

“Fourth-grade students showed higher reading comprehension scores after receiving instruction and having access to learning tools based on psychological type principles.”

Using Psychological Type-related Teaching Tools to Improve Reading Comprehension

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ABSTRACT

Many educators endorse the concept of differentiated instruction, tailoring their teaching to reach students presumed to have diverse learning styles. This research tests the effectiveness of psychological type as a framework for effective diversification of structuring content to help teachers be more effective with more students. In a controlled experiment, teachers delivered two separate 2-week reading instruction units to two randomly assigned classes of fourth grade students. For the first 2-week unit, students taught with a type-enriched approach (*type unit first group*) exhibited significantly higher reading comprehension test scores compared to other fourth graders (*standard unit first group*) taught using the school's standard instruction method. When

instructional methods were reversed for the second reading study unit (the standard unit first group of students was taught with the type-enriched curriculum and the type unit first group given the standard instruction), reading scores significantly improved for the type-taught group, while the type unit first group retained their higher scores even with standard instruction.

Note: For the Myers-Briggs Type Indicator® (MBTI®) instrument, the eight preference categories are the following: Extraversion (E) versus Introversion (I), Sensing (S) versus Intuition (N), Thinking (T) versus Feeling (F), Judging (J) versus Perceiving (P).

BACKGROUND

A popular premise in the field of education is that each student learns differently, and a single method of instruction will work effectively for some but not all

students (see for example Coffield, Moseley, Hall, & Ecclestone, 2004). Many educators (e.g., Tomlinson, 1999) view such *differentiated instruction* as a positive instructional approach because it recognizes the need to treat each child as an individual with a unique learning style.

The concept of *learning style* is compelling. It is commonly endorsed in educational textbooks, and students can readily self-identify as having a particular learning style (Pashler, McDaniel, Rohrer, & Bjork, 2008). Pashler et al., however, maintain that clear empirical support for the *meshing hypothesis* is lacking. This hypothesis predicts that different instructional methods will work for different students, with the best results when teaching and learning styles match. However, a meta-analysis of 36 studies, almost all from dissertation research rather than peer-reviewed publications, claimed support for the meshing hypothesis (Dunn, Griggs, Olson, Gorman, & Beasley, 1995), as did a study by Ford and Chen (2001). Braio, Beasley, Dunn, Quinn, & Buchanan (1997) found an improvement in reading performance following the introduction of differentiated teaching techniques, and research has often shown that students identified as having a particular learning style do perform at different levels in different classes (e.g., Drysdale, Ross, & Schultz, 2001). In sum, learning styles and differentiated instruction remain controversial issues.

Even presuming its beneficial effect, the process of implementing differentiated instruction is a huge challenge. Crafting multiple lesson plans demands time, effort, and resources. More fundamentally, the multitude of available learning style measures and conceptual frameworks (Coffield et al., 2004) complicates the choice of choosing a means of identifying different learning preferences. Early approaches focused on the identification of gifted learners (e.g., Ward, 1961), and the practice of grouping students into learning tracks on the basis of ability is still common (e.g., Swiatek, 2001). Other approaches are based on multiple intelligences (e.g., Carbo, 1995; Gardner, 1983), use of different sensory modalities (e.g., Barsch, 1991; Dunn & Dunn, 1998), and several other schemes (see Guild & Garger, 1998).

Psychological Type and Education. Efficient implementation of differentiated instruction should begin, therefore, with an effort to establish, through research, appropriate differentiation criteria to use with students. One promising avenue is offered by

psychological type assessment, based on the original framework proposed by Carl Jung (1923/1971) and further developed by Isabel Myers (e.g., 1962). Psychological type theory is not only directly relevant to the learning process, but, with its emphasis on positive psychological differences (see *Gifts Differing*, Myers & Myers, 1980), also offers a system for classifying different kinds of learners without stigmatizing some styles as less effective. A final positive is that research on type and education, though not without its limitations, has been ongoing for many years (for reviews and examples, see DiTiberio, 1996, 1998; Kise, 2007; Lawrence, 1984; Myers et al., 1998).

Psychological type is perhaps best known through use of the Myers-Briggs Type Indicator® assessment (Myers, McCaulley, Quenk, & Hammer, 1998), an instrument designed to assess the four key personality dimensions articulated by Myers. Because the MBTI® instrument is designed for a minimum age 14 reading level, its primary use has been with adults. Type in younger people (ages 7–18) can be assessed using the Murphy-Meisgeier Type Indicator for Children® (MMTIC®) instrument. Scores on both instruments typically provide satisfactory evidence for reliability and validity (Murphy & Meisgeier, 2008; Myers et al., 1998). Research (Gilbert, 1998; Lang, 1999; McPeck & Breiner, 2010) has also shown that scales on the two instruments correlate well in children whose ages (and reading levels) are appropriate for either instrument.

Much of the focus of type theory is concerned with individual differences in preferred modes of perceiving and evaluating information, two essential steps in the learning process. Type theory identifies two modes of both perceiving (*Sensing* or *Intuition*, abbreviated S or N) and judging (*Thinking* or *Feeling*, T or F). Four possible perceiving–judging combinations (ST, NT, SF, NF) make up the middle two letters of the four letter type identified by both the MBTI and MMTIC instruments. The Sensing preference pays attention to the here and now (concrete information and details), as opposed to the Intuitive preference for attending to patterns, concepts and abstractions beyond the immediate facts. The Thinking preference is most comfortable with an analytical approach and the use of logic in evaluating information; the Feeling preference gives more weight to personal relationships and values when making decisions.

The first and last letters in the four-letter type code indicate preferences for the remaining two type domains, *Extraversion–Introversion* (E–I) and *Judging–Perceiving*

(J–P). E–I represents the attitude or direction (outward or inward) in which an individual most frequently and comfortably focuses his or her attention. J–P indicates the preferred way an individual orients him/herself to the outer world. A Judging preference is associated with a structured, decisive, organized, and scheduled approach. In contrast, a Perceiving preference is more concerned with gathering information, spontaneity, openness, and flexibility. (Note that a key concept in type theory is that any preference is a primary, but not absolute, way of operating, and that every child or adult is capable of exhibiting both their preferred approaches and their opposites.)

Type theory predicts that children will learn better when the learning environment and curriculum are compatible with their type preferences. Teachers are likely to teach, communicate, and evaluate in ways consistent with their own personal preferences, benefiting students of similar types. Or they may rely upon generally accepted methods of presentation and practice, a common denominator curriculum that works for some but not all. Such an approach may be effective to varying degrees for many or most students; however, there may be some students who fall through the cracks or are challenged by a mismatch of personal learning style to the manner in which lessons are presented. In such situations, students may struggle, need extra help, exhibit poor motivation, grow frustrated, abandon effort, skip school, or exhibit other behavior problems.

A teacher's understanding of learning style differences and knowledge of both his or her type preferences and those of each student can suggest better lesson planning, learning activities, and presentations that will reach and motivate more students. Type-related teaching does not exclude any strategies that a given teacher has found to be effective. Rather, the organizing theory of type provides expansion, enrichment, and refinement of teaching strategies.

Research on Type. Although the results of educational research using psychological type are promising, many of the studies have been correlational in design or limited to describing type preferences of successful teachers (e.g., Mills, 2003; Rushton, Knopp & Smith, 2006) or successful students (e.g., Myers et al., 1998). Two promising studies (Fischetti & Mentore-Lee, 2001; Kise, 2004) showed both attitudinal and academic performance improvements in students following the introduction of type-based curricula. Unfortunately in these studies, participation in the type-based cur-

riculum was decided on a voluntary basis, rather than more rigorous random assignment.

This paper reports research conducted by the senior author, a study designed to provide a more rigorous test of whether reading performance improvements are facilitated by incorporating type-based instructional methods in the classroom. The study measured reading comprehension scores in fourth grade public school students in a small town from a relatively low socioeconomic community in Pennsylvania.

METHOD

Overview. A total of forty students voluntarily (with parental permission) participated in this study, randomly assigned to two different classes taught by different teachers. Two different reading instruction programs of equal length (ten consecutive school days) were delivered to each class. One class was taught using a type curriculum first and the school's standard method second. The order was reversed for the second class.

An hour each morning was dedicated to the reading curriculum. The *standard reading instruction method*, already in place at the school, used the Scott Foresman Reading Series (Afflerbach, 2006) as modified by school faculty teams. This method included activities common to many reading instruction methods—for example, reading aloud (both alone and as a group), classroom discussions, guided practice, worksheets, and teacher modeling.

The *type-based reading instruction method* was designed and facilitated by the senior author. Students were allowed a choice of learning activities from a wide variety of options specifically designed as a set of comprehensive tools and strategies to cover all eight type preferences (that is, each of the two poles for each of the four type domains). All activities were appropriate and objective driven as per the curriculum guidelines. Though students enjoyed choice and independence in their study time, they were offered teacher assistance and intervention when needed. Examples of different type preference oriented learning activity options follow.

Type Related Study Activity Options.

Extraversion. E activities included options for group discussion and teamwork exercises focused on reading, as well as chalk board activities, movement, and group games. An example of the kind of game for Extraverted students was a “wheel of fortune” team activity. This word game required teams to provide answers by consensus, encouraging open communication, teamwork,

and cooperation as each team member took turns suggesting letters to solve the puzzle.

Introversion. Introvert activities included opportunities for non-verbal “quiet time,” independent study, in-depth study, and written (as opposed to verbal) activities such as journaling. A sample of solo activity was a flashcard game involving synonyms, antonyms, prefixes, and suffixes that allowed students to quiz themselves and check their choices against the self-correcting answers on the back side of each card.

Sensing. S-oriented activities included opportunities to make lists or K-W-L charts (what students KNOW, what students WANT to know, and what students have LEARNED), graphic projects such as webbing, use of magnets to match related word pairs at the chalkboard, or use of the multisensory stimulation of brief, animated PowerPoint®-based explanations of language constructs such as synonyms and antonyms. A specific example was the option to take printed step-by-step lesson instructions and display them on a small desk stand, affording a handy, tangible reference for procedural questions.

Intuition. Relevant activities included options to engage in creative and open-ended projects. These included activities like brainstorming, conceptual tasks such as journaling or writing (creative writing activities were particularly targeted for N-types), exploring essay topics or posing questions to be answered, or working with a set of pictures to generate inferences and stories to explain the actions and situations depicted.

Thinking. Thinking preference activities included solution-oriented puzzles such as crosswords (available at three levels of difficulty), in which each puzzle answer appertained to a reading comprehension strategy or concept. Each puzzle listed possible answers (including incorrect ones) at the bottom, allowing students to work through the task in a logical progression until completed.

Feeling. Feeling activities included the choice to engage in learning activities with a friend, with instructions to make corrections gentle and non-threatening (for example, allowing the friend to turn over flash cards to see the answers). Students were also given the option to create “I Am a Learner” journals to record personalized comments from the teacher and to collect personalized photos of students actively engaged with friends.

Judging. J-friendly activities included a methodical learning exercise that involved an organized, progres-

sive elimination of incorrect answers to arrive at a solution. A series of definition problems (at three levels of difficulty) involved choosing the correct comprehension strategy or concept described from possible answers (including two that were incorrect) contained in a word box.

Perceiving. Perceiver-friendly options included the Brain Schema activity designed to be playful, fun, and movement oriented. This option involved a 2-dimensional life-sized model of the head and upper body representing a fourth grader, placed at the front of the room. Students were given the opportunity to leave their desks, choose among magnetized, labeled pictures showing different events representative of their own “schema,” and deposit their choices into the “brain” in a collection envelope attached to the back of the display.

This summary does not include all the available activities. Additional activities are detailed in the senior author’s dissertation (Reeder, 2007).

Data Collection. Both groups completed pre- and post-reading comprehension tests designed for both reading units, resulting in four scores for each student. We also calculated pre-post change scores by subtraction of pre from post scores. Test questions were designed by the faculty team, based on the curriculum guide, in advance of the instructional periods.

The senior author also collected structured qualitative data, based on interviews and surveys of the teachers involved in the study.

RESULTS

Reading Comprehension Scores.

Table 1. Mean Pre and Post-Lesson Scores Collapsed Across Lesson Presentation Order.

	Pretest	Posttest
Post type-based lesson	11.43	14.58*
Post standard lesson	11.53	12.78*

Note: Total $N = 40$. *Means differ significantly from each other ($p = .01$)

Posttest scores collapsed across order of presentation of the two reading units (type or standard first) are shown in TABLE 1. Pretest scores did not differ significantly ($t < 1$) at the start of the reading unit instructions, indicating that the reading skills of students prior to instruction were at a similar level. However, the mean reading comprehension score (14.58) after type-based

Table 2. Mean Comprehension Pre, Post, and Change Scores for Both Groups on Two Reading Units.

	Pre-test 1	Post-test test 1	Unit 1 change	Pre-test 2	Post-test 2	Unit 2 change
Type unit first, standard unit second	10.75 ^a	13.85 ^a	3.10*	11.60**	14.00**	2.40
Standard unit first, type unit second	11.45	11.55	0.10*	12.10***	15.30***	3.20

Note: Each group $N = 20$.

*Means paired by the same number of asterisks differ significantly from each other ($p < .001$).

^a These two means differ significantly ($p < .02$).

instruction was significantly higher than the mean score (12.78) following the standard instruction module, $t(39) = 3.06$, $p < .01$. Likewise, the change in scores from pre to posttest (post minus pre) was significantly higher following type-based instruction (a mean of 3.15 points) than following standard instruction, a mean of 1.25 points, $t(39) = 3.80$, $p < .001$. (All mean differences were tested using repeated measures t-tests.)

TABLE 2 displays pretest, posttest, and changes scores for each of the two order presentation groups for both reading units. As with the combined scores, pretest scores did not differ significantly across these two groups for either unit ($t < 1$). The posttest and change scores, however, did indicate significant differences in the reading comprehension of the two groups at the end of their lessons.

For the first unit, the type-enriched instruction produced greater gains (change scores) in comprehension than the standard instruction, $t(38) = 3.58$, $p < .001$, two-tailed. This difference was also evident in the higher scores at the end of the first unit for the group that received type-based instruction, $t(38) = 2.49$, $p < .02$, and in the posttest minus pretest difference for the type group when analyzed separately, paired samples $t(19) = 5.67$, $p < .001$. This same pre-post comparison for the standard instruction students was not statistically significant.

For the second unit, when the methods of instruction were swapped, the students who now received type instruction exhibited significant improvement from pretest to posttest, paired samples $t(19) = 8.11$, $p < .001$. Interestingly, the gain for the Type Unit First

students was similar in magnitude even when they were taught using the second, standard, study methods, paired samples $t(19) = 7.15$, $p < .001$. The implications of this finding are discussed in greater detail in the Discussion section of this report.

Teacher Interviews and Survey Responses.

Both teachers reported that the entire experience had been very beneficial and enjoyable, noting general improvements in student engagement, motivation, focus, retention, and confidence. They also reported that their students made clear, type-related choices among the various learning activities offered in the type-based reading instruction unit. The two teachers indicated that 14 students (35% of the total) were "significantly impacted" in a positive way by having access to the expanded learning materials. Also impressive were the teachers' ratings of the various type-based learning tools developed for and used in the research, 100% of which were rated as "useful" or "very useful" (63% rated at the higher level). Both teachers praised the benefits of the expanded curriculum, students' enthusiasm for and spontaneous use (during brief unstructured moments) of the type-based activities, and the improved "overall mood" that permeated the post-type classroom. These benefits were mentioned both for themselves, "but most importantly for my students," as one described the experience. Finally, teacher A indicated "very pleasant surprise" at improvements in students' grades, and teacher B noted that she "learned a lot about my students" and that knowledge of type "does help explain some of the difficult personalities that I have in my room."

DISCUSSION

Critics have noted a lack of clear empirical support for the benefit of differentiated instruction based on learning styles (Pashler et. al, 2008). The present research represents a step towards addressing that lack and provides evidence that designing and implementing differentiated reading lessons using the framework of psychological type significantly improves reading comprehension. Randomly assigned fourth grade students scored higher on reading comprehension tests after participating in a learning environment enriched with tools designed to appeal to a broader variety of learning styles, based on the theory of psychological type derived from Carl Jung (e.g., 1923, 1971) and expanded and enhanced by Isabel Myers (e.g., 1962). This learning benefit appeared to persist in a second reading lesson that did NOT incorporate the expanded curriculum.

Teacher comments may help explain the persistence of this benefit. They reported high enthusiasm for the expanded curriculum, a desire to continue to employ the “very useful” tools created for student practice activities, and students’ spontaneous engagement with these new learning tools. Any or all of these may have contributed to a carryover benefit, that is, a learning to learn effect, following the initial exposure to a type-based curriculum. Once students learn effective strategies through participation in a program designed to enhance self-awareness, confidence in learning, and self-management, they may continue to use their new knowledge and skills in future lessons.

This conclusion is tentative, pending additional support. Further research is needed not only to explore the possible persistence of type effects, but to more carefully examine the process by which reading comprehension scores improved in the present study. Although teachers did share observations concerning choices of learning activities by their students corresponding to their type preferences, these observations were not systematically recorded. Nor were any data collected about the reasons for a given student’s choice of different activities, information which could have more clearly tied their choice to a particular type preference. Thus, there may be other explanations besides type for choosing a particular activity, just as there are competing explanations for the observed learning improvements, since the two experimental conditions differed in ways unrelated to type. For example, students in the type unit were given more choice in determining how they

studied and could have benefited by the introduction of another teacher. Additional research is currently underway, under the direction of the second author at several schools around the country, to test the effectiveness of type-based curricula under more carefully controlled conditions.

Psychological type has many attractive qualities as a guiding framework for differentiated instruction. Type theory offers insights into individual motivation, communication, participation, and comfort in the social settings of the classroom. Activities that appeal to the interests and strengths of every preference are the essence of differentiation. Quenk (2000) notes that strengths evolve from the motivated and repeated use of one’s preferences, benefiting self-perception, self-esteem, and ultimately confidence. Again, “preferred style tends to feel more comfortable, takes less energy and concentration, and typically produces better results” (Keefer, 2004, para. 3).

Type assessment provides not only a reliable means of measuring key student learning style differences, but also does so without placing value judgments on the results. Use of strategies that involve differentiating “gifted” students, of course, implies that some students are not gifted, whereas type simply delineates different styles that may all be effective when information is presented appropriately. In addition, type assessment need not be limited to students. It can be expanded to include teachers and parents to help them understand their own preferences in communicating and processing information and formulate strategies to reach across gaps when teaching their students or their children.

When type awareness is included in their learning, students may be better able to gain the confidence they need to take academic risks and to truly view themselves as capable learners. According to Myers & Myers (1980), the real tragedy occurs when individual differences are ignored or individual gifts are not recognized, meaning that some children will continue to struggle to achieve feelings of self-worth throughout their lifetime. On the other hand, when educators provide instruction that respects and incorporates type awareness, students may experience an internal resonance between their own learning preferences and the external reality of expected behaviors. Such resonance is manifested through increased motivation, cooperation and improved academic success, that is, they may find the real joy in learning.

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