

The Effects of a Metacognitive Strategy on the Persuasive Writing Skills of Adolescents With Hearing Impairment and Learning Disabilities

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In this research paper, we present the results from a single-case study examining the effects of the FIX strategy by Sherman and De La Paz (2015). This metacognitive instructional approach was implemented to improve the persuasive writing skills of tenth graders at high risk for school failure: students with comorbid hearing impairment and learning disabilities. The strategy was taught by way of peer tutoring involving four low-achieving tutees and four high-performing tutors. We applied a multiple-baseline design (AB) with between five and eight intervention sessions. Results indicated that the treatment brought about respectable improvements in three of the four tutees' ability to produce essays designed to convince readers of a particular idea. Thus, our findings suggest that peer-tutorial instruction in the FIX strategy can enhance the persuasive writing skills of adolescents with hearing impairment and learning disabilities even after only a small number of sessions. Practical implications of the results are discussed, and directions for future research are provided.

Keywords: Peer Tutoring, FIX Strategy, Persuasive Writing Skills, Single-Case Research, Learning Disabilities, Hearing Impairments

INTRODUCTION

One of the overarching goals of education is to help students think independently. That is, form their own opinions based on a careful reflection of different arguments, a thoughtful analysis of the relevant viewpoints, and a reasonable development of a convincing conclusion (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). Individuals who are able to articulate their positions plausibly and provide cogent reasons for their beliefs are usually more effective problem-solvers and better able to assert their interests than those who are not (Erickson, 2005).

A critical way to develop this kind of independence and autonomy in students is to teach them persuasive writing skills (Crowhurst, 1990). Producing a text aimed at winning over the reader forces students to reflect deeply, make

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their ideas explicit in language, and arrange their thoughts into a comprehensible composition (Graham et al., 2019). While most children and adolescents acquire adequate abilities to write persuasive essays during the course of their school years, some do not.

Two of the largest groups of students who show substantial shortcomings in text production are those with a learning disability (LD) and a comorbid hearing impairment (HI). Specifically, working memory deficits make it extremely difficult for people with LD to collect, process, weigh, and organize information (Graham, Collins, & Rigby-Wills, 2017), and if they have an additional disability, especially an HI, this challenge becomes even more severe (Easterbrooks & Stoner, 2006).

While there is a considerable amount of empirical literature on the effects of various writing interventions for students with LD (see Cook & Bennett, 2014; Datchuk & Kubina, 2013; Gillespie & Graham, 2014; Gillespie Rouse & Sandoval, 2018; Rogers & Graham, 2008, for comprehensive meta-analyses), the literature on evidence-based practices for learners with HI remains “small and fragmented” (Strassman & Schirmer 2013, p. 177). Hearing is an ability whose relevance to understand and produce written language is frequently underestimated (Naff, 2010). Children and adolescents with HI often demonstrate severe difficulties in this area, due to problems with vocabulary, grammar, and pronunciation. Thus, helping learners with HI to acquire literary language skills is an important but demanding task (Vostal & Ward, 2015). When attempting to tackle this problem, it is indispensable to adapt the teaching style to the developmental needs of the students (Slater, 2016).

One instructional framework that seems to be effective in this regard is the Self-Regulated Strategy Development (SRSD) approach by Harris and Graham (1996). Previous meta-analytic research (e.g., Datchuk & Kubina, 2015; Gillespie & Graham, 2014; Gillespie Rouse & Sandoval, 2018; Rogers & Graham, 2008) has consistently substantiated the potency of this strategy. With a 35-year history of effectiveness, SRSD is a comprehensive model that takes all essential features of improving writing performance into account (cognitive, motivational, and academic characteristics). It consists of a six-stage framework for explicitly teaching drafting, composing, and revising: (a) develop background knowledge about a particular strategy and introduce the applications for which it is used, (b) discuss the aim and the advantages of the strategy, (c) model the strategy while thinking aloud, (d) help students to memorize the steps of the strategy, (e) support the use of the strategy through scaffolds based on individual needs, and (f) facilitate independent application of the strategy over time. Within these steps, learners are taught goal-setting and self-regulation procedures, as well as self-statements that assist them in applying the strategy independently (Graham & Harris, 2003).

The SRSD model has been used as a framework for teaching a number of strategies geared towards improving the persuasive essay writing skills of students with special needs, including POW + TREE (e.g., Shora & Hott, 2016); STOP & DARE (e.g., Ennis, Jolivet, & Boden, 2013); and SCAN (e.g., Mason, Harris, & Graham, 2011). Overall, the findings of the body of literature on this topic gives cause for optimism. Thus, the gist of previous studies is that instructing struggling students in the application of various persuasive essay writing strategies by way of SRSD is very promising.

Teaching text production skills is very demanding, involving intense and time-consuming instruction. Unfortunately, the resources for implementing such challenging interventions are often missing. Therefore, the approach to imparting the skills necessary to compose text has frequently involved peer tutoring. This methodology can help to provide struggling children and adolescents with the attention and the support they need in order to learn how to put thoughts on paper (Little, Lane, Harris, Graham, Story, & Sandmel, 2010).

When it comes to acquiring persuasive writing abilities, the complexity of commonly used interventions like POW+TREE, STOP & DARE, and SCAN, as well as the number of steps they need to take to improve their performance often overburden learners who have multiple risk factors (like students with both LD and HI). Fortunately, there is a relatively simple alternative to the approaches just mentioned. Developed by Sherman and De La Paz (2015), it consists only of three simple steps: (a) **F**ocus on essay elements, (b) **I**dentify problems, and (c) **eX**ecute changes (FIX for short).

FIX seems to give consideration to the challenges that students with LD and HI face by reducing the complex concept of text composition to the most basic activities so that even young learners with multiple risks might not feel overwhelmed. Despite its promises, however, until now, FIX has not been systematically evaluated. The aim of this study was thus to examine the effects of the strategy using peer tutoring. We focused on relatively old subjects (10th graders), because younger students presumably would not possess sufficiently developed metacognitive capabilities to benefit from the approach.

METHOD

Participants and Setting

Our sample consisted of adolescents in a 10th-grade classroom in a German special school for students with hearing impairment in a metropolitan area in North-Rhine-Westfalia (Germany). The ages of the 10 participants in the class varied between 15 and 18 years. All of them demonstrated severe auditory disabilities. In addition, several had distinct learning problems.

For this study, the main teacher ranked the students according to their ability to compose text based on her personal impressions and data from school

records. Consistent with the procedures undertaken in the Peer-Assisted Learning Strategies (PALS) program (Fuchs, Fuchs, Mathes, & Simmons, 1997), they were then assigned to teams by matching the first with the sixth, the second with the seventh, the third with the eighth, the fourth with the ninth, and the fifth with the tenth participant. The last pair was absent more than three times during the course of the study, and was therefore excluded from the data analysis. Relatively better performing peers served as tutors, the lower achieving ones functioned as tutees.

A female graduate student of special education who was fluent in sign language conducted interviews with the 10 participants at the beginning of the study, asking the following questions: (a) Where and when were you born? (b) What country are your parents from? (c) Which languages do you and your family speak at home? (d) What kind of hearing impairment do you have? (e) Do you wear a hearing aid or have a cochlear implant? (f) Which decibel level is necessary for you to hear? (g) Which kind of school leaving certificate are you aiming for? (h) Which subjects do you perform well in and where do you struggle?

The group of tutors consisted of Aida¹ (female, 17 years, born of parents from Kosovo); Ben (male, 16 years, no immigrant background); Chris (male, 16 years, no immigrant background); and Diana (female, 16 years, no immigrant background). According to their main teacher, these students demonstrated respectable text-production skills. Besides, they were all very motivated to take part in the study.

As opposed to the tutors, who had never experienced severe performance problems, all four tutees (Aleyna, Bea, Clara, Daria) had been officially diagnosed with an LD, mainly in math. Even though their teacher indicated that the tutees' text-production skills were far from outstanding, they demonstrated adequate spelling skills and were able to write simple stories.

The tutee working with Aida was Aleyna. She had no immigrant background and was 18 years old at the time of the study. Her HI made it necessary for her to wear hearing aids on both ears. Bea (female, 17 years old) worked with Ben. Her parents moved to Germany from Morocco before she was born. In her home, everyone spoke Arabic. Bea wore hearing aids on both sides. Clara (female, 17 years old, working with Chris) did not have a migration background. She wore a cochlear implant on her left ear, because it was completely deaf. With her right ear, she could hear a little with the help of a hearing aid. The last tutee, Daria (female), working with Diana, was 15 years old at the time of the experiment and the daughter of Turkish parents. The only language spoken at her home was Turkish. Daria had a hearing aid on one ear and a cochlea implant on the other.

1 The names of all tutors and tutees have been changed to maintain confidentiality.

Dependent Variables and Measurement

We used 12 persuasive writing prompts to capture the ability of the tutees to produce texts that present reasons and examples to influence action or thought: (a) Should school start at 11 am? (b) Should all German students attend school in England for half a year? (c) Should girls and boys be taught separately? (d) Should attending school until 4 pm be mandatory? (e) Should all homework be abolished? (f) Should summer vacation last for three months? (g) Should students be entitled to pick their teachers? (h) Should school uniforms be obligatory? (i) Should students have a say in what is taught in school? (j) Should a whole school day be dedicated to physical education each week? (k) Should students be allowed to decide where they want to sit in class? (l) Should there be exams and tests in school?

The prompts were printed on paper strips and handed out randomly to tutees, making sure that no one received the same question twice. Students had available as much note paper as they needed and were allowed to take as much time as they wanted to produce their texts. A specific rubric was applied to assess the quality of what the tutees wrote (available from the authors upon request). It contained 14 categories focusing on structure (e.g., “The text contains a comprehensible conclusion”); content (e.g., “The counter-arguments against the proposition expressed in the prompt are convincing”); and language (e.g., “The text is lexically rich”). Each item was rated on a scale from 0 to 3. Thus, scores could vary between 0 and 42. The rubric provided detailed explanations for each quality level of the spectrum.

All the texts produced by the tutees were evaluated by a graduate student, who had been extensively instructed on how to apply the instrument by the second author during two one-hour training sessions. She did not know which text was written by which tutee at what time. To ensure reliability of the results, a random 50% of all texts were independently rated by a male research assistant. Spearman’s rank correlation coefficient equaled 0.84 ($p < .01$). Thus, the scoring of the female graduate student were considered sufficiently reliable, and used as the basis for assessing the quality of the texts.

Experimental Design and Procedure

A multiple-baseline design across subjects (see Horner & Odom, 2014) was used to evaluate the effects of the training. The phases of the experiment extended over a period of 12 school days with 12 measurements. Baseline data collection with the four tutees began at the same time. However, introduction of the intervention was staggered to control for history and maturation. Aleyna’s training started after the fourth measuring point, Bea’s after the fifth, Clara’s after the sixth, and Daria’s after the seventh. Thus, Aleyna’s intervention consisted of eight sessions, Bea’s of seven, Clara’s of six, and Daria’s of five.

In order to guide the tutors through the lessons and provide them with reminders of what to do during the process, we prepared a six-page script containing brief instructions and mnemonics in large print (available from the authors upon request). In addition, prior to the start of the study, the graduate student conducted a training on the components of the instructional framework with Aida, Ben, Chris, and Diana, consisting of four one-hour sessions. She familiarized them with the script and encouraged them to refer to it frequently during the intervention.

A female supply teacher (capable of speaking sign language) took the tutees and their tutors to a resource room in the school every day of the study. The room was only occupied by one team and the supply teacher at a time. During baseline, Aleyna, Bea, Clara, and Daria were just asked to write a text. While the intervention was running, they participated in a 30-minute training session on the FIX strategy before the measurement. The time window during which the intervention and the assessment took place varied each day. To ensure fidelity of the treatment and to provide help whenever necessary, the supply teacher sat right next to the teams and intervened if needed.

Our intervention mirrored very closely the procedures described by Sherman and De La Paz (2015). In the first lesson (step 1 of SRSD), the tutors told their respective tutee the essence of what constitutes a persuasive essay. That is, they explained that it starts with an introduction in which the thesis of an argument is outlined, followed by about three points that support the writer's position using evidence to substantiate it. In the conclusion, the argument is summarized, tying together the writer's ideas and restating the thesis. Further, the text should end with a sentence that leaves the reader with something to think about. Tutors provided their tutees with a short sample essay of 150 words and pointed out the aforementioned features. In closing, they provided a general overview of the three steps in FIX (see above).

During the second session (steps 2 and 3 of SRSD), three different kinds of cards were introduced, representing the three actions someone needs to take when applying the strategy: Red indicates that students are supposed to stop and zoom in on essay elements, yellow prompts them to rethink if what they wrote fits their intention, and green is used to trigger them to execute changes in response to specific problems. During the assessment, the tutors used the cards to go through the texts the tutees had written the day before to identify strengths and weaknesses. They then encouraged the tutees to review the three steps when producing the next text during progress monitoring.

In the third lesson (steps 4 and 5 of SRSD), the tutors asked the tutees to recall and explain the steps in FIX. They also invited them to illustrate the meaning of the three cards. Subsequently, the tutors scaffolded the tutees through the process of reviewing the essay they had written the previous day.

They provided encouraging feedback and praised them for any comment or statement indicating that they had caught on to the strategy.

The purpose of the fourth and all following sessions (step 6 of SRSD) was to instruct and support the tutees in revising their texts independently while consulting the three cards. Again, the essay they had written on the day prior to a respective lesson was analyzed and edited. Tutors provided encouragement and support whenever tutees got stuck.

Even though the intervention was set up in a peer-tutoring format, the supply teacher had to step in several times during each session to help with the instruction and to make sure that the procedure followed the script. However, the main part of the training was always left up to the tutors.

RESULTS

Figure 1 presents the total number of points allocated to each of the tutees' essays over the course of the study.

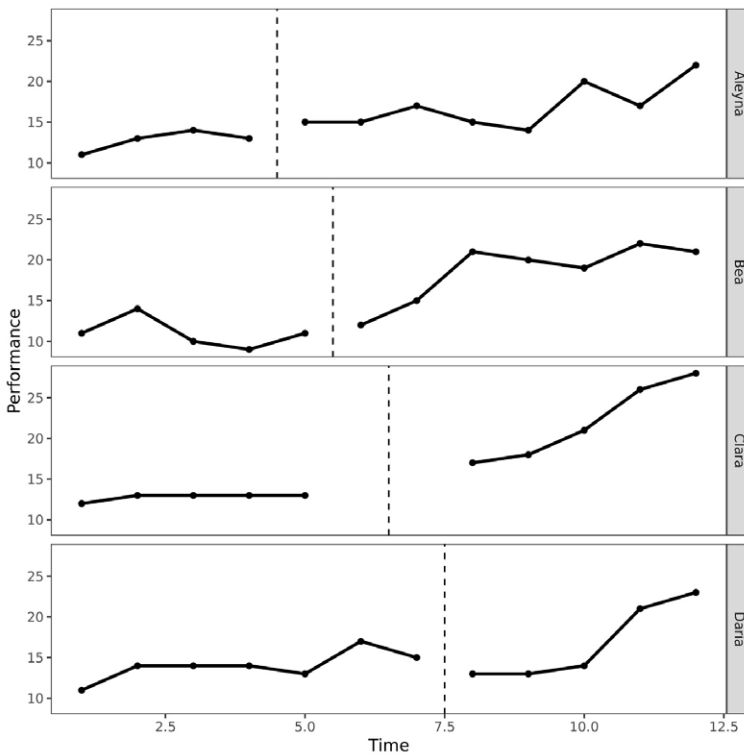


Figure 1. Quality scores for the four tutees in phases A and B.

As illustrated, all tutees increased their performance in the treatment phase. That is, whereas they showed little or no improvement during baseline, their scores improved following introduction of the intervention. However, the gains were not overly impressive. In the case of Daria, only the last two measurements indicated a treatment effect. Table 1 contains all information about the raw scores (as noted, two data points are missing for Clara, who was sick for two days).

Table 1. Raw Scores for the Four Tutees per Phase

Student		Phase A	Phase B
Aleyna	<i>N</i> (Probes)	4	8
	Raw Scores	11; 13; 14; 13;	15; 15; 17; 15; 14; 20; 17; 22;
Bea	<i>N</i> (Probes)	5	7
	Raw Scores	11; 14; 10; 9; 11;	12; 15; 21; 20; 19; 22; 21;
Clara	<i>N</i> (Probes)	6	6
	Raw Scores	12; 13; 13; 13; 13; -/-;	-/-; 17; 18; 21; 26; 28;
Daria	<i>N</i> (Probes)	7	5
	Raw Scores	11; 14; 14; 14; 13; 17; 15;	13; 13; 14; 21; 23;

In all cases, both the mean and the median of the intervention scores exceeded baseline scores. All relevant descriptive data are presented in Table 2.

Table 2. Descriptive Statistics for the Four Tutees per Phase

Student		Phase A	Phase B
Aleyna	Minimum	11	14
	Maximum	14	22
	Median	13.00	16.00
	Mean	12.75	16.88
	<i>SD</i>	1.26	2.80
	Trend	0.70	0.80
Bea	Minimum	9	12
	Maximum	14	22
	Median	11.00	20.00
	Mean	11.00	18.57
	<i>SD</i>	1.87	3.69
	Trend	-0.50	1.39
Clara	Minimum	12	17
	Maximum	13	28
	Median	13.00	21.00
	Mean	12.80	22.00
	<i>SD</i>	0.45	4.85
	Trend	0.20	3.00
Daria	Minimum	11	13
	Maximum	13	17
	Median	14.00	14.00
	Mean	14.00	16.80
	<i>SD</i>	1.83	4.82
	Trend	0.61	2.80

We first tested the mean baseline difference (MBLD; O'Brien & Repp, 1990). Results showed that Clara benefited the most from the training, with an average increase of 71.88% from baseline to intervention. Bea also profited from the treatment to a remarkable extent (MBLD = 68.82). On the other hand, improvement for Aleyna (MBLD = 32.39%) and Daria (MBLD = 20.00%) did not reach an equally distinct magnitude.

The next step in the analysis involved calculating some of the most common non-overlap effect sizes: percentage of non-overlapping data (PND), percentage of all non-overlapping data (PAND), non-overlap of all pairs (NAP),

and percentage of data points exceeding the median (PEM) (Parker, Vannest, & Davis, 2011; see Table 3). Except for Daria, all indices suggested a considerable increase in performance from baseline to intervention. Again, Clara demonstrated the clearest treatment gains with all non-overlap effect sizes reaching the maximum value of 100 (see Table 3).

Table 3. Effect Sizes for the Four Tutees

	PND	PAND	NAP	PEM
Aleyna	87.50	91.67	98.44	100
Bea	85.71	83.33	97.14	100
Clara	100	100	100	100
Daria	40.00	50.00	58.57	40.00

Finally, we calculated Tau-U for each tutee and a weighted, across-case Tau-U using an online calculator (Vannest, Parker, & Gonen, 2011). For Aleyna, Tau-U equaled 0.97 ($z = 2.63$; $p < .01$); for Bea it equaled 0.94 ($z = 2.68$; $p < .01$); for Clara it equaled 1.00 ($z = 2.61$; $p < .01$); and for Daria it equaled 0.17 ($z = 0.49$; $p = .63$). For all tutees except Daria, a Tau-U greater than 0.85 was obtained, which is considered a strong effect (Parker & Vannest, 2009). The weighted Tau-U across the four participants was statistically significant at the 0.1% level, equaling 0.76 ($z = 4.20$). However, the value fell below 0.85, and thus represented only a medium effect.

DISCUSSION

Main Findings

The primary research question asked how well the FIX strategy was able to enhance the ability of 10th graders with LD and HI when applied in a peer-tutorial setting. Our results give reason for optimism. Even though the training effects were modest, they were not insignificant. Mean treatment gains varied between 20.00 and 71.88%. The percentages of the non-overlap indices (PND, PAND, NAP, and PEM) for all but one tutee ranged at least in the 80s, with six of them reaching the maximum of 100.

The Tau-U statistics were significant (except for Daria), indicating distinct changes in level and monotonic trend between phases A and B. Moreover, the weighted aggregated Tau-U for all four cases suggested that the probability of the differences between baseline and intervention scores being due to chance was less than 0.1%. This can be considered a solid argument for the potency of the treatment.

As a side note, all four tutees commented to both the graduate student and the supply teacher after the last session that they enjoyed the lessons very much. They appeared proud of their achievements and regretted that the training had to come to an end. In addition, they all claimed that they would continue to use the FIX strategy when having to write essays aimed at convincing the reader of an idea. This feedback was not captured in a structured form, and can thus only be considered a vague indication of the experiment's social validity.

Limitations

The study was designed as a single-case analysis with only four peer-tutoring pairs. Thus, the representativeness of the findings is even more in question than if we had conducted a well-founded group experiment. Further studies are needed to substantiate our claims, therefore. Another limitation pertains to the characteristics of our sample. All participants attended the same class in the same school. Future experiments need to include subjects from a wider range of geographical areas, age groups, ethnic backgrounds, skill levels, and so on.

Further, the maintenance effects of the intervention were not tested as the study was conducted as a multiple-baseline design with AB phases without any follow-up measurements. In addition, we did not use checklists to ensure treatment fidelity and did not determine the social validity of the study in any structured manner. Upcoming school holidays did not allow us to adhere to the standards recommended by Ganz and Ayres (2018) to collect maintenance data at least three times and at least four weeks following the cessation of the intervention phase for each level, participant, and condition. Although no treatment fidelity checklist was used, we are confident that the training was implemented as intended due to our script, the briefing sessions, and the supply teacher monitoring each session. While we could have captured the perception of the acceptability of our intervention by the tutees in a more methodical manner, their informal feedback allows us to make a cautious case for the social validity of the research.

Even though the study evaluated the effects of a peer-tutoring intervention, an adult was present at each session and interfered whenever deemed necessary. Under conditions of everyday life at school, it is impossible to have a grownup sit by each student pair all the time. Thus, the question remains to what extent the students would have been able to conduct the training independently. A final limitation pertains to our writing rubric. We used a self-made tool for lack of a better alternative. However, an existing instrument might have been more reliable, as self-made rubrics often yield more positive results than established ones.

All in all, our study clearly has its weaknesses. But doing research with students in an educational setting is always messy. In fact, in their comprehensive meta-analysis of 14 single-case experiments on the effects of writing inter-

ventions for students with LD, Cook and Bennett (2014) stated: “After evaluating all requirements for WWC single-case design standards, none of the 14 studies were considered to meet evidence standards for design” (p. 350). This is not meant as an excuse. Yet, it is important to acknowledge that it is virtually impossible to create a flawless study.

Practical Implications and Recommendations for Future Research

Writing persuasive essays is very demanding, and supporting students with both LD and HI in improving their skills in this area is challenging. Against this background, it is remarkable that our intervention, which comprised only a small number of lessons (five to eight), elicited at least moderate increases in the performance of our tutees. Even Daria’s results are noteworthy. Of her seven texts produced during baseline, only one received more than 15 points. On the other hand, her last two essays received 21 and 23, respectively.

It seems to take a while before the effects emerge. However, our approach offers great possibilities for enhancing the persuasive essay writing skills of high-risk students with LD and HI. The findings of our study indicate that the FIX strategy taught through peer tutoring is promising in this respect. Thus, the basic message of our research is that pursuing goals as ambitious as fostering very demanding composition abilities in adolescents with multiple impairments using limited resources can be successful.

Our study is the first of its kind. As a result, the findings must be replicated several times before reliable statements about the effectiveness of a peer-tutoring intervention via FIX for students with LD and HI can be made. In addition, given that it took a while before the effects of the training became visible, prospective research should provide participants with more time to learn how to apply the skills in question. Finally, it would be interesting to find out to what extent not only the tutees, but also the tutors benefit from the training. In closing, we hope that the FIX approach will receive more attention in the future as a means of detecting how best to support students in their endeavor to acquire the vital skill of persuasive essay writing.

REFERENCES

- Cook, K. B., & Bennett, K. E. (2014). Writing interventions for high school students with disabilities: A review of single-case design studies. *Remedial and Special Education, 35*, 344–355.
- Crowhurst, M. (1990). Teaching and learning the writing of persuasive/argumentative discourse. *Canadian Journal of Education, 15*, 348–359.
- Datchuk, S. M., & Kubina, R. (2012). A review of teaching sentence-level writing skills to students with writings difficulties and learning disabilities. *Remedial and Special Education, 34*, 180–192.
- Datchuk, S. M., & Kubina, R. M. (2015). Effects of sentence-combining instruction and frequency building to a performance criterion on adolescents with difficulty constructing sentences. *Journal of Evidence-Based Practices for Schools, 14*, 160–185.

- Easterbrooks, S. R., & Stoner, M. (2006). Using a visual tool to increase adjectives in the written language of students who are deaf or hard of hearing. *Communication Disorders Quarterly, 27*, 95–109.
- Ennis, R. P., Jolivette, K., & Boden, L. (2013). STOP and DARE: Self-regulated strategy development for persuasive writing with elementary students with E/BD in a residential facility. *Education and Treatment of Children, 36*, 81–99.
- Erickson, J. (2005). *The art of persuasion: How to influence people and get what you want*. London, UK: Hodder & Stoughton.
- Fuchs, D., Fuchs, L. S., Mathes, P. G., & Simmons, D. C. (1997). Peer-assisted learning strategies: Making classrooms more responsive to diversity. *American Educational Research Journal, 34*, 174–206.
- Ganz, J. B., & Ayres, K. M. (2018). Methodological standards in single-case experimental design: Raising the bar. *Research in Developmental Disabilities, 79*, 3–9.
- Gillespie, A., & Graham, S. (2014). A meta-analysis of writing interventions for students with learning disabilities. *Exceptional Children, 4*, 454–473.
- Gillespie Rouse, A., & Sandoval, A. (2018). Writing interventions for students with learning disabilities: Characteristics of recent research. *Learning Disabilities: A Multidisciplinary Journal, 23*, 1–17.
- Graham, S., Collins, A., A., & Rigby-Wills, H. (2017). Writing characteristics of students with learning disabilities and typically achieving peers: A meta-analysis. *Exceptional Children, 83*, 199–218.
- Graham, S., & Harris, K. R. (1996). Self-regulation and strategy instruction for students who find writing and learning challenging. In C. M. Levy & S. Ransdell (Eds.), *The science of writing: Theories, methods, individual differences, and applications* (pp. 347–360). Hillsdale, NJ: Lawrence Erlbaum.
- Graham, S., & Harris, K. R. (2003). Students with learning disabilities and the process of writing: A meta-analysis of SRSD studies. In L. Swanson, K. Harris, & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 383–402). New York, NY: Guilford.
- Graham, S., Harris, K. R., Fishman, E., Houston, J., Wijekumar, K., Lei, P.-W., & Ray, A. B. (2019). Writing skills, knowledge, motivation, and strategic behavior predict students' persuasive writing performance in the context of robust writing instruction. *Elementary School Journal, 119*, 487–510.
- Harris, K. R., & Graham, S. (1996). *Making the writing process work: Strategies for composition and self-regulation*. Cambridge, MA: Brookline Books.
- Horner, R. H., & Odom, S. L. (2014). Constructing single-case research designs: Logic and options. In T. R. Kratochwill & J. R. Levin (Eds.), *Single-case intervention research: Methodological and statistical advances* (pp. 27–51). Washington, DC: American Psychological Association.
- Little, A. M., Lane, K. L., Harris, K., Graham, S., Story, M., & Sandmel, K. (2010). Self-regulated strategies development for persuasive writing in tandem with schoolwide positive behavioral support: Effects for second-grade students with behavioral and writing difficulties. *Behavioral Disorders, 35*, 157–179.
- Mason, L. H., Harris, K. R., & Graham, S. (2011). Self-regulated strategy development for students with writing difficulties. *Theory in Practice, 50*, 20–27.
- Naff, C. F. (2010). *Deafness and hearing impairment*. New York, NY: Greenhaven.
- National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). *Common core state standards*. Washington, DC: Authors.
- O'Brien, S., & Repp, A. C. (1990). Reinforcement-based reductive procedures: A review of 20 years of their use with persons with severe or profound retardation. *Journal of the Association for Persons with Severe Handicaps, 15*, 148–159.

- Parker, R. I., & Vannest, K. J. (2009). An improved effect size for single-case research: Non-overlap of all pairs. *Behavior Therapy, 40*, 357–367.
- Parker, R. I., Vannest, K. J., & Davis, J. L. (2011). Effect size in single-case research: A review of nine non-overlap techniques. *Behavior Modification, 35*, 302–322.
- Rogers, L. A., & Graham, S. (2008). A meta-analysis of single subject design writing intervention research. *Journal of Educational Psychology, 100*, 879–906.
- Sherman, C. K., & De La Paz, S. (2015). FIX: A strategic approach to writing and revision for students with learning disabilities. *Teaching Exceptional Children, 48*, 93–101.
- Shora, N., & Hott, B. L. (2016). Write on! Using the POW-TREE strategy to teach persuasive writing to students with emotional or behavioral disorders. *Beyond Behavior, 26*, 14–22.
- Slater, A. E. (2016). *Educating students with hearing and visual impairments*. Horsham, PA: LPR.
- Strassman, B. K., & Schirmer, B. (2013). Teaching writing to deaf students: Does research offer evidence for practice? *Remedial and Special Education, 34*, 166–179.
- Vannest, K. J., Parker, R. I., & Gonen, O. (2011). *Single case research: Web based calculators for SCR analysis (Version 1.0)* [Web-based application]. College Station, TX: Texas A&M University.
- Vostal, B. R., & Ward, M. S. (2015). Adapting self-regulated strategy development in persuasive writing for adolescents who are deaf or hard of hearing. *The Clearing House, 88*, 161–165.

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