A Cognitive Slack Approach to Organizational Design

David Mortimore[1,2](✉), Raymond R. Buettner, Jr.[2], and Kathryn J. Aten[2]

[1] Naval Undersea Warfare Center Division, Keyport, Keyport, WA 98345, USA
[2] Naval Postgraduate School, Monterey, CA 93943, USA
{dbmortim1,rrbuettn,kjaten}@nps.edu

Abstract. Organizational performance and goal attainment depend upon robust decision-making and group employment of relevant information and expertise. However, the effects of structural interference can both inhibit and undermine the ability of organizations to locate, access, and employ needed information and cognitive specializations. Importantly, structural interference is a system property: its effects cannot be eliminated, only mitigated. Contending with the effects of structural interference also consumes scarce organizational resources, particularly cognitive slack, negatively impacting performance and stakeholder value generation. Purposeful use of contributor-bias, receiver-bias, point of origin curation (PoOC), and non-human knowledge worker (NHKW) techniques can lessen the cognitive slack lost to structural interference, enabling groups to make more gainful use of relevant information and expertise in choosing how to best accomplish organizational strategies. Computational experiments indicated that receiver-bias, PoOC, and NHKW techniques can effectively return meaningful amounts of cognitive slack, which can then generate more robust group decision-making and performance, ultimately.

Keywords: Attention · Transactive Memory · Cognitive Slack · Decision-Making · Team Performance

1 Introduction

Decision-making characterizes organizational performance and goal attainment: more robust decision-making reasonably generates stronger group performance and greater stakeholder value. Group decision-making reifies an organization's strategy, which expresses how a group intends to accomplish its mission [1–3]. Choosing between options regarding task designs and the shared employment of resources, therefore, predicates organizational performance and goal attainment [4–9]. However, gathering relevant information is costly: identifying the location of and retrieving needed expertise and other information consume scarce resources that could be used for more gainful purposes [4, 6, 10, 11]. Moreover, greater degrees of ambiguity and uncertainty associated with both an organization's external environment and task performance generally necessitate gathering and processing greater volumes of information, increasing the costliness of decision-making [1, 12, 13].

R. Thomson et al. (Eds.): SBP-BRiMS 2024, LNCS 14972, pp. 110–120, 2024.
https://doi.org/10.1007/978-3-031-72241-7_11

Structural interference, an organizational system property, further increases the costliness of employing relevant information, diminishing performance and goal attainment. Structural interference generally increases the challenges group members encounter in identifying who possesses, employing, and maintaining relevant information [14, 15].[1] Such difficulties inhibit the ability of group members to employ key information in making decisions that, in turn, can result in less optimal outcomes [8, 15]. Simply, structural interference impairs organizational decision-making and performance. Problematically, the nature of structural interference, as a system property, means that its impacts cannot be eliminated, only lessened [12, 15, 17]. Generating stronger group performance, therefore, necessitates organizations purposefully design and incorporate approaches to mitigate the effects of structural interference.

This study investigated the conjecture that techniques reifying four novel constructs—contributor bias, receiver bias, point of origin curation (PoOC), and non-human knowledge workers (NHKWs)—can mitigate the effects of structural interference on organizational performance. This paper describes the relevancy of cognitive slack, a fifth proposed construct, to organizational performance and impacts of notional techniques on mitigating structural interference effects. Then, the research design, including the experiment scenario, hypotheses, and results, are summarized. Finally, study limitations are addressed and recommendations for future work offered. Consistent with organization science studies, in general, this paper situates both the theoretical and empirical work in continuing research trajectories, including seminal studies that remain relevant.

2 Cognitive Slack as Performance Driver

To fully appreciate the relationship between cognitive slack and organizational performance, it is necessary to characterize organizations. Consistent with the modern school of organization theory, organizations are primarily information processing and communication systems that provide members the means to overcome limitations associated with individual performance [12, 18–22]. Among the set of temporal, cognitive, physiological, and institutional limitations on individual performance, the constraints imposed by cognitive performance are particularly impactful because they limit decision-making robustness [4, 5, 11, 18–23].[2] Organizations are effectively decision-making systems [4, 12, 19, 21], and decision-making, itself, is inherently a search for relevant expertise and information [4, 12, 19, 21, 24].

Cognitive slack is essential to robust organizational decision-making and performance and represents the likely performance-limiting resource in groups—the capability to process relevant information. "The scarce [organizational] resource is not information; it is processing capacity to attend to information" [11, p. 270], leading to a need

[1] In the context of transactive memory, *structural interference* is the disruption to the performance of cognitively interdependent systems resulting from organizational network phenomena that increase the costliness of or otherwise discourage organizational members from employing relevant expertise and information [16].

[2] Decision-making *robustness* encapsulates the rationality of decisions [8, 25]. Cognitive limitations and other factors affecting the cognitive performance of individuals effectively bound the rationality of decisions, limiting group performance and goal attainment [8, 20, 22].

to organizationally manage attention for stronger group decision-making and, by extension, performance [5, 10, 11, 26]. Cognitive slack represents the processing capacity described by [11], which is crucial to group decision-making performance, and provides organizational managers and theorists a parameter for managing attention [5, 10, 11].[3] The increasing complexity of decision-making in modern organizations results in processing greater volumes of information [5, 11, 12], amplifying the importance of cognitive slack as an organizational design and management parameter.[4] When inadequate cognitive slack exists, work backlogs result, negatively impacting decision-making and performance [13, 20, 22, 27].

2.1 Structural Interference Reduces Cognitive Slack

Structural interference is particularly pernicious to organizational decision-making and performance. Importantly, structural interference always has a negative impact on organizational performance [14, 15]. Addressing the effects of structural interference generally consumes cognitive slack—wasting an organizational resource that conditions decision-making and, as a result, performance. Structural interference generates impediments to employing relevant expertise, such as cumbersome information retrieval and sharing processes, that necessitate group members use additional amounts of organizationally scarce amounts for task performance [14, 15].

Such impediments effectively prevent group members from employing cognitive slack for more consequential work [14, 15, 18, 20, 22, 28]. The net effect is that the robustness of decision-making generally suffers, leading to less optimal organizational performance and stakeholder value generation [4, 5, 10–12, 15].

2.2 Mitigating Structural Interference Effects

Techniques that reify contributor bias, receiver bias, PoOC, and NHKW constructs—four newly developed constructs, in the context of transactive memory—can mitigate the effects of structural interference on organizational performance. *Contributor bias* describes the intentional design and use of organizational structures, including information sharing and reward mechanisms, to incentivize making relevant expertise and information available to group members [16]. In comparison, *receiver bias* describes the purposeful design and use of organizational structures to encourage group members to retrieve and employ relevant expertise and information. In each construct, the bias is positive: it promotes design and management approaches that encourage making relevant expertise and information available to other group members for use in decision-making and other tasks. *PoOC* describes organizational designs and practices that curate group information stores, automatically, maintaining their relevancy. *NHKWs* are artificial computational agents that perform tasks in the technical core of organizations, alongside human group members [29].

[3] *Cognitive slack* is the volumetric difference between information processing capacity and demands [16].

[4] Notably, cognitive slack is relevant to organizations of human and artificial agents, strengthening its importance in the design and management of modern organizations [18, 20, 22, 23].

Contributor-bias, receiver-bias, PoOC, and NHKW techniques effectively return cognitive slack to organizations, when appropriately applied, allowing use of crucial and limited information processing capacity for more consequential work. Three constructs generally lessen the costliness of employing organizational expertise and information, and the fourth mainly reduces the volume of cognitive workload that human knowledge workers (HKWs) perform. Contributor-bias, receiver-bias, and PoOC techniques usually emphasize the ease of accessing and using information by addressing phenomena that discourage group members from sharing, maintaining, and employing organizationally possessed expertise and information [16, 28]. Unwieldly information sharing mechanisms (ISMs) and inadequate reward processes can dissuade individuals from sharing knowledge, skills, and abilities needed by others [14, 28, 30]. In comparison, NHKWs perform tasks in lieu of HKWs, allowing HKWs to use cognitive slack for more productive work [29, 30]. Employing these constructs to mitigate structural interference impacts on cognitive slack effectively provides organizations the ability to process greater volumes of information, leading to more robust decisions and organizational performance.

3 Research Design

This study employed an organizational engineering modeling application, a community-accepted experiment design, and a generalized call for proposals (CfP) process to explore the conjecture that contributor-bias, receiver-bias, PoOC, and NHKW techniques positively impact group performance.

3.1 Project Organization and Workflow for Edge Research

Project Organization and Workflow for Edge Research (*POWer*) is a computational organization theory (COT) application designed to model group performance of knowledge work, making it particularly appropriate for this study. COT and its tools are grounded in the view of organizations as mainly information processing and communication systems [12, 21, 31, 32], and that decision-making constitutes the primary task performed by organizations [4, 5, 11, 19]. In other words, organizational performance usually represents decision-making performance. COT frameworks and tools facilitate both theory development and testing and enable scholars and practitioners to perform a broader range of experiments, while controlling specific parameters, than laboratory and field experimentation typically allow [31, 32].

POWer is an enhanced version of a validated organizational engineering COT tool [13, 27, 33]. Organizational engineering models use groups as the unit of analysis, instead of individual agents, in detailed representations of the task, coordination, communication, and reporting networks through which organizations reify their strategies to accomplish goals [13, 32, 33]. *POWer* uses discrete event simulation, coupled with both numeric and symbolic reasoning, to stochastically emulate organizational work volumes and impacts on group performance from task uncertainty, project and non-project related communications, cultural norms, and workflows [13, 32, 33]. Moreover, *POWer* is intentionally designed to emulate knowledge work-driven organizations, which typically generate larger volumes of exceptions and, as a result, decisions [13, 27, 33]. Thus, *POWer* provides a robust capability to emulate the effects of contributor-bias, receiver-bias, PoOC, and NHKW techniques on group performance.

3.2 Experiment Design

Strengthening the research design, this study used a COT community-accepted experimentation framework. Summarized below is the design detailed by [33].

- Select the organizational design factors to vary.
- Set other model parameters to average/medium values.
- Using organizational information processing theory (OIPT) [12], predict the directional change in outcomes.
- Run three sets of simulations, with 1,000 trials in each set, for the varied organizational design factors.
- Calculate the mean values of the simulation results.
- Statistically compare experiment results with predicted outcomes.

This research design includes several key assumptions. First, the total amount of organizational work performed is represented by the *total work volume*, which is the aggregate of production work, coordination work, and waiting time volumes [13, 27, 33]. Second, the absence of work backlogs represents adequate cognitive slack, whereas the presence of work backlogs represents inadequate cognitive slack.[5] Third, other factors that can impact organizational performance are modeled by: an individual's experience and skillset; the complexity of tasks and solutions to problems; exception handling at the individual and group levels; and the assigned project and task priorities [13, 27, 33]. A relatively large number of empirical studies used to both develop and test *POWer* and the *Virtual Design Team*, on which *POWer* is based, justify the validity of these assumptions [13, 27, 33]. Table 1 summarizes additional assumptions, which are further described in subsequent sections.

3.3 Scenario Description and Hypotheses

The notional development and dissemination of an annual CfP for an organizational investment program provides a strong scenario for exploring likely impacts of contributor-bias, receiver-bias, PoOC, and NHKW techniques on group performance. This annual task is costly to the organization: it consumes a fairly significant amount of cognitive slack and competes for the attention of group members—that the organization could use for more significant work. Group members must gather, synthesize, and interpret investment inputs from both internal and external sources to draft the CfP,

[5] This study mainly focuses on organizations characterized by greater degrees of uncertainty and ambiguity in both task performance and their operating environments, which usually result in larger exception-handling and decision volumes [1, 11–13]. The performance of such organizations tends to be more sensitive to the availability of cognitive slack.

solicit feedback from stakeholders, make needed revisions, and then obtain organizational approval of the CfP, so it can be disseminated. After the CfP is published, group members continue collecting and reviewing investment inputs for the remainder of the year, in case a significant shift in stakeholder priorities warrants revising the CfP.

However, other organizational priorities compete for the attention of group members, reducing the resources—including cognitive slack—available to publishing the annual CfP. Meetings, communications, and other projects can interrupt developing and circulating the CfP. Such disruptions can also cause group members to wait on others to provide what is needed, generate rework, and increase coordination workload, especially when non-CfP projects have higher priority.

Table 1. Additional model assumptions by technique.

Technique	Contributor bias	Receiver bias	PoOC	NHKW
Design parameters	Transmit call for research proposals using a customer relationship management-like approach	Visualize investment inputs using graph network algorithms (e.g., bibliometrics visualization)	Gather new external investment inputs using information harvesting and natural language processing (NLP) algorithms	Read and synthesize external investment inputs using graph network and NLP algorithms
Dependent variable	Total work volume			
Unit of analysis	Organization			
Significance level	Five percent			

Figure 1 depicts the baseline computational model used in the experiments. An investment program manager (PM) is responsible for soliciting proposals from the workforce for an annual science and technology (S&T) investment program. In addition to overall coordination of the S&T investment program, the PM and their staff work with internal and external stakeholders, S&T Focus Area representatives, and the Executive Director to develop, approve, and publish a CfP, annually. After gathering inputs from internal and external investment sources, the PM and their team read, synthesize, and interpret the aggregated inputs. Normally, the PM drafts an updated CfP and solicits stakeholder feedback, before obtaining the Executive Director's approval. The PM and their staff then send the CfP to the workforce, typically through multiple ISMs, such as electronic mail, intranet sites, and presentations. Once the CfP is published, the PM and their team continue monitoring stakeholder investment inputs for significant changes that might warrant publishing a revised CfP.

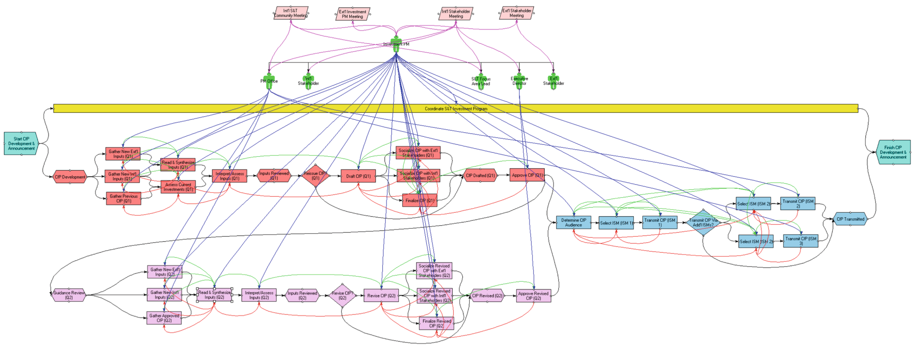

Fig. 1. Baseline S&T investment program CfP computational model.

3.4 Hypotheses

It is hypothesized, in the context of OIPT [12, 33], that:

- contributor-bias, receiver-bias, PoOC, and NHKW techniques will each result in performing a lesser total work volume, compared to the baseline model; and
- an NHKW technique will impact the total work volume the organization performs more significantly than contributor-bias, receiver-bias, and PoOC techniques.

4 Results

Experiment results mostly agree with expectations—three of the four techniques appear to have mitigated the effects of structural interference on cognitive slack and, by extension, organizational performance, and a second technique produced results similar to the NHKW technique. Table 2 compares the mean simulated total work volumes, total work volume deviations, durations, and duration deviations for the CfP development and announcement project [13, 27, 33, 34]. Statistical tests indicated that the differences in mean total work volumes between the baseline model and each of the receiver-bias, PoOC, and NHKW technique models were meaningful, at a five-percent significance level. Confidence interval analyses for the differences in mean total work volumes, again at a five-percent significance level, corroborated these findings. However, statistical tests indicated that there was no meaningful difference between the mean total work volume for the baseline and contributor-bias technique models, at a five-percent significance level. This result was further corroborated by confidence level analysis. Thus, computational results led to rejecting one of the four hypotheses regarding structural interference mitigation techniques.

Surprisingly, the receiver-bias and NHKW techniques generated the same simulated mean total work volumes and total work volume deviations, which led to rejecting the hypothesis that the NHKW technique would outperform other structural interference mitigation techniques. Furthermore, the receiver-bias and NHKW techniques generated equivalent simulated outcomes for the mean duration and mean duration deviation for the CfP development and announcement project (see Table 2). These results suggest that the receiver-bias and NHKW techniques might have completely offset the cognitive slack consumed by the effects of structural interference interpreting/assessing investment inputs and reading and synthesizing investment inputs, respectively.

Table 2. CfP project experiment simulated outcomes (in days).

	Mean total work volume	Mean total work volume deviation	Mean duration	Mean duration deviation
Baseline	641.3	78.9	1,827	238.9
Contributor-bias technique	636.3	81	1,817.3	245.9
Receiver-bias technique	621.9	117.3	1,365.4	213.7
PoOC technique	612.8	79	1,800	236
NHKW technique	621.9	117.3	1,365.4	213.7

5 Discussion

Paradoxically, the mixed results underscore the importance of this and future studies regarding designing techniques to mitigate the effects of structural interference—and how to purposefully incorporate them in engineering organizations. The notion that slack typically contributes positively to organizational performance is fairly well-established [12, 35, 36]. However, it is important to consider in organizational designs that overly zealous efforts to reduce the effects of structural interference might, themselves, generate additional structural interference that consumes more cognitive slack—thereby diminishing group performance—than doing nothing.

Of the limitations associated with this study, three stand out. The first and perhaps most significant limitation is that each experiment considered a single construct: no attempts were made to explore possible interactions between constructs. This conservative approach is in keeping with the community-accepted experiment design used and seems appropriate at this relatively early stage of work [33]. Second, experiment outcomes do not fully describe the amount of cognitive slack available to an organization. *POWer* version 3.4a, used in this study, indicates when organizational information processing capacity is exhausted (i.e., the presence of backlogged work) and the date and maximum amount of backlogged work [34]. Absent is a depiction, or readily attainable calculation, of the volume of information processing capacity remaining when cognitive slack is not exhausted. Lastly, *POWer* generally assumes when individuals perform at 100% capacity when working on project-related tasking, except when group members work longer than the standard workday duration, which can result in greater amounts of rework and other issues [13, 33]. Notwithstanding these limitations, the use of an enhanced version of a community-validated COT tool, specifically designed to emulate organizational behaviors associated with knowledge work, and community-accepted experiment design strengthen confidence in study findings [13, 27, 32, 33].

In modern organizations, it seems increasingly important to treat cognitive slack as an organizational design parameter and purposefully design and incorporate techniques to mitigate the effects of structural interference. Decision-making continues to become increasingly complex; therefore, groups need to gather, process, and communicate even greater volumes of information [4, 10–12, 37], making the organizational management of attention more crucial to performance. Future studies should continue to explore mitigating structural interference effects using contributor-bias, receiver-bias, PoOC, and NHKW techniques—with an eye towards identifying thresholds when the cure could be worse than the disease.

6 Conclusion

Stronger performance of modern organizations likely depends upon treating cognitive slack as a key group-design parameter and using novel contributor-bias, receiver-bias, PoOC, and NHKW techniques to mitigate the effects of structural interference. Computational experiments indicated that intentionally employing already available technical capabilities, such as those in customer relationship management software, can enable groups to use cognitive slack more productively and generate stronger organizational outcomes. In our information-rich world, the largely unmanaged group employment of cognitive slack—which represents the scarce organizational resource—might limit performance and goal attainment more than anything else.

Acknowledgments. The authors thank Dr. Robert (Bob) Iannucci for permitting us to use the expression point of origin curation, in lieu of the original terms used. This study was funded by the Office of Naval Research Cooperative Autonomous Swarm Technology, Cognitive Science and Human & Machine Teaming, and In-House Laboratory Independent Research programs.

Disclosure of Interests. The authors have no competing interests to declare that are relevant to the content of this article.

References

1. Burton, R., Obel, B.: Strategic Organizational Diagnosis and Design: The Dynamics of Fit, 3rd edn. Springer Science Business Media, New York (2004). https://doi.org/10.1007/978-1-4419-9114-0
2. Burton, R., Obel, B., Håkonsson, D.: Organizational Design: A Step-By-Step Approach, 4th edn. Cambridge University Press, Cambridge (2021)
3. Nadler, D., Tushman, M.: Strategic Organization Design: Concepts, Tools, & Processes. Scott, Foresman and Co., Glenview (1988)
4. Arrow, K.: The Limits of Organization. W. W. Norton & Co., New York (1974)
5. Arrow, K.: The economics of information: an exposition. Empirica **23**, 119–128 (1996). https://doi.org/10.1007/BF00925335
6. Cohen, M., March, J., Olsen, J.: A garbage can model of organizational choice. Adm. Sci. Q. **17**(1), 1–25 (1972). https://doi.org/10.2307/2392088
7. Malone, T., Crowston, K.: Toward an interdisciplinary theory of coordination [MIT Sloan Working Paper #3294–91-MSA], pp. 1–48 (1991). http://hdl.handle.net/1721.1/2356

8. Simon, H.: A behavioral model of rational choice. Q. J. Econ. **69**(1), 99–118 (1955). https://doi.org/10.2307/1884852
9. Simon, H.: On the concept of organizational goal. Admin. Sci. Q. **9**(1), 1–22 (1964). https://doi.org/10.2307/2391519
10. Ocasio, W.: Attention to attention. Organ. Sci. **22**(5), 1286–1296 (2011). https://doi.org/10.1287/orsc.1100.0602
11. Simon, H.: Applying information technology to organization design. Public Admin. Rev. **33**(3), 268–278 (1973). https://doi.org/10.2307/974804
12. Galbraith, J.: Organization Design. Addison-Wesley Publishing Co., Menlo Park (1977)
13. Levitt, R.: The virtual design team: designing project organizations as engineers design bridges. J. Organ. Des. **1**(2), 14–41 (2012). https://doi.org/10.7146/jod.6345
14. Hollingshead, A.: Communication, learning, and retrieval in transactive memory systems. J. Exp. Soc. Psychol. **34**(5), 423–442 (1998). https://doi.org/10.1006/jesp.1998.1358
15. Wegner, D., Raymond, P., Erber, R.: Transactive memory in close relationships. J. Personal. Soc. Psychol. **61**(6), 923–929 (1991). https://doi.org/10.1037/0022-3514.61.6.923
16. Mortimore, D., Buettner, Jr., R., Carley, K., Boger, D.: Purposefully mitigating the effects of structural interference on organizational decision-making. Department of Information Sciences, Naval Postgraduate School (2024)
17. Gell-Mann, M.: The Quark and the Jaguar: Adventures in the Simple and Complex. W. H. Freeman & Co., London (1994)
18. Carley, K., Gasser, L.: Computational organization theory. In: Weiss, G. (ed.) Multiagent Systems: A Modern Approach to Distributed Artificial Intelligence, pp. 299–330. MIT Press, Cambridge (1999)
19. Cyert, R., March, J.: A Behavioral Theory of the Firm. Cambridge University Press, Cambridge (1963)
20. Kahneman, D.: Thinking, Fast and Slow. Farrar, Straus and Giroux, New York (2013)
21. March, J., Simon, H.: Organizations. John Wiley & Sons, New York (1958)
22. Sloman, S., Fernbach, P.: The Knowledge Illusion: Why We Never Think Alone. Riverhead Books, New York (2017)
23. Schroder, H., Driver, M., Streufert, S.: Human Information Processing: Individuals and Groups Functioning in Complex Social Situations. Holt, Rinehart and Winston, New York (1967)
24. Drucker, P.: The rise of the knowledge society. Wilson Q. **17**(2), 52–71 (1993). http://archive.wilsonquarterly.com/sites/default/files/articles/WQ_VOL17_SP_1993_Article_02_1.pdf
25. Edwards, W.: The theory of decision making. Psychol. Bull. **51**(4), 380–417 (1954). https://doi.org/10.1037/h0053870
26. Woolley, A., Gupta, P.: Understanding collective intelligence: investigating the role of collective memory, attention, and reasoning processes. Perspect. Psychol. Sci. **19**(2), 344–354 (2024). https://doi.org/10.1177/17456916231191534
27. Jin, Y., Levitt, R.: The virtual design team: a computational model of project organizations. Comput. Math. Organ. Theory **2**(3), 171–196 (1996). https://doi.org/10.1007/BF00127273
28. Hollingshead, A., Fulk, J., Monge, P.: Fostering intranet knowledge sharing: An integration of transactive memory and public goods approaches. In: Hinds, P., Kiesler, S. (eds.) Distributed Work, pp. 335–355. MIT Press, Cambridge (2002)
29. Mortimore, D.: Moving beyond human-centric organizational designs. J. Organ. Des. **13**(2), 65–75 (2024). https://doi.org/10.1007/s41469-024-00167-z
30. McWilliams, D., Randolph, A.: Transactive memory systems in superteams: the effect of an intelligent assistant in virtual teams. Inf. Technol. People (2024). https://doi.org/10.1108/ITP-12-2022-091
31. Carley, K., Prietula, M.: Computational Organization Theory. Lawrence Erlbaum Assoc., Hillsdale (1994)

32. Frantz, T., Carley, K., Wallace, W.: Computational organization theory. In: Gass, S., Fu, M. (eds.) Encyclopedia of Operations Research and Management Science, LNCS. Springer, New York (2016). https://doi.org/10.1007/978-1-4419-1153-7_143
33. Levitt, R., Cohen, G., Kunz, J., Nass, C., Christiansen, T., Jin Y.: The virtual design team: simulating how organization structure and information processing tools affect team performance. In: Carley, K., Prietula, M. (eds.) Computational Organization Theory, pp. 1–18. Lawrence Erlbaum Assoc., Hillsdale (1994)
34. Collaboratory for Research on Global Projects: Project Organization and Workflow for Edge Research (POWer) (Version 3.4a) [Computer software] (n.d.)
35. Mitroff, I., Mohrman, S.: The slack is gone: how the United States lost its competitive edge in the world economy. Acad. Manag. Exec. **1**(1), 65–70 (1987). https://doi.org/10.5465/ame.1987.4275909
36. Peters, T., Waterman, R.: In Search of Excellence: Lessons from America's Best-Run Companies. Harper & Row, New York (1982)
37. Heavey, C., Simsek, Z.: Transactive memory systems and firm performance: an upper echelons perspective. Organ. Sci. **26**(4), 941–959 (2015). https://doi.org/10.1287/orsc.2015.0979