



Through the Looking Glass: Reflections of a Writing Scholar

Steve Graham



“He’s dead. He’s dead. He’s dead,” These are the first words I remember. I did not know the little girl broadcasting my demise or the man and woman who drove me to the hospital. Later, I discovered they were my Sister, Father, and Mother.

The doctors were unable to identify my would-be assassin, but my Dad flushed him out. You could never stop my Dad. He scoured the bathroom where they found me unconscious, and eliminated one possibility after another. The culprit turned out to be an almost odorless and invisible gas, leaking slowly but steadily from a hot water heater in the bathroom of the old farmhouse in a small French village where we lived.

I never regained the memories lost. I still knew how to do things like throw a baseball, talk like there was no tomorrow, and count to 100, but I could not remember staying at Grandma’s house, starting first

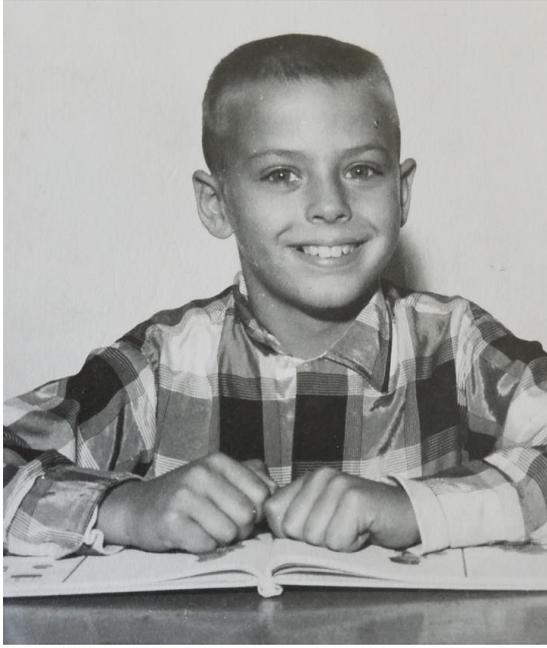
grade in Arizona six months earlier, or the house my Father built in Wichita, Kansas.

I sometimes wonder what changes my silent assailant gave rise to. My first four years of school were not easy for anyone, especially for my teachers. A consistent and constant mantra took form. “He can’t sit still. He can’t keep his hands off of others. He won’t be quiet.” I was everywhere at once, with an abundance of energy that refused to be restrained.

The easy explanation for my unbridled behaviors is that the vapors my body absorbed played havoc with my ability to control my actions. The easy explanation can be satisfying, but it is not always right. My exuberance and lack of control were most likely a consequence of heredity. My Father, my Daughter, my Sister’s only Son acted much like I did when they were little. If I gave voice to our nemesis, you would know him as ADHD.

Whatever the cause of my early challenges, I embrace and I thank them. They provided direction. At the age of 23, my past, present, and future coalesced. I decided to become a teacher and work with children who found school challenging. I knew I could make a difference as a teacher. I had evidence. I had proof. In a rural school in New Mexico, a fifth-grade teacher, Mr. Robinson, turned my school life around.

Later, as I ventured into the realm of research and scholarship, my past shaded each step I took. My intellectual interests revolved around writing and its development, but it rarely traveled far from my childhood opponent, self-regulation. My traveling companion was the spirit of my Father, a mechanic and jack-of-all trades. He



Steve Graham, fifth grade in New Mexico

confidently tackled all problems set in front of him. His shadow was a constant reminder to invest the mental capital I acquired to solve real world problems. William Faulkner's famous observation suited me quite well: "The past is never dead. It is not even the past."

The *Acquired Wisdom* series provides veteran academics, like myself, a soapbox from which to brandish their accomplishments, failures, and lessons they presumably learned. It can be foolish and maybe a tad dangerous to offer an old dog a platform from which to bark. But here we are. I will try my best not to be dangerous. I make no promises about folly and banality.

Start at the Beginning

In the 1951 movie, *Alice in Wonderland*, the March Hare and the Mad Hatter give advice about how to tell a story – simply put: "Start at the beginning."¹ So here we go. (Hopefully the folly meter is not ticking upward yet.)

On the Line: Act One.

My story, or at least this part of it, starts just north of the Georgia-Florida line. I was

studiously avoiding the Vietnam War as a full-time student at Valdosta State College majoring in history with an overly active fascination with the French Revolution, the revolutions of 1848, the Chartist movement, and the Wobblies. Sounds pretty straightforward. What could go wrong? Well, I failed a French course (yes, I had lived in France) and a composition course (yes, I eventually decided to study writing). No problem, I switched my major to education with a minor in history, taking the foreign language courses out of the picture. I didn't learn much in the Education courses, but in my last semester of college I started my student teaching assignment.

At that time, there were only two high schools in Valdosta, Georgia. I was assigned to the county high school. Four years earlier, I had been a student there. As I plied my trade as a student teacher, I held an early evening job at a dining hall where I worked with some of my students. I also knew many of the kids in my classes as they were younger siblings of former classmates. Three days into my practicum, my cooperating teacher disappeared to work on his master's thesis. While these peculiarities presented some challenges, it was just fine with me. I was in charge with no one looking over my shoulder.

At that time, in this particular place, students were tracked into advanced and less advanced history classes. My three "less advanced" classes were especially interesting. Most of the students could not read the textbook, and I had no clue as to how to help them do so. I told them to leave the text in their locker, and we proceeded to learn history orally, through films, enactments, and discussion. I recognize now that I could have done so much more.

My student teaching experience also strengthened my concerns about racial inequities. My family moved to Georgia in 1966. Whites only signs were still evident at bathrooms, water fountains, and

¹ This advice was not present in the book.

laundromats. I grew up on military bases in the United States and Europe. I had never seen anything like this. While I was not blind to social and racial injustices, I was stunned by how blatant this was. It was unmistakable. You had to be willfully ignorant or purposefully blind to miss it. At the school where I was a student teacher, the Principal delighted in telling stories at school assemblies about Black people using the “N” word. My Black students and their families were bullied and mistreated by the local police. As far as I could determine, every Black student in my class lived in a shack. My sister reacted so strongly to these inequities that she found a way to move beyond them. She eloped at 16, moving to Guam a month later.

California Dreaming: Act 2.

It may come as no surprise that at the end of my four-year college tenure, I decided to move. Georgia was the first place I called home, as I had never lived anywhere for more than three years. But act one of my story was over.

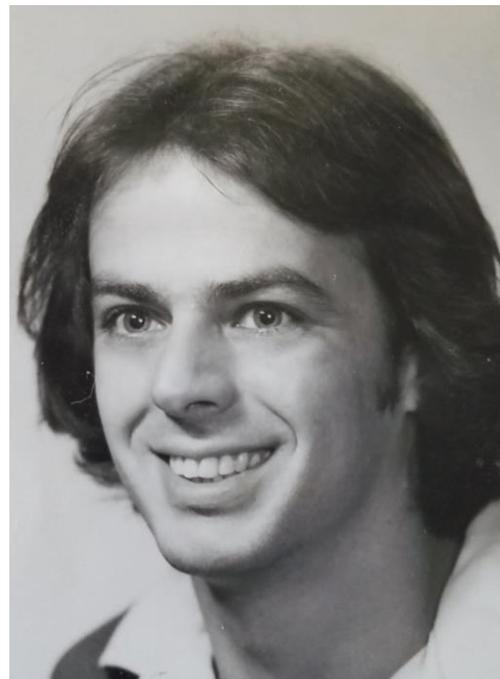
I did not know what I wanted to do (a narrative for many 21-year-olds), but I knew I needed to journey outward to start the next chapter in my life. With two friends, I headed to California – the land of free speech, progressive ideas, and beaches. It took us a month, visiting State and National Parks across the US, before we reached California. My two friends stuck around for several days before we parted ways at an Interstate exit in the desert near Barstow. Despite a college education, I was unsuccessful at finding a job. I even tried working as a farm hand, something I had done before, but to no avail. So I returned to an earlier passion, something I had taken up when I was 14 and 15 in France. I spent the next six months hitchhiking.

I crisscrossed the US on the Southern and Northern routes, I traveled up and down the East and West coasts. I crossed the middle of the country, traveling major arteries and local roads. Some rides lasted less than a mile, others crossed multiple

states. I visited my grandparents at their small berry farm twice in Arkansas. I connected with like-minded friends in Georgia to travel to Miami to protest Nixon’s inauguration at the Republican Convention. I landed in jail in Richmond, Virginia for trying to catch a ride. Then, I ended up in New York City, as the Richmond police took what little monies I had, bought a bus ticket, and shipped me up North.

Kansas and Beyond: Act Three.

While I enjoyed my time in New York City, I eventually came to realize I still had no clue as to where my life was headed. I returned home to Georgia and took a job working with an outfit that sold mobile homes. I set up trailers once they were sold and made minor repairs to them if something went wrong. I enjoyed the physical aspects of the work, but within six months I was bored stiff. Thank God for boredom. I finally saw my path forward.



Special education teacher, Valdosta, GA

I put this newfound clarity into motion by visiting the School of Education at Valdosta State College. I introduced myself to the secretary in the Dean’s office saying, “I want to work with kids who have difficulty learning. Is there anyone I can talk

to?” It was my lucky day. They had just hired a newly minted Assistant Professor, Dr. Lamoine Miller, in special education from the University of Kansas. I talked to him for about an hour, and he offered me a graduate assistantship. Then, and to this day, I still can’t believe he took such a chance on a very raw young man. When I stepped into his office, I wore a tank top, blue jeans with patches all over them, and no shoes.

Lamoine’s influence reverberates in everything I do. I had been slowly drifting towards mysticism, but he reintroduced me to the scientific method and the importance of verification. I had lacked the tools needed to teach my high school history students to read, Lamoine provided me with an introduction to scientifically supported methods for teaching younger and older students to read. Even though I was the first person in my family to attend college, Lamoine encouraged me to go further and pursue a doctoral degree. His advisor at the University of Kansas, Dr. Floyd Hudson, became my advisor.

This brings us to the close of the third act of this particular story. The journey to this point provided the foundation for my eventual research and scholarship in writing. I learned several valuable lessons. Devote yourself to work that is personally meaningful. Make a difference in the life of others. Beware of inequalities and fight against them. Learn from others. These are time-honored lessons, and they assume

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different forms for those who discover and abide by them. In my case, I moved out into the broader world with the goal of working with children who experienced problems in

school like I did, making a positive difference in their success in school and beyond, focusing my efforts on children and families that were marginalized, and learning as much as I could from others about how to do this effectively.

While I am certain I did not meet each of these goals with every new project, they provided a guiding star, illuminating the path ahead. Such touchstones provide anchors, helping us remember who we are and what we hope to accomplish.

Go Long, Go Deep

“Go long” and “Go deep” are directives in American football to throw a long pass down field in the hopes of gaining considerable yardage or scoring a touchdown. They should be imperatives for scholarship as well.

Even so, my scholarship did not initially go long or deep. My dissertation compared the oral reading miscues made by children with learning disabilities (LD) and their typically developing peers. There were two groups of typically developing readers. One group was younger and read at the same reading level as the students with LD, whereas the other group was at the same age but better readers. These two groups provided age- and skill-level benchmarks for interpreting the miscues made by students with LD. Not surprisingly, students with LD made more oral reading miscues than their peers, as they find reading challenging (Graham, 1980).

After passing my dissertation defense, one of my Committee members, Dr. Anita Sundbye, privately and politely told me, “You can do better than this.” She was right. This study was a small brick in a wall of 80 or so miscue analyses studies in reading already conducted. I realized my knowledge of reading research was not deep enough for me to conduct studies that made new and important differences. That was OK, as I was pretty sure that I was not the first and surely not the last young scholar to come to this realization.

I danced and wrestled with Dr Sundbye's comments over the summer, realizing I was still interested in reading, but passionate about writing. As a doctoral student, I had to write papers and craft articles for publication. I became increasingly interested in the process of writing. I began reading interviews with famous writers, such as Steinbeck and Hemmingway, to get a handle on how they wrote. I also recognized that virtually no one was conducting writing research with students with special needs. Writing had my name written all over it!

A suitable response to my newfound interest might be "Good for you," but this shift presented a formidable challenge. I was a new non-tenured Assistant Professor at Auburn University, teaching 18 hours a week and directing a grant designed to help general education teachers teach students with special needs, while simultaneously trying to learn more about my newfound interest. I took the advice of football pundits and went deep. I conducted three comprehensive reviews of the literature to gain a solid grounding in writing research. Each of these reviews began with the earliest research conducted then canvassed the area broadly, providing my audience (and me) with a historical accounting as well as a bird's eye view of critical issues in writing. One review focused on writing broadly (Graham, 1982), and the other two reviews centered on handwriting (Graham & Miller, 1980) and spelling specifically (Graham & Miller, 1979). Each review included a summary of the research conducted with students with special needs.

I also went long. I spent the next 42 years of my life focused on writing. I am not recommending this is the best path for all scholars. My friend and former colleague, Michael Pressley, made seminal contributions in

multiple fields, switching his focus at least three times in a life cut short by cancer (see Graham & Harris, 2008).

For me, going long captured each point in the Greek poet Archilochus's observation, "The fox knows many things, but the hedgehog knows one big thing." As I studied writing over four decades, I became the fox – I knew many things about writing. I also became a bevy of hedgehogs – I knew a lot about the different aspects of writing I studied intensely.

A Sailor Lost at Sea

Blind Sailing.

I mostly view myself as an applied researcher. I work with others to design and test the effectiveness of interventions for improving the writing of students with and without disabilities (e.g., Graham et al., 2002; Harris et al., 2006; Saddler & Graham, 2005). Even when I conduct more basic research to determine how writing operates and develops (e.g., Gillespie et al., 2013; Graham et al., 1993; Graham et al., 2019), it is always with an eye towards practice. Even so, I agree with the philosopher, Immanuel Kant, "Experience without theory is blind..." and Leonardo da Vinci's observation: "He who loves practice without theory is like the sailor who boards a ship without a rudder and compass and never knows where he may cast."

Accordingly, designing interventions without theoretical insight is like sailing blind.

While at Auburn University, I met my future wife and closest colleague, Karen Harris. When we moved to Purdue University in 1982, we considered how to bring our two areas of

academic interest together. She was an avowed "theory junky", especially interested at that time in the work of Donald Meichenbaum (1977). Don had developed an instructional approach based on both cognitive and behavioral theories.

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We made a pact. Karen would design an instructional approach that drew on multiple theories (cognitive, behavioral, social construction, and motivation), including theories and research conducted by Meichenbaum on cognitive-behavior modification; Vygotsky, Luria, and Sokolov on self-regulation and the development of the human mind; Deshler and Schumaker on cognitive strategies instruction; and Brown and Campione on self-control, metacognition, and strategy instruction (see Harris & Graham, 1992a). I had the easiest part of the pact. I would design task-specific strategies that students could use to carry out effectively one or more writing processes (e.g., planning a story). These strategies would be taught using Karen's model, which was initially named, Self-Control Strategy Training (Harris & Graham, 1985), but was later renamed as Self-Regulated Strategy Development (SRSD; Harris & Graham, 1992b).



Karen and Steve

SRSD applies a gradual release model where teachers first familiarize students with the purpose and benefits of the task-specific strategies to be taught as well as the knowledge needed to use these strategies successfully (Harris et al., 2008). The teacher then models how to apply the strategies along with self-regulation procedures (e.g., goal setting, self-assessment, self-instructions, and self-reinforcement) that students use to manage the task-specific strategies, the writing process, and students' behaviors. Students apply the strategies and self-regulation procedures with teacher and peers' assistance until they can successfully and effectively apply them on their own. As they use the strategies and self-regulation

procedures, they monitor and graph their performance to make their progress visible. Special emphasis is placed on the role of effort and strategy use as explanations for students' progress. SRSD is discussion rich and based on mastery learning principles (although this last feature is not always followed in SRSD research conducted by others). Procedures for promoting maintenance and generalization are woven throughout the instructional model. SRSD is designed to help students become more strategic, knowledgeable, and motivated writers.

Initially, SRSD was applied and tested as a teaching tool with students with LD. In the first study (Harris & Graham, 1985), students with LD were taught genre- and task-specific strategies for brainstorming possible ideas for a story by generating action words, describing words, and action helpers to use in their narrative. In our second study (Graham & Harris, 1989), students with LD were taught a genre- and task-specific strategy for generating possible story content by brainstorming ideas using the basic building blocks of a story (e.g., elements of the setting and story episodes). In subsequent studies, investigations moved to informative (e.g., Collins et al., 2020; MacArthur et al., 1996) and persuasive writing (e.g., Kihara et al., 2012), revision (e.g., MacArthur et al., 1995), students with other special needs (e.g., Lane et al., 2011), students without special needs (e.g., Harris et al., 2012), and reading (e.g., Mason, 2006), reading and writing together (Harris et al., 2019), math (e.g., Case et al., 1992), and social studies (e.g., De La Paz, 2005). We also began to conduct component analyses to determine which aspects of SRSD contributed to students' success (e.g., Danoff et al., 1993; Sawyer et al., 1992), and to test the effectiveness of a practice-based model of professional development for delivering SRSD instruction to teachers and schools (e.g., Harris et al., 2015).

I describe SRSD here to illustrate the value of using theory as a guide to developing instructional practices. We

anticipated that a theory-driven and theory-designed instructional approach would be singularly effective. This proved to be the case, as SRSD obtained the largest effect sizes of any writing approach currently tested in four or more intervention studies (see Graham, Harris, & Santangelo, 2015; Graham et al., 2012; Graham & Perin, 2007a; Rogers & Graham, 2008). It is also the most empirically tested writing intervention to date amassing somewhere between 100 and 150 studies by researchers in countries across the globe (e.g., Glaser & Burnstein, 2007; Limpo & Alves, 2013). Independent investigations such as these have obtained even larger effects for SRSD than we have in the studies we or our students conducted (Graham et al., 2013).

Mind Sailing.

Immanuel Kant's thesis, "Experience without theory is blind" was succeeded by a second proposition: "Theory without experience is mere intellectual play." If we apply this to Leonardo da Vinci's observation about theory and practice above, we obtain the following: "He who loves theory without practice is like the sailor who boards a ship with no practice or certainty of how a rudder and compass operate and may not successfully pilot the boat." Accordingly, proposing theories without testing them is like mind sailing. It may fully capture the experience or lead to a wreck on the shoals. This disconnect is captured in a muddled observation by the late baseball player and coach Yogi Berra: "In theory there is no difference between theory and practice. In practice there is."

It is especially important to test the theories we use to anchor our thinking, research, and educational practices. It is an intellectual crime to blindly assume theories are correct. Consider the scientific theory that Mark Russell, the political satirist, indicates he likes best, "The rings of Saturn are composed entirely of lost airline luggage." Probably no need to test this one. In contrast, a theory promoted by some literacy experts that writing develops naturally and is best learned through real use

in meaningful and authentic contexts (e.g., Beregron, 1990; Goodman, 1992) must be tested. I don't disagree that context is important (see Graham, 2018a, 2018b), but it does not necessarily follow that learning to write can be as natural and effortless as learning to speak (Graham & Harris, 1997).

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One venue through which my colleagues and I tested the veracity of the natural learning approach was to focus on the acquisition of English spelling. This is a complex skill, as the same sound can be represented by multiple letters (Seymour et al., 2003). As a result, I conducted a review (Graham, 2000) to examine children's acquisition of spelling using incidental methods of learning which include learning how to spell (1) through acts of reading and writing, (2) as an indirect result of teaching reading, and (3) via informal methods of spelling instruction (e.g., capitalizing on teachable moments). My review provided support for the contention that spelling growth can occur in the absence of formal instruction and students can learn new spellings through reading and writing as well as reading instruction. There were a number of qualifications to these findings though. Growth in the absence of formal instruction was evident only for very young students, children with weaker literacy skills acquired fewer new spellings, and incidental methods were not strong enough to ensure students became good spellers.

In a subsequent review, we conducted a meta-analysis to determine if explicit spelling instruction was effective and if such instruction was more effective than incidental learning methods (Graham & Santangelo, 2014). Spelling instruction enhanced students' spelling growth (effect

size = 0.54), more spelling instruction was superior to less spelling instruction (effect size = 0.70), and teaching spelling produced greater gains than incidental learning methods (effect size = 0.43). The findings from this review demonstrated that directly teaching spelling is desirable. My earlier review (Graham, 2000) provided support for the use of incidental methods for learning to spell. I suspect the best results are obtained through a judicious combination of both approaches. In any event, we cannot adequately evaluate the standing of any educational theory without directly testing it. Hopefully, this example demonstrates the value of such assessments.

Ode to a Schnoodle

We have the privilege of living with a schnoodle. She is 35 years old. I base this estimate on the time-honored formula that a dog ages seven years for every human year. I recently found out that I had it all wrong. She is really 61 years old! This calculation is based on a new and supposedly sound scientific formula (Imbler, 2020). To calculate a dog's age, multiply the age of the dog in human years by the logarithm of this number and add 31. I am certain this is a load of mumbo jumbo designed to fool the weak minded. There is no way my dog is 61 years old. She has more energy than my Daughter did at 18 and certainly more than I did at 35. In case you are wondering, a schnoodle is a cross between a schnauzer and a poodle.

Much to my surprise, determining the age of dogs is a legitimate scientific enterprise. Dogs are seen as good models for studying aging processes in humans. (Google Clever Dog Lab at the University of Vienna.) Dogs suffer many of the same ailments as humans, but they age faster. To understand how they age, scientist apply multiple approaches and tools ranging from the study of their DNA, physical ailments, and personality changes over time. (Yes, I did say personality changes; see Reimer et al., 2016.) This is not unlike other scientific endeavors, such as the study of climate change or evolution, where an array of

procedures is used to collect different forms of evidence. These same principles underlie the research my colleagues and I conduct in writing, and they provide important guidance for any serious educational researcher.

All Dogs Go to Heaven.

When asked to write about a famous psychologist, a middle schooler confidently claimed, "Pavlov studied the salvation of dogs." The exclusion of a single letter completely changed the youngster's intended meaning, but created a world that sounds metaphysically attractive.

Theoretically, it is assumed that difficulties spelling words as well as slow handwriting or typing impede other writing processes such as planning, content generation, and sentence construction (Graham & Harris, 2000). For example, having to consciously switch attention while writing to thinking about how to spell a word can lead a writer to forget ideas or plans held in working memory. Likewise, ideas and plans are likely to slip from memory for students with slow handwriting or typing, as they cannot transcribe ideas fast enough to keep up with their thoughts. Until these skills are automatized, they demand cognitive resources that could potentially be devoted to important writing processes such as planning and sentence construction. Accordingly, writing development is facilitated or impeded depending on children's mastery of these foundational writing skills (Graham, 1999).

To study the mix of contributions of writing skills such as handwriting and spelling, writing processes like planning and revising, writing knowledge, and writing motivation, my colleagues and I apply multiple approaches to study the veracity of specific theoretical claims concerning how these develop and impact writing. I illustrate this below with handwriting and spelling. The application of similar approaches to the study of writing processes, knowledge, and motivation are shared in Graham (2006). I highly recommend the type of approach

illustrated below, as it addresses specific theoretical issues, empirically tests propositions underlying these theories, and uses multiple approaches to collect relevant evidence.

If transcription skills such as spelling and handwriting play an important role in writing and its development, it is reasonable to expect that (1) older and more experienced writers evidence greater mastery of spelling and handwriting than younger and less experienced writers; (2) individual differences in spelling and handwriting predict writing performance; (3) replacing spelling and handwriting with dictation enhances writing performance; and (4) teaching spelling and handwriting improves writing (Graham, 2006; Graham & Harris, 2000).

To address the first proposition, we examined the handwriting legibility, handwriting fluency, and spelling of typically developing students. Students copied a paragraph and wrote a short narrative and an expository composition. All three writing tasks were scored for handwriting legibility using a 9-point rating scale. Handwriting fluency was determined by counting the number of letters written correctly per minute on the copying task. Spelling was assessed by counting the percentage of words spelled correctly in the narrative and expository writing tasks. We found that handwriting fluency became increasing faster from first until ninth grade where it began to level off, whereas students' writing became increasingly legible during the elementary grades, plateauing and even regressing as students moved into middle school (Graham et al., 1998). Students' spelling also became increasingly correct from the primary through the intermediate grades, reaching levels of 95% correct in grades 4 to 6 (Graham et al., 1997). These findings supported the proposition that the transcription skills of young developing writers improve with schooling and age.

To examine the relationship between individual differences in young developing writers' handwriting and spelling skills and

their writing performance (proposition two), we used structural equation modeling to determine if handwriting fluency (based on fluency writing the alphabet and copying a paragraph) and spelling (based on percentage of words spelled correctly on two writing tasks and a norm-referenced measure of spelling) predicted the quality and length of primary and intermediate grade students' writing (based on a narrative and expository writing task). These transcription skills accounted for 25% and 42% of the variance in writing quality at the primary and intermediate grades, respectively. They accounted for 66% and 41% of the variability in length of writing at these same two grade ranges as well. A more recent study conducted by my colleagues and me (Skar et al., 2020) provided additional evidence for proposition two. We found that spelling, handwriting fluency, and handwriting legibility accounted for 15% of the variability in the quality of writing produced by nearly 5,000 first to third grade Norwegian students after we first controlled for writing motivation, syntactic competence, gender, grade, and the nested nature of the data using multi-level modeling.

To address the third proposition, students' writing improves when they do not have to attend to text transcription skills, we removed text transcription from writing by asking students to dictate their papers to a scribe. In one study (MacArthur & Graham, 1987), fifth and sixth grade students with LD produced stories by hand, using a word processor, and through dictation. Dictated stories were longer, qualitatively better, and contained fewer grammatical errors than handwritten or word-processed stories. In a second experiment (Graham, 1990), fourth and sixth grade students with LD produced opinion essays by hand and through dictation. They also participated in a slow dictation condition where the scribe wrote what the student said at the speed the student wrote by hand. By comparing dictation to slow dictation, the impact of rate of composing was isolated, whereas

comparing writing to slow dictation isolated the effects of mechanical interference. Dictated essays were produced more quickly and were qualitatively superior to handwritten ones, and the evidence indicated these effects were mainly due to mechanical interference (text transcription skills) and not rate of production. In addition, a literature review conducted by me and a colleague (De La Paz & Graham, 1995) revealed that young and old writers produce more text when dictating than writing by hand. We also found the dictated text of young children just learning to write and older students with poorly developed transcription skills was rated as qualitatively better than their handwritten text.

I have mastered the use of many different research tools, but I have not come close to mastering all of the tools I need to adequately study writing. This makes it essential to partner with colleagues who know how to apply tools you have not yet mastered or may never master.

We examined the fourth proposition, teaching text transcription skills enhances students' writing, in two ways. First, we conducted multiple studies where handwriting, spelling, or both were taught to young children experiencing difficulties learning these transcription skills (Berninger et al., 1997; Berninger et al., 2002; Graham, Harris, & Atkins, 2018; Graham et al., 2000; Graham et al., 2002). In all of these studies, instruction improved handwriting and spelling, but the effects of this instruction on other aspects of writing were mixed. This led to our second approach for examining the effects of transcription instruction on writing. We conducted three meta-analyses. One review focused on handwriting (Santangelo & Graham, 2016), and found that teaching handwriting resulted in improved legibility (effect size = 0.59),

handwriting fluency (effect size = 0.63), as well as writing quality (effect size = 0.84) and length of compositions (effect size = 1.33). A second meta-analysis (Graham & Santangelo, 2014) examined the effects of spelling instruction. While spelling instruction improved students' spelling of individual words (effect size = 0.54) and words in text (effect size = 0.94), it did not result in statistically significant improvements in writing (effect size = 0.19). Even so, a third meta-analysis (Graham et al., 2011) demonstrated that readers view writers' text less positively when papers contain spelling errors or handwriting is difficult to read. Collectively, these studies/reviews provide compelling evidence for the importance of handwriting and spelling.

A Dog Knows.

Dogs have very sensitive noses. They possess up to 300 million olfactory receptors and they can detect most odors at concentrations of a few parts to trillions. This makes their nose a very sensitive instrument. Dogs are used to detect diseases, explosives, illicit drugs, human remains, wildlife scat, quagga muscles on boats, and bed bugs, to identify just a few of their olfactory capabilities. Despite their incredible nasal power, dogs are just one of the tools available to detect such problems. This same principle applies to the writing research conducted by me and my colleagues. In order to understand a phenomenon adequately, we need to apply multiple tools when studying it. Over the course of my career, I have mastered the use of many different research tools, but I have not come close to mastering all of the tools I need to adequately study writing. This makes it essential to partner with colleagues who know how to apply tools you have not yet mastered or may never master.

In the previous section of the article, I provide multiple examples of different tools my colleagues and I used when studying handwriting and spelling, including hierarchical linear modeling, multi-level modeling, experimental manipulations (e.g.,

composing via dictation, slow dictation, and handwriting), and traditional reviews and meta-analysis. In studying other aspects of writing including writing strategies, writing motivation, writing knowledge, and how to assess writing, we have applied case studies and qualitative methods (e.g., MacArthur et al., 1996; McKeown et al., 2019), interviews (e.g., Graham et al., 1993), generalizability theory (Graham et al., 1996), Rasch analyses (Graham et al., in press), confirmatory factor analyses (Graham et al., 2017), and survey methodology (Cutler & Graham, 2008) to provide some additional examples. I hope this makes it clear how important it is to be able to draw upon multiple approaches and tools when studying a complex phenomenon like writing.

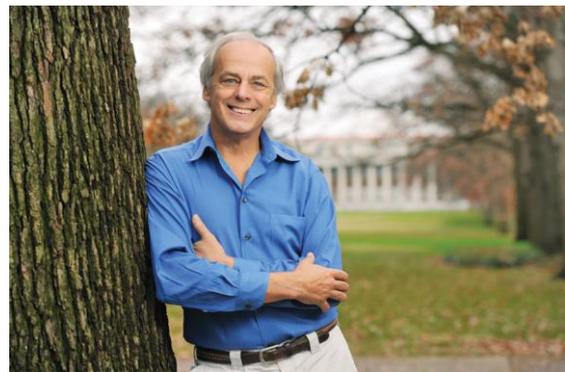
Meta Mania

Science has its ups and downs. In 1962, Mariner 1 bound for Venus had to be destroyed less than 5 minutes from lift off because it acted erratically. The problem: a computer programmer inadvertently forgot a comma. This may be the most expensive writing miscue in history, costing \$18.5 million.

The importance of carefully monitoring science and the scientific enterprise was further illustrated in the Great Moon Hoax of 1835 (Hendrickson, 1994). Richard Locke, a reporter for the *New York Sun*, raised the subscription of the paper eight-fold when it published a reprinted article from the Edinburgh *Journal of Science*. The article claimed Sir John Herschel observed with a new telescope 15 species of animals on the moon, including a race of winged men. The only problem, the *Journal of Science* no longer existed and never published such an article. Locke eventually confessed that the article was a satire aimed at curbing the absurd scientific speculations of the day.

In many ways the scientific enterprise is a self-policing activity, involving peer review and critical reviews as means for establishing the veracity of the evidence and the claims put forward by scholars. A critical element of this process are systematic reviews that

summarize the findings from research to answer specific questions, while at the same time critically analyzing the accumulated evidence so that nuanced and accurate conclusions can be drawn. I found it useful to engage in such reviews in the area of writing for three reasons. One, they provided other scholars as well as practitioners and policy makers (see Graham, 2019) with a road map of what science can tell us about writing and specific issues involving writing. Two, they broadened my knowledge by introducing me to investigations that I had not previously read. Three, they improved my own research, and hopefully the research of others, as I examined the strengths and weaknesses of each investigation reviewed. I highly recommend always having at least one or more systematic reviews in progress.



Thinking about the next meta-analysis, 2007

Initially, the reviews I conducted were integrative and designed to provide guidance to teachers or researchers (e.g., Graham, 1983, 1986). I conducted my first meta-analysis in 2004 (Graham & Harris, 2003) examining the effectiveness of SRSD. In 2007, I conducted a second meta-analysis with Dolores Perin for the Carnegie Corporation of New York entitled *Writing Next* (Graham & Perin, 2007b). We examined the effectiveness of various instructional approaches for teaching writing to students in grades 4 to 12. The *Writing Next* meta-analysis open some kind of valve in my head. As Karen Harris, my colleague and wife, likes to say, “I am like a little boy with a new hammer,” except the hammer never seems to grow old.

To date, I have published over 20 meta-analyses. I suspect these reviews will be my most enduring legacy as a writing researcher. A number of these meta-analyses focused on identifying effective practice for teaching writing to elementary and secondary students (e.g., Graham et al., 2015; Graham & Perin, 2007a; Graham et al., 2012; Graham & Santangelo, 2014; Sandmel & Graham, 2011; Santangelo & Graham, 2016) as well as students with LD (Gillespie & Graham, 2014; Morphy & Graham, 2012). I extended the scope of these meta-analyses, which at first focused on true- and quasi-experimental intervention design studies, to a meta-analysis examining single-participant design interventions (Rogers & Graham, 2008) and meta-syntheses of qualitative research studying the instructional writing practices of highly effective literacy teachers (Graham et al., 2015; Graham & Perin, 2007). The findings from these reviews have influenced writing practice in countries across the globe, and provide a basic framework for effective writing instruction. They laid foundations for five overarching principles: (1) *write* frequently for real purposes; (2) *support* students as they write; (3) *teach* students critical writing skills, strategies, and knowledge; (4) *connect* writing, reading, and learning so that they support each other; and (5) *create* a supportive and pleasant writing community where students can take risks and are motivated to write.

Other meta-analysis that my colleagues and I conducted concentrated on the connections between writing, reading, and learning. These reviews demonstrated that writing about content facilitates learning (Graham et al., 2020), writing and writing instruction enhance reading capabilities (Graham & Hebert, 2011; Hebert et al., 2013), reading and reading instruction enhance writing capabilities (Graham, Liu, Bartlett, et al., 2018), and combining reading and writing instruction improves both reading and writing (Graham, Liu, Aitken, et

al., 2018). These meta-analyses provided the foundation for the principle recommending connecting writing, reading, and learning. They are particularly important to writing as they expand the avenues through which writing can be used to support other aspects of schooling. While learning and reading can occur without composing, writing and writing instruction makes students better learners and readers.

While a single person can ignite a spark that leads to change, it takes a fellowship of like-minded companions to cultivate and spread the resulting fire.

A recent set of meta-analyses examined the writing of students with special needs. Youngsters with LD (Graham et al., 2017), speech and

hearing disorders (Graham, Hebert, et al., 2020), ADHD (Graham et al., 2016), and dyslexia/reading difficulties (Graham et al., in press) all experience challenges with writing. These reviews not only identified these children's writing needs, they also provided important insight into the role of language, reading, and other cognitive processes to writing and its development.

The Power of Fellowship An Ounce of Action.

The American philosopher and poet, Ralph Waldo Emerson, recognized the power of action, admonishing his audiences that, "An ounce of action is worth a ton of theory." While I think Emerson assigned too little weight to theory, I agree: Action is essential. In the arena of writing, research and theory must ultimately lead to better practice.

While a single person can ignite a spark that leads to change, it takes a fellowship of like-minded companions to cultivate and spread the resulting fire. Take for instance Henry Bergh who began a crusade in his 50s to improve ways that animals were treated (Freeberg, 2020). After the success of convincing a carriage driver to treat his horse more humanely, he assembled a group of associates in 1866 to create the American Society for the Prevention of Cruelty to Animals (ASPCA). In a time when many

people believed animals did not feel pain, the ASPCA devised ways to draw public attention to animal suffering. This included court cases where the mistreatment of animals was put on public display, arresting gamblers for arranging dog fights, and publishing books encouraging respect for animals such as Anna Sewell's *Black Beauty*. The work of this fellowship continues today, but on an even broader scale.

I have been fortunate. I have been a member of multiple fellowships. This includes professional organizations devoted to special education (e.g., International Council of Learning Disabilities), writing and reading (e.g., International Literacy Association), and the psychology of education (e.g., Division 15 of the American Psychological Association). It involves the many doctoral students Karen and I advised over the years, who in turn advised their own students – our extended family so to speak. It includes a multitude of research collaborators in the United States and beyond, including but not limited to Patricia Alexander, Rui Alves, Arthur Applebee, Scott Baker, Gerardo Bañales, Charles Bazerman, Virginia Berninger, Carol Booth Olson, Deborah Brandt, Alyson Collins, Steve Cuillo, Fien de Smedt, Don Deshler, Hannah Dostal, Jessica Early, Ralph Ferretti, Jill Fitzgerald, Doug and Lynn Fuchs, Russell Gersten, Anna Hall, Tracy Hall, Elizabeth Hsiang, Jill Jeffrey, Joel Levin, Teresa Limpo, Kevin Liu, Charles MacArthur, Paul Matsuda, Deborah McCutchen, Sandra Murphy, Clarence Ng, Natalie Olinghouse, Festas Oliveira, Dolores Perin, Zoi Philappokos, April Poch, Michael Pressley, Gert Rijlaarsdam, Dan Robinson, Shawn Robinson, Deborah Rowe, Mary Schleppegrell, Jean Schumaker, Gustaf Skar, Lee Swanson, Kay Wijekumar, Kristen Wilcox, Joanna Williams, Kimberly Wolbers, Bernice Wong, Young Suk-Kim, and Matt Zajic. I do not name former doctoral students or postdocs Karen and I have worked with, as this would make the list too long.

This list of collaborators includes new as well as seasoned researchers. It contains some of the most influential scholars in writing, special education, and educational psychology. I do not name my friends and colleagues as a name-dropping exercise, but to illustrate the power of fellowship. I am able to study multiple aspects of writing because of these collaborators. They support me, and I support them. Making such connections is central to the multi-faceted and interdisciplinary work that

If the fellowships you value are to flourish, it is important that you lend support when your turn comes around.

permeates the field of education today.

Early in my and Karen's career, more senior scholars like Michael Pressley created multiple publishing opportunities for us. This included writing book chapters (Graham & Harris, 1996), co-authoring journal articles (Pressley et al., 2006), and contributing articles for special issues (Graham & Harris, 1994). If the fellowships you value are to flourish, it is important that you lend support when your turn comes around.

Strong Minds.

My favorite Socrates quote is, "Strong minds discuss ideas." One of the joys of being a scholar is dissecting, synthesizing, dismantling, and evaluating ideas with others. It is much more rewarding to examine ideas in this fashion than to do it alone. It forces you to examine more carefully your assumptions and biases, while considering the assumptions and biases of others. I am much more likely to learn and change under these circumstances. Consider the alternative posed by the economist David Kenneth Galbraith, "Faced with the choice between changing one's mind and proving there is no need to do so, almost everyone gets busy on the proof."

I would like to offer two examples to illustrate the power of civil discussion

among scholars. Around 2014, I was part of a group of writing scholars that met once a year in Santa Barbara to discuss writing and its development across the life span. The group was led by Chuck Bazerman and included the late Arthur Applebee as well as Virginia Berninger, Deborah Brandt, Jill Jeffrey, Paul Matsuda, Sandra Murphy, Debbie Rowe, Mary Schleppegrell, Kristen Wilcox, and myself. This was an eclectic group of experts studying writing development from preschool through adulthood. It included social-cultural and cognitively oriented scholars as well as a linguist. I was one of the two cognitively oriented scholars.

For three years we met for several days to discuss how we thought writing unfolded. It was exhilarating. While I enjoyed exchanging ideas with everyone in the group, as Bazerman created a safe place for discussion, I most enjoyed my exchanges with Deborah Brandt. We had very different theoretical views about writing. These discussions helped me sharpen my thinking about the role of cognition in writing, while simultaneously moving me toward a more integrative view that encompassed the central role of context in writing as well. As a group, we created a book (Bazerman et al., 2018) that synthesized our agreements and disagreements, while leaving space for each of us to carve out our own personal statements. My contribution included a chapter that presented a new model of writing, combining both social and cognitive perspectives: the Writer(s)-within-Community model (Graham, 2018a). As I wrote my chapter, I often had conversations in my head with Deborah Brandt as I considered how to structure the model. I also received valuable feedback from Chuck Bazerman, Paul Matsuda, and the rest of the group. These conversations were invaluable to my growth as a scholar, and I hope my voice was useful to others in the group.

My second example does not involve face to face conversations, but conversations that occur between authors and readers. To this point, I have served as

an editor for five different journals: *Journal of Educational Psychology*, *Exceptional Children*, *Journal of Writing Research*, *Contemporary Educational Psychology*, and *Focus on Exceptional Children* (as one of three Associate Editors). I can hardly remember a time when I was not a journal editor.

The reason why these editorships were so valuable to me is that they forced me to read widely. I had to read articles that touched on all aspects of special education when reading papers submitted to *Exceptional Children* and *Focus on Exceptional Children*. As one of the editors of the *Journal of Writing Research*, I read papers from across the world, expanding my international view of writing. Most importantly, editing the *Journal of Educational Psychology* and *Contemporary Educational Psychology* required that I read papers (almost 800 papers a year for *JEP*) that touched on all aspects of education and learning. I doubt seriously that I would have read so broadly otherwise. The conversations that I had in mind with the authors of these submitted papers expanded my knowledge of methodology and kept me abreast of the most recent findings in fields that became increasingly important to my research in writing, including motivation (e.g., Camping et al., 2020; De Smedt et al., 2019) and epistemology (e.g., Hsiang, Graham, & Yang, 2020). Whether you might pursue becoming an editor is, of course, up to you, but reading broadly will yield incredible dividends for how you think about the problems that interest you.

Closing Stanza

The March Hare and the Mad Hatter told Alice that when you tell a story, “Start at the beginning,” and also advised, “When you come to the end – stop.” Well, I am at the end of this story but hopefully not at the end of the story. I plan to stay an active scholar of writing for many years to come. So you never know, I may have more to say down the road. In any event, I hope the folly meter stayed relatively low throughout this exposition. If not, I suspect you left me many stanzas ago.

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About Acquired Wisdom

This collection began with an invitation to one of the editors, Sigmund Tobias, from Norman Shapiro a former colleague at the City College of New York (CCNY). Shapiro invited retired CCNY faculty members to prepare manuscripts describing what they learned during their College careers that could be of value to new appointees and former colleagues. It seemed to us that a project describing the experiences of internationally known and distinguished researchers in Educational Psychology and Educational Research would be of benefit to many colleagues, especially younger ones entering those disciplines. We decided to include senior scholars in the fields of adult learning and training because, although often neglected by educational researchers, their work is quite relevant to our fields and graduate students could find productive and gainful positions in that area.

Junior faculty and grad students in Educational Psychology, Educational Research, and related disciplines, could learn much from the experiences of senior researchers. Doctoral students are exposed to courses or seminars about history of the discipline as well as the field's overarching purposes and its important contributors. .

A second audience for this project include the practitioners and researchers in disciplines represented by the chapter authors. This audience could learn from the experiences of eminent researchers – how their experiences shaped their work, and what they see as their major contributions – and readers might relate their own work to that of the scholars. Authors were advised that they were free to organize their chapters as they saw fit, provided that their manuscripts contained these elements: 1) their perceived major contributions to the discipline, 2) major lessons learned during their careers, 3) their opinions about the personal and 4) situational factors (institutions and other affiliations, colleagues, advisors, and advisees) that stimulated their significant work.

We hope that the contributions of distinguished researchers receive the wide readership they deserve and serves as a resource to the future practitioners and researchers in these fields.



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