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Methodological Status and Trends in Expository Text Structure Instruction Efficacy Research

Janet J. Bohaty
University of Nebraska - Lincoln, janet.bohaty@huskers.unl.edu

Michael A. Hebert
University of Nebraska - Lincoln

J Ron Nelson
University of Nebraska - Lincoln

Jessica A. Brown
University of Nebraska - Lincoln

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Janet J. Bohaty, University of Nebraska– Lincoln
Michael A. Hebert, University of Nebraska– Lincoln
J. Ron Nelson, University of Nebraska– Lincoln
Jessica A. Brown, University of Minnesota

—————————————— Abstract ——————————————

This systematic descriptive historical review was conducted to examine the status and trends in expository text structure instruction efficacy research for first through twelfth grade students. The analysis included sixty studies, which spanned the years 1978 to 2014. Descriptive dimensions of the research included study type, research design, treatment fidelity, school level, number of participants, service delivery settings, and comprehensiveness of demographic reporting, text structure instruction, and measurement. Researchers primarily used randomized and quasi-experimental research designs. Analysis of results revealed that (a) a relatively large number of text structure efficacy research studies have been conducted, (b) complete demographic information was difficult to ascertain for many of the participants, (c) researchers of few studies instructed students in all five expository text structures, (d) treatment fidelity data were often missing, and (e) researchers rarely used both direct and indirect measures of effects. Limitations of the analysis and future research directions are discussed.

Methodological Status and Trends in Expository Text Structure Instruction Efficacy Research

Text structure refers to the organization of information within both narrative and expository text (Kintsch, 1974; Meyer, 1975). Recognizing and understanding narrative and expository text structures helps the reader mentally organize and comprehend the story or information presented by the author (Meyer, 1987; Spires, Gallini, & Riggsbee, 1992; Wijekumar, Meyer, & Lei, 2012; Williams et al., 2005). Although there are some variations, narrative text includes a common structure centering on a setting, set of characters, problem, and resolution (Mandler & Johnson, 1977). This text structure is independent of the story; although the plot changes from story to story, the structure of narrative text remains constant.

In contrast, there are five commonly referenced expository text structures that vary and are inseparable from the content: compare/contrast, cause/effect, problem/solution, description, and sequence (Meyer, 1975, 1985). Authors use *compare/contrast* to point out similarities or differences, *cause/effect* to show a causal relationship, *problem/solution* to organize the text into a problem part and an attempted solution to the problem, *description* to state attributes or specify setting information, and *sequence* to group ideas on the basis of order or time. Depending upon the information being conveyed, authors of expository text may use multiple expository text structures in the same passage, switch abruptly from one structure to the next, or embed one text structure within another text structure (Englert & Hiebert, 1984).

Students who approach text without an awareness of these five structures, are less likely to recognize and recall important information (Meyer, Brandt, & Bluth, 1980; Snow, 2002). Further, research indicates that teaching strategies for identifying features of expository text structures are effective for improving reading comprehension (Gersten, Fuchs, Williams, & Baker 2001; Williams & Pao, 2011). However, without a structured review of the literature, the generalizability of this research is unclear. Knowing more about the history of text structure intervention research (e.g., types of designs, number and school level of participants, service delivery setting, and comprehensiveness of instruction) can guide practitioners and future research.   Thus, it is of educational significance and interest to conduct a historical analysis of the

methodological status and trends in expository text structure instruction efficacy research. Efficacy research considered were those studies in which researchers used a randomized control trial, quasi-experimental, or single subject design to assess the effects of text structure instruction on the reading comprehension of students.

To date, it appears that four unsystematic narrative reviews of expository text structure instruction efficacy research have been completed (Meyer, 1979, 1987; Meyer & Ray, 2011; Slater, 1988). Meyer (1979) conducted the first review of expository text structure instruction efficacy research. This review was restricted to her work on expository text base analyses that led to her identification of the five expository text structures (i.e., compare/contrast, cause/effect, problem/solution, description, sequence), as well as her efficacy research on text structure instruction. She summarized several of her observational text structure studies and her students' experimental dissertation efficacy studies. The primary conclusion she drew was that teaching students expository text structures significantly improves both immediate and delayed recall of informational text for most students.

In a second review, Meyer (1987) updated her first review by including additional studies conducted during the interim time period. She summarized multiple studies on readers' understanding and use of text structures and described text structures as an additional schema in which to place newly learned information. She also reported that some text structures (i.e., compare/contrast, cause/effect, problem/solution) are more complex than others and may assist comprehension to a greater degree. The primary conclusion she drew was that text structure instruction improves comprehension of expository text and that it appears skilled readers use text structures more effectively than poor readers.

Slater (1988) provided a broader picture of expository text structure research by widening the scope beyond studies conducted by Meyer and colleagues. In his review, he included a discussion of the elements of good expository text, as well as a narrative summary of the research on expository text structure instruction. He stated five findings specific to expository text structure instruction research. First, as a student's age increases, so does their ability to use expository text structures to comprehend text. Second, students who use expository text structures remember more of what they read than

those who do not. Third, students can be taught to effectively identify expository text structures. Fourth, students who learn to use expository text structures are better able to comprehend informational text. Fifth, students who fail to use expository text structures do not perform as well on unfamiliar topics as they do on familiar topics.

Meyer and Ray (2011) built on and extended Meyer's two previous narrative reviews (1979, 1987) by providing a selective review of efficacy research on expository text structure instruction conducted by herself and other researchers. They drew two primary conclusions regarding expository text structure instruction efficacy research. First, expository text structure instruction aids comprehension of informational text. Second, the positive effects of expository text structure instruction extend to elementary-aged students and English language learners. Although these conclusions are important, a more systematic look at the methods and samples used in previous research efforts is needed to fully understand the generalizability of text structure instruction and guide future research.

It appears that no systematic analysis of the expository text structure efficacy research has been conducted to date. Therefore, the purpose of this review was to conduct a systematic descriptive historical analysis of the methodological trends of expository text structure instruction efficacy research. We conducted this analysis to inform researchers about the status and trends in the research methodologies used to assess the efficacy of text structure instruction on student reading comprehension (e.g., type of experimental designs, characteristics of participants, service delivery setting, the type and number of text structures taught, dependent measures). The findings from this review can be used to guide future expository text structure instruction efficacy research. The following questions guided this descriptive historical analysis:

1. What number and types (i.e., peer reviewed, non-peer reviewed) of studies were described in the literature?

2. What types of experimental designs (i.e., randomized control trial, quasi-experimental, single subject) were used to assess the efficacy of text structure instruction?

3. Was treatment fidelity reported?

4. What was the total number and school level (i.e., elementary,

middle, high school) of participants?

5. What was the service delivery setting (i.e., instruction in regular or support classrooms)?

6. Was comprehensive demographic information reported (i.e., reported gender, socioeconomic status (SES), ethnicity, student status)?

7. Was comprehensive text structure instruction provided to students (i.e., all five text structures were taught; compare/contrast, cause/effect, problem/solution, description, and sequence)?

8. Was a comprehensive approach to measurement used to assess expository reading comprehension (i.e., researchers used both direct and indirect measures)?

Method

Definition of Database and Search Procedures

We conducted this database search simultaneously with a search for studies for a related meta-analysis (Hebert, Bohaty, Nelson, & Brown, 2015). Different inclusion criteria were used for each study, but the search terms and procedures were identical. Two authors identified articles through computer database and reference list searches from the earliest dates available through January 2014. Specifically, a computer search using key words related to text structure instruction and reading comprehension was conducted from six databases. These included ERIC, PsychINFO, Academic Search Premier, ProQuest (including Dissertation Abstracts International), Education Index Retrospective, and Web of Science (which includes 3 searchable databases: Science Citation Index Expanded, Social Science Citation Index, and Arts and Humanities Citation Index). Initially, keywords used in the computer searches were text structure, expository, informational, nonfiction, reading comprehension, compare contrast, sequence, problem solution, and cause and effect. Following the documentation of several relevant studies, additional keywords were identified. Keywords used in subsequent searches included top-level structure, structure strategy, attribution, adversative, enumeration, enumerative, covariance, matrix, generalization, explanatory, response, collection, claim-counterclaim, claim-support-conclusion, simple listing, ordered

listing, topical net, hierarchy, linear string, falling dominos, and branching tree.

The computer searches yielded 3,121 articles. The authors reviewed the titles and abstracts for these articles. Articles that appeared to match the targeted area based on their title and/or abstract were obtained for further review. A title search using the obtained articles' reference lists served to identify additional potential studies. The abstracts of these papers were then reviewed. A total of 337 potential articles were identified through this process. Three authors independently read each article to determine if the study met the pre-identified inclusion criteria (see below). The authors then met and discussed the decisions. The percentage of total agreement was 95 %. Three disagreements were resolved through discussion.

Duplicate studies published or unpublished in multiple formats (e.g., dissertations that were later published in a peer-reviewed journal) were identified during the search. In these cases, both reports were used to make determinations for inclusion and results. For citation purposes, the original work was cited when non-peer reviewed studies were later presented in another non-peer reviewed format. For coding purposes, non-peer-reviewed studies were coded as peer-reviewed when they were later published in a peer-reviewed scholarly journal. For example, a dissertation study (e.g., Alvermann, 1980) later published in a peer-reviewed journal (e.g., Alvermann, 1981) was designated as peer-reviewed. We identified 18 duplicate studies.

Inclusion and Exclusion Criteria

We included articles published in both peer reviewed scholarly journals and non-peer reviewed outlets (e.g., dissertations, book chapters), as well as studies involving text structure instruction in reading, writing, or both reading and writing. Otherwise, studies were required to meet our inclusion and exclusion criteria.

Studies were included in the review if:

1. The study was an original efficacy trial.

2. The researchers employed a randomized control trial, quasi-experimental, or single subject design. Randomized control trials included experiments with randomization at the student level as well as cluster-randomized designs. Quasi-experiments included nonequivalent control group designs and counterbalanced

designs. Single subject designs included reversal (ABAB) and multiple-probe across participants.

3. Study participants were in the first through twelfth grades.

4. Treatments involved instruction in expository text structures as operationalized by Meyer (1975, 1985). These five text structures included: compare/contrast, cause/effect, problem/solution, description, and sequence.

5. Text structure instruction took place in regular education or support classrooms (e.g., special education, Tile I, literacy support, English learner).

6. At least one outcome measure assessed expository reading comprehension (the measures could be researcher created or norm-referenced).

Studies were excluded from the review for the following reasons:

1. Other conceptualizations of writing structure were used (e.g., hierarchical structure of text, Taylor, 1982; argumentative structure of text, Haria, 2010).

2. Study used a qualitative design or presented only qualitative data (e.g., Bellows, 1994).

Sixty journal articles, dissertations, book chapters, technical reports, research series, and conference papers met the criteria for inclusion in this analysis. Each study is noted with an asterisk in the References section.

Coding Procedures

Operational definitions and an associated coding form were developed to record information contained in the articles. Articles were coded using the following criteria:

- *Type of study.* Study Type was categorized as either peer reviewed or non-peer reviewed.

- *Type of experimental design.* Experimental design was categorized as randomized control trial, quasi-experimental, or single subject.

- *Treatment fidelity reported.* Treatment fidelity was categorized as reported or not reported. We coded fidelity as being reported if

researchers reported, gave qualitative information about, or simply stated that they collected fidelity data. Not reported referred to no evidence presented of teachers being observed during instruction.

- *Total number and school level of participants.* The total number of students was recorded. School level was categorized as elementary, middle, or high school. Elementary referred to the number of participants in grades 1-5, middle school referred to the number of participants in grades 6-8, and high school referred to the number of participants in grades 9-12 who completed the study.

- *Service Delivery setting.* Service delivery setting was categorized as regular education or support setting (e.g., special education, Tile I, literacy support, English learner).

- *Comprehensive demographic reporting.* Demographic reporting was categorized as comprehensive if researchers reported the gender, SES, ethnicity, and student status of the specific participants in the study. Demographics were classified as not comprehensive if only three or fewer demographic characteristics were reported. Demographic characteristics were considered to be reported if they met the following criteria:

    - *Gender:* The number or percentage of males and females was reported.

    - *SES of Participants:* The number or percentage of participants receiving free or reduced lunch was reported.

    - *Ethnicity:* The number or percentage of participants from ethnic groups was reported.

    - *Student status.* The number or percentage of participants in regular education, special education, English learner, and/or Title 1 was reported.

- *Comprehensive text structure instruction.* Text structure instruction was categorized as comprehensive or not comprehensive. Comprehensive referred to instruction that taught students all five

expository text structures (i.e., compare/contrast, cause/effect, problem/solution, description, and sequence) conceptualized by Meyer (1975, 1985). Not comprehensive referred to instruction that taught students four or fewer of the text structures.

- *Comprehensive approach to measurement.* Approach to measurement was categorized as comprehensive or not comprehensive. Comprehensive measurement referred to those studies in which researchers used both direct (i.e., researcher developed measures aligned directly with the intervention effects) and indirect (i.e., norm-referenced measures not aligned directly with the intervention effects) outcome measures. Not comprehensive measurement referred to those studies in which researchers used either direct or indirect outcome measures, but not both.

Following the development of the criteria and coding forms, two coders recorded data independently on 41 (68%) of the articles. Inter-observer agreement for each category on the coding form was calculated by dividing the number of agreements by the total number of possible agreements and multiplying by 100. Agreement by category was 100% for study type, 95% for experimental design, 95% for treatment fidelity reported, 98% for school level of participants, 88% for service delivery setting, 100% for demographic reporting, 85% for text structure instruction, and 99% for approach to measurement. The two coders reconciled disagreements through discussion.

Time Periods

Publication years for the 60 identified articles ranged from 1978 to 2014. The authors chose 1978 as a starting point because this was the earliest study found. For comparison purposes, we decided to report data in terms of three equal time periods of 12 years. However, one study with an advanced online publication in 2013 (Williams et al., 2014) was published in a journal in 2014. Also, following a conference poster presentation at the Society for the Scientific Study of Reading, 2014, we were contacted about an additional study that was in press (Wijekumar et al., 2014), which was included. Thus, the final time period spanned an additional year relative to the first two time periods. The three time periods for this historical review were 1978-1989, 1990-2001, and 2002-2014.

Although these three time periods were somewhat arbitrarily chosen to

establish comparative time lengths, these dates coincide with two policy and practice changes that were likely to impact literacy research. The advent of Reading First in early 2000 caused an emphasis in the use of decoding based reading practices within multi-tiered models of instruction. As a result, we anticipated that the focus of researchers would shift to the development of basic reading skill interventions and less of an emphasis on comprehension of informational text. Additionally, the Education Sciences Reform act of 2002 had an effect on methodological quality. Thus, we expected the quality of educational research to improve with the establishment of the Institute of Education Sciences (IES).

Results

The eight guiding questions were used to organize the results. The results across the three time periods for each question are summarized in Table 1 and described below.

1. What Number and Types of Studies were Described in the Literature?

A total of 60 efficacy studies were conducted between 1978 and 2014. A majority of the studies (80%) were completed during the 1978-1989 (*n*=23) and 2002-2014 (*n*=25) time periods. The remaining 12 studies were conducted during the 1990-2001 time period. Twenty-seven (45%) of the 60 studies were peer reviewed; whereas, the remaining 33 studies were not peer reviewed. The relative ratio of peer reviewed to non-peer reviewed studies within each of the time periods increased across the 1978-1989 (8 of 23), 1990-2001 (5 of 12), and 2002-2014 (14 of 25) time periods.

2. What Types of Experimental Designs were Used to Assess the Efficacy of Text Structure Instruction?

Researchers of 28 (47%) of the 60 efficacy studies used randomized experimental designs, 30 (50%) used quasi-experimental designs, and 2 (3%) used single subject designs. The relative ratio of randomized experimental to quasi-experimental designs within each of the time periods remained relatively stable across the 1978-1989 (10 of 23), 1990-2001 (6 of 12), and 2002-2014 (12 of 25) time periods. The two single-subject design studies (Carnahan & Williamson, 2013; Nealy, 2003), were conducted during the 2002-2014 time period.

3. Was Treatment Fidelity Reported?

Table 1. *Study Characteristics for the 1978-1989, 1990-2001, and 2002-2014 Time Periods*

Citation	Study Type	Design	Treatment Fidelity Reported	School Level	Number of Participants	Delivery Setting	Demographic Reporting	Text Structure Instruction	Approach to Measurement
						1978-1989		Comprehensive	
Alvermann, 1981	PR	Rand.	No	HS	24	SS	No	No_2	No
Alvermann, 1982	PR	Rand.	No	HS	30	NR	No	No_1	No
Alvermann & Boothby, 1986	PR	Rand.	Yes	E	24	RE	No	No_1	No
Armbruster & Anderson, 1980	NPR	Quasi	No	HS	54	NR	No	No_4	No
Armbruster et al., 1987	PR	Quasi	No	E	82	RE	No	No_1	No
Bartlett, 1978	NPR	Quasi	No	HS	102	RE	No	No_4	No
Bartlett et al., 1981	NPR	Quasi	No	E	54	RE	No	No_4	No
Boothby & Alvermann, 1984	PR	Quasi	No	E	38	RE	No	No_2	No
Clewell, 1981	NPR	Rand.	Yes	MS	60	NR	No	No_1	No
Coleman, 1983	NPR	Rand.	No	HS	116	SS	No	No_2	No
Duffy, 1985	NPR	Rand.	No	MS	45	SS	No	Yes	No

Table 1 (cont'd.)

Citation	Study Type	Design	Treatment Fidelity Reported	School Level	Number of Participants	Delivery Setting	Demographic Reporting	Comprehensive Text Structure Instruction	Approach to Measurement
Gould, 1987	NPR	Quasi	No	E & MS	74 & 119	RE	No	No[4]	No
Hickerson, 1986	NPR	Quasi	No	MS & HS	60 & 60	RE	No	Yes	No
Raphael et al., 1986	NPR	Quasi	No	*E	159	RE	No	No[2]	No
Raphael & Kirschner, 1985	NPR	Quasi	No	MS	45	RE	No	No[1]	No
Reasor, 1988	NPR	Quasi	No	E	56	RE	No	No[3]	No
Reese, 1988	NPR	Rand.	No	HS	32	RE	No	Yes	No
Richgels & McGee, 1989	NPR	Rand.	No	E	58	RE	No	No[2]	No
Samson, 1982	NPR	Quasi	No	HS	61	RE	No	No[2]	No
Slater et al., 1985	PR	Rand.	No	HS	224	RE	No	No[2]	No
Smith & Friend, 1986	PR	Quasi	No	HS	54	SS	No	Yes	No
Taylor, 1985	PR	Rand.	No	MS	93	RE	No	No[1]	No
Weisberg & Balajthy, 1989	NPR	Quasi	No	HS	32	SS	No	No[1]	No

Table 1 (cont'd.)

Citation	Study Type	Design	Treatment Fidelity Reported	School Level	Number of Participants	Delivery Setting	Demographic Reporting	Comprehensive Text Structure Instruction	Approach to Measurement
						1990-2001			
Armbruster et al., 1991	PR	Quasi	No	E	365	RE	No	Yes	No
Bakken et al., 1997	PR	Rand.	No	MS	54	NR	No	No_2	No
Dickson, 1994	NPR	Quasi	Yes	MS	96	RE	No	No_1	No
Englert et al., 1991	PR	Rand.	Yes	E	183	RE	No	No_2	No
León & Carretero, 1995	PR	Rand.	No	HS	72	RE	No	No_3	No
McDermott, 1990	NPR	Quasi	No	E	66	RE	No	No_2	No
McLaughlin, 1990	NPR	Rand.	No	E	68	NR	No	No_1	No
Moore, 1996	NPR	Quasi	No	MS	77	RE	No	No_2	No
Spires et al., 1992	PR	Rand.	No	E	74	RE	No	No_2	No
Troyer, 1994	NPR	Rand.	No	E & MS	123 & 50	RE	No	No_2	No
Walker, 1991	NPR	Quasi	No	E	92	RE	No	Yes	No
Whittaker, 1992	NPR	Quasi	No	MS	48	RE	No	No_2	No

Table 1 (cont'd.)

Citation	Study Type	Design	Treatment Fidelity Reported	School Level	Number of Participants	Delivery Setting	Demographic Reporting	Comprehensive Text Structure Instruction	Comprehensive Approach to Measurement
					2002-2014				
Brimmer, 2004	NPR	Quasi	No	MS	57	RE	No	Yes	No
Broer et al., 2002	PR	Quasi	No	MS	354	RE	No	No_1	No
Carnahan & Williamson, 2013	PR	Single	Yes	MS	3	RE	No	No_1	No
Gentry, 2006	NPR	Rand.	Yes	E	57	SS	No	Yes	No
Hall et al., 2005	PR	Rand.	Yes	E	72	RE	No	No_1	No
Hammann & Stevens, 2003	PR	Quasi	No	MS	63	RE	No	No_1	No
Hoffmann, 2010	NPR	Quasi	No	E	162	RE	No	No_1	Yes
McCormick, 2006	NPR	Rand.	Yes	MS	96	RE	No	No_2	No
Meyer et al., 2002	PR	Rand.	No	E	60	RE	No	No_2	No
Meyer et al., 2011	PR	Rand.	No	E	131	RE	No	No_2	Yes
Meyer et al., 2010	PR	Rand.	No	E & MS	56 & 55	RE	No	No_2	Yes
Nealy, 2003	NPR	Single	Yes	MS	4	SS	No	Yes	No
Newman, 2007	NPR	Quasi	Yes	E	77	RE	No	No_3	No

Table 1 (cont'd.)

Citation	Study Type	Design	Treatment Fidelity Reported	School Level	Number of Participants	Delivery Setting	Demographic Reporting	Comprehensive	
								Text Structure Instruction	Approach to Measurement
Ocasio, 2006	NPR	Quasi	No	E	58	SS	No	No[4]	No
Reynolds & Perin, 2009	PR	Quasi	Yes	MS	121	RE	No	No[1]	No
Russell, 2005	NPR	Quasi	Yes	HS	40	RE	No	No[4]	No
Scott, 2011	NPR	Quasi	No	MS	205	RE	No	No[3]	No
Ulper & Akkok, 2010	NPR	Quasi	No	MS	28	NR	No	No[1]	No
Wijekumar et al., in press	PR	Rand.	Yes	E	2173	RE	No	Yes	Yes
Wijekumar et al., 2012	PR	Rand.	Yes	E	1900	RE	No	Yes	Yes
Wilkins, 2007	NPR	Quasi	No	MS	30	SS	No	No[1]	No
Williams et al., 2005	PR	Rand.	Yes	E	128	RE	No	No[1]	No
Williams et al., 2007	PR	Rand.	Yes	E	35	RE	No	No[1]	No
Williams et al., 2014	PR	Rand.	Yes	E	197	RE	No	No[1]	No
Williams et al., 2009	PR	Rand.	Yes	E	215	RE	No	No[1]	No

Treatment fidelity was reported in 18 (30%) of the 60 studies. The relative proportion of studies that reported treatment fidelity increased across the 1978-1989 (2 of 23), 1990-2001 (2 of 12), and 2002-2014 (14 of 25) time periods.

4. What was the Total Number and School Level of Participants?

A total of 9,501 K-12 students served as participants in the 60 efficacy studies. Of these, 1,756 (19%), 1368 (14%), and 6,377 (67%) served as participants during the 1978-1989, 1990-2001, and 2002-2014 time periods, respectively. It is important to note that two studies conducted during the 2002-2014 time periods were comprised of 1,900 4th grade students and 2,173 5th grade students (See Table 1). These two studies account for a relatively large proportion of the participants during this time period. Of the 9,501 total participants, 6,861 (72%) were enrolled in 1st-5th grades, 1,763 (19%) in the 6th-8th grades, and 877 (9%) in the 9th-12th grades.

There were noticeable changes in the grade levels of participants across the three time periods. A majority (69%) of the participants were enrolled in the 6th-12th grades during the 1978-1989 time period. In contrast, a majority of the students were enrolled in 1st-5th grades during the 1990-2001 (71%) and 2002-2014 (83%) time periods. Note that eliminating the 1,900 4th grade students and the 2,173 5th grade students who participated in the two studies conducted by Wijekumar and colleagues (2012, 2014, respectively), would result in similar percentages of 1st-5th (54%) and 6-12th (46%) grade participants during the 2002-2014 time period. Additionally, the percentage of students enrolled in the 6th-8th grade during the 1978-1989, 1990-2001, and 2002-2014 time periods was 24%, 24% and 16%, respectively.

5. What was the Service Delivery Setting?

Researchers of six studies did not report the service delivery setting. Of the remaining 54 studies, researchers of 45 studies reported instruction was delivered in general education settings; while, 9 reported instruction was delivered in support settings (e.g., special education, literacy support). Based on the 54 studies in which setting was reported, it did not appear there were substantive changes in the relative proportion of studies in which instruction was delivered in general education or support settings over time. The ratio of studies in which instruction was provided in a general education setting across

the 1978-1989, 1990-2001, and 2002-2014 time periods were 15 of 20, 10 of 10, and 20 of 24, respectively.

6. Was Comprehensive Demographic Information Reported?

Comprehensive demographic reporting was not provided by any researchers of the 60 studies. Few researchers reported substantial demographic information on even the most rudimentary characteristics of the participants. For example, the percentage of studies in which researchers reported the gender of participants across the 1978-1989, 1990-2001, and 2002-2014 time periods was 26%, 50%, and 48%, respectively. Across all studies, researchers reported gender in 24 studies (40%), SES in 3 studies (5%), ethnicity in 11 studies (18%), and student status in only 2 studies (3%). Thus, we could not provide detailed information about participant demographics.

7. Was Comprehensive Text Structure Instruction Provided to Students?

Researchers of 11 of the 60 studies (18%) examined the effects of comprehensive text structure instruction (i.e., taught students all five text structures). Four of these studies were conducted during the 1978-1989 time period, two during the 1990-2001 time period, and five during the 2002-2014 time period. Researchers taught four or fewer text structures in the remaining 49 studies. Of these 49 studies, researchers examined the effects of teaching one (n=21, 35%), two (n=18, 30%), three (n=4, 7%), or four (n=6, 10%) text structures.

8. Was a Comprehensive Approach to Measurement Used to Assess Expository Reading Comprehension?

Overall, researchers of 5 of the 60 studies (8%) used a comprehensive approach to measurement (i.e., used both direct and indirect outcome measures). All of these studies were conducted during the 2002-2014 time period. Researchers of three studies (5%) used only indirect (standardized) outcome measures of comprehension. One of these studies was conducted in the 1978-1989 time period, while the remaining two were conducted during the 2002-2014 time period. Only direct outcome measures were used by researchers of the remaining 52 studies.

Discussion

Reading is a crucial skill used to gain content knowledge and

information (National Reading Panel, National Institute of Child Health, & Human Development, 2000). The multiple and varied uses of text structures by authors within a section, chapter, or book presents a challenge to readers' comprehension of expository text (Englert, Okolo, & Mariage, 2009). Expository text structure instruction is recommended to enhance the abilities of readers to comprehend expository text (Dickson, Simmons, & Kameenui, 1998; Duke & Pearson 2008; Ehren, 2005). Meyer (1975, 1985) identified and described five text structures commonly used by authors of expository text: compare/contrast, cause/effect, problem/solution, description, and sequence. Researchers in the literacy field have conducted research on the effects of teaching expository text structures using students' comprehension of informational text for over three decades. This systematic descriptive historical analysis was undertaken to investigate the methodological status and trends in the expository text structure instruction efficacy research. This analysis revealed three positive findings related to the number of efficacy studies and associated participants and four problem areas related to demographic reporting, comprehensive instruction, treatment fidelity, and measurement.

Number of Studies and Associated Participants

Positive findings that emerged from this historical analysis center on the number of efficacy studies conducted to date and the number of participants and varied school levels included in each. A total of 60 diverse expository text structure instruction efficacy studies conducted since 1978 were identified. These studies included 9,501 first through twelfth grade students. These groups of students were comprised of a somewhat balanced number of elementary, middle, and high school students. Although there appears to be no established metric for assessing comprehensiveness of a body of research, our sense is that this body of work on a specific approach to enhancing expository reading comprehension is relatively large.

Comprehensive Demographic Information

A problematic finding of importance that emerged from our analysis is how little we know about the participants in these studies. Knowing the characteristics of the participant sample is necessary to generalize to a target population (Campbell & Stanley, 1963; Cook & Campbell, 1979; Gersten et al., 2005). As noted previously, researchers generally reported very little

information on the sample characteristics. In some cases, researchers only provided demographic information about the school(s) in which the study was being conducted but not for the study sample. For example, Williams, Stafford, Lauer, Hall, & Pollini (2009) reported demographic information on the free and/or reduced lunch status, special education status and ethnic make-up of the schools in which the study was conducted. However, this information was not provided for the study sample.

Comprehensive Text Structure Instruction

Another problematic finding from this historical analysis is that researchers of only a few studies assessed the effects of comprehensive text structure instruction (i.e., taught all five text structures). Authors of expository text use multiple text structures to communicate information (Meyer, 1975) and often quickly switch from text organized in one structure, to another structure in adjoining sections of the text (Englert et al., 2009). Thus, we believe that expository text structure instruction should be comprehensive in nature if we are to provide students with a complete understanding of how to comprehend expository text. Researchers of only 11 of the 60 studies reviewed provided students comprehensive text structure analysis. Researchers of a majority of the studies (n=39) taught only one or two text structures.

Treatment Fidelity

Another finding we view as problematic is how few researchers reported any form of qualitative or quantitative treatment fidelity data. Without treatment fidelity, no understanding of the effect of the treatment on the dependent measures can be made (Gresham, MacMillan, Beebe-Frankenberger, & Bocian, 2000; Hagermoser Sanetti & Kratochwill, 2009). In this analysis, the overall percentage of studies in which researchers reported treatment fidelity (30%) was low. Although the reporting of treatment fidelity increased during the most recent 2002-2014 time period, over 40% of researchers still did not report treatment fidelity. This is surprising given the interest in and requirement to provide information on treatment fidelity (Martella, Nelson, Morgan, & Marchand-Martella, 2013).

Comprehensive Approach to Measurement

A final problematic finding of this historical analysis is the low number

of studies in which researchers used both direct and indirect comprehension outcome measures. Direct measures are typically developed by the researcher to align directly with the text structure instruction effects; whereas, indirect measures are typically norm-referenced and not aligned directly with the treatment effects. Including both direct and indirect outcome measures is an essential indicator of the quality of the study outcomes (Gersten et al., 2005). Furthermore, the Institute of Education Sciences "What works procedures and standards manual" (What Works Clearinghouse, 2009) cautions against studies that rely solely on measures that are overly aligned with treatment effects. In this analysis, researchers of only five studies used both direct and indirect comprehension outcome measures. Researchers tended to rely primarily on direct outcome measures, aligned with the expository text structure instruction being assessed.

Limitations, Implications, and Future Research

There are a variety of limitations in this study. First, our historical analysis was based on the expository text structures articulated by Meyer (1975, 1985). Although the results of our search suggest that her conceptualizations of five common expository text structures have been used to guide a majority of the efficacy research of expository text structure instruction, the use of a different conceptualization may have resulted in different search results. For example, Chambliss and Calfee (1998) identified three purposes for expository writing: to inform, argue, and explain. Several rhetorical patterns are associated with each purpose (e.g., informative texts can be organized according to descriptive or sequential patterns.) Related to this matter, various terms are often used for each text structure (e.g., adversative for compare/contrast, falling dominoes for cause/effect). Although we were as comprehensive as possible, we may have inadvertently excluded terms like those that would have yielded different search results. Second, by using only studies that included a reading comprehension measure rather than including writing quality, identification of text structures, or qualitative data, we may have missed important information about students' understanding and use of expository text structures related to other vital components of literacy. Finally, the data presented should be considered within the strictly descriptive parameters that comprised the methodology.

Despite the aforementioned limitations, there were some noteworthy

observations regarding expository text structure instruction efficacy research that act as an impetus for increased attention in future efficacy research in this area. Based on the findings of this historical analysis, we make the following suggestions:

- Increase and improve reporting of participant demographics (e.g., ethnicity, gender, subsidized lunch status; English language learner status, special education status).

- Include participants of more varied backgrounds (e.g., students with learning disabilities, English language learners).

- Incorporate both direct and indirect outcome measures (i.e., studies in which measures aligned directly and indirectly with the intervention are used to assess intervention effects).

- Conduct more comprehensive expository text structure instruction efficacy research (i.e., assess the effects of teaching five expository text structures: compare/contrast, cause/effect, problem/solution, description, and sequence).

- Increase reporting and use of treatment fidelity in data analysis plans (e.g., direct observations of implementation).

A close review of the 60 studies included in this historical analysis of the literature suggests that 48 would meet the requirements (e.g., design, data for computing an effect size) for a meta-analysis. This number of studies would enable a systematic or meta-analytic review of the effects of expository text structure instruction on students' comprehension of informational text.

We believe that this historical analysis suggests that significant opportunities exist for researchers to apply proven research methods to an important area of efficacy research. There is a clear need for high quality research to provide guidance to educators seeking to provide students expository text structure instruction. Based on the lack of studies providing comprehensive demographics information and fidelity, this is especially important for improving the generalizability of the findings of this literature.

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About the Authors

Janet J. Bohaty is a Postdoctoral Researcher at the University of Nebraska – Lincoln.

Michael A Hebert is an Assistant Professor at the University of Nebraska – Lincoln.

J. Ron Nelson is a Professor at the University of Nebraska – Lincoln.

Jessica A. Brown is an Assistant Professor at the University of Minnesota.