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ABSTRACT

This collaborative study examined episodes in primary through secondary classrooms in which writing and reading were working together, exploring the extent to which student learning and development were enhanced. Review of research and extrapolations from classrooms suggest that benefits for students are likely to be accrued in four areas: (1) acquisition of certain skills, including letter-sounding correspondence, knowledge of genre and stylistic features as well as other literacy skills; (2) motivation to engage in learning activities; (3) acquisition, clarification, elaboration and discovery of ideas; and (4) development of a sense of authorship, readership, and critical thinking abilities. (Four figures and writing samples are included; one appendix about learning to spell and 55 references are attached.) (KEH)

# Center for the Study of Writing


Occasional Paper No. 5

## WRITING AND READING WORKING TOGETHER

Robert J. Tierney
Rebekah Caplan
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University of California, Berkeley
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# CENTER FOR THE STUDY OF WRITING

# WRITING AND READING WORKING TOGETHER

by

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## INTRODUCTION

*Over the past several years, the authors of the present paper have spent a great deal of time working with teachers and students in their efforts to improve literacy by teaching writing and reading in tandem. Early in 1986, a conference sponsored by the Center for the Study of Writing and Center for the Study of Reading brought us together to plan a paper on how writing and reading can be intertwined in the classroom. The authors agreed that the paper should be approached collaboratively. At subsequent meetings, and through the mail, each of the authors shared examples of classroom episodes involving various combinations of writing and reading activities. Some classroom episodes were drawn from our own experiences; others were drawn from the experiences of colleagues. Together, they allowed us, as a group, to reflect upon the nature of these activities, especially the benefits.*

*As we examined classroom episodes in which writing and reading were working together, we were struck with the extent to which student learning and development could be enhanced. Repeatedly, we were impressed with these results: (a) the social and personal growth of students who explored their own work in the context of sharing their writing and reading with others; (b) the growth in learning as students integrated what they read with what they knew and would discover as pen was put to paper; (c) the establishment of a framework in which students read more critically whether they were reading their own writing or the writing of others; and (d) improvements in their writing and reading skills as students explored an author's craft--including the use of letter-sound relationships to write a word, the use of techniques to invite predictions or create suspense for one's reader and so on. The paper which follows tries to capture these episodes, our consideration of them, together with research which relates to these efforts.*

In the everyday world, writing and reading are naturally intertwined. A mechanic jots down marginal notations while studying a manual or textbook. A journalist surrounds herself with books to which she refers as she outlines or develops an essay. After receiving a letter from a friend, one refers to the letter while writing a response. As an application form is being completed, a prospective employee reads directions and generates written responses. Even when a writer creates a text without appearing to do any reading, he or she is repeatedly reading that text.

What occurs in the everyday world is in sharp contrast with what has been happening in classrooms. In the world of classrooms, writing and reading have tended to be kept apart. When it comes to reading assignments teachers have rationalized not giving students writing assignments because they distract from reading. Writing periods are the reverse. Teachers often admonish students to clear the desk of any books when they work in case their reading should interfere with their writing. Even in those classrooms purported to represent an integrated approach to teaching writing and reading, the two cohabited rather than worked together. Whatever the reason, in many classrooms, it has only been in recent years that teachers have embraced the marriage of writing and reading. The question we would like to address is: what if writing and reading are working together? We would like to invite you to explore analyses of such marriages. Our analyses are based upon research and classroom examples representing a variety of working relationships in different settings. We begin with primary classrooms.

## WHAT IF WRITING AND READING ARE WORKING TOGETHER IN THE ELEMENTARY SCHOOL?

As far back as 1908, Edmond Huey reported the use of the sentence method which enlisted students' writing as the basis for learning to read. Since that time, various educators have advocated numerous practices in which writing and reading are interrelated. For example, they have urged integrating writing and reading through the "language experience" approach as well as selected "creative writing" approaches (Ethan, 1976; Ashton-Warner, 1963; Clay 1976; Montessori, 1964; Stauffer, 1970; Fader and Shaevitz, 1966). Support for these approaches often came from the longstanding professional belief in the worth of interrelating the language arts as well as from teachers' testimonials about the benefits of doing so. Research support tended to be limited to large-scale survey-like comparisons of methods. Nonetheless, such studies did show that students involved in such approaches improved in concept development, word recognition, vocabulary and comprehension (Bond & Dykstra, 1967; Stauffer & Hammond, 1967, 1969).

More recent analyses of the attitudes, strategies and understandings of children during their first five years by Bissex (1980), Chomsky (1979), Dyson (1984), Ferreiro and Teberosksy (1982), Harste, Woodward, and Burke (1984), Read (1971), and others have substantiated these notions and given them further impetus as well as new directions. Through examining writing samples collected from very young children, these studies have shown how various writing experiences (e.g., creating notes, stories, signs, picture captions) provide children with opportunities to develop, test, reinforce, and extend their understandings about written language. As Harste, Woodward, and Burke (1984) stated, writing allows children the opportunity to test their "growing understanding of storiness, of wordness, of how one keeps ideas apart in writing, how the sounds of language are mapped onto written letters, of how one was writing to mean and more" (p. 218).

Based upon their analyses of the writing samples of young children, Carol Chomsky (1979) and Charles Read (1971) who introduced us to the notion of "invented spellings" have argued strongly for early writing in conjunction with learning to read. As Chomsky stated:

> . . . children who have been writing for months are in a very favorable position when they undertake learning to read. They have at their command considerable phonetic information about English, practice in phonemic segmentation, and experience with alphabetic representation. These are some of the technical skills that they need to get started. They have, in addition, an expectation of going ahead on their own. They are prepared to make sense, and their purpose is to derive a message form the print, not just to pronounce the words. (pp. 51-52)

The notion that writing supports young readers' efforts "to make sense" has also emerged from the recent widespread advocacy for process-oriented writing experiences. For example, Atwell (1987), Calkins (1983), Giaccobbe (1983), Graves and Hansen (1983), and Hansen (1987) among others suggest that students involved in a rich writing curriculum develop a keen sense of authorship and readership. These educators report that children understand why something they are reading was written, as well as what its strengths and weaknesses might be. In elementary classrooms where children wrote extensively, Calkins (1983) recorded questions initiated by children, like "[I wonder] why the author chose the lead he did?" and "I wonder if these characters come from the author's life?" during discussions about various texts.

To extend our consideration of these notions, we would like to invite you to explore with us selected teachers' attempts to tie together writing and reading. In a growing number of elementary classrooms, teachers are exploring the power of creating interrelated writing/reading experiences as vehicles for learning more about topics as well as to learn more about how to write and read. Our examples in this section are drawn from kindergarten through third grade in U.S. settings ranging from the far west to northeast.

Our first illustration suggests that even for very young children, writing/reading experiences can create opportunities for students to explore ideas (their own and others') as well as develop their writing and reading skills. For example, a kindergarten teacher in the midwest shared a wordless picture book with her class and then gave them the opportunity to write their own stories to accompany the pictures (Harste, Woodward, & Burke, 1984). Figure 1 is a copy of the text that one kindergartner (Cassie) wrote.

Approximately one week later a classmate read the story and commented on how she liked it. The teacher overheard Cassie say that she no longer liked her story because she failed to tell what people were thinking. Upon the teacher's invitation, Cassie rewrote her story. (See Figure 2.)

Providing Cassie with the opportunity to develop her own story gave her the chance to express herself, recreate another person's story and revisit her own story. It enabled Cassie to explore her understanding of written text--including the structure of a story, the use of dialogue, sentence form, the relation between pictures and text, and letter-sound correspondence. Interestingly, across just a single week Cassie's spelling improved. Across the two drafts Cassie included 92 words of which 52 were different. Among the 20 words in common, 50% were spelled conventionally, 15% moved toward conventionality, and 15% became conventional.


FIGURE 1. *Cassie's initial response to wordless picture book.*


FIGURE 2. *Cassie's revised response to wordless picture book.*

What role did reading play in this child's writing? In Cassie's classroom, the wordless picture book was the stimulus for Cassie's own story rendition. It provided a source of ideas and a basis for comparison. In addition, Cassie's reading of her own text and her classmates' reading and reaction prompted her to reconsider and subsequently revise that text.

Other classroom episodes provide further glimpses of the relationship between reading, writing and student learning. In one of our classrooms (Mary Hurdlow's), the teacher shares with the students "My Friend John," a story by Charlotte Zolotow. One of the excerpts from the story follows:

John is my best friend and I'm his...
We know where the secret places are in each other's house.

After hearing the story and being interviewed by a classmate about best friends, six-year-old Jesse wrote:

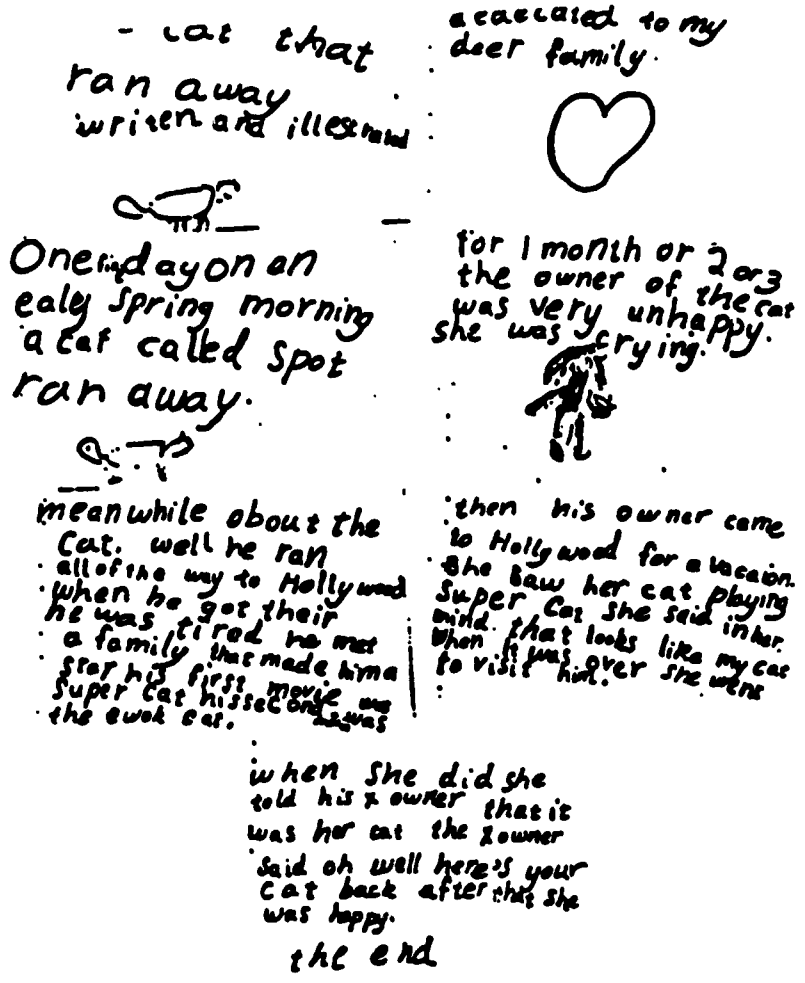
I like my friend and he likes me.
He knows where my toys are
and I know where his toys are.

Here the story and the interview provided a framework by which Jesse could share his own sense of friendship in writing. In echoing the author's style, and assuming what appeared to be his ownership of it, Jesse was learning about how his own ideas might be expressed. It was as if Jesse was reading like a writer--recognizing and then borrowing a turn of phrase, learning how to provide descriptive detail.

In this same classroom the teacher read to the second graders, *Higglety Pigglety Pop!*, by Maurice Sendak. In this book, Jennie, the dog heroine, runs away from her comfortable home to become a star in the World Mother Goose Theatre. The teacher shared with the class that Maurice Sendak wrote this book when his own dog Jennie became ill and died. One student, Sarah, asked to read the book during the sustained silent reading period. When it was time to check out a book to take home overnight, she chose *Higglety Pigglety Pop!* The teacher knew one of the reasons for this book's special appeal to Sarah. Having waited several years to have a cat of her own, Sarah was suffering greatly because her new kitten, a Christmas present, had recently run away. Sarah seemed to find comfort in Sendak's melancholy but humorous tale of a beloved pet's adventure after running away from home.

On Thursday of the same week Sarah sat in front of the class to read to her teacher and classmates her recently completed book entitled *The Cat That Ran Away*. In Sendak's book, Jennie writes to her old master, "I am even a star." Sarah writes about her cat, "He met a family that made him a star." Figure 3 contains Sarah's text and, for ease of reading, her teacher's conventionalized version.

In this same classroom a different adult author is featured each month. In October, Arnold Lobel was "Author of the Month." The teacher read his books daily to the class, and the Frog and Toad stories were immediate favorites. The simple, straightforward sentences describing the very human adventures of Frog and Toad seemed to attract the second graders. Jane, a second grader, wrote her own book,




THE CAT THAT RAN AWAY

written and illustrated by Sarah
dedicated to my dear family

One fine day on an early spring morning a cat called Spot ran away. For one month or two or three the owner of the cat was very unhappy. She was crying.

Meanwhile about the cat. Well he ran all of the way to Hollywood. When he got there he was tired. He met a family that made him a star. His first movie was Super Cat. His second movie was The Ewok Cat. Then his owner came to Hollywood for a vacation. She saw her cat playing Super Cat. She said in her mind, "That looks like my cat." When it was over she went to visit him. When she did she told his X-owner that it was her cat. The X-owner said, "Oh well, here's your cat back." After that she was very happy.

THE END

FIGURE 3. *Sarah's story (the cat that ran away).*

*Frog and Toad at San Francisco*, and read it to the class. The following is a copy of her complete story, retaining her invented spellings and punctuation.

> One day Frog and toad were sitting at home. they were thinking of sump thing to Do toDay when all of the Suden Frog sed lets go for a walkIno sed toad weve all rety Don tht. Let's go to Safranciscoff! Ya! sed Forg Lets go! So they got there good shoos and coat and hat then they went outide. So Frog and toad walkedto SanFrancisco. When they got to SanFrancisco they rode the Cabelcar up the hill. an then it stopdIwhen itstoped they got off and then theyIBote some stickers and pensels and then they got back on the cabelcar. and then they went to petzza for lunch. and then they went back home. When they got home they sed good by and frog left. The End

Following the reading, the class told Jane specifically what they liked about her book. Then they asked her questions. Ethan asked her where she got the idea for the book. Jane replied, "From Arnold Lobel, of course. And when I went to San Francisco I rode the cable cars, ate pizza for lunch and bought stickers and pencils, so I thought it would be fun to make Frog and Toad do that too."

As this example demonstrates, sometimes the books written by students are a direct reflection of the books they have read or listened to. Sometimes a single book will be the impetus for a student's story. Sometimes students synthesize ideas and characters from two or more books when they write their own. The following are some titles of books authored by the students in this class. The listings are followed, in parentheses, by the titles and authors of the books that inspired them.

> Garfield Meats Frog and Toad (The Garfield cartoon books and Arnold Lobel's Frog and Toad books.)
>
> Commander Hurdlow and the Planet of the Kids! (*Commander Toad and the Planet of the Grapes* by Jane Yolen.)
>
> The Trumpet of the Bears (*The Trumpet of the Swan* by E.B. White and various books about bears.)
>
> Arthur's Teeth (*Arthur's Eyes* by Marc Brown.)
>
> Not Again Pinkerton! (*Pinkerton Behave* by Steven Kellog.)

Students' relationship with authors is developed in a number of ways when writing and reading are interrelated. Class discussions might center on who wrote the story and why. In Mary Hurdlow's class, discussions resulted in some students initiating letters to authors. For example, after discussing his work, some of the students wanted to write to Arnold Lobel. Diane, for example, wrote:

> I have two of your books and I am going to get a new one and then I will have all of them. It is the book of *Frog and Toad All Year*. What is the book you are working on now? I like how you draw your pictures. How did you get the idea of putting a frog in the book? I feel sorry for you because you were sick for along time when you were little. [The class had seen a filmstrip about Arnold Lobel in which this was mentioned.] I like the way you right your words.

Kelly wrote:

> Dear Arnold, I like your book *Frog and Toad are Friends*. What kind of book are you doing now? I like to write books to. I like your books they are the best! I hope you are writing a book right now!

The types of outcomes which emerged in Mary Hurdlow's classroom are not exceptional. Indeed, in other classrooms in which writing and reading are interrelated, similar developments occur. Furthermore, students who are involved in such experiences for several years become quite sophisticated readers and writers. For example, in a third grade classroom, a teacher (Marilyn Boutwell) worked with a number of students who had received rich experiences with writing since first grade. In addition to maintaining the richness of their experience, she focused upon relating their writing and reading.

On a semi-formal basis, she encouraged her students to compare their writing with their reading. She found that her students would not only use ideas from stories that they had read, they would use techniques that they noticed. Melissa, a student in this third grade classroom, developed a character, Natasha, in conjunction with a book, *Natasha Koren and Her Runaway Imagination*. Her story was rich with descriptive language, powerful dialogue and even included a preface to introduce her readers to the story and a moral to ensure they understood her point. When Melissa was asked about the source of her ideas and techniques, she explained:

| | |
|---|---|
| Melissa: | Well, I read this other book and it was about this girl's imagination, but I just thought about the book and I thought it would be a good title for Natasha Koren to have a runaway imagination. . . . it (the other book) wasn't the same. . . . she looks at pictures and stuff and she imagines that they are moving and stuff like that. |
| Interviewer: | I noticed at the beginning of Chapter 5 (you wrote) "meanwhile at home" . . . how did you know how to do that? |
| Melissa: | I have seen it in other books. |
| Interviewer: | What are some of the other things that you use? |
| Melissa: | Words and dedications, dialogue, ways to show people that you are going back to something else. |

In a class discussion of how writers revealed their characters to readers, Melissa's third grade classmates compared her character development in *Natasha Koren and Her Runaway Imagination* to Robert Peck's in *Soup*. They discussed how Melissa used dialogue and events to reveal her character. In turn, these classmates used Melissa's techniques, Peck's and some of the techniques used by other classmates as a basis for their own attempts to reveal their characters to their readers. There is no reason why students' own stories cannot serve the same functions as texts written by professional authors. Indeed, students will sometimes be more apt to experiment with ideas and techniques they see their classmates enlist than techniques they notice professional authors use.

Writing and reading may work together on a less formal basis. Sometimes it is reading a note from the teacher or another student which prompts students to write. Melissa wrote to her teacher about her enjoyment of a classmate's story. She discussed how the author makes the characters "so alive." In response, her teacher shared aspects of her own reading experience and suggested that Melissa might compliment her classmate for his story. In Mary Hurdlow's first grade, Garth wrote his friend Bret's name twice, once across the "tummy" of the drawing of Bret. The teacher wrote: "What do you and Bret do?" Garth responded, in the first written sentence of his school life, "Me and Bob make cars, by Garth."

In the same class, the teacher wrote a note to Brandon asking, "Will you play Little League this year?" Brandon responded, "I'm going to play Pee Wee Baseball. I played last year my friend was there." And, when Ian wrote, "Spot is a nice dog. A dog nice enough for me." The teacher: "Do you like dogs better than cats?" Ian wrote back: "Yes I do like dogs better than cats. I don't know why, I just do like them better."

To return to our initial question, what if writing and reading are working together in primary classrooms? Our examples illustrate that writing and reading can work together in primary classrooms, and, when they do certain learning outcomes are supported. First, our examples suggest that when writing and reading work together certain skills are enhanced. For instance, in Mary Hurdlow's class we were able to see how writing and reading contributed to an understanding of sound-symbol correspondence. By being given opportunities to write, students were able to explore and test their knowledge of sound-symbol correspondence. More specifically, writing draws a learner's attention to sounds in words and to letters that might symbolize those sounds. Thus students may form expectations about how spellings might be structured and become more interested in specific spellings as well as how the general spelling system as a whole works. Reading exposes learners to the conventional spellings of words and declares which of the various possibilities are "correct." Reading provides the input learners need to store the conventional spellings of specific words in memory and also to figure out how the general system words. Thus reading directs writing toward more conventional forms, and writing enhances readers' interest in and grasp of the alphabetic structure of print.

Consider the changes which occurred in the spelling patterns of one of the children in Mary Hurdlow's class. Over a two-year period from the beginning of first grade to the end of second grade, Mary Hurdlow dictated a 20-word spelling test to her students five times. These words were never taught directly to students. The spellings of one child who was an average reader-speller are reproduced in Figure 4. Correct spellings of words are underlined. At the time of the first test, this child was able to read only a few words presented in isolation. At the time of the final test, he was reading words at grade level. The number of correctly spelled words increased from the first to the fifth test, slowly at first and then dramatically at the end: 0, 1, 1, 6, and 16 words correct, respectively. One feature of the spellings is especially noteworthy. Although few words were spelled correctly during the first three tests, the quality of the spellings changed markedly, from forms that bore little resemblance to the words to forms that symbolized a number of sounds in the words. Many teachers are reluctant to adopt a reading/writing program like Mrs. Hurdlow's because of children's spelling difficulty. We, therefore, have elaborated on the connection between learning to read and learning to spell in the Appendix.

Spelling Test of 20 words dictated to one student five times over a two-year period in first and second grades. Correct spellings are in italics.

| Words | Test 1 grade: 1.3 | Test 2 1.6 | Test 3 1.9 | Test 4 2.3 | Test 5 2.8 |
|---|---|---|---|---|---|
| *rag* | 1 | RG | *rag* | *rag* | *rag* |
| *buzz* | BP | BZ | Boz | buz | *buzz* |
| *lid* | E | LD | lad | *lid* | *lid* |
| *six* | 6 | SS | sis | siks | *six* |
| *game* | | GEM | gam | gars | *game* |
| *nice* | SAT | Nis | nis | nis | *nice* |
| *doctor* | DA | DOD | did | doktdr | *doctor* |
| *view* | Y | vyou | vo | vu | *view* |
| *yellow* | | yellw | yao | *yellow* | *yellow* |
| *kiss* | C | kits | kis | *kiss* | kis |
| *camp* | MP | CAP | cap | kap | *camp* |
| *zero* | O | ZW | zio | ziro | *zero* |
| *hill* | | *Hill* | ole | hil | *hill* |
| *tack* | P | TAK | tac | tac | *tack* |
| *five* | 5 | FAV | fi | *five* | *five* |
| *pickle* | PO | PL | pal | pikl | pikel |
| *muffin* | KO | MN | mufn | mufin | muffen |
| *wife* | 1 | yuf | wif | wif | *wife* |
| *job* | | JB | jig | *job* | *job* |
| *quick* | Ka | KWK | cwy | kwic | quice |

FIGURE 4. *Student response to spelling test across two years.*

In addition to supporting students' understanding of our spelling system, writing and reading working together have an impact upon students' understanding of genre and stylistics. In Marilyn Boutwell's class, students had acquired an understanding and willingness to experiment with as well as adapt dialogue, descriptive techniques and transitions. Boutwell's experiences are consistent with Barbara Eckhoff's (1983) findings. She compared the written text of two groups of first graders who were exposed to very different writing styles in their basal reading programs. One of the basals tended to include short and choppy sentences characteristic of controlled vocabulary and sentence length constraints; the other basal was written using a more natural style. Students assigned to the former basal tended to write using a similar pattern of short and simple sentences; students assigned to the latter basal wrote more complex sentences after the style of those materials. When students were encouraged to compare their style with the style of others they appear willing not just to adopt but also experiment with various stylistic techniques.

A second outcome of writing and reading working together is the enhancement of motivation. Cassie, the kindergartner described earlier, revised her text after her classmates read and responded to it. In Mary Hurdlow's class, students were motivated to initiate letters to the teacher and to authors. Moreover, they continued writing and reading outside of school. In Marilyn Boutwell's class motivation to learn was apparent in some of the comments offered by students. One explained:

> I like to challenge myself. I do a report that I don't know a lot about and then do research on it, and if I am doing a story and I don't know what to write, I just conference with others to get ideas.
>
> After writing about what I've read I can go back and see what I've learned.

In response to the hypothetical situation of being stranded on an island without books, television or radio, one student responded, "I would be fine. I would find a stick and write in the sand."

Third, many of our examples illustrate how writing and reading can work together to enhance clarification, elaboration, and adaptation of ideas. Cassie, the kindergartner, redeveloped her text to incorporate what the children in her story were thinking. In Mary Hurdlow's class we saw evidence of students taking events and characters that they had met in stories written by peers and professional authors and placing them in their own. As Mary Hurdlow pointed out, "Students would synthesize ideas and characters from two or more books." She described how a student took several books about bears, together with E.B. White's *The Trumpet of the Swan,* to write about *The Trumpet of the Bears*. The students in Marilyn Boutwell's class displayed similar tendencies, as when Melissa explained the origins of her story *Natasha Koren and Her Runaway Imagination:*

> Well I read this other book and it was about this girl's imagination but I just thought about that book and I thought it would be a good title . . . to have a runaway imagination. . . . It (the other book) wasn't the same. . . . she looks at pictures and stuff and imagines they are moving and stuff like that.

Her own book is about a girl who leaves home because she is upset with her mother. The girl's imagination carries her away into strange and wondrous experiences.

Fourth, the classroom examples suggest that writing and reading working together contribute to an appreciation of authorship and readership as well as an ability to read critically both one's own writing and the writing of others. In both Mary Hurdlow's first grade class and Marilyn Boutwell's third grade the students had a clear sense of who wrote what and where the ideas may have come from, and could often offer some reasons why the book they were reading was written. Likewise, students, especially in Boutwell's class, had a sense of how others might react to what they had written and were often able to use these understandings to refine their craft. For example, one of Marilyn Boutwell's students offered these comments about a piece he was writing.

> Well, on the second page it says 'Brad Wilson was walking down a dirt road' and they (the readers) have a dirt road in their mind, but when they say 'which is really a mud road because of a good day's ran,' they have a clue and they keep it in their heads.

## WHAT IF WRITING AND READING ARE WORKING TOGETHER IN THE SECONDARY SCHOOL?

Data from the National Assessment of Educational Progress (1981, 1986) paint a bleak picture of our high school students' writing and reading activities. Most high school students are relatively incapable of writing an effective persuasive essay, responding critically to essays written by others, or generating an analytical response to what they have read. For those familiar with classroom observations of writing and reading in schools, these data are not surprising. Past surveys of teaching practices suggest that students have not often been expected to write extensively (Applebee, 1981, 1984). Furthermore, even in those classrooms where students have been expected to do a lot of writing and reading, their writing has rarely served to examine critically or to extend their reasoning. In essence, writing was often viewed as an activity which detracted from reading; reading was viewed as an activity which confounded writing.

In recent years a number of educators have proposed a marriage between writing and reading as a partial solution to the problem in high schools. As has been stated in national reports on education:

> It cannot be overemphasized too strongly that reading is one of the language arts. . . . Writing activities in particular, should be integrated into the reading period. (Anderson, et al., Becoming a Nation of Readers, 1985, p. 79)

> Reading and writing hold strong positions in American school life today. But our task force concurs that the two have been kept apart, with both losing strength. (Excellence in Our Schools, 1985, p. 15)

The question we wo. d like to explore next is what if there is a marriage between writing and reading in high school classrooms? For purposes of exploring this question, we have reviewed the research on integrating writing and reading with high school and college students and have also taken several examples from high school classrooms as a basis for elaborating upon some of these issues. First, we present examples from two English classrooms together with research pertaining to the role of writing and reading in teaching literature. One of our examples is from

an advanced high school English classroom in California. The writing-reading activities in this classroom represent attempts to heighten students' sensitivity to what they read and what they write by attuning them to variations in style, elements of plot and their own ideas. The other examples were drawn from a middle school English classroom in an inner-city school in the midwest. This example illustrates how writing and reading might work together to enhance critical thinking, especially understanding of theme, as well as selected writing and reading skills. Second, we present selected examples from a variety of content area classrooms--a history, biology, and science classroom--together with research in writing in reading in content areas.

## WHAT IF WRITING AND READING ARE WORKING TOGETHER IN ENGLISH CLASSROOMS?

In most high schools, literature serves as the cornerstone of the English program. Short stories, novels, and poems are used as the basis for exploring issues and themes as well as developing literacy skills. Our examples of classroom practice demonstrate the potential power of students writing as well as reading literature. Writing and reading in tandem affords the students the opportunity to engage with literature, to develop as authors, and to make comparisons of their own efforts with the work of their peers as well as that of professional authors.

In one of the classrooms (Rebekah Caplan's), an advanced high school English class, the teacher uses writing activities as a means of ensuring student engagement with their reading and, in turn, uses their reading to empower their writing development. She feels that, prompted to visually substantiate their own thoughts, they become actively involved as participants as well as observers of their own craft of meaning-making. Having to invent his own vision, a student is likely to have an interest in seeing how others, including a professional writer, create similar moods, plots, characters and settings (see Caplan, 1984). Caplan often asks her students to write in preparation for reading. For example, students might expand a scenario, like "The living room was romantic." During a brief discussion, students may evaluate the vividness of each other's examples. One student, Jennifer, read this scenario to the class:

THE LIVING ROOM WAS ROMANTIC
Jennifer

> She patiently waited for the arrival of her boyfriend. It was their six month anniversary and she had so carefully planned the evening and menu. There was fresh-fallen snow three feet deep outside the glass doors, and the moon gave a glistening glow into the room. The crackling, burning fire in the fireplace gave the room a soothing warmth as it flickered almost simultaneously with the candlelight. Chilled champagne rested impatiently in the ice bucket which sat in the shadow of the vase of red roses. The soft, flowing sound of Air Supply drifted from the high-tech stereo and the bear skin rug seemed almost to smile from the pleasant music. The doorbell rings. It was sure to be a memorable night.

The class appreciated the numerous specifics that filled Jennifer's description: snow outside contrasting with the warmth from within; moonlight to provide an inner glow to the room; candlelight, champagne, roses, a bear skin rug as typical romantic accoutrements. They especially enjoyed the mentioning of the popular group Air

Supply and the use of the word "high-tech," details they considered especially helpful in making the scene more contemporary and less traditional. They appreciated that a living room could be romantic with modern influences as well as the old standbys of candlelight, champagne, and roses.

Roger shared his scenario:

THE LIVING ROOM WAS ROMANTIC
Roger

> The sun, rising over the lake, created a rosy glow in the living room as it shone through the window, and the unseasoned wood in the fire gave the room a musky smell as Christy sat down on the couch. She snuggled closer to her husband, that word was going to take some getting used to, and took a sip of coffee. A honeymoon to her family's cabin in the Sierras was a wonderful idea, and now as she fell deeper into the cushions of the couch and her daydreams she could hear the ticking of the cuckoo clock on the wall, her grandfather's gift to her mother and father on their wedding day. So many memories, so much of a future.

The class liked Roger's phrase "that word was going to take some getting used to," in reference to "husband." They thought Roger clever in the way he weaved in the comment, showing the shyness of the recent bride. They also thought the cuckoo clock had a nice original touch; they enjoyed the idea of tradition being passed from one generation to another--tradition, they said, is usually romantic.

Finally, Julia shared her scenario:

THE LIVING ROOM WAS ROMANTIC
Julia

> Margarite gasped as she entered the room Tony had told her to wait in. Stravinsky floated through the air and a hissing sound emerged from the brilliant fire of orange and red in the fireplace that threw light on the dark blue walls of which were dotted with Renoirs and Monets. A matching love seat of the same blue stood not far from the fire and a chilled bottle of champagne waited near by. Valentino could have done no better.

The class thought Julia's version "the most sophisticated." Some of them questioned who Stravinsky, Renoir, Monet, and Valentino were, but they knew enough to understand they were famous artists and an actor. If someone could afford originals of Renoir and Monet, and have a decor similar to Valentino's, he must have a great deal of money. In this version of a romantic living room , then, the expensiveness and elegance of the surroundings contributed to the romantic vision.

The students were then introduced to an excerpt from F. Scott Fitzgerald's book *The Great Gatsby* which describes the same scenario:

> We walked through a high hallway into a bright, rosy-colored space, fragilely bound into the house by French windows at either end. The windows were ajar and gleaming white against the fresh grass outside that seemed to grow a little way into the house. A breeze blew through the

room, blew curtains in at one end and out the other like pale flags, twisting them up toward the frosted wedding-cake of the ceiling, and then rippled over the wine-colored rug, making a shadow on it as wind does on the sea.

The only completely stationary object in the room was an enormous couch on which two young women were buoyed up as though upon an anchored balloon. They were both in white and their dresses were rippling and fluttering as if they had just been blown back in after a short flight around the house. I must have stood for a few minutes listening to the whip and snap of the curtains and the groan of a picture on the wall. Then there was a boom as Tom Buchanan shut the rear windows and the caught wind died out about the room, and the curtains and the rugs and the two young women ballooned slowly to the floor.

As Caplan suggests, such comparisons are not intended to suggest that Fitzgerald's version is better than the students' or that the students should be writing like Fitzgerald in order to be successful writers. Rather, the exercise is meant to help students notice alternatives--to perhaps come to realize that a romantic setting can be achieved beyond the traditional uses of champagne, candlelight, (or firelight), roses and sentimental music, that romance might be created in ways they might not have considered. Indeed, when looking back to their own versions of the romantic living room, some students preferred their own writing over Fitzgerald's. They felt their descriptions were more "direct," not clouded in "difficult metaphors which were hard to understand." On the other hand, many students were favorably impressed with Fitzgerald's talent. When they looked back to their own writings, they suggested that candlelight, champagne and roses seemed mundane by comparison. At times, the discussion moved to a consideration of what makes particular writing styles appealing or unappealing. At other times, the discussion centered upon specific images. For example, some students admired how Fitzgerald captured the exquisiteness of the room through imagery. They liked, for instance, the way the breeze "ripples over the wine-colored rug, making a shadow on it as wind does on the sea." The students remarked that the rug comparison gave the reader the impression of a rug so thick and luxurious, a rug so deeply piled, it moved in waves as the wind moved over it. Also, "wine-colored rug" was quite different from, let's say, a "maroon-colored" rug. A "wine-colored rug" was also a more "original" way to weave-in the old "champagne" cliche.

Some students offered the phrase, "curtains twisting up toward the frosted wedding-cake of the ceiling" as an appealing line; others protested, complaining they didn't understand what "frosted wedding-cake of the ceiling" meant. When one student who understood the phrase, however, commented that the frosted wedding-cake reminded him of the ornate sculptings of fancy, palatial ceilings, his insight became a learning experience for those who didn't understand. When asked why the writer chose "wedding-cake," then, as the term for comparison, students said that wedding-cake is frosted, is "sculpted" in a way similar to the ceiling with all the little swirls of decoration. Also wedding-cake itself implied a kind of romantic vision of perfection--the courtship culminated on the marriage day, so the house became the "dream" house, the ideal form. Students saw the use of "wedding-cake of the ceiling" as more subtle than "two lovers on a loveseat" as in previous student versions.

Sometimes, in the course of dealing with a novel, Caplan pursues an even closer examination of a writer's style. For example, to sensitize students to the subtleness of Fitzgerald's style, she has had students develop parallel versions of excerpts taken

from *The Great Gatsby* which they in turn discussed. For example the following student text parallels the Gatsby excerpt presented above:

> I ran along the dirt path through short scratchy weeds, fiercely grabbing at my legs around bare ankles on both sides. My shoes were new and sparkling clean on the dry dirt below that swirled to form a miniature cyclone of a cloud. A breeze blew through my hair, flung strands across one eye and then the other like a tattered blindfold, tangling it into the hideous snarl of a labyrinth, and then flowed down the back of my neck, creating a coolness on my skin as an oasis does in the desert.
>
> The only really recognizeable sound in my ears was my beating heart that quite painfully knocked against my ribs as if it were a caged bird. It was in my throat, and its presence was frightening and weakening as though it was just about to explode at any minute if it continued to work so hard. I must have run for a few minutes listening to the whimper and roar of my breathing and the pounding of my shoes on the path. Then there was a cheer as I neared the finish line and some last energy propelled me towards the crowd, and my heart and my breathing and the heat mattered not at all.

It is Caplan's claim that when students parallel and later evaluate the distinguishing styles of major authors, not only may they come to appreciate the talent and craft of the writer, they may also learn new rhetorical devices for delivering ideas. As she stated, students consider the varying impact of different sentence lengths, of descriptive and nondescriptive language, of direct and indirect narrations. In short, they learn to tell their stories in new and different voices. At the same time, Caplan claims that students may acquire "a feel for a writer which enables them to appreciate how style contributes to the story." She suggests that once students are attuned to an author's style, they will spontaneously comment on his or her use of certain techniques. For example, having emulated Fitzgerald's move from idealism to reality, students were quick to identify other Fitzgerald paragraphs which repeated this tendency.

Sometimes Caplan pursues goals which are less directed toward preparing the students for dealing with an author's stylistic idiosyncrasies and more centered upon having students pull together their own ideas. For example, when they had read Fitzgerald's *The Great Gatsby* in its entirety, students were asked to compare Jay Gatsby's quest for Daisy Buchanan with the quest for the American dream. Here is an excerpt from one student's response:

TWO DREAMS
Alycia

> When the founders of this country came to the new world, they were looking for a fresh start. They were looking for the fulfillment of a dream; searching for a place where they could start a new life and shape a better future. Their ideals were high, and they were spiritually enriched by the promise that this new land, America, seemed to hold for them. Gatsby, too, is like these early explorers. Just as the "green beast of the new world" promised new hope for the explorers, so does the "single green light, minute and far away" promise to Gatsby that he may obtain his dream.

So Gatsby's dream to win the love of his fantasy girl, starts out fresh and pure like the dream of the new explorers. However, Gatsby becomes enamored with the idea that the money will win her love, and from this point on, his dreams will begin to decay and eventually crumble. . . .

In these views, Gatsby is demonstrating the characteristics of the American dream. Obsessed with materialism, Americans now believe money can buy love, happiness, and can forever capture youth and beauty. . . .

Ironically, Gatsby's obsession with materialism eventually destroys him. His car, "a rich cream color, bright with nickel, and swollen here and there in its monstrous length with hat-boxes and supper-boxes," is the ultimate American status symbol of money and affluence. It eventually causes his death . . .

This parallels the moral decay and destruction of American society because of the obsession with money. . . .

In writing this novel, F. Scott Fitzgerald chose Gatsby to symbolize the American experience. Gatsby's dream, starting out as a spiritual quest, "the following of a Grail," and its subsequent corruption, is the personification of the course of the American dream. Fitzgerald wishes to show to us the decline of America, from the fresh "green breast of the new world," to, because of gross materialism, nothing more than a "Valley of Ashes."

In this essay Alycia explains, first, the similarity between both dreams. Both begin as a search for a better life--Gatsby will be happier with Daisy; Americans crave comfort and security. "Just as the 'green breast of the new world' promised new hope for the explorers, so does the 'single green light, minute and far away' promise to Gatsby that he may obtain his dream (winning Daisy)." Next, in separate paragraphs she details the course of each dream. Gatsby thinks he needs money to impress Daisy, so he becomes obsessed with getting enough to win her approval. Similarly, Americans think money will buy them the happiness and security they long for.

In an additional set of paragraphs, this student interprets the consequences of each obsession. For Gatsby, money had indirectly caused the death of Myrtle and George Wilson as well as his own, symbolizing the destructive powers of materialism. For Americans, dependence on money for happiness had indirectly allowed "spiritual goals and morals (to) disintegrate in the race to 'keep up with the Joneses'." Finally, Alycia integrates these likenesses, suggesting how a personal vision might be derived from a larger, collective one--that the corruption of one man's dream is the corruption of all.

As each of the examples taken from her class illustrates, Caplan believes that a marriage between writing and reading sets into work a number of powerful forces. As she stated, these activities are conscious attempts to join one process to another--writing assignments to facilitate increased understanding of text, as in a critical essay in response to a controversial article, or presentations of prose models for analysis and imitation, students reading each others' writing, for example, for evaluation and response, and students reading their own writing for self-analysis. The fact that Caplan does not leave this to chance is well documented by these classroom episodes.

In Columbus, Ohio, the middle school and high school teachers have developed a variety of writing-reading activities for use in conjunction with the literature program. Their initial goal was to tie together writing and reading strategies toward enhancing skill development, writing and critical thinking abilities. Their approach involves a cycle of writing and reading activities which tie together the exploration of themes from literature such as "fear" and "courage" with a study of an author's craft (e.g., character development, plot). Writing activities are intended to prompt students to share their own experiences relevant to certain themes and to explore how such themes are crafted by authors. Reading one another's texts together with those written by professional authors enables students to compare experiences and examine the various techniques used to present those experiences. The latter might involve studying the author's use of plot, setting, character development and language.

One set of activities involved Edgar Allen Poe's short story "The Tell-Tale Heart." This story served as the cornerstone for exploring the theme "irritation" and how an author's choice of words could enhance an understanding of a character's actions. First, students discussed various people and circumstances which aroused feelings of irritation. They were then asked to write a description of these irritating circumstances, capturing the flavor of their response. Students next discussed how they might convey to readers the intensity of their reaction. They commented on the need to choose words which would relay the irritation. Then, after writing for five minutes or so, some students shared their developing text, and the class discussed their reactions and the techniques the author used. One student, Jerome, shared his irritation with his brother's early morning regimen. His text was as follows:

> Every morning at 6:30 sharp, he rises. At 6:35 he has a shower, 6:45 he dresses and at 7:00 he eats breakfast. He finishes breakfast at 7:10, brushes his teeth at 7:12, grabs his books and leaves at 7:18.

The class commented that they could appreciate Jerome's irritation and felt his description captured the tedium of the regimen. They all felt that the inclusion of specific times made the point well. Another student, Debbie, described her irritation with a shop clerk. Her text, written as a stream of consciousness, was as follows:

> "I wasn't stealing it." "I was just showing my girlfriend."
>
> "This can't be happening." "I could have guessed it would." "That lady had had it in for me from the moment I entered the store."

Debbie's text grabbed her classmates' attention immediately. They wanted to know more, especially about the lady and what happened. They liked Debbie's choice of topics and especially her statement "had it in for me."

After two more students shared their texts, the teacher directed the class to read and discuss "The Tell-Tale Heart." The student read silently and, once finished, spontaneously shared how much they enjoyed the story and admired Poe's craft. When directed to discuss how Poe gave the reader an appreciation for the irritation being felt, they readily generated examples of descriptive language. However, while they did like Poe's story, some students indicated that they preferred their own. They claimed their own stories were "more realistic." Finally, on returning to work on their own texts, most students revised using more descriptive language to illuminate their own irritations. For example, as background for his description of his

brother's regimen, Jerome added information about how neat and tidy his brother tended to be and about how his brother "fussed at his (Jerome's) easy-going, slothful habits." Debbie gave a detailed description of the "cold eyes of the lady who scrutinized her every step."

The Columbus teachers have commented that the writing and reading together create a cycle. The writing sparks the students' desire to read and the reading empowers the students' writing. Furthermore, the teachers suggested that even students who were normally reluctant became interested in what they were asked to write and read. The students seemed more committed to sustain their engagement with what they were doing. In addition, their engagement involved reflection, self-assessment and interaction among self, the text they had read, and the one they were writing as well. When asked how writing influenced reading and reading influenced writing, one of the Columbus students stated:

> I think that writing a rough draft helped me to have a better understanding of the story. As soon as I started reading the story I could see how it related to the topic I was writing about. I had a better understanding of the story because I was familiar with the theme of the story before I started reading it. Also, I feel that I was more interested in the story because I could relate to the characters better.
>
> Reading the short story helped me get some ideas on how to improve my rough draft. Writing my first rough draft was kind of difficult because I didn't have any of my ideas organized. After I finished reading the short story I felt more confident with my writing. My second draft was much easier to write because reading the other story helped me to better understand my topic.

In Rebekah Caplan's literature class, similar outcomes were apparent. Writing and reading motivated discussions among students about their work. Comparisons of their own work with the work of authors such as Fitzgerald prompted energetic discussions. As one student commented:

> I don't see reading and writing as work but as fun. It's a way of growing, expanding oneself through voicing one's thoughts (writing) and listening to other's thoughts (reading).

The experiences of Caplan and of the teachers in Columbus should not be viewed as extraordinary. There are numerous testimonials regarding the power of writing to ignite students' engagement with and reflection about literature. In addition, when the effects of writing and reading have been examined in research settings, similar outcomes have emerged; understandings are enhanced; meaning-making skills and an appreciation of author's craft are heightened; and attitudes and approaches to learning are improved.

Consider the following studies. Salvatori (1985) used a thoughtfully developed sequence of reading, writing and discussion activities to demonstrate the students' approach for exploring personal experiences and to reading assignments changed from one which was passive to one which was actively questioning and evaluative. Colvin-Murphy (1986) compared the effects on reading comprehension of using extended writing activities with using worksheet activities and with reading alone. She found

that students who wrote remembered more, were more engaged in thinking about what they were reading and were more sensitive to the author's craft. McGinley (1987), and Denner and McGinley (1986) explored the use of writing as a prereading activity. Compared with students not engaged in prereading activity or engaged in prereading activity involving no writing, the students in the writing group recalled more and their engagement in the story itself seemed enhanced.

Marshall (1987) examined the effects of using different types of writing experiences in conjunction with doing a unit on J. D. Salinger. During the unit, students read Salinger short stories with no teacher sponsored discussion and wrote in each of three modes: (a) restricted writing, in which the students were to state but not elaborate upon their descriptions, interpretations, and generalizations about a story; (b) personal writing, in which students were to explain and elaborate upon their individual responses to the story, drawing on their own values and previous experience; and (c) formal writing, in which students were to interpret the story in extended fashion, drawing inferences mainly from the text alone. Marshall's results showed that students involved in formal and personal writing had a substantial advantage over students engaged in restricted writing in their understanding of Salinger's stories and his craft and in how they approached the text.

Some researchers have examined writing and reading as a way of enhancing students' understanding of certain features of literature. For example, in a series of experiments, Bereiter and Scardamalia (1984) investigated the knowledge gained by students from exposure to single examples of literary types (suspense, fiction, restaurant review, and an invented fictional genre defined as "concrete fiction"). In one experiment, some students were explicitly taught features of the genre while others simple read and wrote in those genres. In another experiment, students read an example of a genre type (concrete fiction), wrote their own rendition, and then indicated what they deemed to be the features of that literary type. Across all experiments, writing in conjunction with reading a single text proved to be a powerful vehicle for learning, even more powerful than direct instruction. Students demonstrated that they not only acquired a sense of the genre features, but they had also developed a sense of possible variations of the genres.

In summary then, our classroom episodes suggest and research supports that when writing and reading are used to explore topics in literature, a number of benefits accrue: understandings are enhanced; meaning-making skills and appreciation of author's craft are heightened; and attitudes and approaches to learning are improved. The question which we next address is: How generalizable are these findings to other fields of study?

## WHAT IF READING AND WRITING ARE WORKING TOGETHER IN CONTENT AREA CLASSROOMS?

In the 1970s many of us were excited by the publication of a set of books entitled *The Foxfire Books* which represented the research of high school students from Appalachia (Wittington, 1975). The books were filled with a rich assortment of folklore, historical facts, and advice. The content was interesting, but what was most impressive was that the books had been developed by high school students who were considered reluctant readers and writers. *The Foxfire Books* represented students writing and reading "real" texts about "real-world" experiences. At the same time,

the books served as a stimulus for learning. As students explored their research questions, they fine-tuned their problem-solving skills and became immersed in local history and crafts.

Two essential purposes drove the development of *The Foxfire Books:* a) learning in the content areas and, b) developing communication tools. By learning in the content areas, we mean exploring various issues and topics in different fields of study, as well as acquiring the necessary problem-solving skills for continuing to do so on one's own initiative. For example, in history, we want students to explore various historical concerns at the same time that they develop research skills. In science, we want them to understand key concepts and the procedures of scientific inquiry. By communication tools, we mean the ability to enlist reading, writing, speaking and listening skills as tools for learning. For example, scientists, as they pursue answers to questions, interact with others by written communication or by face-to-face or telephone conversations. Business persons, as they pursue investment opportunities, sales and other matters, are involved in an assortment of interactions with others through memos, face-to-face communication and so on. With learning and communication as goals, then, writing and reading in the content areas emerge as more than tools to evaluate and maintain records; instead, they become vehicles to explore issues, solve problems, interact with others and discover new questions. The flavor of this sentiment is captured by the following comment, offered by a recent panel of United States educators, about a biologist's use of writing and reading:

> A learner is only a partial biologist, for instance, if he cannot read or write to discover information and meaning in biology. When a student takes the results of his or her observations about lobsters, reads, writes a draft, talks, reads, then writes again, he or she learns what it is to think critically. (Guthrie, 1986, p. 15)

Unfortunately, observations of content area teaching suggest that the use of writing and reading for these purposes is more the exception than the rule. Most teachers require students to complete content area textbook reading assignments and respond with a word or two to predetermined questions, but not much more. In the following section, we would like to examine some exceptions.

In Caplan's high school class students often used explorations of literature as a basis for writing and reading on topics in the sciences. For example, some of her students were being introduced to investigative reporting. Students chose various topics to research using field notes, interviews and other research techniques. En route to students doing their own final reports, the students were asked to examine selected books for reporting style. For example, students were invited to examine paragraphs in Tom Wolfe's The Right Stuff--to watch how he artfully weaves together interviews, on-sight investigations and outside research. Here is one student's, Wendy's, analysis of some passage she selected from the book:

> One passage I found memorable was near the end, when Yeager is flying the NF-104 and he goes up to tip downwards because of aerodynamic pressure. He, Tom Wolfe, writes the passage in sentences linked together with three dots, "He's weightless, coming over the top of the arc . . . 104,000 feet . . . It's absolutely silent . . . Twenty miles up . . ." He does this to show how Chuck Yeager is thinking. He's in space and millions of things are going through his mind and Tom Wolfe lets one get the feel of it by having these

bits and pieces of thought flying around between three dots, like Chuck in space. Chuck is probably hyped up now and his adrenaline is pumping and he's thinking in fragments, Tom Wolfe shows this. My report is taking the driving test, and this strategy may be useful to me. I'll be driving for another stranger who will be grading me and I'll probably be mega-nervous and things will probably run through my head like Chuck Yeager's. My adrenaline will be pumping a mile a minute and I'll think in fragments and use Tom Wolfe's technique. For example, "the blinker's off . . . the light is green . . . the car ahead of me is moving . . . press the gas pedal . . . not too fast . . . not too slow . . ." I think that it will show how I'm thinking at that moment, in bits and fragments. It will show what happens in my driving test without repetitiously using "I", eg., "I saw the green light. I saw the car ahead of me move. I pressed the gas pedal. I made sure I didn't speed, or go too slow." It breaks the monotony of starting all the sentences with "I."

The other passage I found memorable is when Pete Conrad is having his barium examination by the radiologist and after he's done he has to walk to a john two floors below the one he is presently on and he had to hold the balloon, which keeps the barium in place, and he has to hunch over and walk "with his tail in the breeze" (p. 76) in a public corridor. Tom Wolfe has interviewed Pete Conrad but he doesn't describe it like an interview, he writes it out as if he could see Pete Conrad then. He doesn't write "and Pete Conrad said, "My tail was in the breeze." as he walked down the corridor. He incorporates it into the third person form and shows what Pete Conrad has told him, without using direct quotes, and quotation marks. I think this will come in handy for me when I interview people and they tell me how their driving tests went. For example, if a person told me he forgot to stop at a stop sign, instead of writing "And Jim said, 'and I realized I had passed it just as I passed it. That's what made me flunk.'" I could write instead, 'After realizing he had just passed a stop sign, Jim continued on, knowing he had flunked the test." This will become useful so I don't have to keep on writing, "he said" or "And she said." It also lends a certain continuity to the paper without the constant breaking in of quotes and quotation marks which tend to alienate the reader from the writer's work and who said what.

As Wendy's comments suggest, in the context of developing her own report--involving a variety of other writing and reading activities--writing and reading serve as tools for learning and communication not only with others but also with herself. More specifically, writing and reading served as vehicles for Wendy to reflect upon what she found memorable ("Yeager flying NF-104" and "Conrad having his barium examination"), issues related to style ("He incorporated it into the third person--without using direct quotes"), and possible options for her own reports ("This will become useful so I don't have to keep writing 'he said' or 'and she said.' It also lends a certain continuity to the paper").

Another example of writing and reading being used effectively to fuel learning comes from a biology classroom (Healy, 1984). Students in a middle school biology class were asked to write self-reports in conjunction with reading their textbooks. Specifically, they were asked to read selected pages and then write down what they had learned and reactions to that learning. The teacher explained her rationale thus:

They're not going to learn something until it really becomes part of them and they can use it. I think the idea of the responses is making a bit of knowledge a part of themselves so they can use it. The responses seem to me a much better way of getting them to think about what they've read and make it a part of their own body of knowledge than anything else I've used. I do want them to be able to put it (the reading) in their own words and fit together the ideas from the reading. I feel that's part of the mastery of the material, but I love it more if they would also comment on it. Because I think that's taking it one step more. You sort of can fit it all together but then if you can take it out of the page and the context of the class and comment on it from your own experience, then that's sort of one more step of learning.

The following are reading responses by two of this teacher's seventh grade biology students on a three-page textbook reading on diffusion and osmosis:

When I read these pages I gained an understanding for the following ideas: Diffusion: when any substance from its starting point spread out evenly to cover the whole space it is given. Osmosis: When water diffuses through a membrane. The section with the lesser amount of water will be filled by the other section which has a higher concentration. The substance will diffuse through a membrane making both sections equal. Turgor: Is the stiffness of a cell due to osmotic pressure (turgor) will rise. Plasmolysis: Is when water diffuses out of the cell causing it to be limp.
This reading was too short! I enjoyed it thoroughly.

--an eleven year old girl

In reading this section I thought of the lab that I did on Diffusion. I knew something about diffusion, but I didn't know *it*. I thought of who neat it was that these molecules seem to have a *brain*. It's like they *knew* and have always known what to do. How to diffuse.

--an eleven year old boy

In this part I read about the different parts of the circulatory system. The vains and arteries serve as sort of subway tunnels used to transport blood to the different parts of the body. The valves in the vains and/or heart, are very important in terms of which way the blood is to flow. I learned about the difference in vains and arteries which I thought was pretty neat.

--an eleven year old boy

Despite the variations in response, the writing together with the reading served similar purposes. In particular, these responses enabled the students to identify what they saw as key issues or main ideas and to share their reactions with their teacher. From the teacher's perspective, the responses also served some diagnostic functions. The teacher could tell what students were keying upon and to what extent they were integrating what they knew with what they read. In the first response, the student is making notes for herself on the subject matter of the reading; her personal response is rather limited. The second reading response is the opposite--all personal connection and little commentary on the information in the chapter. The third student's response represents more of a balance between the information in the chapter and his personal response.

In this same biology class, the teacher asked the students to write a story or a narrative as a means of coming to an understanding of selected textbook material. Blythe, age 11, wrote the following on the circulation of red and white blood cells:

> I am Ruthie, one of the billion red blood cells in Ruthie's body. As I go on my journey through the circulatory system, I will explain it Right now I'm entering the right ornament at the normal pace without any oxygen on my back besides the hemoglobin. Now I'm going through the left ventricle and I wait there while it pumps me up into the pulmonary artery. As the crowds start to go every other one, each to each lung, I find I will go into the right lung. As I go through, I suddenly turn and lots of little chemicals called carbon dioxide go through your esophagus. When that's over, I go back to the left ventricle which pumps it up to the aorta. This time I'm going to head in line and after that start all over.

Blythe's story caused a great deal of reaction. Her classmates immediately began to question her on the accuracy of the account:

> Student 1: [to Blythe] The only thing is yours . . . Is that the right way? I thought it goes . . . I thought it had to go . . . OK, it went into the left atrium . . . OK, then it went into the left, well, I mean the right, it went into the right ventricle . . . ?
>
> Student 2: Yeah, I was looking at the sheet-thing too . . .

Other students took out their single-sheet descriptions of the circulatory system. As they continued talking, their voices became indistinguishable from each other as they reflected upon Blythe's description.

> Well, I started out . . .
> You go there . . .
> I started in the pulmonary vein.
> OK, anyway, you start in the right atrium: the right ventricle?
> No, the pulmonary vein and then . . .
> OK, the pulmonary vein . . .
> You can start right there, too . . . You pass through there . . .
> Down through the atrium . . . then up there and then . . .
> It's . . . *this* atrium and go down and you're supposed to in through there and then you come up and you go into . . .
> The lungs . . .
> Right atrium . . . and the right ventricle . . .
> Uh huh . . .
> Are we supposed to use . . .
> The esophagus . . . and then you came back to the pulmonary vein and then to the left ornament . . .
> Atrium . . .
> Atrium . . . and to the left ventricle and then to the . . .
> Aorta . . .

During this rapid-fire exchange, the students concentrated with unbroken intensity on the material they had learned about the circulatory system. Moving from the text book to the single sheet diagram, they reviewed the material, corrected each other's

narratives. When the comments about her paper began to subside Blythe brought the group back to their focus on her paper:

Blythe: I don't understand what you want me to do? (to everyone in the group)

Ellen: Look in the book. See? (pointing to a section of the textbook) Look . . . Look, all you do is look under "red blood cells" and then there's all of this (turning pages in the book)

Blythe: I think I'm going to write mine more like a story and add stuff like you did in the beginning (to Ellen) I've got to explain all the things that he does. But I did explain . . . I thought . . .

Thus, writing and reading by a single student spurred further writing and reading together with a discussion which resulted in the students reviewing their understanding of what they knew about the circulatory system. From their initial focus on their own written narratives, they became absorbed in one another's ideas, made specific reference to diagrams, notes, and the textbook in their search for the correct route of the red blood cell: and used most of their small group time to clarify for themselves and each other their understanding of the process of blood circulation.

Our next example comes from an American history class where the topic was civil rights. To initiate their exploration of the topic, students were presented a hypothetical situation: a decision to prohibit students from congregating in school halls and the school playground. To respond to the situation, students were asked to adopt different perspectives (teacher, school administrator, parent) and stances (pro, con, mixed) in conjunction with developing position statements. Some students adopted the perspective of a teacher in support of the students right to congregate, other students adopted a parent's perspective and so on. As they developed their arguments students were exposed to writings and films on civil rights including textbook accounts of the civil rights movement, newspaper articles on this topic, as well as famous speeches. After the students wrote their position statements, the students held a panel discussion, with audience participation, to represent the various opinions. The students were then invited to redevelop their position statements.

Some of the students commented on their exploration of the topic. Two offered the following remarks:

I now have a clearer view of how I think and a better sense of others. I did not appreciate what the arguments were until I began writing my opinion and reading the textbook and some of the other material.

I changed my opinion. Yes I changed my ideas several times. Writing and reading gave me a sense of what I really wanted to say and how.

The results forthcoming from these classrooms parallel the findings from research on the effects of writing and reading in the physical and social sciences. Writing and reading experiences described in the classrooms not only appeared to prompt what students learned; they also had an impact on how they learned. Students gleaned ideas, discovered ways to formulate them, and were actively involved in questioning and thinking evaluatively about the topic.

Research suggests that outcomes such as these do not emerge by chance, but are reasonably predictable given the type of writing and reading activities in which the students were engaged. For example, Tierney (1981) demonstrated that the amount his biology students learned was influenced by a combination of various writing activities with reading (logs, notes, essays, summaries, group writing). Gould, Haas and Marino (1982) examined the effects of writing assignments related to reading about historical settings and demonstrated that students who wrote recalled more information.

In addition, studies have shown that students who engage in particular kinds of reading and writing activities not only learn more, they also think more critically about what they are studying. Newell (1984), demonstrated that students involved in essay writing, especially those students who had limited knowledge of a topic, gained more in terms of knowledge than equivalent students who either took notes or responded to study guide questions. Further, an analysis of think-aloud protocols collected when students were involved in essay writing showed students engaged in more planning, self-questioning and reviewing. Tierney, Soter, O'Flahavan & McGinley (in press) examined the effects of traversing different social studies topics with specific kinds of reading, writing, questioning and combinations of these activities (e.g., reading plus writing, reading alone, writing alone). They found that students who engaged in the writing activities before reading approached their exploration of the topic evaluatively (pursuing ideas, answers to questions, judging their own ideas and the author's, reworking these ideas and sometimes shifting perspectives); students who did not did not engage in the writing activities prior to reading appeared to read for purposes of remembering ideas. Further, they were more concerned with editing their own written presentation of those ideas than reworking or rethinking them.

We return here to our question: What if writing and reading are working together in content areas? Although the research which we have cited, together with our classroom examples, represent a small sample of what can happen when writing and reading work together, a consistent pattern of outcomes is apparent. Writing and reading activities structured to engage students creatively and critically with varied topics enhance knowledge acquisition, strategy usage, and critical thinking.

## DISCUSSION

So then, what if writing and reading are working together in ways that we have illustrated? Let us re-examine the learning outcomes which are served when writing and reading work together. Our review of research and extrapolations from classrooms suggest that benefits are likely to be accrued in four areas:

1. Acquisition of certain skills, including letter-sound correspondence, knowledge of genre and stylistic features as well as other literacy skills.

2. Motivation to engage in learning activities.

3. Acquisition, clarification, elaboration and discovery of ideas.

4. The development of a sense of authorship, readership, and critical thinking abilities.

What is important to note is that writing and reading offer more together than apart. As Tierney and McGinley (1987) recently suggested:

> Reading and writing are sufficiently overlapping activities that they support a symbiosis in which the impact of the two together becomes greater than the sum of their separate impacts. As they traverse back and forth across the landscape of various domains, writing and reading prompt shifts in perspective which support not just the emergence of new understandings and perspectives, but also the emergence of a new dialectic. And, it is this dialectic which can prompt critical thought--an understanding of understandings or the accruing of a perspective(s) on one's perspectives. It is as if reading and writing foster an attitude of exploring the topic akin to that of being both a "producer" and a "consumer" of texts. As productive consumers, we become involved in a dialogue with authors as well as with what Murray (1982) terms our "otherselves."

In closing, then, we would hypothesize that when students criss-cross their explorations of topics with writing and reading, they will often be motivated to learn, be mobilized to access their own thoughts and be in a position to discover and evaluate what they themselves understand.

We offer this conclusion notwithstanding the fact that we recognize the following:

1. Writing and reading are not the only modes/vehicles by which the aforementioned learning goals are achieved.

2. Individual differences exist in students' ability to coordinate the use of writing and reading.

3. Various facets of classroom life support the outcomes we have described. Indeed, most of the examples included in the present paper involve writing and reading supported by a rich classroom environment.

4. Research on writing and reading working together is in its infancy. Further research is needed to explicate the constellations of functions, reasoning operations, learning outcomes and perspectives which writing and reading working together support. At the same time, research is needed which clarifies the saliency of the various dimensions of classroom life and other factors which surround writing and reading experiences.

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## Appendix

### Learning to Spell/Learning the Written Language System

In writing words, spellers are thought to utilize two knowledge sources: information about specific words stored in memory, and knowledge about how the general spelling system works. Spellers acquire information about specific words from their reading as well as their spelling experiences. They remember letters as symbols for sounds in the word and also visual properties of the word. Spellers learn how spellings in general are structured from the instruction they receive and also from their experiences reading and spelling specific words. They learn which letters typically symbolize which sounds, how to divide pronunciations into sound units, typical positions of letters in words, how long words tend to be, and so forth. When they spell a word, spellers first look in memory for specific information about the word. If it is not there or only partially there, then they use their general knowledge to invent a spelling or to supplement the recalled spelling.

Researchers have examined the kinds of spellings that young children invent and have proposed several stages to describe the development of their general spelling knowledge (Beers & Henderson, 1977; Ehri, 1986, in press; Gentry, 1982; Henderson, 1981, 1986; Morris & Perney, 1984). Each stage denotes a period of development. However, its boundaries can be seen to overlap with the next stage. Some of these stages are nicely illustrated in Mrs. Hurdlow's data in Figure 4. The earliest precommunicative stage involves the production of scribbles, or strings of randomly selected letters, or numbers to represent words and sentences. At this stage only a few letters may be known, and they may not be differentiated from numbers. When spellers select letters for words, it is not because they correspond to sounds. For example, some of the spellings in Test 1 *[P (tack), KO (muffin)]* bear no relationship to sounds in pronunciations of words. This stage may begin very early, when preschoolers begin noticing what written language looks like and where to find it (Goodman & Altwerger, 1981; Harste, Burke, & Woodward, 1982).

The next stage occurs when children learn the names or sounds of letters and use this knowledge to select letters for their spellings. At the onset of this semi-phonetic stage, only one or two of the letters may correspond to sounds in the word. This stage is illustrated by *C (kiss), BP (buzz)* and *PO (pickle)* from Test 1 in Figure 4. As children gain more experience with print, they become able to detect more sounds and to represent them with letters, for example, *BZ (buzz), PL (pickle), KWK (quick)* from Test 2 in Figure 4. Letter names may be the basis for selecting letters. For example, *Y* was used to spell "wife" as *YUF*, *H*, whose name includes the sound /ch/, might be used to spell "chicken" as *HKN* (Read, 1971). Although children's choices may violate spelling conventions, they are nevertheless logical and indicate that learners are attempting to use what they know about letters to figure out how the spelling system works. Adopting this goal is considered to be an extremely important step in learning to spell as well as learning to read.

At this stage, children symbolize only some of the sounds with letters, those that are salient and those that they can find in letter names: consonants more often than vowels, long rather than short vowels, single consonants rather than consonant blends, first and final more often than medial sounds. Sometimes extra nonphonetic letters are

added at the end because a word does not look long enough. Sometime boundaries between words are omitted because children lack awareness that the words are separate units; they detect no breaks in their speech, for example, "Gimmeapiceacandy." (Ehri, 1979; Francis, 1973; Holden & MacGinitie, 1972) Sometimes children analyze speech differently from adults. They may hear the sound /ch/ at the beginning of "truck" and spell it with *H*, or /j/ at the beginning of "dress" and spell it with a *J*, or /sg/ at the beginning of "skate" and spell it with SG (Read, 1971; Treiman, 1985a, 1985b). These choices are all sensible linguistically. (Say the words and see if you can detect these sounds.) These are characteristics that typically appear in spelling inventions along the course of development but subsequently disappear as learners discover that the conventional spelling system works another way.

The next stage occurs when children become able to produce more complete phonetic spellings that contain letters for most of the sounds in words. Vowels as well as consonants and consonant blends are represented, for example, *SIKS (six), KWIC (quick), WIF (wife),* from Test 3 in Figure 4. Some kinds of sounds may be delayed in their appearance in spellings during this stage. Nasal-consonant blends such as the *M* in "camp" and the *N* in "bend" are typically omitted because the nasal is actually part of the vowel sound and not separately articulated. Note in Figure 4 that "camp" was spelled *CAP* or *KAP* before the *M* was finally included in Test 5. Vowels in unstressed syllables are also overlooked; for example, "pickle" was spelled *PKL* in Test 4 but *PIKEL* in Test 5, while "muffin" was *MUFN* in Test 3 but *MUFIN* in Test 4.

During this stage children become wedded to the belief that every sound they detect in a pronunciation requires a letter or digraph in the spelling. In stretching out pronunciations to spell words, children may even find extra sounds not symbolized in conventional spellings: *DOKTDR (doctor)* in Figure 4, for example, or *BALAOSIS (blouses)* (Ehri, 1986). Acquiring the idea that the words consist of a sequence of sound segments or phonemes is considered to be very important insight for the development of reading as well as spelling skill (Bradley & Bryant, 1983; Bryant & Bradley, 1985; Calfee, Lindamood, & Lindamood, 1973; Lewkowicz, 1980; Liberman & Shankwieler, 1979; Lundberg, Olofsson, & Wall, 1980; Torneus, 1984; Williams, 1984). In fact, phonemic awareness is one of the best predictors of how well children learn to read (Juel, Griffith, & Gough, 1986; Share, Jorm, MacLean, & Matthews, 1984). If they have this idea, then reader/spellers are in a good position to make sense of conventional spellings of words, many of which are not completely phonetic. They can recognize which letters correspond to sounds and which do not. This knowledge is thought to be necessary for storing the spellings of specific words in memory so that the words can be spelled and also read accurately (Ehri, 1984).

The final stage might be termed a *morphemic* stage because spellers begin recognizing and using word-based spelling patterns (Becker, Dixon, & Anderson-Inman, 1980) when these are seen as more appropriate than phonetic spellings, for example, spelling past tense verbs consistently with *-ED* rather than according to their sounds, as in *WOCHED* rather than *WOCHT (watched),* spelling long vowels with two vowel letters or a final *-E* rather than with one vowel, as in *RISE* rather than *RIS (rice), SEAD* rather than *CED (seed)* (Morris & Perney, 1984). This stage is thought to emerge once children have learned the conventional spellings of several specific words and begin recognizing spelling patterns that recur across words.

The child whose spellings are reported in Figure 4 wrote several words correctly with final *-E* in Test 5, indicating that he may have been on the verge of the morphemic stage. However, because the spellings are correct, it is unclear whether they were invented or recalled from memory. The child added final *-E* incorrectly to a short-vowel word in Test 5, "quick" spelled *QUICE*. This may be a case of over-generalizing a pattern that is newly learned before its correct application is fully understood (Mason, 1980). Overgeneralization errors are commonplace during the course of written language development as well as oral language development (Berko, 1958). Such errors are actually to be welcomed as a sign that students are making progress in learning the system.

From this description of the stages of spelling development, it is apparent that children may need to learn how the spelling system works phonetically before they become very skilled at remembering the complete spellings of specific words. This may take some time and practice to accomplish. Also it is apparent that the errors children make in their spellings are often a reflection of the state of their developing knowledge of the system and that various types of errors will inevitably appear and disappear as their knowledge grows and approximates the conventional system. This suggests the importance of teachers' tolerating spelling errors during the time that students are developing competence with the system.

The development of reading skill is related to the development of spelling skill. Several studies have found high positive correlations between reading and spelling, among first graders, $r = .86$ (Morris & Perney, 1984), among second graders, $r = .66$, and among fifth graders, $r = .60$ (Shanahan, 1984). This indicates that better readers tend to be better spellers. Also, training studies have shown that teaching beginners to decode print improves their spelling ability, and teaching beginners to spell improves their reading skill (Bradley & Bryant, 1983). If one examines the course of development in reading, one can see how spelling and reading contribute to each other's development. There are several processes that can be used to read words. If the words are read in context, contextual cues lead readers to expect certain words or word classes. If readers know how the spelling system works, they can decode words by translating letters into sounds to form recognizable spoken words. If readers have read those specific words before and remember them, then they can find the words in memory to read them. Spelling, then, contributes to readers' knowledge of--and thus their ability to take advantage of--the spelling system to decode words.

## Appendix Notes


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