What are Cognitive Aids in Strategy?

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Abstract

In this chapter, we reflect on cognitive aids and their role in strategy work. Strategy research and practice abounds with frameworks, models, tools, and processes, meant to describe and guide the strategy work of managers. These are all examples of cognitive aids. These aids guide and support managerial cognition, the way managers make sense of the world. What we collectively call the cognitive aids of strategy have a profound impact on the way managers learn about, conceptualize, share, and enact strategy work and strategies in their organizations. Despite the importance of their cognitive role, many cognitive aids in strategy are presented without reference to the underlying cognitive theory that explains why and how the aid might be useful. Tools are presented as useful for management thinking, but without any substantive reflection or exploration of the cognitive reasons. In this chapter, we provide a definition of cognitive aids in strategy and begin exploring the landscape of cognitive theories that can explain *why* something might be a *cognitive* aid. We then briefly outline the contributions to the edited volume "Cognitive Aids in Strategy," and end with an invitation to expand your exploration beyond.

Keywords: Strategy tools; cognitive aids; cognition; learning; schema; sensemaking

Defining Cognitive Aids

The field of strategy is known for its many tools, frameworks, and process models that can guide managers in their strategy work (Whittington, 2006). Some of the more well-known tools include Porter's five forces model and generic strategies, SWOT analysis, the resource-based View of the firm and the VRIO or VRIN analysis, value chain analysis, the Boston Consulting Group (BCG) matrix, the McKinsey 7S framework, the balanced scorecard, Bowman's strategy clock, strategic group maps, strategic factor analysis summary (SFAS), Blue ocean and strategic gap analysis, and the business model canvas (Wright, Paroutis, & Blettner, 2013).

To this, we can add the use of music, games, and artifacts, designed to stimulate strategic sensemaking. As both management practices and the external environment change over time, new tools continue to emerge (Laamanen, 2017; Vuorinen, Hakala, Kohtamäki, & Uusitalo, 2018; Whittington, 2006).

Common to such tools is their objective to support actors when making rational decisions under conditions of limited powers of human cognition (Cabantous & Gond, 2011), focus attention on what data and issues are relevant (Egfjord & Sund, 2020; Sund, 2013), reduce complexity and uncertainty (Jarzabkowski & Kaplan, 2015; Sund, Galavan, & Huff, 2016, 2022), encourage new ways of thinking (Wright, 2023 this volume), and identify innovation opportunities (Sund, Galavan, & Bogers, 2020; Sund, Galavan, & Brusoni, 2018). Unfortunately, the theoretical grounding of the use of physical, conceptual, and digital cognitive aids for managerial cognition and strategic decision-making is rarely made explicit. In other words, why and how do these tools interact with managers' cognition?

We adopt the term cognitive aid in strategy in a broad sense as *a physical or conceptual artifact purposefully used as a sensory input to influence a cognitive state or process in the context of strategy*. Such aids include structured strategy simulations or games, visual tools used in strategy work such as conceptual models, drawings, images, or frameworks, and physical and sensory artifacts such as clay, Lego bricks, sound, smell, or physical presence, to guide and support the cognition of managers engaging in strategy work and strategic decision-making. Cognitive aids are often employed in a social context that is deliberately designed. Such a context could be a class, a meeting, or a workshop, and it could be interactive or not. Often one or more persons act as facilitators, thereby influencing the use of the aid, and how it is made sense of cognitively. Contexts in which cognitive aids are used in strategy work can offer a break from everyday practice (Wright et al., 2013), and are integral to the effectiveness of the aid.

Cognitive aids in the strategy include conceptual and abstract models and frameworks recognized and shared by managers. It is a somewhat unique feature of the field of strategy that academics not only derive theoretical models from the scientific study of management practice but also quite systematically subsequently use these models to normatively guide managers. The age-old BCG 2×2 matrix is a good example of this (see Untiedt, Nippa, & Pidun, 2012, for a separate discussion of the usefulness of this particular matrix and other corporate portfolio analysis tools). The BCG matrix illustrates how products or strategic business units can be described along two dimensions: market growth, and current relative market share. As with any 2×2 matrix, four resultant positions emerge. In this case, they constitute a typology: the star, the cash cow, the question mark, and the dog. This particular cognitive aid provides normative guidance for managers in terms of how to strategically manage each type, suggesting that cash cows be harvested to feed the question marks (that may later become stars), while dogs should be divested.

The aid introduces a heuristic to managers. Gigerenzer and Gaissmaier (2011, p. 454) define a heuristic as "a strategy that ignores part of the information, with the goal of making decisions more quickly, frugally, and/or accurately than more complex methods." This is indeed what the BCG matrix invites the user to do.

The aid reduces the complexity of corporate strategy to two very simple metrics: market growth (which could be proxied by the overall industry growth, or market growth in a particular product group), and market share. It invites users to suspend consideration of information other than market share and growth and to make more rapid and cost-effective decisions regarding what products or business areas to invest in. Furthermore, it introduces imagery to help visualize each of the four types in the typology. Thus, the BCG matrix illustrates perfectly what cognitive aids in strategy typically aim to achieve.

Why Study Cognitive Aids?

Cognitive aids in strategy have many roles in supporting and advancing strategy work. They reduce complexity and enable more rapid decision-making for the individual. They also enable sensemaking and sense-giving between individuals and teams, within and between organizations, and for communication with external audiences. Thus, they help managers overcome the limitations of language. Communication in strategy work is often restricted by vagueness in language use, how we think, and the beliefs of individuals (Keefe, 2000). Another challenge is that groups in organizations easily develop a group-specific verbal and graphic dialogue that is not easily understood by outsiders (Fay, Garrod, Lee, & Oberlander, 2003). Communication through language furthermore requires turn-taking that is sensitive to interactional constraints (Healey, Swoboda, Umata, & King, 2007). Over the years, strategy scholars and practitioners have devised and studied a plethora of aids to strategy work beyond language. These include physical and digital tools and artifacts, such as frameworks, simulations, war gaming, arts, theater, serious play, or artifacts such as clay or Lego or prototypes, that engage with complexity and explicate ideas and thoughts (Bačić & Fadlalla, 2016; Roos, Victor, & Statler, 2004). Other examples are the use of sketches, symbols, pictures, and digital artifacts and tools (Eppler & Platts, 2009; Marion & Fixson, 2021; Pershina, Soppe, & Thune, 2019).

Kinesthetic tasks are commonly used in arts-based learning processes in strategy work because of their tendency to reduce inhibitions (Nissley, 2010). Play facilitates the expression of positive and negative emotions through engagement in fantasy and play (Kolb & Kolb, 2010), allowing the creation of a liminal state where behaviors are different from those in the workplace (Johnson, Prashantham, Floyd, & Bourque, 2010). The use of cognitive aids may thus stimulate both "hot" and "cold" cognition (Hodgkinson, Sund, & Galavan2018). It provides a context for teams to identify and argue contentious or critical issues (Jacobs & Heracleous, 2005). Different materials can even be associated with deeper human emotions (Taylor & Statler, 2014), which can act as a connection between artifacts and the organization (Rafaeli & Vilnai-Yavetz, 2004). Cognitive aids can enable individuals to explicate or simplify complex issues, support attention, enhance perceptual processing and memorizing, attend to what others are saying, and be more receptive to learn (Dehaene, 2021). Cognitive aids thus focus attention, trigger curiosity, enable individuals to understand, and express themselves, in complementary ways other than verbal.

A look at the domain statement of the managerial and organizational cognition (MOC) division of the Academy of Management suggests some of the many avenues that could be explored if we are to build a firm theoretical understanding of the many ways in which cognitive aids impact cognition. Mentioned in this statement are (for example) theories of attention, attribution, emotions, identity, ideology, information processing, creativity, learning, memory, mental representations and images, categories, framing, interpretation processes, and change. All of these and more represent possible theoretical avenues that can inform research on cognitive aids.

Enriching the well-established domains of MOC, the study of cognitive aids in strategy aims to enhance decision-making processes and provide valuable insights for organizations. Further, by exploring new horizons of neuroscience and socio-cognitive and socio-psychological research, we can better understand how cognitive aids, artifacts, and tools (beyond language alone) can support strategic thinking and facilitate the development of adaptive and innovative strategies. This interdisciplinary approach allows researchers and practitioners to tap into a wealth of knowledge and expertise, ultimately leading to more effective and sustainable outcomes for organizations.

Recent advances in neuroscience are helping shed light on the underlying mechanisms of cognitive aids in strategy, as discussed by Gustafsson (2023, this volume) and Heaton (2023, this volume) in their respective chapters. These findings are leading to the emergence of new areas of inquiry that combine neuroscientific and socio-cognitive perspectives with management and organizational psychology research, deepening our understanding of how the human brain interacts with various cognitive aids to make sense of complex strategic issues and how to advance communication and collective sensemaking with those complexities. As a result, researchers are becoming better equipped to also design and implement cognitive tools that address specific cognitive challenges faced by strategists, such as information overload, cognitive biases, and decision-making under uncertainty. Worren (2023, this volume) in his chapter brings up that researchers can advance rigor and relevance in management research by focusing on the development and testing of such cognitive aids rather than developing and testing theories. Examining the interplay between individual, group, and organizational cognition when using various cognitive aids in strategy offers promising directions for future research and has the potential to revolutionize the field of strategy through the development and application of novel cognitive aids.

Contributions in this Volume

This volume of *New Horizons in Managerial and Organizational Cognition* contains 9 chapters, including this one, that explore a broad range of cognitive tools. The chapter by Wright (2023, this volume) introduces the FOCUSED dice tool and its framework as a cognitive aid to strategy, strategizing, and strategy-making. The FOCUSED framework is grounded on base evidence collected over time and presents the possibility of framing and understanding something from a new perspective. It is purposefully designed to expand worldviews by opening individuals

to otherness, including other forms of reasoning, logic, explanations, and ways of knowing, through play. The framework consists of seven different dice, each with its own key theme, for example, *bring a fresh idea*, or *have a sense of urgency*, which enables managers and executives to break down a problem and think comprehensively about specific aspects during strategy work. The FOCUSED dice tool encourages different perspectives on strategic challenges, while also requiring integration between key discussion points from one dice to the other. It cultivates a mindset for agility, situational and contextual awareness, and the need to change cognitive gears as Wright puts it. In the chapter, Wright discusses the theoretical foundations, including personal construct theory and alternative constructivism, that have shaped the design of the tool and the method. The chapter then discusses how the FOCUSED dice tool can be used as a facilitative tool and its benefits in strategizing and provides guidance for organizations that wish to use it more systematically. The chapter ends by discussing experiences and challenges for integrating the FOCUSED tool as a tool used on a regular basis in organizations.

The chapter by Worren (2023, this volume) is a thought-provoking piece for management researchers. Worren suggests reconciling rigor and relevance in management research by prioritizing the development and testing of practical tools. He discusses the importance of focusing on the development and testing of tools rather than theories to achieve pragmatic validity. Pragmatically validity concerns testing and validating how a tool for strategy work helps produce value for the organization by achieving certain goals or intended consequences. The scientific validity of a theory may not necessarily correlate with the pragmatic validity of the tool derived from it. As Worren explains "scientific validity of the underlying theory may thus be relatively independent of the pragmatic validity of the tool derived from the theory." He suggests that by testing the tools derived from theories, rather than the theories themselves, we can determine whether they actually aid practitioners in achieving their goals. Worren outlines seven cognitive effects to consider when evaluating why there is value in the use of a tool. These are (1) attention-directing; (2) sense-making; (3) ideation; (4) mnemonics; (5) cognitive coordination; (6) knowledge acquisition; and (7) decision support. He then proceeds to discuss various empirical approaches for testing pragmatic validity and re-visits past studies on tools such as the SWOT analysis, the BCG portfolio planning matrix, different tools for multi-criteria decision-making (MCDM), and the balanced scorecard. The chapter ends with a discussion of the need for pragmatic re-interpretation of existing theories.

The chapter by Short and Hubbard (2023, this volume) on extending the upper echelon theory provides an overview of the theoretical underpinnings of Upper Echelons Theory and verbal and nonverbal signals. It examines the cognitive base and values of three key evaluators of the firm and its CEO – boards of directors, financial analysts, and the media – and examines how these characteristics shape their evaluations of the firm and its executive team. It also outlines how CEOs can use this understanding to craft verbal and nonverbal signals that appeal to and influence these evaluators. Finally, it suggests strategic considerations that CEOs can use to interact with board members, financial analysts, and members

of the media. The key insights from the chapter are for boards of directors, the CEO, and other top managers. The authors suggest that they all should strive to craft communications that clearly reflect their strategic thinking and the strategic opportunities available to them. Presentations should be well-organized and reflect the strategic context the executive team is in and the opportunities they face. Perhaps most importantly, the executive team should focus on conveying any information that speaks to their competence and the quality of their strategic decision-making. In doing so, the executive team should be aware that boards of directors, who are charged with overseeing the firm's strategic direction, are likely to focus on such information and that this focus has a reciprocal influence on their evaluations of the executive team.

Spaniol and Rowland (2023, this volume) explore the use of scenarios to examine the future through facilitated processes contextualized in practice. Scenario planning is a challenging process, and the authors examine the complexities of hot and cold cognition in its application. Spaniol and Rowland converge on the nexus of scenarios as cognitive aids, by framing cognitions as an embodied and enacted process involved in the doing of this strategy work. Scenarios, as implicitly facilitated and engaged forms of practice are therefore cognitive in nature. They argue that scenarios are used to cool cognition, discipline thinking, and selectively retain the capacity to be future-focused. In practice however, experiences show how conditions of effect can inhibit the preferred discipline of logic and scenario planning. Rather than shy away from the challenges that arise, Spaniol and Rowland (2023, this volume) propose that facilitators utilize the concept of emotional labor to support the management of cognition during these facilitations.

Turner (2023, this volume) examines music as a metaphorical tool to help organizations grapple with the intricacies of working within an environment that is unstable and increasingly prone to rapid changes, leading to shifts in company focus and direction. Three types of music are considered (classical orchestral, pop music, and jazz). Each metaphor helps to reveal alternative approaches to leadership, and more specifically strategic development. There is, moreover, no template for success, just the building of possibilities by using music as a different lens in which to scrutinize the strategic field. The role of music is used to help understand the role of staff collaboration and learning. It helps expose and give meaning to the ways in which humans remember and relate to dynamic organizational life. It also acknowledges the need for anchor-points to help with memory. Music provides both the possibilities of collaboration and soloing. It exposes leadership and followership as well as the ways in which listening, unlearning and collaboration aid the development of a more emergent, flexible, and dynamic strategic development and policy.

In Heaton's (2023, this volume) chapter on a neuroscience approach to entrepreneur pitch outcomes, she frames entrepreneurial pitches as cognitive aids. Heaton investigates the neural mechanisms behind investor behavior and how they affect pitch success, providing valuable insights into the cognitive processes at play during these critical interactions. Building on insights from neuroscience, Heaton uncovers the neural processes engaged during pitches and identifies

factors promoting pitch success, enhancing our understanding of the cognitive underpinnings of effective strategic communication. She hypothesizes that pitch outcomes are influenced by covert cognitive, emotional, and social processes, as well as demographics (gender, ethnicity), physical context (online vs in-person), and tactical approach (storytelling vs dry facts). The chapter presents four propositions related to the impact of inter-brain synchrony on pitch outcomes, demonstrating the role of cognitive aids in facilitating mutual comprehension and fostering interpersonal relationships. Furthermore, Heaton discusses the potential benefits of mirroring techniques as a cognitive aid, enabling entrepreneurs to adjust word usage, posture, tone, and behaviors to build rapport with investors and improve pitch outcomes. By examining the neural mechanisms and cognitive aspects of entrepreneurial pitches, Heaton's chapter contributes to the broader understanding of cognitive aids in strategy and their potential to guide managers in their decision-making processes.

Gustafsson (2023, this volume) provides a comprehensive review of visual artifacts in strategy work and draws together the so far disparate work on the topic from the field of neuroscience, to identify the neurocognitive advantages of utilizing visual artifacts. The advantages identified include increased attention, emotional control, learning and memory, and intuition. Gustafsson then draws these together through the elaboration of three key practices of storytelling, playfulness, and collective sense-building. This comprehensive chapter examines the role of leading-edge considerations in cognition, concluding that visual artifacts have substantial untapped potential to exploit neurocognitive processes in strategy work.

Secchi (2023, this volume) highlights the importance of social dynamics and dispositions in the strategic decision-making process. It is clear that the application of non-traditional methods is not a trivial choice. To assess the efficacy of these approaches Secchi uses an agent-based model to examine the interaction of managers and tools. The results draw our attention to the need to consider the use of these tools in the context of the strategic process, rather than independently from the process. In doing so, we begin to get an understanding of their dependencies and efficacious application. Secchi draws our attention to the importance of the role of actors in the use of these tools, writing that "the theory of social organizing claims that by moving from unanimated artifacts to sentient humans, cognition changes dramatically." Bringing together the tools (traditional and non-traditional) with managers who discuss strategic issues in an agent-based model, Secchi provides insights into the efficacy of the tools and three interesting findings are discussed. One, non-traditional strategy aids do not produce results independent of the context in which they are used. Interestingly he finds that in most cases there is no significant difference between traditional and non-traditional tools and suggests some of the cognitive process that may be at play. Two, the extent to which managers can listen to and use each other's expertise shapes outcomes by influencing social dynamics and creating stronger reliability of the information that flows among members. Three, where cues are ambiguous and make interpretation difficult for managers, and social cognitive resources are scarce, the use of artifacts becomes more relevant.

Concluding Remarks and an Invitation to Explore

The "Cognitive Aids in Strategy" volume of *New Horizons in Managerial and Organizational Cognition* addresses a broad and challenging range of questions regarding the role and cognitive theoretical foundations of such aids. We could not ever hope to do full justice to the many possible avenues of enquiry on such cognitive aids, but we hope together with the individual chapter authors to have stimulated the reader to think about the whys and hows of cognitive aids in strategy. We hope to have demonstrated the important role they play and the opportunities they represent. The numerous theoretical and methodological advances in the field of MOC provide ample opportunities for further research (Galavan, Sund, & Hodgkinson, 2018).

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