

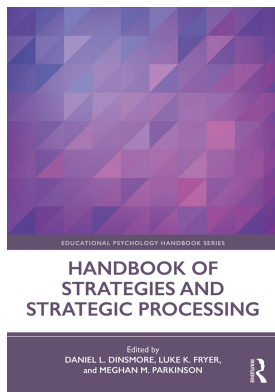
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## **Handbook of Strategies and Strategic Processing**

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### **Introduction**

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# 1

## INTRODUCTION

### What Are Strategies?

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### INTRODUCTION: WHAT ARE STRATEGIES?

The purpose of this introductory chapter of the Handbook is two-fold. First, we as co-editors want to lay out the case for the importance of the Handbook. Second, we want this chapter to serve as a guide for the reader to more deeply understand the need for continuing high-quality research on strategies and strategy use.

### WHY A HANDBOOK ON STRATEGIES AND STRATEGIC PROCESSING?

Research on strategies and strategic processing has been steadily expanding over the last few decades. This expansion includes increases in the numbers of studies that examine cognitive strategies (Dinsmore, 2017), levels of strategic processing (Asikainen & Gijbels, 2017; Dinsmore & Alexander, 2012), and strategies associated with self-regulation (Dinsmore, Alexander, & Loughlin, 2008; Schunk & Greene, 2017). As many of these cited sources have indicated, the proliferation of this research has far from clarified the relation between strategies, strategy use, and performance. In fact, the past few decades have been marked with numerous calls to clarify these relations in numerous contexts and settings (Block, 2009; Dinsmore & Fryer, 2018) that include higher education (Fryer & Gijbels, 2017).

Two particular issues with regard to research on the influence of strategies and strategic processing on task and problem-solving performance have emerged that this Handbook is well positioned to address: how strategies and strategy use have been conceptually considered (across domains and contexts as well as levels of processing), and how they have been operationalized and analyzed. We will now turn to how this Handbook addresses each of these two challenging issues as well as additional contributions from the authors of these chapters.

## CONCEPTUALIZATIONS OF STRATEGIES AND STRATEGY USE

The editorial decision to position the conceptualizations of strategies and strategy use early in this Handbook underscores the primacy of the issue of poor or misspecified conceptualizations of strategy use in the literature. First, numerous contributions in the first section of this Handbook – *Definitions, Forms, and Levels of Strategies* – explore conceptually and theoretically how strategies and strategic processing have been defined. Dumas (Chapter 2) explores the relations between strategies and their relations to the domains in which they are useful. He provides an overview of how the field has attempted to understand whether or not a strategy is domain general (i.e., useful across a wide number of domains) or domain specific (i.e., useful in one or a limited number of domains). Similarly, Dinsmore and Hattan (Chapter 3) explore how strategies have been stratified with regard to their purpose, or purported purpose – surface-level processing, deep-level processing, or metacognitive processing. Further, Rogiers, Merchie, De Smedt, De Backer, and Van Keer (Chapter 4) overview and offer a new framework to conceptualize strategy use over the lifespan. Finally, Butler and Schnellert (Chapter 5) explore the degree to which a strategy is an individual endeavor, or whether (and how) these strategies and utilization of these strategies may be socially shared across individuals performing a task or solving a problem. Research on strategies and strategic processing must be grounded in terms of how the learner is using them and what the learner is getting out of using them, which in our view is dictated by many factors, chief among them the development of many other cognitive and motivational factors.

Despite the fact that there is a section dedicated to conceptualizations of strategy use, we encourage the reader to consider this issue as they read the remaining three sections of the Handbook. In many cases, the theoretical frameworks from which these expert authors write color how strategies and strategic processing are conceptualized. For some, strategies are subsumed by or heavily influenced by self-regulation (e.g., Baars, Wijnia, de Bruin, & Pass, Chapter 14; Butler & Schnellert, Chapter 5; Winne, Chapter 15). While we as editors do not share this view that strategies should be subsumed in this way, the influence of self-regulation and self-regulated learning on the research regarding strategies and strategy use is undeniable. We strongly encourage readers – especially those new to the field – to keep in mind that the conceptual lines between metacognition, self-regulation, and self-regulated learning themselves have been conceptually muddled for quite some time (Dinsmore et al., 2008) and the role that strategies play within and beyond these three constructs has been even murkier. Additionally, we note that the distinction between *strategies* and *skills* is often blurred. This distinction is made in numerous chapters throughout (Afflerbach, Hurt, & Cho, Chapter 7; Alexander, Chapter 25; Dinsmore & Hattan, Chapter 3; Dumas,

Chapter 2) – an issue of great import since Alexander and Judy’s (1988) review article. We hope the chapters in the first section provide the reader with a solid foundation to consider these two issues as they attempt to synthesize these chapters for themselves. Fortunately, the reader is further aided in this synthesis through Van Meter and Campbell’s (Chapter 6) illuminating commentary. As we have attempted in this introduction as well, Van Meter and Campbell expertly lay out the case for why strategies should garner special consideration in the literature, in particular given the connections between strategies and problem-solving and task outcomes.

## CONCEPTUALIZATIONS OF STRATEGIES IN THE CONTEXT OF INSTRUCTION

Many of the issues alluded to in the previous section may be dependent on the context in which strategies are employed. These issues refer to both the domain and social setting within which strategies and strategy use are considered. The second section – *Strategies in Action* – explores how domain or social setting may change the role of strategies within the broader framework of learning. Strategies and strategy use are considered in the five major academic domains – reading, writing, mathematics, science, and history.

First, Afflerbach et al. (Chapter 7) consider the nature of how strategies and strategic processing both influence the reading situation, as well as how optimal reading strategies can be instructed. Similarly, Graham et al. (Chapter 9) consider domain-specific strategies in writing and how these can be trained. Both of these chapters embed notions of strategy use and their training in contemporary models of reading comprehension (e.g., Kintsch, 2004) and writing (e.g., Graham & Harris, 2006). An important addition to the research on strategy use while reading and writing is undertaken by List (Chapter 8) in her exploration of strategies around multiple text use. The need to employ specific strategies to navigate multiple sources of information is becoming particularly salient with the explosion of information that is prevalent in the age of the Internet and social media. This is especially true as that multitude of information contains conflicting views that the reader must navigate.

Similar explorations of mathematics and science are undertaken by Newton (Chapter 10) and Lombardi and Bailey (Chapter 11) respectively. Given the incredibly broad depth of the field of mathematics, Newton focuses primarily on strategies used to solve algebraic problems and fraction problems – two critical gatekeepers for future mathematical inquiry. Although her chapter focuses on these two areas, we are confident the implications of the chapter could be applied to numerous other areas of mathematical inquiry (e.g., trigonometry) and hopefully give the reader a framework to explore these other areas on their own. Similar to mathematics, the broad range of strategies required across the numerous physical, life, and social science domains are difficult to manage in one chapter. Lombardi and Bailey handle this well by focusing on recent strategies that are common across these sometimes disparate fields – namely, argumentation, science as modeling, and the incorporation of socio-scientific topics to promote strategy use. In the current climate where science is under attack by certain political forces, this chapter provides clear direction with regard to helping the populace use these strategies to better advance science as well as our overall way of life.

While the preceding domains have a richer history of strategies and strategy instruction, De La Paz and Nokes (Chapter 12) tackle strategies in the domain of history. These authors discuss the intertwined nature of historical inquiry with both the domains of reading and writing. However, as they astutely point out, historians must possess particular strategies that enable them to engage in historical thinking that reaches beyond just those who read and write text. For instance, being able to generate interpretations and knowledge claims are considered a central strategy for historians to have at their disposal.

Next in this section is a primer for understanding how learners' individual differences may influence their strategy use and ultimately their learning outcomes. Taboada Barber, Lutz Klaua, and Cartwright (Chapter 13) explore how language proficiency and atypical reading development (i.e., students with reading comprehension deficits) may influence strategy use. Their key argument is to examine these issues in relation to executive function (i.e., working memory, inhibition, and cognitive flexibility). While they situate this exploration primarily within the domain of reading, we believe this framework could be used equally well to explore strategy use and individual differences across multiple domains and contexts.

However, task completion and problem solving are not always so easily broken down into a single domain or context. Baars, Wijnia, de Bruin, and Pass (Chapter 14) discuss how working across individuals in social settings as well as across domain barriers can be best conceptualized and facilitated. Using an SRL framework, these authors provide the reader with strategies – at the cognitive, metacognitive, and self-regulatory levels – to cope with complex, dynamic problems.

Winne (Chapter 15) takes on the difficult task of trying to synthesize strategy use and training across these multitudes of domains, contexts, and individual differences. Winne provides a framework – situated within self-regulated learning – to tie together these otherwise disparate chapters. This insightful synthesis will no doubt go far in helping the reader construct for themselves a more global view of strategies and strategy use, whether or not that view is more heavily oriented toward SRL, as Winne would argue, or less so, as the editors here would argue for.

## **OPERATIONALIZATIONS AND ANALYSIS OF STRATEGIES AND STRATEGY USE**

While the first two parts of the Handbook explore conceptual and contextual issues of strategies and strategy use, clarifying conceptions is far from the only issue in the contemporary strategies literature. As we hope this Handbook can help lead to some consensus on what strategies are, we are equally concerned with how strategies have been operationalized in the literature. This issue has encompassed both cognitive strategies themselves (e.g., Dinsmore, 2017) as well as metacognitive strategies (e.g., Veenman, Van Hout-Wolters, & Afflerbach, 2006).

The third section – *Measuring Strategic Processing* – begins with the most ubiquitous measurement of strategies and strategic processing (Asikainen & Gijbels, 2017; Dinsmore, 2017; Dinsmore et al., 2008). In this chapter Vermunt (Chapter 16) captures both the historical role of surveys and retrospective self-report as well as the fraught relationship researchers have had with these measures over the past few decades.

While critical of the shortcomings of self-report, Vermunt also offers suggestions for how retrospective self-report and surveys can continue to contribute to the literature. In addition to the arguments in the literature around retrospective self-report, concurrent self-reports have also endured some criticism as well. Bråten, Magliano, and Salmérón (Chapter 17) mirror Vermunt's concerns in discussing both the shortcomings of concurrent self-report, in addition to their future as viable measures of strategies and strategic processing going forward.

These more established measures are recently being challenged by two new paradigms: the emergence of Big Data and the use of physiological measurements of strategic processing. Lawless and Riel (Chapter 18) explore how Big Data is becoming more and more ubiquitous in examining strategies – primarily consumer strategies – in the corporate setting. Behemoth companies like Google employ complex algorithms to examine this strategic behavior (or lack thereof) across Internet search platforms as well as social media platforms. On the one hand, the amount of data is enticing; however, as Lawless and Riel point out, this avalanche of data and the secrecy with which the algorithms are used to examine this data are troubling. In addition to the arrival of Big Data on the scene, the use of physiological measures continues to increase year by year. Catrysse, Gijbels, and Donche (Chapter 19) overview two of these measurements – eye tracking and functional magnetic resonance imaging (fMRI). As with the Big Data chapter, they expose the reader to the promises of these new technologies to better understand strategies and strategic processing, while at the same time critically examining the gaps and difficulties these new approaches represent.

Gijbels and Loyens (Chapter 20) in their commentary weigh the pros and cons of these approaches and offer readers a way to think about designing experiments that leverage the strengths of these particular measurements to best answer their research questions. We certainly agree with Gijbels and Loyens that no one measurement will provide a panacea to investigating strategies and strategic processing. Rather, it will be necessary to smartly employ some combination of these techniques to better help learners become strategic.

The final section – *Analyzing Strategic Processing* – examines the multitude of ways that strategic processing has been examined. Of particular import here is that, similar to the measurement of strategic processing, the analysis or analyses has to first and foremost serve the purpose of the research questions as well as help us better build theories relevant to strategic processing. The Handbook offers three such chapters to help the reader ponder appropriate analytic strategies. The first of these, quantitative variable-centered approaches, are probably most familiar to our readers. Freed, Greene, and Plumley (Chapter 21) not only overview these familiar approaches but also help situate these approaches in the context of analyzing strategic processing, something that not every reader will necessarily have considered. The other quantitative approach – the person-centered approach – is discussed at length by Fryer and Shum (Chapter 22). They offer exciting new ways to analyze strategic processing that have been used primarily in the motivation literature thus far. Finally, with regard to analyses, Cho, Woodward, and Afflerbach (Chapter 23) offer approaches to qualitative examinations of strategic processing. Situated mostly in the context of strategic processing during reading, this chapter provides a framework for qualitative analysis that could certainly be applied in a multitude of contexts.

Of course, being able to select the appropriate analysis is most crucial to effectively analyzing strategic processing. While this is often a difficult endeavor, the reader is aided by Cromley's (Chapter 24) synthesis of these analytic approaches. She deftly describes the pros and cons of these approaches which will undoubtedly aid the reader in selecting an appropriate analysis or analyses.

## THE FUTURE OF RESEARCH ON STRATEGIES AND STRATEGIC PROCESSING

While our hope is that this Handbook will help researchers in the field, both experienced and new, to understand the history of strategies in the literature as well as state-of-the-art conceptualizations and methods, we also hope these chapters and commentaries will inspire researchers to challenge existing paradigms, refine and possibly replace theoretical frameworks, and trailblaze new methods to uncover how strategies can help learners overcome challenges and solve the complex, dynamic problems that we face in the 21st century. To help readers synthesize across the four sections of the Handbook, Alexander (Chapter 25) has provided a unique and insightful overview of this history, contemporary research, and a vision for future research that can enable us to employ the vast knowledge that we possess about strategies and strategy use to help learners young and old alike.

This Handbook is a unique collaboration of contributions from researchers across a wide array of theoretical frameworks and disciplinary perspectives. We are indeed fortunate as editors that these authors have shared their wisdom and insights and we hope you agree that they have made this Handbook an informative and inspiring guide for the future.

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