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Past, Present, and Future Contributions of Cognitive Writing Research to Cognitive Psychology

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Introduction

VIRGINIA WISE BERNINGER and GERT RIJLAARSDAM

If you don't know the past, then ye will not have a future. If ye don't know where your people have been, then ye won't know where your people are going.

Carter, *The Education of Little Tree* (1990), p. 40

Ironically, although researchers place considerable emphasis on citing names of researchers who author publications, they seldom address who the author is—the person who is writing about the research and its findings. To honor four pioneers in the field of writing research, the editor of this volume encouraged others to tell their stories—their professional journey as a writing researcher. The resulting stories in the first four chapters provide not only a glimpse into the history of the writing field from its earlier times to the current issues and unfinished work for the future, but also provide a model of programmatic writing research across a career for the new generation of writing researchers. David Olton at Johns Hopkins University emphasized to graduate students in psychology the importance of systematic programmatic research in addressing research questions in a meaningful, productive way, which often does not follow linear progression. With the current obsessive focus on the number of single-article publications and citations, we often lose sight of how the contributions of systematic, sequential studies address changing questions, based on the outcome of prior investigations, to build a cumulative body of scientific knowledge, and verify findings across variations in methods or samples. The three chapters in [Part I](#) and first chapter of [Part II](#) ([Chapter 4](#)) of this book offer an opportunity to learn to know the author, that is, the person who is the researcher behind the systematic and programmatic writing research and to learn about that researcher's personal professional journey in conducting a lifetime of programmatic research, which has made significant contributions to the field.

In [Chapter 1](#), Hayes tells of his transformation from a physicist to behavioral psychologist to cognitive psychologist, his application of think-aloud protocols to the study of cognitive processes in writing, evolving models of the cognitive processes in writing, and discovery of language bursts marked by pauses in written production. In [Chapter 2](#), Fayol describes his journey from writing teacher in a small French village to university cognitive researcher who studied writing from developmental, psycholinguistic, and experimental perspectives, and introduced

the concept of online experiments, based on production rather than reaction times, and in the process mentored students who are now leading writing researchers. In [Chapter 3](#), Boscolo, who also began as a writing teacher, shares a personal account of his developmental and instructional research, which considered both cognitive and affective/motivational variables, and in the process makes the important case that writing research has as much to learn from writing teachers as writing teachers have to learn from cognitive, developmental, and educational psychologists who study writing. In [Chapter 4](#), Charles Bazerman introduces cognitive psychologists to the sociocultural and historical traditions in writing, which take into account affective as well as cognitive variables, and tells the story of his professional trajectory as writer, teacher, researcher, and theorist of writing.

Not only has each of these four pioneers contributed to the research literature on writing but each has also made major contributions to the professional organizations in the field of writing: Hayes to teachers of English at the college level and professional writers; Fayol and Boscolo to the special interest group (SIG) for writing of the European Association for Research on Learning and Instruction (EARLI); and Bazerman to Across-the-Borders, an international organization he organized and launched, which to date has brought writing researchers from over 40 countries together three times (in 2005, 2008, and 2011) to share their work. The professional careers and contributions of the four writing pioneers were celebrated in a symposium at the Writing Research Across Borders II, in February 2011 in Virginia.

Moreover, collectively their careers tell a story of great importance in the global age. These four honored researchers form a complementary quartet that has made remarkable music around the world in the field of writing research. To celebrate their collective contributions, the continuing global story is now told from the European perspective.

Pietro Boscolo and Michel Fayol were the founding fathers of the SIG of EARLI. This association was founded in 1985, and Boscolo participated from the very beginning in establishing this international group of scholars. Fayol and Boscolo took the lead to establish the SIG Writing Conference, which stood out among the other SIGs and had themes such as "Learning and Development in Early Childhood" and "Social Interaction in Learning and Instruction." Fayol and Boscolo were the first SIG Writing coordinators, and they started the biennial series of SIG Writing Conferences, which met in Padova (Italy 1988) and then Paris (France). The first conferences were attended by invitation only. Since 1994 (Utrecht, the Netherlands), conferences have had about 200 participants, from all over Europe, with a small contingent from other continents, especially from North America. Even after Fayol and Boscolo left their SIG coordination position after 4 years (EARLI regulations), they supported the SIG actions by establishing (a) the book series "Studies in Writing" (started in 1996, 21 volumes and more in progress), (b) the *Journal of Writing Research* (first publication 2008), and (c) international networks, including the COST network (Denis Alamargot, chair). Both inspired many young researchers in the tradition of psycholinguistic-inspired ingenious experiments with developmental factors, including educational interventions (Pietro Boscolo in Padua). They inspired master's and PhD students

who continue the efforts, and both are respected advisors for national scientific research boards.

When Boscolo and Fayol established the SIG Writing Conference in the 1980s, Europeans were conducting writing research, based in linguistics, psycholinguistics, text linguistics, cognitive psychology, and educational psychology. Rijlaarsdam, Van den Bergh, and Couzijn (1996a, 1996b) and Levy and Ransdell (1996)¹ note that national papers or papers in English were cited most often, but references to other European works were beginning to be added. Most European researchers at that time published primarily in their home languages. The establishment of the SIG Writing Conference stimulated writing researchers to publish internationally, and the SIG Writing Conference peer-reviewed book series served that goal.

Much writing research in Europe and North America has been inspired then and now by the two chapters written by John Hayes and Linda Flower in a book based on papers from a symposium edited by Gregg and Steinberg (1980). These chapters stimulated thinking about how think-aloud protocols could support and test theory building and proposed a model of cognitive writing processes (components with a monitor that could fit various configurations and deal with recursiveness). These chapters generated research on understanding the writing process using a new methodology for studying these processes and designing educational interventions. John (Dick) Hayes was invited for a sabbatical in Utrecht in the early 1990s where he learned that in Europe many writing researchers borrowed from his model and supported the cognitive approach. His participation in SIG Writing Conferences was much appreciated, especially his approachable nature; he was well known yet so interested in what other researchers do and think. His presentations at these conferences are examples of how work in progress can stimulate thinking in the participating audience.

The influence of Bazerman's work in Europe occurred later. The scientific attention in Europe for writing in higher education and in the disciplines is relatively recent. During the past two decades, as access to higher education became a major educational policy of Europe, attention to writing also grew: Teachers in higher education found that students' basic skills in composing longer texts based on sources were not always strong enough once they reached higher education levels. Even in the SIG Writing group, the interest in learning to write was far more pronounced than for writing to learn (although see Tynjälä, Mason, & Lonka, 2001). Therefore, another European network was set up to inform teachers in higher education about writing: The European Association for the Teaching of Academic Writing (EATAW) was established as a formal association in 2007. This association has strong links to the U.S. networks on Writing in the Disciplines (WID) and Writing Across the Curriculum (WAC). As Dick Hayes had, Bazerman also detected the wealth of writing research in Europe and participated in the SIG Writing Conferences. He combines a wide interest in current issues with a strong

¹ Michael Levy and Sarah Ransdell, who were among the first U.S. researchers to attend a SIG Writing Conference (Utrecht, the Netherlands, 1994), were quite surprised that in Europe the cognitive approach was still a major research area because in the United States it had fallen into disfavor. They decided to edit a volume for Erlbaum on the cognitive tradition in writing, with United States and European research included.

voice in his commentaries; one of his scientific missions, to which he devotes much time and energy, is organizing cross-nation and cross-linguistic activities to bridge the various communities. Both Hayes and Bazerman are internationally oriented writing researchers.

The story of the cognitive psychology of writing research is also one that is currently being told by contemporary leaders in the field, including established and up-and-coming researchers. The rest of this book is their story and a story that all contributors hope will continue to be told and written in the future. One emerging theme across the remaining chapters in this volume is that in creating a specialization in writing research within mainstream cognitive psychology, researchers should draw on multiple disciplines.

In keeping with this theme, **Part II** provides examples of interdisciplinary collaboration between the cognitive psychology and the sociocultural traditions. In **Chapter 5**, Beaudet, Graves, and Labasse share their separate lines of writing research with adults, including both undergraduates and professionals in the world of work. Collectively these studies serve as a reminder that learning to write is a lifespan task, and adult writing is not just scaled-up children's writing—rather, it is qualitatively different, with different goals, requirements, and applications. In **Chapter 6**, Klein and Leacock introduce the concept of distributed cognition, which is a currently influential paradigm in both adult and child writing and draws attention to writing as a shared, collaborative activity rather than merely a solo activity of an isolated individual. In **Chapter 7**, Gelati considers the effects of gender, a salient individual difference variable with social implications, on writing development.

Part III illustrates how writing—how it is learned, effectively taught, and validly assessed—changes across the lifespan at home and school from early to middle childhood to adolescence to adulthood (in higher education and the world of work). In **Chapter 8**, Graham and Harris pay tribute to the pioneering cognitive researchers featured in **Part I** as they describe their own 30-year programmatic research on teaching and learning self-regulated writing. In **Chapter 9**, McCutchen makes the case for more research focus on language processes in writing and shows how phonological, orthographic, and morphological word-level processes contribute across levels of text generation during the writing process. In **Chapter 10**, Connelly, Dockrell, and Barnett tackle the important topic, which deserves more research attention, of children who struggle with not only writing but also reading and oral language and/or motor problems. They provide conceptual frameworks for asking assessment and treatment questions for both research and practice. In **Chapter 11**, Myhill demonstrates how metalinguistic knowledge, which is becoming a cutting-edge topic in writing research, is relevant to writing assessment and instruction for adolescents. Not only language but also awareness of and reflection about language contribute to writing. In **Chapter 12**, Shriver fleshes out the picture of lifespan writing with a focus on the adult professional writer and writers in the work world, where not only writing but also design are fundamentally important. Note that although **Chapters 5, 6, and 7** are in **Part II** because of their social cultural grounding, they also contribute to understanding of lifespan writing development from elementary

(Gelati, Chapter 7), to middle school, to adolescent and adulthood (Klein & Leacock, Chapter 6), and to adults in college and the workplace (Beaudet et al., Chapter 5). Likewise, Chapter 12 draws on sociocultural influences in Shriver's work with real world writers.

Part IV, which focuses on language processes in writing, is considerably longer than Part V, which focuses on the cognitive processes in writing, in keeping with the emerging vision among writing researchers in this volume that more attention should be paid to language processes, but with cognitive processes in mind (see Vision "Looking Into the Text Generation Box to Find the Psycholinguistic (Cognitive–Language) Writing Processes" and Chapters 9 and 11). The first three chapters of Part IV focus on *word level*: lexical access and retrieval (Chapter 13, Bonin et al.), graphotactic and morphological regularities in spelling (Chapter 14, Pacton et al.), and spelling in a shallow orthography, which appears in a groundbreaking new study, reported here for the first time, to share common, heretofore overlooked linguistic features with morphophonemic deep orthographies (Chapter 15, Arfé et al.). The next three chapters take into account transcription mode and language processes at different levels of language in cutting-edge studies: bursts (Chapter 16, Alves et al.) and single words and sentences (Chapter 17, Torrance & Nottbusch). The final chapter in the language section (Chapter 18, Mazur-Palandre et al.) reports results for macrolevel language variables such as text types (genre) and modalities of output. This line of research is likely to expand as writing researchers investigate how different kinds of technology, used for either written or oral output, may interact with the language and cognitive processes in translation.

Of the chapters in Part V on cognitive processes in writing, only one deals with translating (Chapter 19, Alamargot et al.), in this case how subject–verb agreement is managed during online translation. The cognitive $\leftrightarrow$ language translating process is sufficiently complex and timely and is discussed in greater depth in a related book (Fayol, Alamargot, & Berninger, 2011). Chapter 20 by MacArthur provides a lively up-to-date account of the evaluation (review) and revision processes with suggestions for future research directions on this important topic. Revision of writing is increasingly the norm now in educational contexts, as it always has been in professional writing. The final chapter in this part (Chapter 21, Olive) provides an overview of past, current, and future directions in research on working memory and writing. Not only does working memory support the writing process, but individual differences in working memory explain why individual writers vary in how easily they learn to write or why they may struggle with the writing process. Hopefully the research on the cognitive processes of writing will expand in the future with fresh new approaches, perhaps inspired by one or more chapters or visions in this volume. For example, time emerged as a dimension of considerable promise for learning more about the cognitive processes in writing. To an earlier preoccupation with reaction times, contemporary cognitive writing researchers are adding production times or pauses (to support inferences about online processing) (see Parts IV, V, and VI and Visions "Through the Models of Writing: Ten Years After and Visions for the Future" and "The Future Is Bright for Writing Research") and in measurement of writing products (see Vision "Writing Research: Where to Go To?").

Part VI on technology tools has one chapter (**Chapter 22**, Van Waes et al.), but it is one that cognitive psychologists who become interested in writing will find extremely valuable. Here the available technology tools for writing research are compared, contrasted, and discussed for writing instruction. Thus, in an era of increasing use of technology in all aspects of life and work, this chapter is an important resource for those who teach writing in middle or high school, higher education, or the work world.

Part VII on the emerging cognitive neuroscience of writing also has only one chapter (**Chapter 23**, Berninger & Richards). It explains what is known about the cognitive, language, sensory, and motor systems that operate within a working memory architecture to support the writing process as the writing brain interacts with both its internal mental and external physical and social environments. As such, this chapter also serves as a synthesis of important points made by the authors of all the prior chapters in the volume. Also, in keeping with the volume's theme of interdisciplinary collaboration in cognitive writing research, this chapter models how a cognitive psychologist could be partnered with a neuroscientist in interdisciplinary research.

The volume concludes not with an ending but with visions for the future. Vision "Through the Models of Writing: Ten Years After and Visions for the Future" foresees a future of less model building of the entire writing process and more empirical research on specific research questions focused on just a few aspects of the complex writing process. In a similar fashion, Vision "Looking Into the Text Generation Box to Find the Psycholinguistic (Cognitive–Language) Writing Processes" recommends attending less to the text generation box and more to the interactions of the cognitive and language processes, especially at the higher levels. Vision "Writing Research: Where to Go To?"—setting the research agenda to improve writing education and in turn cognitive writing research—calls for intervention studies conducted in close collaboration with teachers and designed to include process and product measures and individual learner variables that inform writing practice and theory. Vision "Evolving Integration and Differentiation in Cognitive and Sociocultural-Historical Writing Research" looks forward to more cross-tradition collaborations across the cognitive and sociocultural traditions as well as longitudinal and instructional studies. Vision "The Future Is Bright for Writing Research" predicts a bright future for writing research, which draws on cognitive and linguistic processes and technology tools for experimental, developmental, and instructional research, with acknowledgment that the future is unknown, for the current generation, standing on the shoulders of those who came before, to discover.

For readers who are new to the field of writing research or writing researchers who wish to update their knowledge of writing research across traditions (Bazerman et al., 2010; Grigorenko, Mambrino, & Preiss, in press) and countries (EARLI writing series editor, Rijlaarsdam), lists are provided at the end of this Introduction of current sources of writing research, which began near the end of the 19th century but increases in volume and scope at the beginning of the 21st century. Hopefully this volume will inspire further reading, reflecting, researching, and writing—the four R's of the information age.

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