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ABSTRACT

An overview is provided of the limited body of research on the transfer of learning between reading and writing in mature adults. First, the paper traces the development of models portraying generalization between reading and writing, beginning with a discussion of audio-lingual theory, which hypothesizes that language is learned through a receptive mode (listening) then transferred to an expressive mode (speaking). Subsequent studies speculating that this model would extend to the transfer of learning between reading and writing are also described. After reviewing a number of atheoretical studies that tested transfer from writing to reading, the paper considers research that elucidated reading as a generative, active process and the subsequent development of interactive models that portrayed reading and writing as similar activities with learning transferring freely between the two processes. The Thoughtful Reader Model, which portrays reading and writing processes in terms of the work of a monitor, planner, composer, and editor, is explained. Next, studies focusing on the value of planning, composing, and editing activities are reviewed. Finally, the curricular implications of interactive models are discussed. A 30-item bibliography is included. (MAB)

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Conventional wisdom has long held that reading and writing share a symbiotic relationship: Knowledge and skills learned in one mode can be used in the other. And yet, much of the testing of this assumption in professional literature is flawed. Some of the studies are correlational and therefore provide no evidence of transfer (Evans, 1977; Evanechko, Ollila, & Armstrong, 1974; Zeman, 1969). Others that did establish transfer of learning were intended to test praxis rather than the theoretical issue of transfer (Hall, 1990; Marino, Gould, & Haas, 1985; Kulhavy, Dyer, & Silver, 1975), or introduced more than one independent variable (Kulhavy, Dyer, & Silver, 1975; Miller & Ney, 1968; Raub, 1966; Ney, 1966).

Another problem for college and adult educators is that the bulk of research in this field has been conducted on child and adolescent populations. However, viable studies verify results determined from flawed research. In addition, the studies conducted on children and adolescents and the studies conducted on college students verify very similar hypotheses, this condition suggesting that findings on younger pupils are generalizable to older learners. In short, despite a limited body of research on the transfer of learning between reading and writing in mature learners, trends in this area may be discerned.

This paper first will trace the development of models portraying generalization between these modes. These models began as an offshoot of the audio-lingual theory, which hypothesized that learning transfers from reading to writing. Later, atheoretical studies that tested transfer from writing to reading emerged. Finally, after research elucidated reading as a generative, active process, interactive models emerged, portraying reading and writing as similar activities that share knowledge both ways. Second, this paper will discuss curricular implications of interactive models, including stressing writing across the curriculum with a primary purpose of aiding recall and comprehension of content-area texts and coupling reading and writing courses to exploit complementary lessons.

The Audio-Lingual Model

Behavioral psychology provided the basis for the audio-lingual model. It was theorized that language was learned through a receptive mode (listening) then transferred to an expressive mode and used (speaking). Skinner's construct of language acquisition includes the echoic behavior model in which infants learn language by following adults' commands and receiving reinforcement. To illustrate, an adult might direct, "Say grandma," and the infant is reinforced after responding in kind (1957). Similarly, Bijou and Baer (1965) posited that children learn verbal behavior by hearing their mothers, and after an unspecified "internal mediation process," speak in emulation of their mothers, who reinforce them.

Brooks (1964) and Ausubel (1968) speculated confidently that this model would extend to the transfer of learning between reading and writing. They posited that language skills learned through reading, which they considered a receptive process parallel to listening, generalize to writing, which they considered an expressive process parallel to speaking. In similar studies, Ney (1966), Raub (1966), and Miller and Ney (1968) used the entire audio-lingual hierarchy to teach syntactical patterns. In each lesson, a new syntactical pattern was presented. First, students listened to the instructor combine short sentences into longer ones with the selected syntactical pattern, then orally combined short sentences into novel long sentences using the same pattern. Next, the classes engaged in choral reading of text containing the newly learned syntactical patterns, and finally, the students were directed to write sentences in the new syntax.

Ney (1966) used this procedure with seventh graders, and counted 57 of the featured syntax patterns on an essay pretest and 79 on an essay posttest. Raub (1966) and Miller and Ney (1968) experimented with fourth graders, and the experimental group wrote significantly more multiclause T-units than the control group on a six-month delayed essay posttest.

These studies support a hypothesis that skills transfer to writing, but from which mode remains unclear. The order of modalities in these studies gives rise to the assumption that skills are learned through listening, then transferred to speaking, next to reading, and finally to writing.

Atheoretical Studies

As the influence of behaviorism waned, experimenters began to explore the transfer of learning in the other direction. Without citing a model or theory, Combs (1975) hypothesized that skills transfer from writing to reading. Over 10 weeks, he administered written sentence-combining exercises to seventh graders. On the posttest, the experimental group recalled significantly more information from a passage written at the 13th-grade level. There were no differences between the groups on a general test of reading ability, however. The passage was selected so that long sentences, not advanced vocabulary, created the high readability estimate.

Straw and Schreiner (1982) found similar results after administering a sentence-combining treatment to fourth graders. The experimental group scored significantly higher on a cloze test that contained long sentences, but not on a general test of reading ability.

Towards an Interactive Model

By themselves, the audio-lingual and atheoretical studies do little more than predict the direction of the transfer of skills. The audio-lingual model can be summed up by four boxes labeled, left to right: *listening, speaking, reading,* and *writing.* An arrow between each adjacent box, pointing to the right, indicates the direction of skills transfer. Similarly, the atheoretical studies may be summed up by two boxes labeled *reading* and *writing,* with an arrow pointing from writing to reading. No components exist within these boxes to predict what knowledge generalizes, or how. However, as a group the studies demonstrate that skills transfer both to and from writing, suggesting that the transfer of learning between the modes is interactive.

Meanwhile, evidence mounted that reading is not a passive, receptive activity, as the audio-linguists had assumed, but that it is an active process in which both beginning and mature readers, like writers, create meaning. Beginning readers were found to use semantic and syntactic cues to form hypotheses about upcoming words and phrases in the text (Goodman, 1979); sixth graders generated meanings for unfamiliar words through their familiarlity with context (Wittrock, Marks, & Doctorow, 1979); and fifth graders instantiated general terms (Dreher & Singer, 1981). Similarly, college students were found to instantiate general terms (Anderson, Pitchert, Goetz, Schallert, Stevens, & Trollip, 1979), select and use appropriate schemata to subsume information, fill in missing information, facilitate recall and interpret information (Anderson, Reynolds,Schallert, & Goetz, 1979), and elaborate on information learned in the text (Stein & Bransford, 1979).

The Thoughtful Reader Model

Not long after generalization was established in both directions, and reading was characterized as a generative process, Pearson and Tierney (1984) posited the thoughtful reader model. The model portrays both reading and writing in mature readers, approximately 10th grade and up, as activities in which a monitor coordinates the activities of a planner, composer, and editor that collaborate to produce text. The planner decides alignment on the text, sets goals, and activates prior knowledge. The composer generates text, and the editor demands changes and revisions. A few differences exist: The reader's stimulus is the print on the page, and the final product is a text to be stored in memory, whereas the writer's stimulus is an idea to be written down, and the final product is a written text.

This portrayal of reading and writing as parallel processes indicates that learning transfers freely between them. Thoughtful readers know and draw on the strategies that they employ as writers, such as organizational devices and revision of unclear, incorrect, or biased passages. Similarly, thoughful writers draw on their knowledge as readers of what constitutes friendly, informative, or entertaining text.

Research on transfer of learning between the reading and writing modes in mature readers is limited to only a few studies (Shanahan & Tierney, 1990). However, the few existing studies conducted on mature readers corroborate the transfer of planning, composing, and editing activities as predicted by the thoughtful reader model and are themselves corroborated by studies performed with younger subjects.

Planning Activities

Two planning activities conducted in the writing mode enhanced recall in reading. First, Hall (1990) assigned university students enrolled in remedial reading courses to write one-page essays in rhetorical modes that matched the modes of passages they read later. A control group read the same passages but did not write a preparatory essay. Three assignments were administered, including pro and con, argumentative, and editorial. The experimental group recalled significantly more information from the passages, although it did not show significant improvement in overall comprehension on the Nelson-Denny Reading Test.

Marino, Gould, and Haas (1985) matched topics instead of rhetorical modes in a prereading writing assignment. Fourth graders were assigned to imagine living in a historical setting, then write a letter to their grandparents about it. A control group wrote about a contemporary experience. Immediately afterward, both groups read a passage about Western pioneers, and, the next day, the control group displayed significantly higher recall of the passage.

Composing Activities

Composing activities in the writing mode during reading also enhance recall. High school juniors and seniors were assigned to read an 845-word passage. One-third of the students were directed to write three lines of notes per page; another third was directed to underline three lines per page; and a control group did neither activity. The notetakers recalled significantly more information than either of the other groups (Kulhavy, Dyer, & Silver, 1975). However, a confounding variable exists: Notetaking requires more time than the other

activities, so it remains unclear whether notetaking or increased time on task caused the higher recall.

Similarly, Combs (1975) and Straw and Schreiner (1982) demonstrated the generalization of composing skills with fourth and seventh graders.

Composing and Editing Activities

Composing skills learned in writing were found to be useful as editing skills in reading. Community college remedial English students were taught to write paragraphs using Christensen's levels of generality while a control group wrote journal entries. After six sessions, both groups read a 1,200-word passage containing paragraphs written using levels of generality. Seven of these paragraphs contained one sentence that was misplaced in such a way that it violated the principle of levels of generality, but did not change the meaning of the paragraph. Students who had learned to compose using levels of generality recalled significantly more information from misplaced sentences than did the control group. Afterward, interviews with students indicated that the experimental group edited the misconstructed paragraphs as they read, and this extra activity enhanced recall of the information (Simonsen, 1988).

Conclusion

Support of Interactive Models

An interactive model that portrays mature reading as a generative activity is the latest stage in the evolution of models depicting generalization between reading and writing. The support for interactive models, however, is limited and has shortcomings. First, with one exception (Kulhavy, Dyer, & Silver, 1975), the studies all introduce knowledge in the writing mode and measure transfer to reading. Transfer by mature readers in the other direction is hypothesized, but tested infrequently. Indeed, evidence exists that postsecondary students vary their reading strategies and time on task in accordance with the type of testing they anticipate (McKeachie, Pintrich, Lin, & Smith, 1986; d'Ydewalle, Swerts. & De Corte, 1983). Studies could well explore the effects that anticipated writing tasks (e.g., essay tests, gathering information for a research paper, writing summaries) bear on reading done in preparation. Second, with the same exception (Kulhavy, Dyer, & Silver, 1975), the subjects in studies of mature readers were remedial. Support for a model would be more convincing if more studies were done on developmental learners. Third, the studies all employ recall as the dependent measure. Examination of a process instead of measurement of a product could elucidate what skills or knowledge is transferred. Fourth, although interactive transfer in mature readers is corroborated by studies on younger subjects, the number of studies conducted on college and adult readers is small. In short, support exists for interactive models, but more studies are needed.

Implications for Curriculum

Finally, implications for curriculum may be categorized according to the three types of knowledge that generalize between reading and writing. *Content knowledge* is information the pupil possesses of the subject; *strategic knowledge* is the store of rules, procedures, strategies, and routines to use when reading or writing; and *metacognitive knowledge* is the ability to use content and strategic knowledge in concert to complete tasks (Feeley, Wepner, & Wehrle, 1987; Brown, Campione, & Day, 1980).

One implication of interactive models is that writing directly aids the acquisition of content knowledge through reading. Hall (1990), Marino, Gould, and Haas (1985), and Kulhavy, Dyer, and Silver (1975) increased recall of text by administering writing assignments. In all three studies, the intent was not to improve writing skills; students were not taught *how* to write, but instead were given short instructions (100 words or fewer) on *what* to write. This pattern suggests that writing may be used across the curriculum, not to teach writing skills, but as a tool to increase retention of text and that content area teachers do not need to become writing teachers to use writing as a part of their activities.

Perhaps the most significant curricular implication for developmental instruction stems from the transfer of strategic and metacognitive knowledge. Simonsen (1988) demonstrated that knowledge of paragraph construction generalized to reading, utilizing edited error-embedded paragraphs. This generalization of knowledge suggests that reading and writing courses may be coordinated to exploit transferred skills and to allow one course to provide additional practice of the knowledge gained in the other. This coordination is in contrast to the current practice of offering reading and writing courses as separate entities, at times offered by different departments, and at times without coenrollment required.

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