world (see Figure 3).

A group of sixth graders in Leslie's classroom read *Toughboy and Sister* (Hill, 1990) while studying survival. This is the story of two children stranded on an island in Alaska. The group initially explored many issues but then focused on how the children survived. They used mathematical thinking to question the children's decision to eat one type of food until it was gone and then go to another food. They discussed other patterns the children could have used to eat the food and whether these patterns would make eating more interesting or allow the food to last longer. These issues came up later when they explored the relationship between time, food, and starvation in Holocaust novels.

Leslie read aloud *We Remember the Holocaust* (Adler, 1989) during a broad focus on racism and the Holocaust. As the class discussed this book, it was obvious that the students were struggling to understand the feelings associated with prejudice, and so Leslie encouraged them to move into drama. The students first worked individually on storyboards of a possible drama. These were shared with the class and resulted in a number of dramas that helped children reflect more deeply on prejudice. One drama involved

Figure 3
Web in literature log (Michelle, age 9)



students portraying characters with two characters talking to each other or an interviewer talking to a character (such as Hitler, a Nazi soldier, a Jew, a German citizen, or a teacher). They also took dramatic scenes from books they had read earlier, such as *Snow Treasure* (McSwigan, 1942), and played them out in their own Arizona desert context. These dramas allowed students to cross the lines of friendship, ability, and ethnicity in their relationships and to gain deeper insights about prejudice (see Figure 4).

Constructing understandings through intertextuality

Intertextuality refers to the process of making connections with past texts in order to construct understandings of new texts. Readers understand the new by searching past experiences with texts and life to find connections that will bring meaning to the current text. The greater the range of experiences and texts con-

sidered, the more complex the understandings (Short, 1992). Typically, intertextuality is defined as the connections students make between pieces of written literature. Because we extended our definition of text, students had a wider range of connections to consider as they read and responded. For us, text refers to any chunk of meaning that has unity and can be shared with others (Short, 1986; Siegel, 1984). A text therefore can be a novel, a piece of art, a play, a dance, a song, or a mathematical equation.

The most common intertextual connections that students make are to movies and the mass media. These texts fill their lives and are a natural point of connection. For example, Raul brought connections about the maze and echoes from the movie *The Name of the Rose* (Jean-Jacques Annaud, director, 1986) into a discussion about two boys lost in a cave in *Building Blocks* (Voigt, 1984) and how they might use echoes to find their way. While teachers often do not value these connections to movies and tele-

Figure 4
Storyboard for drama (Danielle, age 12)



vision shows, these are the most easily accessible texts for children and a significant point of reference for their views of texts and life.

During the Holocaust inquiry, Leslie placed many reproductions of photographs and primary source documents around the room. As the sixth-grade students read, they often made intertextual connections with these photographs. One powerful connection was when Gabriel noticed that a photograph matched an illustration in *Rose Blanche* (Innocenti, 1985), a picture book about a concentration camp. The book immedi-

ately took on a different meaning as students realized that these books were not just stories but reflected actual historical events. The books alone did not persuade them that these events had occurred, but when “intertextualized” with the photographs both took on new meaning. Sean pointed out that if the Nazis came into their classroom, “they would take the photographs away so we couldn’t prove that this happened.”

Students also make intertextual connections with experiences involving movement. During a focus on prejudice, a group of boys in Gloria’s classroom discussed *Baseball Saved Us* (Mochizuki, 1993), a story about a boy in a Japanese American internment camp and his involvement in baseball. In trying to understand the character’s feelings during the game and his fear of failing in front of others, the boys described their own experiences with sports and with trying to hit the ball while their fathers watched. They intertextualized their own emotional and kinesthetic experiences with those of the character in the book and so were able to understand the character in a different way.

Gloria encouraged intertextualizing across texts from different sign systems when her intermediate students used text sets on storytelling in different countries. She put a dance video in each set along with folk tales from those countries. For example, the text set on Africa contained a video of a dance called “The Leopard Hunt.” Juliett initially saw this set as a school assignment, but the dance video drew her into the text set because she saw a connection to her way of communicating. She liked the patterns and dance in the books and video and responded to the set by playing the mbira, an African instrument. She felt that playing the mbira with her hands allowed her to concentrate more on the music and express herself and her thoughts.

Gloria also highlighted responses across sign system texts by placing many calendar reproductions of artwork in the classroom and encouraging children to choose one to reflect on in their journals through writing and sketching. Matthew looked at a painting by Vincent Van Gogh of the artist’s bedroom and made an intertextual connection to *The Barn* (Avi, 1994) and to his own memories of his grandmother. Intertextualizing the art and the book triggered a memory, and Matthew took a broader perspective on death beyond the story details.

Transforming understandings through presentations

Once students have explored a book or text set through responses and talk in a literature circle, they usually pull their understandings together to share with the class (Kauffman & Ediger, 1998). Sometimes they share informally, and other times they create a presentation where they consider the best way to present what they have been thinking about in their literature circles. Planning these presentations often involves transmediation; students talk about what they consider the most significant ideas from their discussions and then take those understandings into other sign systems.

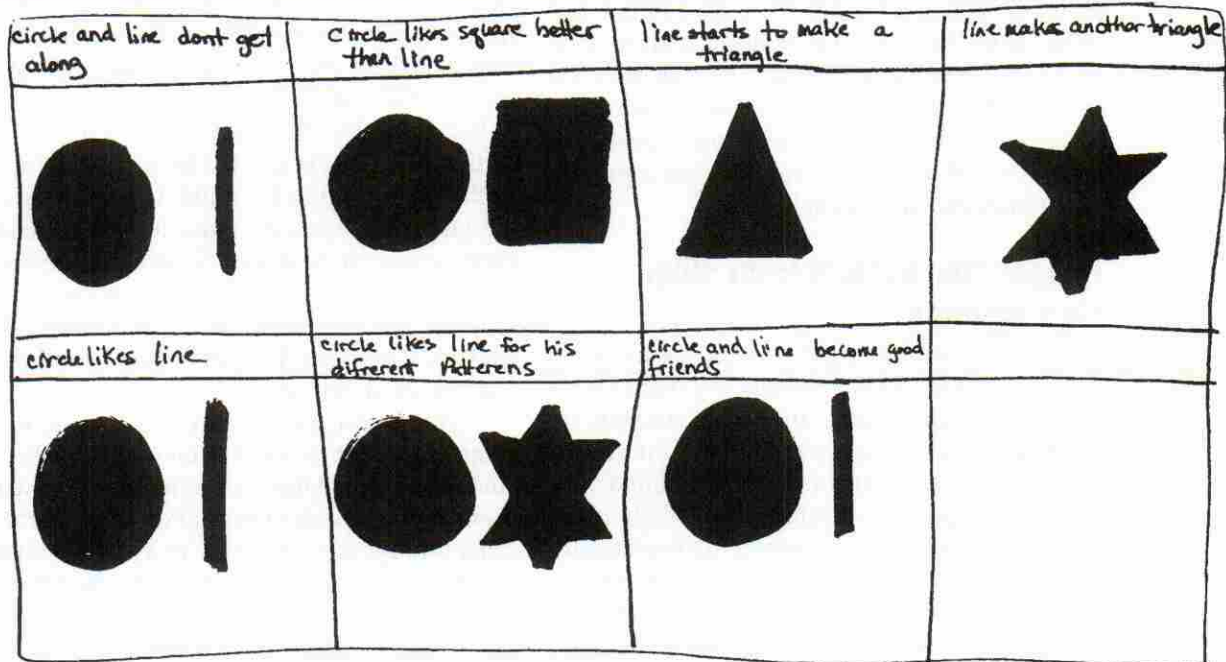
Drama is often a creative tool for students to use to present their thinking to others. A group of 9-year-olds in Gloria's classroom read a folk tale set of "magic pot" variants. They developed a list of characteristics of a "magic pot" story in their discussions and then used these to develop their own original drama for the class. Their drama focused on giving and sharing and how the unlimited pot rewarded giving.

Some of the groups in Leslie's classroom who read a text set of novels about racism and the Holocaust used charcoal to produce dark, powerful images about the Holocaust. They were influenced by books on "degenerate art," the art that Hitler had denigrated and outlawed, and saw this style of art as a way they could convey their own inner feelings about the horror and pain.

Children often combine art and mathematics in their presentations, such as when a group in Leslie's class read *Journey of the Sparrows* (Buss, 1991) about illegal refugees and created a circle graph to compare the expenditures of an average American family with what they thought the El Salvadoran family might spend. Another group read *The Cay* (Taylor, 1969) as part of their class focus on racism. They created four panels that used geometric shapes to reflect relationships ranging from mutual respect to prejudice and death. Adam (see Figure 5) and Ramon explained their thinking as follows:

Adam: In the first one, circle and line don't get along. In the second one, the circle likes square better than line so the line starts getting jealous. So he makes a triangle

Figure 5
Sketch of literature presentation (Adam, age 12)



and then the line makes another triangle and it makes a star. So then circle likes line and circle and line become good friends because he has different patterns.

Ramon: I did my idea with what prejudice means to me. And it means to me that if two things are different and if they look the same, it doesn't really matter. It's still prejudice, because it's the way you act.

Some students incorporate music with their presentations. A literature circle in Gloria's classroom read *The Lucky Stone* (Clifton, 1979) as part of an inquiry on slavery. During the class focus, Gloria played tapes of spirituals from that period, and the class talked about how slaves used these songs to pass messages. As the group members talked about how to present their interpretation that the stone in their book reflected hope and luck, they decided to take the melody of one song and create their own prayer asking for strength and hope as a way to present this book to the class.

Often the most engaging presentations use multiple sign systems. A third-grade group in Gloria's classroom explored a text set around the theme of ugly ducklings and acceptance of self (e.g., *The Ugly Duckling*, Cauley, 1979; *Beauty and the Beast*, Mayer, 1978; *Crow Boy*, Yashima, 1955; *Sleeping Ugly*, Yoken, 1981). They chose music and created a dance for their presentation, in which Jason put a paper bag over his head and the others taunted him. Later in the dance, he turned his cloak around and took off his paper bag to signify that he was beautiful inside. The others put paper bags over their heads to signify that they were ugly on the inside. After the dance, Jason painted a picture about internal and external beauty.

Responding to texts from other sign systems

These same ideas about response to literature are relevant when students respond to texts from other sign systems. Instead of students responding to a literary text, they might view a piece of art and respond through music, or dance, or language to that text. They might listen to a piece of music and respond mathematically to explore the rhythms and patterns or artistically through painting the images in their minds. Just as with literary texts, they transmediate across sign systems as they respond to these

"texts" in order to share their initial response, extend their response through reflection and analysis, make intertextual connections, and present their understandings.

During a year-long focus on racism, Leslie's class engaged in a study of the Holocaust. Leslie showed a short black-and-white video called *The Ambulans* (available through video stores in the U.S.) in which Jewish children enter a truck with a Red Cross symbol, believing they are safe when they are, in fact, in great danger. This video text became a powerful point of response through talk and drama as students moved into small groups of four. Group members took turns at the roles of rescuer, victim, bystander, and aggressor in situations from their own lives to experience the video from different perspectives.

These dramas gave students a chance to express their feelings and think about the discomfort and horror they felt watching the video. They created their own situations to think about how they would react. They entered into these dramas with a seriousness that reflected their need to think through the video and the connections to their lives.

When Gloria was teaching a primary multi-age class, the students listened to musical texts from the Walt Disney Co. movie *Fantasia* (Samuel Armstrong, director, 1940) during a focus on storytelling in different cultures. Many began spontaneously creating their own movements and dances as one form of response to the music. During one piece, Sean made martial arts moves, but during another piece, he created a ballet dance. He changed his moves on the basis of the musical text and the feelings and images each one created in his mind. Others drew, created drama scenes, or chose a book to read as they listened to the music. Several children commented that moving to the music allowed them to listen, really hear the instruments, and feel the rhythm. They could express their feelings and learn more about the music.

Gloria brought in many texts including art prints as part of an inquiry on human rights. As students explored these art prints, several created their own chalk drawings and wrote poetry to think through their response to a particular piece of art. After viewing a painting of a modern city, Leola, a fifth grader, produced a drawing and a poem (see Figure 6) that connect modern violence, her own experiences with prejudice be-

Figure 6
Poem and drawing (Leola, age 11)

Racism
This wind is blowing but
nobody is knowing.
The animals are dying
and people are crying.
Racism is going
but nobody is bearing
the fact
of its going.
The Tainoes are dead.
The Spanish?
But nothing is to be said.
The gun goes off
a bewildered sound
nobody cares
lying on the ground
A person in pain
not ashamed
Why?
Did I do this?
Such pain?



cause of her skin color, and previous class inquiries into the Columbus Quincentenary.

The role of sign systems and transmediation in learning

In our work with response to literature, we no longer do cute art or drama activities with a book. Instead, students use sign systems as tools for thinking about a book and for sharing their thinking with others. Within a sign system perspective, literacy is defined broadly as all the ways in which we make and share meaning—including music, art, mathematics, movement, drama, and language (Short & Harste, with Burke, 1996). This perspective takes us beyond just doing activities for fun or to increase comprehension to a different understanding of the role of these systems in thinking and learning.

Often sign systems other than language are used only for presentations at the end of literature discussion, sending the message that these systems are just ways to communicate ideas already developed through language. Because we believe that all sign systems are potential tools for thinking and exploring new ideas and for communicating and going public with ideas, these systems need to be available throughout the entire literary experience.

While schools have focused on language, the other sign systems are basic processes that should be available to all learners. Sign systems are not just for use by a few “gifted” people with special talents or intelligences. Although we have different abilities within different systems, we all have the potential to use these systems as tools for making and sharing meaning. We do not all expect to become professional writers, but we do use reading and writing to go about our daily lives. The other sign systems should have this same availability in daily life without the expectation that we will become professional musicians or theoretical mathematicians.

It is true that many adults are uncomfortable with some of these sign systems, but that is the result of a lack of exposure to, and use of, those systems in schools. If we had been immersed as students in these systems in the same ways we were surrounded with language throughout the school day, we would be able to use them in more meaningful ways in our lives today.

Sign systems are significant because they form the basis for creative and critical thought processes (Eco, 1976). In the process of taking our ideas public through a sign system, we create new ideas that go beyond our original conceptions. Once these ideas are in a stable public

form, we can critique, think and reflect critically, and revisit and edit those ideas. If we view an experience from the perspectives of different sign systems, we add to the complexity of our thinking through new connections because each sign system offers a distinctive way of making meaning (Eisner, 1994). There are parts of the world we can never know, and understandings that we can never communicate to others, if all of the sign systems are not available. Sign systems are thus multiple ways of knowing about the world.

Flexibility in sign-system use is important to becoming a successful learner, just as flexibility in cueing systems is important to becoming a successful reader (Harste, 1994). We know that readers need flexibility when using a range of appropriate cueing systems within the reading event. The same is true with sign systems. Within an experience, learners need fluidity when moving among sign systems to be effective in their meaning making and to create more complex understandings. They need to be able to choose the sign systems that are most effective for a particular message or that support their understandings about a particular issue.

We also realize that all sign systems involve processes of interpreting and composing and that these processes are interdependent (Short & Kauffman, in press). It has become a cliché to say that students learn about reading through writing and about writing through reading, but this cliché is grounded in important understandings about this relationship. It is not uncommon, however, for students to be expected to “compose” meanings in art when we do not surround them with art in the same way that we surround writers with literature. This article focused on the use of sign systems to compose and think through ideas as readers respond to literature. However, unless students are surrounded by art prints, musical recordings, dance videos, drama performances, and mathematical diagrams, they will not have the demonstrations they need to compose in those systems.

We have argued in this article that one way learners push their understandings and create more complex meanings is through transmediation (Siegel, 1984; Suhor, 1984). Transmediation is the process of taking understandings created in one sign system and moving them into another sign system. This process is not a simple transfer or translation of meaning from one system to an-

other because the meaning potentials in each system differ. Instead, learners transform their understandings through inventing a connection so that the content of one sign system is mapped onto the expression plane of another (Siegel, 1995). They search for commonalities in meanings across sign systems, but because each system has different meaning potentials, and there is no one-to-one correspondence, their search creates anomalies and tension. In turn, this tension encourages learners to invent a way to cross the gap as they move to another sign system, and in so doing they think and reflect generatively. They create a metaphor that allows them to make new connections, ask their own questions, and open new lines of thinking (Siegel, 1995).

Transmediation is thus a generative process in which new meanings are produced and the learner’s understandings are enhanced. When students take the meanings they are constructing through reading, writing, or talk and think about them through art, music, drama, or mathematics, they create new meaning potentials. The other sign systems become woven into their talk about literature and provide multiple perspectives and points of connection that add to the complexity of the issues and ideas they consider.

Final thoughts

We noted a number of recurring themes in our observations of children and our interviews with them as they responded to literature through a range of sign systems. Children stated that the availability of a range of systems gave them the opportunity to think more broadly, to consider other ideas, to connect to memories, and to think through feelings. The availability of multiple sign systems created a larger pool of ideas and connections from which they could pull in thinking, solving problems, gaining new understandings, and responding to literature.

Children noted that they could more fully enter into and reflect on the story world because they experienced it from so many perspectives. They had not just talked about the book and done analytical thinking but had used art, music, mathematics, and movement to imaginatively and aesthetically consider the story. By engaging in transmediation across sign systems, they were encouraged to think and reflect creatively and to position themselves as meaning makers and inquirers. They were supported in gaining new

perspectives and creating new visions about literature and life.

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References

- Eco, U. (1976). *A theory of semiotics*. Bloomington, IN: Indiana University Press.
- Eisner, E. (1994). *Cognition and curriculum reconsidered*. New York: Teachers College Press.
- Harste, J. (1994, December). *Curriculum as conversations about knowledge, sign systems, and inquiry*. Paper presented at the National Reading Research Conference, San Diego, CA.
- Kahn, L. (1994). *Mathematics as life: Children's responses to literature*. Unpublished educational specialist thesis, University of Arizona, Tucson.
- Kahn, L., Fisher, P., & Pitt, D. (1994). Teacher, artist, lawyer, kids: Cycles of collaboration and the Holocaust. In S. Steffey & W. Hood (Eds.), *If this is social studies, why isn't it boring?* (pp. 23–44). York, ME: Stenhouse.
- Kauffman, G., & Ediger, K. (1998). Celebrating authorship: A process of collaborating and creating meaning. In K.G. Short & K.M. Pierce (Eds.), *Talking about books* (pp. 135–154). Portsmouth, NH: Heinemann.
- Peterson, R. (1992). *Life in a crowded place*. Portsmouth, NH: Heinemann.
- Rosenblatt, L. (1978). *The reader, the text, the poem*. Carbondale, IL: Southern Illinois University Press.
- Short, K. (1986). *Literacy as a collaborative experience*. Unpublished doctoral dissertation, Indiana University, Bloomington.
- Short, K. (1992). Researching intertextuality within collaborative classroom learning environments. *Linguistics and Education*, 4 (3–4), 313–333.
- Short, K., & Harste, J., with Burke, C. (1996). *Creating classrooms for authors and inquirers*. Portsmouth, NH: Heinemann.
- Short, K., & Kauffman, G. (in press). Exploring sign systems within an inquiry curriculum. In M. Gallego & S. Hollingsworth (Eds.), *Challenging a single standard*. New York: Teachers College Press.
- Short, K., Schroeder, J., Laird, J., Kauffman, G., Ferguson, M., & Crawford, K. (1996). *Learning together through inquiry*. York, ME: Stenhouse.
- Siegel, M. (1984). *Reading as signification*. Unpublished doctoral dissertation, Indiana University, Bloomington.
- Siegel, M. (1995). More than words: The generative power of transmediation for learning. *Canadian Journal of Education*, 20, 455–475.
- Suhor, C. (1984). Towards a semiotic-based curriculum. *Journal of Curriculum Studies*, 16, 247–257.

Children's books cited

- Adler, David. (1989). *We remember the Holocaust*. New York: Holt.
- Avi. (1994). *The barn*. New York: Orchard.
- Base, Grahame. (1986). *Animalia*. New York: Abrams.
- Buss, Fran Leeper. (1991). *Journey of the sparrows*. New York: Dutton.
- Cauley, Lorinda B. (1979). *The ugly duckling*. San Diego, CA: Harcourt Brace Jovanovich.
- Clifton, Lucille. (1979). *The lucky stone*. New York: Delacorte.
- Fitzhugh, Louise. (1969). *Bang, bang, you're dead*. New York: Harper & Row.
- Hill, Kirkpatrick. (1990). *Toughboy and sister*. New York: Macmillan.
- Innocenti, Roberto. (1985). *Rose Blanche*. Mankato, MN: Creative Education.
- Mayer, Marianna. (1978). *Beauty and the Beast*. New York: Four Winds Press.
- MacLachlan, Patricia. (1985). *Sarah, plain and tall*. New York: Harper.
- McSwigan, Marie. (1942). *Snow treasure*. New York: Scholastic.
- Mochizuki, Ken. (1993). *Baseball saved us*. New York: Lee & Low.
- Taylor, Theodore. (1969). *The cay*. New York: Doubleday.
- Voigt, Cynthia. (1984). *Building blocks*. New York: Fawcett.
- Yashima, Taro. (1955). *Crow Boy*. New York: Viking.
- Yep, Laurence. (1991). *Star fisher*. New York: Morrow.
- Yolen, Jane. (1981). *Sleeping Ugly*. New York: Coward-McCann.