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ORGANIZATIONAL AMBIDEXTERITY

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Introduction

Organizational ambidexterity refers to the ability of an organization, or a subsystem of an organization, to perform two tasks with equal skill. The terminology “ambidexterity” is metaphorical: it is the application of a human attribute (that of being equally skilled with both hands) to organizations. While early work varied in respect of the duality ambidexterity was applied to, scholars have now largely coalesced around organizational ambidexterity as referring to exploration and exploitation. These terms were introduced by James G. March, a leading figure in the Behavioral Theory of the Firm tradition, in a seminal 1991 article (cited under *Foundational Papers*).

The normative challenge that broadly characterizes organizational ambidexterity research is the following: how do organizations manage to effectively explore and exploit, when these likely jointly influence long run performance but can compete for scarce resources and crowd each other out? In contrast to schools of thought in management, such as population ecology, that see organizational adaptation as an impossible (or near impossible) feat, scholars of organizational ambidexterity assume that organizations can adapt. Moreover, organizations can, while it might present extreme management challenges, find ways to successfully explore and exploit – and to do so more or less at the same time. Scholarly literature on organizational ambidexterity started out as a trickle of articles in the 1990s, was catapulted into mainstream management scholarship in the mid- to late 2000s, and now constitutes a sizeable corpus of research, which continues to grow and mature.

This bibliography provides a selective representation of works from this corpus, drawing principally on works published in the core journals within management and organization studies. It is organized into eight major sections. First, key foundational papers are introduced. Second, influential review articles and special issues are presented. Third, major theories drawn on in ambidexterity research are identified. Fourth, the settings most represented in organizational ambidexterity research are highlighted. Fifth, as a topic that gathered a great deal of attention in the early growth phase of organizational ambidexterity research, studies addressing whether and, if so, when ambidexterity delivers performance benefits to companies are outlined. Sixth, writings on the major forms through which organizations effect ambidexterity are identified. Seventh, research into ambidexterity focusing on human actors is overviewed. Finally, an emerging conversation on temporal dimensions of ambidexterity is presented.

Except where specifically noted cited works are listed alphabetically (by first author surname).

Foundational Papers

The first application of the metaphor of ambidexterity to organizations is credited to Duncan 1976: a conceptual work adopting a contingency perspective to organization design, which focused on the design dilemmas encountered by organizations in managing innovation projects. This article posits that two major temporal phases of innovation projects (namely, initiation and implementation) present competing organizational design demands. Managing what are viewed as competing organizational demands represents the essential theme in organizational ambidexterity research.

The seminal simulation-based 1991 article by March, a leading figure within the Behavioral Theory of the Firm tradition (see the separate *Oxford Bibliographies* article *Behavioral Theory of the Firm*), despite not employing the language of ambidexterity, has played a defining role in articulating the theoretical objects around which much ambidexterity literature has coalesced: that is, exploration and exploitation as modes of organizational adaptation. Trade-offs between the two and their dual importance for organizational adaptation have formed key orienting assumptions within the domain too.

Early foundational work, which varied in its emphasis accorded to the March 1991 exploitation-exploration dichotomy, focused on how organizations might manage central competing demands. Two pieces geared principally towards managerial audiences, Tushman and O'Reilly 1996 and O'Reilly and Tushman 2004,

develop what has come to be regarded as “structural ambidexterity”, and Gibson and Birkinshaw 2004 posit an alternative “contextual ambidexterity”. In brief, structural ambidexterity involves the structural separation of organizational units undertaking exploration from those engaging in exploitation, accompanied by targeted senior team. In contrast, contextual ambidexterity advocates a dual focus on exploration and exploitation within an organization unit, facilitated by a supportive “behavior-framing” context. The arguments within Gibson and Birkinshaw 2004 resonate with the emphasis in Adler, et al. 1999, on mechanisms through which employees might simultaneously perform routine and non-routine tasks, supported by a conducive organizational context. Literature on structural and contextual approaches to ambidexterity is overviewed in the section “Forms of Organizational Ambidexterity”.

Note that the citations in this section are listed chronologically.

Duncan, Robert B. “The Ambidextrous Organization: Designing Dual Structures for Innovation.” In *The Management of Organization Design: Strategies and Implementation*. Edited by Ralph H. Kilmann, Louis R. Pondy, and Dennis Patrick Slevin, 167-88. New York: North Holland, 1976.

Adopting a contingency perspective, this work by Duncan is widely credited with introducing the descriptor “ambidextrous” to organizations. It proposes a prescriptive model to manage two broad innovation phases (initiation and implementation) that place significantly different demands upon organizations. It advocates “dual structures” whereby organizations shift or switch between structures of low versus high complexity, formalization and centralization, respectively, either within or across organizational units, to manage these innovation phases.

March, James G. “Exploration and Exploitation in Organizational Learning.” *Organization Science* 2.1 (1991): 71-87.

The conceptual arguments in this work have been foundational to ambidexterity research, even if its simulation models have garnered less attention therein. Crucially, in this work, March distinguishes exploration from exploitation, associating distinctive risk and return profiles therewith, and identifying exploration as being more vulnerable in organizations. The call in this work for organizations to balance exploration and exploitation has been taken up as a central tenet in ambidexterity literature.

Tushman, Michael L., and Charles A. O'Reilly III. “Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change.” *California Management Review*. 38.4 (1996): 8-30.

In this article, geared principally towards a managerial audience, Tushman and O'Reilly set out the case, drawing on theories of punctuated equilibrium and technology cycles, for companies to successfully manage periods of both incremental (evolutionary) and radical (revolutionary or discontinuous) change. Organizations and managers that possess the ability to do so are identified as “ambidextrous”, with a few structural, cultural and personal attributes briefly being proposed as common across these.

Adler, Paul S., Barbara Goldoftas, and David I. Levine. *Flexibility Versus Efficiency? A Case Study of Model Changeovers in the Toyota Production System*. *Organization Science*. 10.1. (1999): 43-68.

Informed by a case study on the NUMMI auto plant in California, the authors argue that a set of mechanisms enabling employees to simultaneously engage in routine and non-routine tasks facilitated the plant's ability to “shift the efficiency-flexibility trade-off”. These mechanisms comprise meta-routines, job enrichment, switching and partitioning. NUMMI's success with these mechanisms is attributed to the broader organizational context, which embodied high levels of training and trust.

Gibson, Cristina B., and Julian Birkinshaw. "The Antecedents, Consequences, and Mediating Role of Organizational Ambidexterity." *Academy of Management Journal* 47.2 (2004): 209-226.

This highly influential empirical work by Gibson and Birkinshaw introduced a "contextual" model of ambidexterity. They argue, and demonstrate using survey data, that the capacity for organizational ambidexterity (alignment and adaptability) can reside within business units. Unit members are argued to make choices between aligned and adaptive behaviors, facilitated by a behavior-framing organization context (combining stretch, discipline, support and trust). Ambidexterity mediated relationships between supportive organization contexts and unit performance.

O'Reilly III, Charles A., and Michael L. Tushman. "The Ambidextrous Organization." *Harvard Business Review*. 82.4 (2004): 74-81.

This work is typically cited as first proposing the "structural" model of ambidextrous organization, whereby exploratory units are structurally separated (into distinctive organizational units) from their more exploitative counterparts. A tightly integrated senior team is deemed essential by the authors to counterbalance the differentiation occurring within the organizational structure. Multi-case research is used to argue for the superiority, relative to other designs, of ambidextrous organizations for effecting breakthrough innovation.

Reviews and Special Issues

A number of special issues or themed sections of journal issues have been published since the mid-2000s which have helped advance the study of organizational ambidexterity. These have frequently included review articles which provide useful summaries of contemporaneous ambidexterity literature and suggest directions for future research. Over time, as literature on ambidexterity has matured, special issues have frequently narrowed their scope, examining ambidexterity in relation to a specific management discipline, theory or empirical setting.

Gupta, et al. 2006 introduces a special issue of the *Academy of Management Journal*, centered on research relating to the March 1991 (cited under *Foundational Papers*) exploration-exploitation dichotomy. This introduction set out four key issues pertaining to the exploration-exploitation typology (and germane to ambidexterity research even if this was not the primary focus of the special issue) wherein scholarly practice had been incomplete, contradictory or ambiguous. In 2009, Raisch, et al. introduces an influential special issue in *Organization Science* focusing directly on organizational ambidexterity. A symposium followed in *Academy of Management Perspectives* in 2013. In two rather different articles, Birkinshaw and Gupta 2013 and O'Reilly and Tushman 2013 provide personal reflections on the growth of ambidexterity research and recommend directions for the domain. Both call for a re-focusing of ambidexterity research - albeit of rather different flavors. More recent special issues reflect more specialist topics. Two examples are: (a) the role of human resources and organizational factors in ambidexterity in *Human Resources Management* (introduced in Junni, et al. 2015) and (b) the micro-foundations of ambidexterity in *Long Range Planning* (introduced in Tarba, et al., 2020).

Widely-cited review articles published in regular journal issues include those of Raisch and Birkinshaw 2008, Simsek 2009, Lavie, et al. 2010, and Wilden, et al. 2018. Raisch and Birkinshaw 2008 synthesize early research under the banner of, or contributing towards, organizational ambidexterity, offering a framework showing antecedents, moderators and outcomes of ambidexterity. Similarly, Simsek 2009 provides another early and influential review, notably introducing an input-process-output model to

advance conceptual development within the domain. Lavie, et al. 2010 reviews research on the March 1991 exploration-exploitation dichotomy, focusing on its application at intra- and inter-organizational levels. Wilden, et al. 2018 also takes March 1991 as its starting point, but casts it net wider. Using bibliometric analysis and text-mining, “ambidexterity and performance” is identified as one of five clusters of research inspired by this publication.

Note that the citations in this section are listed chronologically.

Gupta, Anil K., Ken G. Smith, and Christina E. Shalley. “The Interplay Between Exploration and Exploitation.” *Academy of Management Journal*. 49.4 (2006): 693-706.

This special issue introduction poses probing questions regarding the exploitation-exploration typology introduced in March 1991. Questions around defining exploration and exploitation, how these inter-relate, and conditions affecting whether a “balance” thereof is achievable and desirable, continue to inform ambidexterity research. It is worth noting, however, that scholars examining individual and intra-unit levels of ambidexterity have frequently rejected its propositions regarding exploration-exploitation (typically) functioning along a continuum within sub-systems.

Raisch, Sebastian, and Julian Birkinshaw. “Organizational Ambidexterity: Antecedents, Outcomes, and Moderators.” *Journal of Management*. 34.3 (2008): 375-409.

Raisch and Birkinshaw 2008 provides an early review of ambidexterity research. As the corpus of research conducted explicitly under the banner of ambidexterity at that stage was very small, the authors drew strongly on works from contributory literature streams. Thus, a useful lineage of research on which organizational ambidexterity was founded can be traced through the article, even if many of the specifics of the review are now out of date.

Raisch, Sebastian, Julian Birkinshaw, Gilbert Probst, and Michael L. Tushman. “Organizational Ambidexterity: Balancing Exploitation and Exploration for Sustained Performance.” *Organization Science*. 20.4 (2009): 685-695.

Raisch, et al. 2009, in this special issue introduction, raises a number of issues for organizational ambidexterity research to grapple with: (a) understanding tensions and complementarities between differentiation and integration in managing ambidexterity; (b) developing accounts of ambidexterity that reflect its multi-level, nested nature; (c) adopting a temporal, process lens to studying ambidexterity; and (d) exploring the interplay of internal and external activities in ambidexterity. Subsequent research has made progress on these, but they by no means represent fully resolved topics.

Simsek, Zeki. “Organizational Ambidexterity: Towards a Multilevel Understanding.” *Journal of Management Studies*. 46.4. (2009): 597-624.

Simsek 2009 provides an early and influential review, introducing an input-process-output model to organize the disparate literature to that point. An important distinction is drawn between antecedents to ambidexterity (including structural, behavioral and TMT antecedents) and ambidexterity as realized, high levels of exploration and exploitation. A multi-level model theorizing organization, interfirm and environmental influences on organizational ambidexterity and performance is presented to help redress limited integration across contemporaneous ambidexterity research.

Lavie, Dovev, Uriel Stettner, and Michael L. Tushman. "Exploration and Exploitation Within and Across Organizations." *Academy of Management Annals*. 4.1 (2010): 109-155.

Lavie, et al. 2010 reviews intra- and inter-organizational level research on the exploration-exploitation framework (c.f. March 1991 cited under *Foundational Papers*). The authors situate ambidexterity within a range of "modes of balancing", including a "domain separation" modality. Although research has since progressed, and some of its propositions are disputed (e.g., continua-based measures for exploration-exploitation), it remains useful for scholars wishing to understand the broader debates within which ambidexterity research occurs.

Birkinshaw, Julian, and Kamini Gupta. "Clarifying the Distinctive Contribution of Ambidexterity to the Field of Organization Studies." *Academy of Management Perspectives*. 27.4 (2013): 287-298.

Birkinshaw and Gupta 2013 provides a highly readable reflection on the dramatic growth, partly attributed to the flexibility of the ambidexterity construct, in ambidexterity research. Pointing to diversity within the levels of analysis, operationalizations and calculations of ambidexterity, the authors argue for a refocusing of ambidexterity research on the managerial choices - how these are made, who makes them, and what the choices entail - among competing objectives facing organizations.

O'Reilly III, Charles A., and Michael L. Tushman. "Organizational Ambidexterity: Past, Present, and Future. *Academy of Management Perspectives*. 27.4 (2013): 324-338.

O'Reilly and Tushman 2013 initially overviews progress within ambidexterity research, placing particular emphasis on the accumulation of broad evidence of positive performance effects to ambidexterity. Turning then to issues to be resolved, the authors call for more commonality in the use of the terms "exploration" and "exploitation" and a re-centering of research on concerns with companies' long-term survival – in their words, "organizational ambidexterity is about survival" (p. 333).

Junni, Paulina, Riikka M. Sarala, Shlomo Y. Tarba, Yipeng Liu, and Cary L. Cooper. "Guest Editors' Introduction: The Role of Human Resources and Organizational Factors in Ambidexterity." *Human Resource Management*. 54.S1 (2015): s1-s28.

Junni, et al. 2015 reviews 41 empirical studies investigating human resource (HR) and organizational factors as antecedents to ambidexterity. They synthesize the findings (categorized into seven "streams") into an integrative framework and also provide a tabulation showing the volume of studies crossing more than one stream. Drawing on these analyses, the authors identify a number of gaps in knowledge pertaining the role of HR and organizational factors in ambidexterity.

Wilden, Ralf, Jan Hohberger, Timothy M. Devinney, and Dovev Lavie. "Revisiting James March (1991): Whither Exploration and Exploitation?" *Strategic Organization*. 16.3. (2018): 352-369.

Wilden, et al. 2018 reviews articles citing the seminal work by March 1991 (see article cited under *Foundational Papers*). Bibliometric analysis and text-mining are used to identify clusters of related research and the main themes and concepts discussed by each cluster, respectively. "Ambidexterity and performance" is one of five clusters. Of these, it is the most homogenous cluster and is amongst the top clusters in respect of recency of research.

Tarba, Shlomo Y., Justin J.P. Jansen, Tom J.M. Mom, Sebastian Raisch, and Thomas C. Lawton. "A microfoundational perspective of organizational ambidexterity: Critical review and research directions." *Long Range Planning*. 53.6. (2020): 102048.

Tarba, et al. 2020 reviews literature that has advanced an understanding of the "microfoundations" of organizational ambidexterity and introduces the four empirical papers, all concerned with cross-level effects, of the special section. While microfoundational literature is typically concerned with how phenomena at lower levels generate effects at higher levels, the authors include the inverse pattern within their 2 x 2 matrix classifying research on the microfoundations of ambidexterity.

Major Theories

From the outset, a plurality of theoretical traditions has characterized organizational ambidexterity research. March 1991 (cited under *Foundational Papers*) has had a profound impact on research into organizational ambidexterity. Central tenets within ambidexterity literature flow from this article. However, while March 1991 is invariably cited within works on ambidexterity, other behavioral theory literature is seldom referenced. Raisch and Birkinshaw 2008 (cited under *Special Issues and Reviews*) provides a good overview of the broader streams of literature on which ambidexterity, especially in its early years, was built. These streams include organizational learning (incorporating March 1991), technological innovation, organizational adaptation, strategic management and organization design. As ambidexterity literature has expanded, the theoretical base its scholars draw on has necessarily expanded too. By way of illustration, Junni, et al. 2015 (cited under section *Special Issues and Reviews*) reviews an array of human resource and organizational theories informing ambidexterity research.

Thus, any discussion of the theories that ambidexterity research draws on and is related to is necessarily incomplete – and a moving target. Theory on firm capabilities – in particular, dynamic capabilities - has been invoked in a number of works. For example, Gibson and Birkinshaw 2004 (cited under *Foundational Papers*) conceptualized contextual ambidexterity as a "meta-capability", and O'Reilly and Tushman 2008 seeks to integrate ambidexterity and dynamic capabilities theory. Ambidexterity literature has also frequently drawn on organizational paradox theory, given parallels between the two traditions in their concern with managing dualities seen as enduring (see the separate Oxford Bibliographies article *Organizational Paradox*). Prominent examples include Smith and Tushman 2005, Andriopoulos and Lewis 2009, and Zimmermann, et al. 2018. Recent years have seen increasing adoption of the language of microfoundations, in particular concerning antecedents to individual ambidexterity (see the section on *Individuals and Teams*). Tarba, et al. 2020 reviews and calls for ambidexterity literature adopting this perspective (cited under *Special Issues and Reviews*). Martin, et al. 2019 provides an example, which is also noteworthy for emphasizing, in its examination of conflict, a "darker side" to ambidexterity little represented in research to date. Finally, although limited at present, studies taking interpretivist and/or symbolic approaches to ambidexterity appear to be entering the corpus. Maclean, et al. 2021 constitutes one example, presenting a narrative history of speeches on innovation at Procter & Gamble; and Hill and Birkinshaw 2014 raised symbolic along with functionalist arguments for ambidexterity in corporate venture units.

Andriopoulos, Constantine, and Marianne W. Lewis. "Exploitation-Exploration Tensions and Organizational Ambidexterity: Managing Paradoxes of Innovation." *Organization Science*. 20.4. (2009): 696-717.

In a prominent early example of empirical research adopting a paradox lens on ambidexterity, Andriopoulos and Lewis 2009 delineate three underlying organizational tensions (concerning strategic intent, customer orientation and personal drivers) arising from excelling at both exploration and exploitation. Managerial approaches embodying both differentiation and integration are identified as

facilitating successful management of these tensions. Multi-case research in five US-headquartered product design firms informs the analysis.

Hill, Susan A., and Julian Birkinshaw. "Ambidexterity and Survival in Corporate Venture Units." *Journal of Management*. 40.7. (2014): 1899-1931.

Hill and Birkinshaw 2004 includes legitimacy-based arguments when positing that corporate venture units manifesting ambidexterity will increase their odds of survival within their parent companies. In this setting, units' "relational contexts" (i.e., the set of relationships with parties inside and outside the parent company) are theorized to play a key role in fostering unit-level ambidexterity. Survey and archival data on 95 corporate venture units tests and finds support for the predictions.

Martin, Alexander, Arne Keller, and Johann Fortwengel. "Introducing Conflict as the Microfoundation of Organizational Ambidexterity." *Strategic Organization*. 17.1 (2019): 38-61.

In this conceptual work, Martin, et al. 2019 introduces "conflict as *the* microfoundation of organizational ambidexterity" (p. 39, emphasis in the original). Different functions (shifting, balancing and enabling) and types (core, peripheral and inner) of conflicts are posited for sequential, structural and contextual approaches to ambidexterity, respectively, and key management tasks and activities are proposed for each form. The arguments draw on dialectical thinking and organizational paradox theory.

Maclean, Mairi, Charles Harvey, Benjamin D. Golant, and John A. A. Sillince. "The role of Innovation Narratives in Accomplishing Organizational Ambidexterity." *Strategic Organization*. 19.4. (2021): 693-721.

Bringing the "linguistic turn" in management scholarship into ambidexterity research, Maclean, et al. 2021 analyzes TMT speeches made between 1987 and 2001 at Procter & Gamble. Four narrative themes are identified – contextualizing, mutualizing, dramatizing, and focalizing – with each new narrative emerging from a reflexive cycle of critique and response. These discursively constructed narratives are argued to have played a performative role in the (ongoing, dynamic) process of accomplishing ambidexterity.

Smith, Wendy K., and Michael L. Tushman. "Managing Strategic Contradictions: A Top Management Model for Managing Innovation Streams." *Organization Science*. 16.5. (2005): 522-536.

In a prominent, early application of organizational paradox theory to organizational ambidexterity, Smith and Tushman 2005 attends to how TMTs might effectively manage the contradiction between exploration and exploitation. Cognitive literature on frames and processes whereby senior leaders or entire TMTs "embrace, rather than avoid, contradictions" (p. 533) is invoked. These frames and processes are characterized as "paradoxical cognition", which entails a dual emphasis on differentiation and integration.

O'Reilly, Charles A., and Michael L. Tushman. "Ambidexterity as a Dynamic Capability: Resolving the Innovator's Dilemma." *Research in Organizational Behavior*. 28 (2008): 185-206.

In this conceptual article, O'Reilly and Tushman "embed the notion of ambidexterity in the dynamic capabilities framework" (p. 188). They argue that ambidexterity "is a specific capability embodied in senior leadership's learning and expressed through their ability to reconfigure existing organizational assets and

competencies in a repeatable way to adapt to changing circumstances” (p. 200). Propositions are presented linking senior team conditions to ambidexterity.

Zimmermann, Alexander, Sebastian Raisch, and Laura B. Cardinal. “Managing Persistent Tensions on the Frontline: A Configurational Perspective on Ambidexterity.” *Journal of Management Studies*. 55.5. (2018): 739-769.

Zimmermann, et al. 2018 adopts a paradox lens and is informed by a case study of ten “ambidextrous” innovation projects. The authors theorize a key role for frontline managers in dynamically shaping organization context to reconcile - persistent and evolving across space and time - tensions between exploration and exploitation. Frontline managers are characterized as using configurational practices to “incorporate the tension into the collective systems and processes” (p. 764).

Settings for Ambidexterity Research

Foundational organizational ambidexterity research focused on large, established firms. This is the setting for which March 1991 (cited under *Foundational Papers*) posits the exploration-exploitation duality, and that addressed within all the articles listed in the *Foundational Papers* section. Over time though, researchers have applied the lexicon and tenets of ambidexterity research to a broader range of settings. These are too numerous to list here (see Birkinshaw and Gupta 2013 and O'Reilly and Tushman 2013, cited under *Reviews and Special Issues*, for a synopsis and a critical commentary).

Small- and medium-sized enterprises (SMEs) constitute a setting that has garnered sustained interest amongst ambidexterity researchers. A typical assumption is that SMEs possess fewer resources and thus have lesser capacity to implement, in particular, resource-intensive structural designs for balancing exploration and exploitation (refer to *Forms of Organizational Ambidexterity*). Thus, how ambidexterity might be cultivated in such settings has been seen as an empirical puzzle. Readier access to SMEs than large firms, especially for questionnaires which have formed the mainstay of empirical ambidexterity research, might also be a factor accounting the high representation of SMEs in the literature.

SMEs have thus become frequent sites for testing contextual ambidexterity (refer to Gibson and Birkinshaw, 2004, cited under *Foundational Papers*), as well as for examining leadership and behavioral factors as antecedents of ambidexterity. Lubatkin, et al., 2006, provides an early and very highly cited example of organizational ambidexterity research set within SMEs. Bierly and Daly 2007 investigates exploration and exploitation in the research setting of small, manufacturing companies, and Andriopoulos and Lewis (2009) examines the management of paradoxes arising from exploration and exploitation within SMEs (specifically, five product design firms). Zimmermann, et al. 2020 provides another recent example. Perusing the articles listed under *Forms of Ambidexterity* and *Individuals and Teams* will provide many more.

A similar assumption about limited slack is typically made for entrepreneurial startups. A much smaller body of work currently exists on the intersection of startups and ambidexterity (see Wilden, et al. 2018 on the limited in-roads March 1991 has made to date within the discipline of entrepreneurship), and recent calls have been made for more studies (e.g., Tarba, et al., 2020; cited under *Reviews and Special Issues*). Beckman 2006 and Patel et al. 2013 are two widely cited exceptions that employ samples of young firms, and a more recent example is Wang, et al. 2019.

Andriopoulos, Constantine, and Marianne W. Lewis. “Exploitation-Exploration Tensions and Organizational Ambidexterity: Managing Paradoxes of Innovation.” *Organization Science*. 20.4. (2009): 696-717.

This work describes a multi-case study of five US-headquartered product design firms (all SMEs), each having demonstrated sustained profitability alongside industry awards for innovativeness (“ambidexterity”). Adopting a paradox lens, the authors delineate three underlying tensions (concerning strategic intent, customer orientation and personal drivers) arising from excelling at both exploration and exploitation in these firms and identify managerial approaches embodying both differentiation and integration to successfully manage these tensions.

Beckman, Christine M. “The Influence of Founding Team Company Affiliations on Firm Behavior.” *Academy of Management Journal*. 49.4. (2006): 741-758.

Beckman 2006 describes research showing that high founding team commonality (divergence) in prior company affiliations predicts firm-level exploitative (exploratory) strategies. Founding teams high in both common and diverse prior affiliations (“ambidextrous” founding teams) demonstrate stronger employment growth. The restriction of the sample to firms not founded by solo entrepreneurs and to those with a minimum of ten employees potentially places bounds on the study’s generalizability to start-ups more broadly.

Bierly, Paul E., and Paula S. Daly. “Alternative Knowledge Strategies, Competitive Environment, and Organizational Performance in Small Manufacturing Firms.” *Entrepreneurship: Theory & Practice*. 31.4. (2007): 493-516.

Focusing on small firms, Bierly and Daly 2007 examines relationships between exploration, exploitation, environmental characteristics, and firm performance. Exploration and exploitation are found to act as complements, with exploitation exhibiting a stronger (concave) association with performance. Environmental contingencies moderated relationships between exploration, exploitation and performance. Survey responses from 98 manufacturing firms (over 80% of which were classified as small) across a variety of sectors in the US informs the analysis.

Lubatkin, Michael H., Zeki Simsek, Yan Ling, and John F. Veiga. “Ambidexterity and Performance in Small- to Medium-Sized Firms: The Pivotal Role of Top Management Team Behavioral Integration.” *Journal of Management*. 32.5. (2006): 646-672.

In this first investigation of ambidexterity within SMEs, Lubatkin et al. use data derived from two rounds of questionnaires to find support for their arguments of a pivotal role for behaviorally integrated senior teams in SMEs in managing the contradictory knowledge inherent in balancing exploration and exploitation. They find too a positive association between ambidexterity and firm performance in their SME sample.

Patel, Pankaj C., Jake G. Messersmith, and David P. Lepak. “Walking the Tightrope: An Assessment of the Relationship Between High-Performance Work Systems and Organizational Ambidexterity.” *Academy of Management Journal*. 56.5. (2013): 1420-1442.

Patel et al. theorize that SMEs utilizing high-performance work systems (HPWS) will be better equipped to produce suitably flexible human resource bases capable of balancing exploration and exploitation. In a sample of manufacturing ventures, under ten years of age and comprising 10-250 employees, they find positive associations between HPWS utilization, organizational ambidexterity and firm growth (with organizational ambidexterity playing a partially mediating role therein). Note that this sample intersects startups and SMEs.

Wang, Stephanie L., Yadong Luo, Vladislav Maksimov, Jinyun Sun, and Nikhil Celly. "Achieving Temporal Ambidexterity in New Ventures." *Journal of Management Studies*. 56.4. (2019): 788-822.

Wang, et al. 2019 examines how young ventures might reconcile tensions between actions suited to the short- versus long-term. Three managerial capabilities of founder CEOs – expertise breadth, external connectivity and empowering leadership – are found to enable ventures to navigate inter-temporal tensions (achieve “temporal ambidexterity”), with heightened effects being demonstrated for younger ventures. Survey and archival data on 243 ventures in the Yangtze River Delta region of China informs the analysis.

Zimmermann, Alexander; Susan A. Hill, Julian Birkinshaw, and Martin Jaeckel. "Complements or Substitutes? A Microfoundations Perspective on the Interplay Between Drivers of Ambidexterity in SMEs." *Long Range Planning*. 53.6. (2020): 101927.

Ambidexterity research has typically examined either one or a maximum of two drivers. Challenging assumptions of complementarity between drivers, this study within SMEs by Zimmermann et al. finds that structural (i.e., compensatory structuring), contextual (i.e., supportive organization context), and leadership (i.e., CEO behavioral complexity) drivers act largely as substitutes for each other, with the highest levels of ambidexterity being associated with either structural or contextual drivers, but not both.

Organizational Ambidexterity and Performance

A central theme within early organizational ambidexterity literature was establishing whether or not ambidexterity was linked to positive performance outcomes – in particular, from the vantage point of a focal (typically, large) firm. The notion that ambidexterity enhances firm performance was variously referred to as “the ambidexterity premise” or “the ambidexterity hypothesis” in early work. This strongly normative orientation within early literature is consistent with its origins in which explaining firm survival over the long-term was of central concern (see, for example, March 1991, O'Reilly and Tushman 1996, and Tushman and O'Reilly 2004 cited under *Foundational Papers*).

He and Wong 2004 provides an influential early demonstration of growth in sales being associated with manufacturing firms pursuing an ambidextrous technological innovation strategy. These authors operationalized ambidexterity as both a multiplicative interaction and an absolute difference score, with the former demonstrating stronger effects. A period of years followed in which further studies - employing a variety of conceptualizations of ambidexterity - investigated the performance effects of ambidexterity, often examining moderators of the organizational ambidexterity-performance relationship. The studies of Jansen, et al. 2006, Cao, et al. 2009, and Uotila, et al. 2009 provide illustrations.

Junni, et al. 2013 offers a widely cited meta-analysis of studies on the organizational ambidexterity-performance relationship. Overall, the study finds a significant, positive relationship between these variables. However, several contextual factors and methodological choices moderate the strength of this relationship. It needs mention too that most of the studies informing the meta-analysis were cross-sectional or examined just a few years of performance data.

Recent years have seen a lessening interest in investigating the performance implications of ambidexterity, especially where the latter is conceptualized as the simultaneous(near) balanced pursuit of exploration and exploitation. However, a small body of research has increasingly examined more nuanced propositions regarding exploration, exploitation and firm performance, frequently challenging prior findings of simple positive associations between ambidexterity and firm performance. For example, an emerging conversation (covered more fully in *Temporal Accounts of Ambidexterity*) asks rather different questions about performance, shifting from largely static to more dynamic accounts. Piao 2010 and Luger, et al. 2018 represent two examples of such work. In addition, studies (covered under *Multiple

Modes: Comparing and/or Integrating Forms*) have increasingly sought to compare the performance effects of different forms of ambidexterity, or of ambidexterity relative to other modes of balancing exploration and exploitation. Stettner and Lavie 2014 represents an influential example of such work.

Cao, Qing., Eric Gedajlovic, and Hongping Zhang. "Unpacking Organizational Ambidexterity: Dimensions, Contingencies, and Synergistic Effects." *Organization Science*. 20.4. (2009): 781-796.

Cao, et al. theorize different organizational mechanisms behind "balance" and "combined" dimensions of organizational ambidexterity: the former buffering against the risks of excessive focus on either exploration or exploitation, and the latter permitting synergistic effects between these modalities. Survey data from three science parks in China provides support for these arguments, with firm size and industry munificence demonstrating asymmetric moderating effects on the relationships between these dimensions and firm performance.

He, Zi-Lin., and Poh-Kam Wong. "Exploration vs. Exploitation: An Empirical Test of the Ambidexterity Hypothesis." *Organization Science*. 15.4. (2004): 481-494.

This survey-based, empirical work outlines the first formal test of the performance effects of ambidexterity. In a sample of Malaysian/Singaporean manufacturing firms, multiplicative (in particular) and balance conceptualizations of ambidextrous innovation strategies were positively associated with three-year sales growth. Also, as would be anticipated from March 1991, firms employing ambidextrous innovation strategies demonstrated moderate variance in sales growth, relative to those employing exploitation (low variation) and exploration (high variation) strategies.

Jansen, Justin J. P., Frans A. J. Van Den Bosch, and Henk W. Volberda. "Exploratory Innovation, Exploitative Innovation, and Performance: Effects of Organizational Antecedents and Environmental Moderators." *Management Science*. 52.11. (2006): 1661-1674.

Jansen, et al. 2006 outlines empirical, survey-based research investigating rates of exploratory and exploitative innovation within organizational units of a European bank. The study finds contingency-based effects of industry dynamism and competitiveness on the relationships between exploration, exploitation and unit-level "profitability-achieved rate" (i.e., actual unit profitability over targeted profitability; derived from company records). Specifically, dynamism (competitiveness) positively moderates the effect of exploratory innovation (exploitative innovation) on unit performance.

Junni, Paulina, Riikka M. Sarala, Vas Taras, and Shlomo Y. Tarba. "Organizational Ambidexterity and Performance: A Meta-Analysis." *Academy of Management Perspectives*. 27.42. (2013): 299-312.

The meta-analysis detailed in Junni, et al. 2013 proved influential in finding an overarchingly significant, positive ambidexterity-performance relationship. This was strongest at more aggregate levels, with "combined" (i.e., additive or multiplicative) ambidexterity measures, in cross-sectional or multi-method designs, with perceptual measures (and pertaining specific dimensions) of performance, and in more dynamic industries. A small set of studies represented some variables at that point, suggesting potential value to an updated study.

Luger, Johannes, Sebastian Raisch, and Markus Schimmer. "Dynamic Balancing of Exploration and Exploitation: The Contingent Benefits of Ambidexterity." *Organization Science*. 29.3. (2018): 449-470.

Luger, et al. posit self-reinforcing tendencies in organizational ambidexterity, paralleling those in exploration and exploitation. A longitudinal study in the global insurance industry (1999-2014), employing content analysis of press releases, supports inertial tendencies in respect of ambidexterity. The performance effects (RoE) to firms of maintaining high levels of ambidexterity are contingent on environmental conditions, yielding benefits in times of incremental change, and detriments in periods of discontinuous change.

Piao, Ming. "Thriving in the New: Implication of Exploration on Organizational Longevity." *Journal of Management*. 36.6. (2010): 1529-1554.

Observing that firms intersperse episodes of exploration within longer spells of exploitation, Piao draws on archival data from the disk drive industry (1980-1999) to establish that firms experiencing no exploration episodes exhibit reduced odds of survival. For those firms that do undertake episodes of exploration (operationalized as introducing a new disk drive form), a moderate period of "temporal overlap" between the new and old disk drive forms proves optimal for increasing their odds of survival.

Stettner, Uriel, and Dovev Lavie. "Ambidexterity under Scrutiny: Exploration and Exploitation via Internal Organization, Alliances, and Acquisitions." *Strategic Management Journal*. 35.13. (2014): 1903-1929.

Stettner and Lavie 2014 utilise a panel dataset on 190 US software firms (1990-2001) to challenge the notion that firms benefit by balancing exploration and exploitation (i.e., acting ambidextrously) *within* internal organization, alliance and acquisition modes. Instead, they find evidence that firms balance exploration and exploitation *across* these modes, and that doing so yields performance advantages - in particular, where exploiting via the internal organization and exploring through external modes.

Uotila, J., Markku Maula, Thomas Keil, and Shaker A. Zahra. "Exploration, Exploitation, and Financial Performance: Analysis of S&P 500 Corporations." *Strategic Management Journal*. 30.2. (2009): 221-231.

This empirical work introduced automated content analysis of publicly available news to the ambidexterity literature. Employing a longitudinal (1989-2004) panel design of US manufacturing firms, the study finds that a firm's relative exploration orientation (i.e., exploration over exploitation) exhibits an inverted U-shaped relationship with firm market value (Tobin's Q). This relationship is amplified for firms operating in highly technologically dynamic (proxied by R&D intensity) sectors.

Forms of Organizational Ambidexterity

A number of major forms through which companies can pursue ambidexterity are recognized in the literature. These are identified using a variety of terms, including "designs", "mechanisms", "solutions", "modes" and "approaches". Most prominent amongst these are two forms generally referred to as "structural ambidexterity" and "contextual ambidexterity" (refer to the section *Foundational Papers*). Both target the simultaneous pursuit of high levels of exploration and exploitation.

Another major form, identified after these two, involves the use of inter-organizational relationships (e.g., alliances, acquisitions and buyer-supplier relationships) to conduct exploration and/or exploitation. Inter-organizational relationships are not uniformly accepted as falling under the umbrella of organizational ambidexterity though and, accordingly, only a few examples of well-cited papers within this stream will be outlined in this bibliography.

Even more contested is the use of temporal separation – also termed cycling, punctuated equilibrium or vacillation – which advocates that organizations alternate between exploration and exploitation over time. Most scholars (albeit with prominent exceptions, such as Simsek, et al. 2009, cited under *Multiple Modes: Comparing and/or Integrating Forms*) view temporal separation as an alternative to ambidexterity (see, for example, Lavie, et al. 2010 cited under *Special Issues and Reviews*). Accordingly, no papers focusing exclusively on this form will be outlined in this bibliography. However, articles presenting research where temporal separation is compared to ambidextrous forms will be represented.

This section will outline prominent articles on (a) structural ambidexterity, (b) contextual ambidexterity, and (c) inter-organizational forms. Thereafter, examples from a growing literature comparing and/or integrating forms of ambidexterity (and, in some cases, temporal separation) will be outlined.

Structural Ambidexterity

O'Reilly and Tushman 1997 introduced, and Tushman and O'Reilly 2004 elaborated (both articles are cited under *Foundational Papers*), the form of ambidexterity that has come to be known as “structural ambidexterity” – or sometimes, especially in earlier literature, as simply “organizational ambidexterity”. The founders of this approach typically refer to this model using the term “ambidextrous design”.

Essentially, it represents an organizational design solution to the challenge of balancing exploration and exploitation, which, per March 1991 (cited under *Foundational Papers*) are deemed to pose inconsistent organizational demands. There is a high degree of consistency across works regarding the essential constituents of this form of ambidexterity. Structural differentiation is accompanied by structural integration. Structural differentiation entails units principally responsible for exploration being organizationally (and sometimes, physically) separated from those primarily concerned with exploitation. Each unit embodies a consistent “architecture” (i.e., a coherent bundle of tasks, people, culture and processes) tailored to its exploratory or exploitative mandate. Integration (“targeted integration”) across these units is effected by the senior team who seek both to allocate resources across exploration and exploitation and to realize synergies between these learning modalities. Common values, vision and reward systems facilitate the senior team integrative role.

A variety of evidence is offered in support of this form. Benner and Tushman 2003 provides conceptual arguments for ambidextrous designs focusing on their role in buffering exploration from potentially damaging crowding out by exploitation. Tushman, et al. 2010 outlines case study research supporting the superiority of ambidextrous designs relative to three other structural designs. Fang, et al. 2010 employs formal modelling to demonstrate performance advantages accruing to semi-isolated organizational groups.

The originators of the structural ambidexterity construct are at pains to emphasize that ambidextrous designs embody more than just simple structural differentiation of exploratory from exploitative units. Accordingly, the nature of senior team integration has been the subject of a number of scholarly works. For example, Smith and Tushman 2005 posits a key role for “paradoxical cognition” in senior team efforts to manage contradictions between exploration and exploitation. Jansen, et al. 2009 describes empirical research investigating a range of potential integration mechanisms.

Per organizational ambidexterity research in the main, a static orientation has dominated literature on structural ambidexterity (see the section *Temporal Accounts of Ambidexterity*). Raisch and Tushman 2016 represents one effort to theorize dynamic processes informing ambidextrous designs.

Benner, Mary J., and Michael L. Tushman. "Exploitation, Exploration, and Process Management: The Productivity Dilemma Revisited." *Academy of Management Review*. 28.2. (2003): 238-256.

Taking the spread of process management techniques beyond their original domains of application at the turn of the century as its starting point, Benner and Tushman present a theoretical model and propositions on the influence of process management on organizational adaptation. "Ambidextrous organizational forms" are identified as key to buffering variance-reducing process management practices from variance-increasing exploratory innovations, countering the otherwise dampening effects of process management on innovation.

Fang, Christina, Jeho Lee, and Melissa A. Schilling. "Balancing Exploration and Exploitation Through Structural Design: The Isolation of Subgroups and Organizational Learning." *Organization Science*. 21.3. (2010): 625-642.

While not exactly testing the structural model of ambidexterity as set out by Tushman, O'Reilly and colleagues, this paper is frequently cited for its resonance with this model. Fang, et al. 2010 simulate organizations with varying degrees of connectedness between subgroups. Moderate levels of cross-group linkage – "semi-isolated subgroups" - exhibit superior equilibrium performance. This finding applies to problems of moderate complexity and is robust across a range of contingency conditions.

Jansen, Justin J. P., Michiel P. Tempelaar, Frans A. J. van den Bosch, and Henk W. Volberda. "Structural Differentiation and Ambidexterity: The Mediating Role of Integration Mechanisms." *Organization Science*. 20.4. (2009): 797-811.

Jansen, et al. 2009 outlines a survey-based study examining the role of integration mechanisms in realizing the benefits to ambidexterity of structural differentiation. Four integration mechanisms are investigated, differing in whether formal or informal, and their locus of integration. Two – senior team social integration (an informal, senior team mechanism) and cross-functional interfaces (a formal, organizational mechanism) – were found to mediate between structural differentiation and ambidexterity (both additive and multiplicative operationalizations).

Raisch, Sebastian, and Michael L. Tushman. "Growing New Corporate Businesses: From Initiation to Graduation." *Organization Science*. 27.5. (2016): 1237-1257.

This empirical work focuses attention on exploratory units within structural designs for ambidexterity. Moving away from a static perspective on structural ambidexterity, Raisch and Tushman offer a multi-level, process model of the shifts new corporate businesses need to successfully navigate in their relationships with their peer units and their corporate parent if they are to transition from fledgling exploratory units to fully-fledged corporate business units, scaled to exploit an opportunity.

Smith, Wendy K., and Michael L. Tushman. "Managing Strategic Contradictions: A Top Management Model for Managing Innovation Streams." *Organization Science*. 16.5. (2005): 522-536.

This conceptual piece attends to how TMTs might effectively manage strategic contradictions – in particular, between exploration and exploitation. "Paradoxical cognition" (i.e., "cognitive frames and processes that allow teams to effectively embrace, rather than avoid, contradictions"; p. 533), residing either in the leader or the TMT, is argued to be key. They ground their exposition within organization

contexts characterized by “ambidextrous designs” (i.e., separate architectures for exploration and exploitation).

Tushman, Michael, Wendy K. Smith, Robert Chapman Wood, George Westerman, and Charles O'Reilly. “Organizational designs and innovation streams.” *Industrial & Corporate Change*. 19.5. (2010): 1331-1366.

This work extends the analysis of the multi-case research referenced in O'Reilly and Tushman 2004 (cited under *Foundational Papers*). Of four organizational design options studied, ambidextrous designs were found to be most effective in hosting innovation streams. Emphasis is placed on ambidextrous designs as going beyond structural features, embodying instead a “set of interrelated leader behaviors, roles, incentives, linking mechanisms and cultures” (p. 1356), which the article details.

Contextual Ambidexterity

Gibson and Birkinshaw 2004 (cited under *Foundational Papers*) introduced the construct of “contextual ambidexterity”. While not without its detractors (e.g., comments questioning its legitimacy as a form of ambidextrous organization are common within works by Tushman, O'Reilly and colleagues), contextual ambidexterity has come to be widely regarded as major form through which organizations might engage in simultaneous exploitation and exploitation.

Gibson and Birkinshaw 2004 defines contextual ambidexterity as “the behavioral capacity to simultaneously demonstrate alignment and adaptability across an entire business unit” (p. 209). The “contextual” descriptor is explained as follows: “contextual because it arises from features of its organizational context” (p. 209). Organization context, in turn, is defined as “the systems, processes, and beliefs that shape individual-level behaviors in an organization” (p. 212) – with organization contexts that combine the four behavior-framing attributes of stretch, discipline, support and trust being seen as supportive of ambidextrous behavior. Points of departure from structural ambidexterity include: contextual ambidexterity as occurring within an organizational unit (rather than at the level of the organization); individuals as the locus of exploration and exploitation (rather than organizational units, which specialize in one or the other of these modalities); and constituting a principally behavioral approach to ambidexterity (rather than, primarily, an organization design approach).

Perhaps arising from the multiple dimensions along which contextual ambidexterity is distinctive from structural ambidexterity, research conducted under the banner of contextual ambidexterity, or heavily citing Gibson and Birkinshaw 2004, demonstrates considerable heterogeneity. The degree of cumulative knowledge-building on this form is less clear-cut than for structural heterogeneity.

Few empirical articles have directly measured the behavior-framing attributes attended to by Gibson and Birkinshaw, even where these are repeatedly invoked by authors. Patel, et al. 2012 is a case in point, and Zimmermann, et al. 2020 represents an exception. More typically, articles have adopted the label of contextual ambidexterity (e.g., Nemanich and Vera 2009; Havermans, et al. 2015) or heavily cited Gibson and Birkinshaw 2004 (e.g., Jansen, et al. 2012) when adopting an intra-unit focus. Frequent settings for research on contextual ambidexterity have been SMEs (e.g., Patel, et al. 2012; Zimmermann, et al. 2020) and project-based organizations (Güttel and Konlechner 2009; Havermans, et al. 2015).

Güttel, Wolfgang H., and Stefan W. Konlechner. “Continuously Hanging by a Thread: Managing Contextually Ambidextrous Organizations.” *Schmalenbach Business Review*. 61.2. (2009): 150-172.

Güttel and Konlechner 2009 represents an early effort to investigate contextually ambidextrous organizations. Multi-case research is set in large, “research-intensive” organizations in Europe, with contextually ambidextrous organizations or units being those that simultaneously conduct research and provide client services. Idiosyncratic characteristics are identified as contributing towards contextual ambidexterity, including fluid project structures and semi-structures, shared cultural values and norms, common knowledge background, and a common frame of reference amongst employees.

Jansen, Justin J.P., Zeki Simsek, and Qing Cao. “Ambidexterity and performance in multiunit contexts: Cross-level moderating effects of structural and resource attributes.” *Strategic Management Journal*. 33.11. (2012): 1286-1303.

This empirical work examines how performance effects accruing to unit ambidexterity are conditioned by broader organizational-level structural and resource characteristics. While extensively referencing Gibson and Birkinshaw 2004 (cited under *Foundational Papers*), unit-level ambidexterity is conceptualized in strictly structural terms. Company records and survey data from a European financial services company find the unit ambidexterity-profitability relationship to be positively moderated by decentralization, resource munificence and limited interdependencies in the broader organization.

Havermans, Liselore A., Deanne N. Den Hartog, Anne Keegan, and Mary Uhl-Bien. Exploring the Role of Leadership in Enabling Contextual Ambidexterity. *Human Resource Management*. 54 Supplement (2015): s179-s200.

Taking projects as their primary unit of analysis, Havermans, et al. investigate day-to-day leadership practices enabling dynamically (re)attaining contextual ambidexterity in project-based organizations. Two interview-based studies in The Netherlands inform the analysis. Project leaders were found to encourage exploration (exploitation) through practices that stimulate a high (lower) complexity of beliefs and actions, adjusting the balance between these in response to changes in the perceived complexity of the environment.

Nemanich, Louise A., and Dusya Vera. Transformational Leadership and Ambidexterity in the Context of an Acquisition. *Leadership Quarterly*. 20.1. (2009): 19-33.

Arguing that newly integrated, acquired companies represent suitable settings for examining contextual ambidexterity, Nemanich and Vera investigate the role of team leaders in influencing “the internal context at the team level” (p. 29). Surveys from members of 71 teams within a newly integrated organization inform their analysis. The study demonstrates that transformational leadership behaviors (on the part of supervisors) and learning cultures support team-level ambidexterity.

Patel, Pankaj C., Jake G. Messersmith, and David P. Lepak. Walking the Tightrope: An Assessment of the Relationship Between High-Performance Work Systems and Organizational Ambidexterity. *Academy of Management Journal*. 56.5. (2013): 1420-1442.

Patel et al. position their study on the impact of high-performance work systems (HPWS) in SMEs on ambidexterity and firm growth within a “behavioral view of ambidexterity”. HPWS are argued to facilitate a behavioral context characterized by stretch, discipline, trust and support – which in turn enable ambidexterity and firm growth. Although behavioral context is central to their theorizing, it is unmeasured in their empirical study.

Zimmermann, Alexander; Susan A. Hill, Julian Birkinshaw, and Martin Jaeckel. Complements or Substitutes? A Microfoundations Perspective on the Interplay Between Drivers of Ambidexterity in SMEs. *Long Range Planning*. 53.6. (2020): 101927.

This work by Zimmermann et al. investigates the interplay of three “drivers” to ambidexterity within SMEs – with one driver being “behavioral context” as theorized in Gibson and Birkinshaw 2004. Challenging assumptions of complementarity between antecedents to ambidexterity, structural (i.e., compensatory structuring), contextual (i.e., supportive organization context), and leadership (i.e., CEO behavioral complexity) drivers were found to act largely as substitutes for each other in a survey-based study of German SMEs.

Inter-Organizational Forms of Ambidexterity

A significant body of work on the intersection of inter-organizational relationships, exploration and exploitation, has developed over the past two decades. While much of this conversation has been pursued outside of mainstream ambidexterity research (refer to Wilden, et al. 2018 cited under *Special Issues and Reviews*), some works have offered direct contributions on the topic of organizational ambidexterity. It warrants mention that while some commentators have identified inter-organizational relationships as a major modality through which firms might achieve ambidexterity, others have restricted the term “organizational ambidexterity” to refer to intra-organizational designs. From the latter vantage point, inter-organizational ambidexterity might be seen rather as a research setting for ambidexterity studies than a distinctive form of ambidexterity.

The entirety of this bibliography is selective rather than comprehensive. However, this section is particularly selective given the extensiveness of the inter-organizational literature pertaining exploration and exploitation, much of which speaks to a different (or dual) audience. The works outlined in this section are thus ones that are especially highly cited within ambidexterity literature. Moreover, they are either explicitly positioned within debates on ambidexterity or address key themes of interest to ambidexterity research. Given the emphasis on the citation records of these works, the set included here is biased towards older works. For a more comprehensive coverage, the reader is encouraged to refer to Lavie, et al. 2010 for a review of early works, and to Wilden, et al. 2018 for more recent coverage of highly-cited works clustering on this topic (both articles are cited under *Special Issues and Reviews*).

An array of forms of inter-organizational relationships have been studied in relation to organizational ambidexterity. These include alliances (Lavie and Rosenkopf 2006, Lin, et al. 2007, Tiwana 2008), acquisitions (Phene, et al. 2012) and buyer-supplier relationships (Im and Rai 2008). Consistent with contemporaneous ambidexterity literature (see the section *Organizational Ambidexterity and Performance*), scholars have examined the extent to which the “ambidexterity hypothesis” - i.e., the hypothesis that simultaneous exploration and exploitation enhances firm performance - applies to inter-organizational relationships (Im and Rai 2012 and Lin, et al. 2007). Lavie and Rosenkopf 2006, rather than examining normative outcomes to “balancing” exploration and exploitation, investigates actual patterns of balancing over time and across three alliance domains. Antecedents to exploration, exploitation and ambidexterity in inter-organizational relationships has been another frequent interest. For example, Tiwana 2008 investigates the influence of social network characteristics on alliance project ambidexterity, and Phene, et al. 2012 examines target-acquirer patenting profiles facilitating exploratory and exploitative innovation.

Im, Ghiyoung, and Arun Rai. “Knowledge Sharing Ambidexterity in Long-Term Interorganizational Relationships.” *Management Science*. 54.7. (2008): 1281-1296.

Im and Rai 2008 examines the “ambidexterity hypothesis” in the context of long-term, buyer-supplier relationships. Dyadic survey data on buyer-supplier relationships for a large logistics company found that

combining explorative and exploitative knowledge-sharing was associated with both higher average, and a lower variance-to-mean ratio, relationship performance for both parties. Contextual ambidexterity (i.e., alignment and adaptability between the partners) and “ontological commitment” (i.e., use of digital boundary objects) facilitated knowledge sharing.

Lavie, Dovev, and Lori Rosenkopf. “Balancing Exploration and Exploitation in Alliance Formation.” *Academy of Management Journal*. 49.4. (2006): 797-818.

Lavie and Rosenkopf 2006 extend inter-organizational learning research by identifying three alliance domains (function, structure and attribute) in which learning can occur. Arguing that exploration and exploitation within each domain presents considerable organizational challenges, they posit that firms balance exploration and exploitation over time and across alliance domains. Path dependencies restrict adjustments to gradual processes. Data on alliances formed by US-based software firms between 1990 and 2001 supports the arguments.

Lin, Zhiang (John), Haibin Yang and Irem Demirkan. “The Performance Consequences of Ambidexterity in Strategic Alliance Formations: Empirical Investigation and Computational Theorizing.” *Management Science*. 53.10. (2007): 1645-1658.

This work, which combines empirical investigation (alliancing in five sectors in the US; 1988-1995) and a simulation, investigates boundary conditions on the “ambidexterity hypothesis” in respect of alliance formation. Ambidextrous alliance formation is defined balancing partnerships with prior and new ties. Relative to focused alliance formation, it is observed to improve firm performance under a specific set of conditions (including large firm size, high environmental uncertainty, and network centrality).

Phene, Anupama, Stephen Tallman, and Paul Almeida. “When Do Acquisitions Facilitate Technological Exploration and Exploitation?” *Journal of Management*. 38.3. (2012): 753-783.

Phene, et al. 2012 examines conditions under which acquisitions enable exploratory or exploitative innovation by an acquiring firm. Data on acquisitions by semi-conductor firms in the US between 1987 and 2002, incorporating patenting profiles, informs the analysis. More acquisitions demonstrated exploitation than exploration, with very few acquisitions enabling both. Technological uniqueness of the target firm enhanced exploration but impeded exploitation, while common geographic bases enabled both forms of innovation.

Tiwana, Amrit. “Do bridging ties complement strong ties? An empirical examination of alliance ambidexterity.” *Strategic Management Journal*. 29.3. (2008): 251-272.

Drawing on social network theory, this empirical work investigates the influence of weak ties (which foster knowledge integration) and bridging ties (which provide access to heterogeneous knowledge) within alliance project teams. Analysis of surveys from members of 42 “innovation-seeking”, e-business project alliances of a US-headquartered conglomerate in 2000-2002 finds support for the central arguments, namely: strong ties complement bridging ties in facilitating knowledge integration, and consequently ambidexterity, in alliance projects.

Multiple Modes: Comparing and/or Integrating Forms

Historically, works on organizational ambidexterity have tended to examine one form of ambidexterity in isolation. Starting in the late 2000s, a growing corpus of research jointly considering multiple forms of ambidexterity (or ambidexterity in relation to other modes of balancing between exploration and exploitation) has developed. These can broadly be grouped into works that (a) compare forms of ambidexterity and/or other designs for balancing exploitation and exploitation, and (b) that seek to integrate these.

Comparing Forms

The volume of articles making comparisons between forms of ambidexterity and/or comparing ambidexterity to other designs for balancing exploitation and exploitation has grown in recent years. Most of these studies have been concerned with evaluating the relative efficacy of these designs – either outright or via illuminating contingencies affecting their efficacy.

Case study research is a common method used in these comparisons, possibly due to the limited public data on company's organizational structures and approaches to exploration and exploitation. For example, Raisch 2008 employs case studies to compare the organizational contexts supporting, execution strategies for, and outcomes deriving from structural separation, temporal separation and parallel structures; Tushman, et al. 2010 uses longitudinal, multi-case methods to compare the effectiveness of functional designs, spin outs, cross-functional structures and ambidextrous designs in hosting innovation streams; and Boumgarden, et al. 2012 draws on two longitudinal “illustrative” case studies to infer the long-run performance advantage of vacillation over structural ambidexterity. Uotila 2018 employs simulation modelling to identify environmental conditions suggesting either ambidexterity or punctuated equilibrium models of adaptation, and Fourné, et al. 2019 conducts a meta-analysis in an effort to tease out firm and sectoral conditions better suited to either contextual or structural ambidexterity. Comparisons of intra- and inter-organizational forms are limited at present (see Stettner and Lavie 2014 for an exception). There appears to be considerable room for more comparative research in the future across all forms.

Reviewing rather than directly comparing a range of designs for balancing exploration and exploitation, Simsek, et al. 2009 offers a typology which delineates four types of ambidexterity; its view on ambidexterity is more expansive than that held by some others in the scholarly ambidexterity community.

Boumgarden, Peter, Jackson Nickerson, and Todd R. Zenger. *Sailing Into the Wind: Exploring the Relationships Among Ambidexterity, Vacillation, and Organizational Performance. Strategic Management Journal. 33.6. (2012): 587-610.*

This work undertakes a comparison of structural vacillation and (structural) ambidexterity. These modalities are mapped conceptually along a performance landscape, and two longitudinal case studies are drawn upon to infer their relative efficacy in yielding high levels of exploration and exploitation. Observed patterns of vacillation in both cases (with some managerial efforts towards ambidexterity within epochs of vacillation) are interpreted as evidence of the long run superiority of vacillation.

Fourné, Sebastian P. L., Nina Rosenbusch, Mariano L. M. Heyden, and Justin J.P. Jansen. *Structural and Contextual Approaches to Ambidexterity: A Meta-Analysis of Organizational and Environmental Contingencies. European Management Journal. 37.5. (2019): 564-576.*

This meta-analytic work examines firm and sectoral conditions influencing the efficacy of structural and contextual forms of ambidexterity. Drawing on 113 primary studies, an unusual dependent variable is

used, namely: the correlation between exploration and exploitation (“balance”). Few of the predicted relationships, including regarding firm size, were borne out. There is some indication that structural ambidexterity might be preferable in high-tech industries and contextual ambidexterity in service industries.

Raisch, Sebastian. “Balanced Structures: Designing Organizations for Profitable Growth.” *Long Range Planning*. 41.5. (2008): 483-508.

Raisch 2008 outlines a case study in six leading European companies, which investigates three “balanced” designs to manage exploration and exploitation. These comprise temporal separation, structural separation (akin to “structural ambidexterity”), and parallel structures. The article, richly illustrated with case examples, explores the contexts suited to, execution strategies for, and likely outcomes arising from, these designs. The designs are found to be complementary rather than mutually exclusive within the organizations.

Simsek, Zeki, Ciaran Heavey, John F. Veiga, and David Souder. “A Typology for Aligning Organizational Ambidexterity’s Conceptualizations, Antecedents, and Outcomes.” *Journal of Management Studies*. 46.5. (2009): 864-894.

In this highly cited article, Simsek et al. offer a typology delineating four “archetypes” of ambidexterity. Two dimensions differentiate these types, namely: a temporal dimension (simultaneous versus sequential pursuit of exploration and exploitation) and a structural dimension (whether ambidexterity is pursued within an independent organizational unit or across organizational units). It bears mention that this conceptualization of ambidexterity is an expansive one given its inclusion of sequential and inter-organizational modalities.

Stettner, Uriel, and Dovev Lavie. “Ambidexterity under Scrutiny: Exploration and Exploitation via Internal Organization, Alliances, and Acquisitions.” *Strategic Management Journal*. 35.13. (2014): 1903-1929.

In a rare comparison of internal and external modes, Stettner and Lavie 2014 posit that firms benefit by balancing exploration and exploitation across internal organization, alliance and acquisition modes – instead of balancing within these modes. A panel dataset on product introductions, alliances and acquisitions by 190 US software firms (1990-2001) confirms this proposition. Furthermore, an optimal distribution across modes involves exploitation via the internal organization and exploration through external modes.

Tushman, Michael, Wendy K. Smith, Robert Chapman Wood, George Westerman, and Charles O’Reilly. “Organizational designs and innovation streams.” *Industrial & Corporate Change*. 19.5. (2010): 1331-1366.

Tushman, et al. 2010 outlines multi-case research comparing the efficacy of four organizational design options for hosting innovation streams (i.e., portfolios including incremental innovations as well as more substantial innovations). Relative to functional designs, spin outs, and cross-functional structures, ambidextrous designs – “designs that coupled high structural differentiation with targeted structural linkage and senior team integration” (p. 1356) - were found to be most effective across innovation types within innovation streams.

Uotila, Juha. "Punctuated Equilibrium or Ambidexterity: Dynamics of Incremental and Radical Organizational Change Over Time." *Industrial & Corporate Change*. 27.1. (2018): 131-148.

Uotila 2018 outlines an NK-modelling study comparing the propensity for firms to adopt punctuated equilibrium versus ambidextrous modes of adaptation given differing conditions in their task environments. Ambidexterity is found to dominate in environments that are "either simple and stable or highly complex and turbulent, although the mode of ambidexterity is different in these two types of environments" (p. 132), with the latter more closely resembling ambidexterity as typically conceived.

Integrating Forms

Kauppila 2010 and Foss and Kirkegaard 2020 represent two examples of research that seeks synthesis across different ambidexterity forms, which have typically been presented as stand-alone forms in the literature. Both use single, embedded company case methods to explore – rather different - models whereby structural and contextual ambidexterity might be integrated in practice.

Foss, Nicolai J., and Matilde F. Kirkegaard. "Blended Ambidexterity: The Copresence of Modes of Ambidexterity in William Demant Holding." *Long Range Planning*. 53.6. (2020): 102049.

Foss and Kirkegaard 2020 explores "blended ambidexterity", which is defined as the co-presence of structural and contextual ambidexterity modes in a company. Blended ambidexterity is investigated via a case study of a medical devices company (Oticon/William Demant) which is characterized as having employed a deliberate, blended approach to managing its innovation activities over three decades. Different configurations of blended ambidexterity were found to be associated specific work motivations, formal organizations and informal structures.

Kauppila, Olli-Pekka. Creating Ambidexterity by Integrating and Balancing Structurally Separate Interorganizational Partnerships. *Strategic Organization*. 8.4. (2010): 283-312.

Alleging that firms "are likely to create ambidexterity through a combination of structural and contextual antecedents and at both organizational and interorganizational levels" (p. 284), Kauppila 2010 offers a synthesis of approaches to ambidexterity, derived from an embedded historical case study of a Finnish environmental measurement company. The model observed in the case company involves structurally separating external exploratory and exploitative activities, whilst creating a contextually ambidextrous internal organization.

Both Comparing and Integrating Forms

Research that both compares forms of ambidexterity and identifies hybrid approaches is rare. Ossenbrink, et al. 2019 offers one such example.

Ossenbrink, Jan, Joern Hoppmann, and Volker H. Hoffmann. "Hybrid Ambidexterity: How the Environment Shapes Incumbents' Use of Structural and Contextual Approaches." *Organization Science*. 30.6. (2019): 1319-1348.

While research has typically studied structural and contextual ambidexterity in isolation, Ossenbrink, et al. 2019 examines the role of environmental characteristics (specifically, the perceived nature of environmental opportunities) in inducing these modalities. Case study research within the four largest

utility companies in Germany (between 2005 and 2016) also identified a further “hybrid” approach to ambidexterity. Ideation, incubation and integration hybrids combined characteristics of both structural and contextual ambidexterity.

Individuals and Teams

A growing volume of ambidexterity research is concerned with individuals and teams. Executives have been afforded an important role in fostering and maintaining organizational ambidexterity since early writings on ambidexterity, particularly in respect of structural ambidexterity (c.f. Tushman and O’ Reilly 1996 and O’ Reilly and Tushman 2004, cited under *Foundational Papers*). Accordingly, most ambidexterity literature to date on individuals or teams is centered on executives (in particular, on TMTs). This is increasingly supplemented by a growing corpus of research examining (a) the roles of managers at levels beneath that of the TMT, and (b) what has become known as “individual ambidexterity” (i.e., individuals as loci for ambidexterity). The latter body of research is largely limited to managerial samples at present, although recent exceptions investigating non-managerial employees do exist. Note that the articles outlined in this section have been clustered on the basis of the descriptors (e.g., TMT, executive, senior team member, manager, and so on) employed by study authors, so each cluster might contain variation in organizational levels resulting from terminology being used differently by different authors.

Executives

Within research on antecedents to organizational ambidexterity, a common theme has been how senior teams might effectively be integrated. The assumption made is that managing the contradictions between exploration and exploitation requires a high degree of integration across a senior team. Lubatkin, et al. 2006 played an influential role in stimulating this conversation, introducing the meta-construct of behavioral integration to ambidexterity research. Similarly, Jansen, et al. 2008, 2009 investigate the use of social integration mechanisms in senior teams, and Halevi, et al. 2015 examined environmental dynamism as a moderator to the effects of TMT behavioral integration on ambidexterity.

Other research has focused on both integration and differentiation within senior teams, arguing that the combination of these is necessary to manage the complex demands of ambidexterity. Attributes and processes centered on cognition and information flows have frequently received attention in such research – for example, Smith and Tushman 2005, on paradoxical cognition in senior teams; Beckman 2006 on diverse and common prior company affiliations in founding teams; Cao, et al. 2010 on synergies between CEO networks and CEO-TMT interfaces; Heavey and Simsek 2017 on synergies between highly developed TMT transactive memory systems and diverse TMT experiences; and Chen, et al. 2021 on longer and more diverse time horizons within TMTs. Taking a behavioral lens on integration and differentiation within senior teams, Carmeli and Halevi 2009 argues for both TMT behavioral integration and behavioral complexity to effect (contextual) ambidexterity.

Most ambidexterity research on executives has taken the TMT as its unit of analysis, with some works drawing distinctions between CEOs and other members of TMTs (e.g., Smith and Tushman 2005, Jansen, et al. 2009, Cao, et al. 2010, and Chen, et al. 2021). Research specifically focusing on CEOs has been scant. Two recent examples addressing this lacuna are Kammerlander, et al. 2015 (investigating CEOs’ regulatory focus, and firm-level exploration and exploitation) and Kiss, et al. 2020 (examining CEO’s cognitive complexity, information search, and firm-level ambidexterity).

Survey methods have dominated in studies of executives and ambidexterity, as has the research setting of SMEs. One recent article that bucks both trends, and introduces narrative analysis to ambidexterity research, is Maclean, et al. 2021. Finally, very few articles investigating how executives contribute

towards ambidexterity have specified the form(s) of ambidexterity to which their research applies (with exceptions including Smith and Tushman 2005, Jansen, et al. 2008, 2009, Carmeli and Halevi 2009, and Halevi, et al. 2015).

Beckman, Christine M. "The Influence of Founding Team Company Affiliations on Firm Behavior." *Academy of Management Journal*. 49.4. (2006): 741-758.

Beckman 2006 examines the influence of founding team composition – specifically, common and diverse prior company affiliations – on explorative and exploitative strategies. Longitudinal, multi-source data on firms founded by teams in Silicon Valley informs the analysis. High founding team commonality (divergence) in prior company affiliations is found to predict firm-level exploitative (exploratory) strategies. Founding teams high in both common and diverse prior affiliations ("ambidextrous" founding teams) demonstrate stronger employment growth.

Carmeli, Abraham, and Meyrav Yitzack Halevi. "How Top Management Team Behavioral Integration and Behavioral Complexity Enable Organizational Ambidexterity: The Moderating Role of Contextual Ambidexterity." *Leadership Quarterly*. 20.2. (2009): 207-218.

Carmeli and Halevi 2009 offers a theoretical model of how TMTs can help create ambidexterity. Behavioral integration (i.e., degree of "teamness") amongst TMT members is theorized to give rise to TMT behavioral complexity (i.e., a broad repertoire of leadership behaviors which are applied in a differentiated manner across different circumstances). Behaviorally complex TMTs, in turn, shape organizational contexts such that these embody the contradictory roles necessary for ambidexterity to emerge.

Cao, Qing, Zeki Simsek, and Hongping Zhang. "Modelling the Joint Impact of the CEO and the TMT on Organizational Ambidexterity." *Journal of Management Studies*. 47.7. (2010): 1272-1296.

Cao, et al. 2010 posits that an ambidextrous orientation in SMEs is a joint function of (a) CEOs' information network extensiveness, and (b) the nature (i.e., communication-richness and power decentralization) of CEO-TMT interfaces. Together these enable CEOs to access diverse information which can then be pooled effectively within their TMTs to support ambidexterity. Survey data from CEOs and CTOs of 122 SMEs in three Chinese high-tech parks informs the analysis.

Chen, Jianhong, Danny Miller, and Ming-Jer Chen. "Top Management Team Time Horizon Blending and Organizational Ambidexterity." *Strategic Organization*. 19.2. (2021): 183-206.

This empirical work examines the effects of TMT members' time horizons on organizational ambidexterity. Via surveys of CEOs and TMT members in 146 SMEs in five high-tech industrial parks in China, both diversity and mean measures of TMT time horizons were shown to be, independently and jointly, positively associated with levels of organizational ambidexterity. Furthermore, contributing to CEO-TMT interface literature on ambidexterity, these effects were amplified by CEO temporal leadership.

Halevi, Meyrav Yitzack, Abraham Carmeli, and Nir N. Brueller. "Ambidexterity in SBUs: TMT Behavioral Integration and Environmental Dynamism." *Human Resource Management*. 54.S1. (2015): S223-238.

Halevi, et al. 2015 investigates TMT behavioral integration within the setting of strategic business units. TMT behavioral integration is found to be positively associated with ambidexterity in strategic business units, and this effect is amplified for more dynamic task environments. Multisource, survey data from 101 small strategic business units across organizations in multiple sectors in Israel informed the analysis.

Heavey, Ciaran, and Zeki Simsek. "Distributed Cognition in Top Management Teams and Organizational Ambidexterity: The Influence of Transactive Memory Systems." *Journal of Management*. 43.3. (2017): 919-945.

Heavey and Simsek 2017 proposes that highly developed transactive memory systems enable TMTs to address the "differentiation-integration" challenge of organizational ambidexterity. Survey data was obtained from CEOs and TMT members in 99 SMEs in technology sectors in the US. The strength of a TMT's transactive memory system was found to be positively associated with the firm's ambidextrous orientation, and this effect was amplified by TMT organizational and functional experience diversity.

Jansen, Justin J. P., Gerard George, Frans A. J. Van den Bosch, and Henk W. Volberda. "Senior Team Attributes and Organizational Ambidexterity: The Moderating Role of Transformational Leadership." *Journal of Management Studies*. 45.5. (2008): 982-1007.

Jansen, et al. 2008 investigates the role of senior executives in achieving ambidexterity. Survey data was collected from 305 senior team members and 89 executive directors in Dutch branches of a large European financial services firm. Senior team shared vision and contingency rewards predicted organizational ambidexterity. Executive directors' transformational leadership behavior amplified the effect of senior team social integration on ambidexterity but attenuated that of senior team contingency rewards.

Jansen, Justin J. P., Michiel P. Tempelaar, Frans A. J. van den Bosch, and Henk W. Volberda. "Structural Differentiation and Ambidexterity: The Mediating Role of Integration Mechanisms." *Organization Science*. 20.4. (2009): 797-811.

Jansen, et al. 2009 investigates the role of senior team integration mechanisms in mediating between structural differentiation of exploratory and exploitative organizational units, and organizational ambidexterity. Survey-based research in 230 companies demonstrated one informal integration mechanism (social integration) to play such a mediating role, but a formal mechanism (contingency rewards) was not found to do so.

Kammerlander, Nadine, Dominik Burger, Alexander Fust, and Urs Fueglistaller. "Exploration and Exploitation in Established Small and Medium-Sized Enterprises: The Effect of CEOs' Regulatory Focus." *Journal of Business Venturing*. 30.4. (2015): 582-602.

In a rare empirical study on the role of CEO personality on ambidexterity, Kammerlander, et. al. 2015 posits that a CEO's chronic regulatory focus influences firm-level exploration and exploitation. Survey responses from 153 CEOs of Swiss SMEs finds a positive effect of CEO promotion focus on firm-level exploration and exploitation. This pattern is intensified where firms experience high competitive intensity. CEO prevention focus is negatively associated with firm-level exploration.

Kiss, Andreea N., Dirk Libaers, Pamela S. Barr, Tang Wang, and Miles A. Zachary. "CEO cognitive flexibility, information search, and organizational ambidexterity." *Strategic Management Journal*. 41.12. (2020): 2200-2233.

Kiss, et al. 2020 contributes to empirical research on CEO cognitive characteristics and organizational ambidexterity. The main study consists of surveys from 212 CEOs of SMEs in India. More cognitively flexible CEOs are found to engage in more effortful ("search effort") and persistent ("search persistence") information search, which, in turn, is associated with higher, firm-level ambidexterity. Search effort and persistence fully mediate the effects between CEO cognitive flexibility and ambidexterity.

Lubatkin, Michael H., Zeki Simsek, Yan Ling, and John F. Veiga. "Ambidexterity and Performance in Small- to Medium-Sized Firms: The Pivotal Role of Top Management Team Behavioral Integration." *Journal of Management*. 32.5. (2006): 646-672.

Drawing on the meta-construct of behavioral integration, Lubatkin, et al. 2006 posits that TMTs, where characterized by high levels of behavioral integration ("wholeness and unity of effort"; p. 650), play a pivotal role in fostering ambidexterity within SMEs through managing the contradictory knowledge processes inherent in exploration and exploration. Multi-source survey data from 139 SMEs supported the predictions of positive associations between TMT behavioral integration, firm-level ambidexterity, and firm performance.

Maclean, Mairi, Charles Harvey, Benjamin D. Golant, and John A. A. Sillince. "The role of Innovation Narratives in Accomplishing Organizational Ambidexterity." *Strategic Organization*. 19.4. (2021): 693-721.

In an unusual contribution to ambidexterity literature, Maclean, et al. 2021 presents findings from an analysis of TMT speeches at Procter & Gamble between 1987 and 2001. Four narrative themes are identified – contextualizing, mutualizing, dramatizing, and focalizing – with each new narrative emerging from a reflexive cycle of critique and response. These discursively constructed narratives are argued to have played a performative role in the (ongoing, dynamic) process of accomplishing ambidexterity.

Smith, Wendy K., and Michael L. Tushman. "Managing Strategic Contradictions: A Top Management Model for Managing Innovation Streams." *Organization Science*. 16.5. (2005): 522-536.

In this conceptual piece, Smith and Tushman highlight the role of TMTs in managing strategic contradictions, arguing that "paradoxical cognition" is required by either the senior leader (in "leadercentric teams") or the TMT (in "teamcentric teams"). Contingencies informing the locus of strategic integration – whether senior leader or TMT - are posited. An organization context characterized by structural ambidexterity is assumed although not all arguments appear limited to such contexts.

Managers

Two main approaches are evident in ambidexterity research centered on managers. On the one hand, studies – per the ambidexterity literature on executives – examine how managers contribute towards ambidexterity (typically, as manifest within an organizational subsystem). On the other hand, studies investigate determinants of and/or performance implications of managers' own ambidextrous behavior. In the first, managers are viewed as enablers of ambidexterity within a firm sub-system; in the second, the extent to which managers themselves act ambidextrously is of interest.

Examples of the first approach include Nemavich and Vera 2009, Havermans, et al. 2015, and Zimmermann, et al. 2018. All examine how the behavior of managers – variously identified as team leaders (Nemavich and Vera 2009), project leaders (Havermans, et al. 2015), and frontline managers (Zimmermann, et al. 2018) - operating within organizational subsystems, influences ambidexterity within that subsystem. Importantly, both Havermans, et al. 2015 and Zimmermann, et al. 2018 utilize case studies, investigating the constitutive practices of managers in shaping ambidexterity within their subsystems. Until recently, a practice lens had been missing from ambidexterity research. It appears to hold considerable potential for understanding how managers shape ambidexterity (see also *Temporal Accounts of Ambidexterity*).

The most prominent proponent of the second approach is Tom J. M. Mom. Studies by Mom and colleagues – e.g., Mom, et al. 2007, 2009, 2015, 2019 – draw on survey responses, and have progressed over time from examining antecedents of manager's ambidexterity to also investigating the circumstances under which managers acting ambidextrously is beneficial (or otherwise). Simultaneously, research by Mom and colleagues has increasingly been informed by literature on HR practices. Alongside research by Mom and colleagues, studies by Laureiro-Martínez, et al. 2010, 2015, Rogan and Mors 2014, and Tempelaar and Rosenkranz 2019 also examine individual-level ambidexterity (within managerial samples). Laureiro-Martínez, et al. 2010 is a conceptual piece calling for the application of cognitive neuroscience to studying individual-level exploration and exploitation; Laureiro-Martínez, et al. 2015 answers this call with an experimental study utilizing a four-armed bandit task and mFRI brain scanning. The latter suggests that managers with superior attentional control facilities will perform better on exploration-exploitation tasks. Rogan and Mors 2014 offer a social network perspective on variation in individual managers' ambidexterity, and Tempelaar and Rosenkranz 2019 draw on role identity theory to examine individual managers' propensities to engage in ambidexterity.

Havermans, Liselore A., Deanne N. Den Hartog, Anne Keegan, and Mary Uhl-Bien. Exploring the Role of Leadership in Enabling Contextual Ambidexterity. *Human Resource Management*. 54 Supplement (2015): s179-s200.

Havermans, et al. 2015 describes research focusing on the role of project leaders in enabling contextual ambidexterity. Two interview-based studies investigate day-to-day leadership practices in project-based organizations in The Netherlands. Project leaders were found to employ a range of practices to stimulate higher (lower) complexity of beliefs and actions, targeting exploration (exploitation). The emphasis placed on practices targeting exploration versus exploitation varied dynamically response to perceived changes in environmental complexity.

Laureiro-Martínez, Daniella, Stefano Brusoni, and Maurizio Zollo. "The Neuroscientific Foundations of the Exploration-Exploitation Dilemma." *Journal of Neuroscience, Psychology, & Economics*. 3.2. (2010): 95-115.

Drawing on the discipline of cognitive neuroscience, this conceptual article calls for an in-depth examination of individuals' attention allocation tendencies – as well as how these might be shifted - in order to better understand their exploratory or exploitative responses to decision problems. Thomas Alva Edison's approach to serial innovation serves as an illustration of some of the ideas explored in the exposition. Methods are proposed to test the propositions argued for.

Laureiro-Martínez, Daniella, Stefano Brusoni, Nicolla Canessa, and Maurizio Zollo. "Understanding the Exploration-Exploitation Dilemma: An fMRI Study of Attention Control and Decision-Making Performance." *Strategic Management Journal*. 36.3. (2015): 319-338.

In this empirical paper, Laureiro-Martínez, et al. 2015 outlines an experiment wherein 63 managers undertake a “four-armed bandit” task whilst lying inside a fMRI scanner. Consistent with the predictions, different brain regions are activated in making decisions to explore (i.e., regions relating to attentional control) versus to exploit (i.e., regions relating to reward-seeking). Moreover, stronger activation of the regions associated with attentional control leads to better decision-making performance.

Mom, Tom J. M., Yi-Ying Chang, Magdalena Cholakova, and Justin J. P. Jansen. “A Multilevel Integrated Framework of Firm HR Practices, Individual Ambidexterity, and Organizational Ambidexterity.” *Journal of Management*. 45.7. (2019): 3009-3034.

Mom, et al. 2019 develops and tests a multi-level model of HR practices, manager ambidexterity, and organizational ambidexterity. Empirical data centers on survey responses from 467 operational managers in 52 financial service Taiwanese firms. Ability- and motivation-enhancing HR practices – mediated by a manager’s self-efficacy and motivational orientation – are associated with a manager’s ambidexterity. In turn, manager’s ambidexterity is associated with organizational ambidexterity, especially in the presence of opportunity-enhancing HR practices.

Mom, Tom J. M., Sebastian P. L. Fourné, and Justin J. P. Jansen. “Managers' Work Experience, Ambidexterity, and Performance: The Contingency Role of the Work Context.” *Human Resource Management*, 54 Supplement (2015): s133-s153.

Mom, et al. 2015 investigates tenure as a driver, and the performance implications, of manager’s ambidexterity. Organizational (functional) tenure is found to be positively (negatively) associated with managers’ ambidexterity. Contingent relationships are found between managers’ ambidexterity and their performance, specifically: these are positively associated in work contexts high in uncertainty or interdependence, and vice versa. Survey data from 377 managers of two large firms in different sectors informs the analysis.

Mom, Tom J. M., Frans A. J. Van Den Bosch, and Henk W. Volberda. “Investigating Managers' Exploration and Exploitation Activities: The Influence of Top-Down, Bottom-Up, and Horizontal Knowledge Inflows.” *Journal of Management Studies*. 44.6. (2007): 910-931.

Mom, et al. 2007 presents the first empirical investigation into ambidexterity on the part of managers (rather than the system or subsystem they are responsible for managing). Top-down knowledge inflows are found to influence managers’ exploratory activities, while bottom-up and horizontal knowledge flows influence their exploitative activities. Survey responses from 104 managers in the semi-conductor division of an international electronics company informed the analysis.

Mom, Tom J. M., Frans A. J. van den Bosch, and Henk W. Volberda. “Understanding Variation in Managers' Ambidexterity: Investigating Direct and Interaction Effects of Formal Structural and Personal Coordination Mechanisms.” *Organization Science*. 20.4. (2009): 812-828.

Mom, et al. 2009 investigates the influence, independently and jointly, of formal structural and personal coordination mechanisms on managers’ ambidexterity. Survey responses from 215 business unit and 501 operational level managers in five firms find that a manager’s decision-making authority, participation in cross-functional interfaces, and connectedness are positively associated with their ambidexterity. Two-way interactions between these variables (and formalization) prove significant too.

Nemanich, Louise A., and Dusya Vera. Transformational Leadership and Ambidexterity in the Context of an Acquisition. *Leadership Quarterly*. 20.1. (2009): 19-33.

An early investigation into the role of leadership in team-level ambidexterity, Nemanich and Vera ground their arguments in transformational leadership and learning organization theories and draw on survey evidence from members of 71 teams within an organization in the US that resulted from an acquisition. The study finds that transformational leadership behaviors (on the part of supervisors) and intra-team learning cultures (influenced, in turn, by transformative leadership behaviors) support team-level ambidexterity.

Rogan, Michelle, and Marie Louise Mors. "A Network Perspective on Individual-Level Ambidexterity in Organizations." *Organization Science*. 25.6. (2014): 1860-1877.

Rogan and Mors 2014 presents a network perspective on variation in ambidextrous behavior among managers. Networks characterized by, in particular, a high volume of informal internal and external ties, and heterogeneous internal contacts, were positively associated with ambidextrous behavior by senior managers. Analysis is conducted on data covering 1,449 network ties of 79 senior managers, collected via face-to-face surveys, along with supervisory performance assessments, in a management consulting firm.

Tempelaar, Michiel P., and Nicole A. Rosenkranz. "Switching Hats: The Effect of Role Transition on Individual Ambidexterity." *Journal of Management*. 45.4. (2019): 1517-1539.

Drawing on role identity theory, Tempelaar and Rosenkranz 2019 posit and find support for their predictions of (a) a negative (positive) effect of an individual's predisposition towards role segmentation (integration) on their ambidexterity, and (b) a helping (hindering) role of exposure to cross-functional coordination on an individual's ambidexterity for segmenters (integrators). Survey responses from 120 strategic account managers across multiple multinational companies informs the analysis.

Zimmermann, Alexander, Sebastian Raisch, and Laura B. Cardinal. "Managing Persistent Tensions on the Frontline: A Configurational Perspective on Ambidexterity." *Journal of Management Studies*. 55.5. (2018): 739-769.

This work examines, drawing on an inductive case study of ten "ambidextrous" innovation projects within three multinationals, how "frontline" managers shape, and reshape, project contexts to effectively manage the tensions between exploration and exploitation they embody. Three sets of "configurational" practices employed by frontline managers are identified. These are argued to be more influential in whether projects achieve their ambidextrous objectives than are formal structural decisions of senior managers.

Employees

Within early foundational works, both Adler, et al. 1999 and Gibson and Birkinshaw 2004 (both cited under "Foundational Papers") identify employees as a potential locus of ambidexterity. Research adopting an (non-managerial) employee level of analysis has, however, been extremely limited to date. Two recent exceptions are the studies by Kaupilla and Tempelaar 2016 and Bidmon and Boe-Lillegraven 2020.

Bidmon, Christina M., and Siri Boe-Lillegraven. "Now, Switch! Individuals' Responses to Imposed Switches between Exploration and Exploitation." *Long Range Planning*. 53.6. (2020): 101928.

Informed by participant observation of facilitated strategy workshops, Bidmon and Boe-Lillegraven 2020 outlines inductive research examining individuals' responses to top-down requirements to switch between exploration and exploitation. A model is produced demonstrating patterns of cognitive, emotional and behavioral resistance to switching demands – with switches from exploration to exploitation showing somewhat different behavioral patterns to the inverse switch. Strong "scripts" (i.e., clear behavioral instructions) are observed to reduce switching resistance.

Kauppila, Olli-Pekka, and Michiel P. Tempelaar. "The Social-Cognitive Underpinnings of Employees' Ambidextrous Behavior and the Supportive Role of Group Managers' Leadership." *Journal of Management Studies*. 53.6. (2016): 1019-1044.

Kauppila and Tempelaar 2016 theorizes and tests a psychological model of individual ambidexterity. An individual's general self-efficacy is posited and found – mediated by their learning orientation - to be positively associated with their ambidextrous behavior. The influence of an individual's learning orientation on their ambidextrous behavior is heightened where their manager adopts a paradoxical leadership style. A survey of 638 non-managerial employees from 34 Finnish organizations informs the analysis.

Temporal Accounts of Ambidexterity

Research on organizational ambidexterity has largely been characterized by a "static" orientation (see Raisch and Birkinshaw 2008; cited under "Special Issues and Reviews"). Studies investigating structural and contextual approaches to ambidexterity, or other antecedents thereto, have largely focused on "snapshots" in time, typically assuming ambidexterity to be established and stable within focal companies. Similarly, studies of performance implications of ambidexterity have usually adopted cross-sectional designs or, at most, evaluated outcomes deriving from ambidexterity over a few years. In recent years, these assumptions have been questioned in a small but seemingly growing conversation on temporality in ambidexterity.

A number of strands can be discerned in this conversation. First, one strand constitutes studies comparing the propensity for and/or performance effects over time of different approaches to ambidexterity, or ambidexterity relative to assumedly competing models (e.g., temporal sequencing). For example, Boumgarden, et al. 2012 employs "illustrative", longitudinal case studies to evaluate the relative performance superiority of temporal vacillation versus structural ambidexterity. Uotila 2018 uses formal modelling to examine the propensity for punctuated equilibrium and ambidextrous modes of adaptation to occur under varying environmental conditions. Ossenbrink, et al. 2019 compares, via a longitudinal case study, the propensity for structural and contextual ambidexterity to emerge, dependent on the nature of environmental opportunities at the time. Second, another strand is less concerned with comparisons of forms over time, and more interested in addressing more nuanced questions concerning temporal variation (or otherwise) in ambidexterity. By way of illustration, Piaio 2010 employs an event history study to investigate how the duration of temporal overlap between exploration and exploitation influences firm survival in the disk drive industry; and Luger, et al. 2018 identify self-reinforcing tendencies in firm levels of ambidexterity using a longitudinal, archival and content-analytic study of the global insurance industry. Third, prominent ambidexterity scholars have undertaken process studies examining the dynamics of organizing for ambidexterity. Via comparative case studies, Zimmermann, et al. 2015 examines the role of bottom-up, charter definition processes effected by frontline managers seeking to reclassify their organizational units as ambidextrous; and Raisch and Tushman 2016 investigate the temporal shifts in

the relationships between exploratory units, their peer units and the corporate parent required for new corporate businesses to scale effectively.

Boumgarden, Peter, Jackson Nickerson, and Todd R. Zenger. "Sailing Into the Wind: Exploring the Relationships Among Ambidexterity, Vacillation, and Organizational Performance." *Strategic Management Journal*. 33.6. (2012): 587-610.

The authors infer from two longitudinal case studies that structural vacillation – i.e., modulating between organizational structures targeting high levels of exploration and exploitation, wherein the informal organization adjusts more slowly resulting in brief periods of “dual capability” – delivers superior long-run performance relative to (structural) ambidexterity. Managerial efforts to engage in ambidexterity during epochs of vacillation are observed to prolong dual capability, increasing performance on the margin.

Luger, Johannes, Sebastian Raisch, and Markus Schimmer. "Dynamic Balancing of Exploration and Exploitation: The Contingent Benefits of Ambidexterity." *Organization Science*. 29.3. (2018): 449-470.

Per exploration and exploitation, Luger, et al. posit and find empirical support for self-reinforcing tendencies in organizational ambidexterity. A longitudinal study of the global insurance industry (1999-2014) finds maintaining ambidexterity to deliver contingent performance effects, dependent on the degree of environmental dynamism. The authors argue for redefining ambidexterity as the “ability to dynamically balance exploration and exploitation” (p. 466) and emphasize capability-building and capability-shifting as necessary to its realization.

Ossenbrink, Jan, Joern Hoppmann, and Volker H. Hoffmann. "Hybrid Ambidexterity: How the Environment Shapes Incumbents' Use of Structural and Contextual Approaches." *Organization Science*. 30.6. (2019): 1319-1348.

Ossenbrink, et al. 2019 investigates, via a longitudinal study of 18 initiatives in the four largest utilities in Germany, how environmental characteristics induce either structural, contextual or “hybrid” approaches to ambidexterity. Ambidexterity approach(es) adopted were associated with (a) the number and uncertainty of opportunities, and (b) their distance from organizational culture and capabilities. Managerial cognition, affected by firm geographic location, influenced perceptions of the nature of opportunities.

Piao, Ming. "Thriving in the New: Implication of Exploration on Organizational Longevity." *Journal of Management*. 36.6. (2010): 1529-1554.

Piao 2010 argues that temporal separation represents a special case few firms possess the resources to support. Instead, temporally overlapping exploration within “existing exploitation trajectories” (p. 1532) is deemed more viable. An events history study in the disk drive industry (1980-1999) supports moderate periods of temporal overlap (embodying complementarity of resource usage between exploration and exploitation) between new (exploration) and old (exploitation) disk drive forms to heighten firm survival odds.

Raisch, Sebastian, and Michael L. Tushman. "Growing New Corporate Businesses: From Initiation to Graduation." *Organization Science*. 27.5. (2016): 1237-1257.

Drawing on a longitudinal case study of six corporate new business initiatives in three multinationals, the authors offer a process theory of how exploratory units scale. Exploratory units that successfully transition to fully-fledged exploitation units are theorized to engage in sets of critical activities that significantly shift their relationships with their peer units and corporate parents from those of differentiation to integration, and vice versa, respectively.

Uotila, Juha. "Punctuated Equilibrium or Ambidexterity: Dynamics of Incremental and Radical Organizational Change Over Time." *Industrial & Corporate Change*. 27.1. (2018): 131-148.

Uotila 2018 investigates how characteristics of a firm's task environment (namely, environmental turbulence and complexity) might influence whether it displays a punctuated equilibrium or ambidexterity model of adaptation. Findings from NK modelling suggest that firms in task environments either low or high on both turbulence and complexity would typically exhibit ambidexterity while those in environments high in either turbulence or complexity would typically demonstrate a punctuated equilibrium model of adaptation.

Zimmermann, Alexander, Sebastian Raisch, and Julian Birkinshaw. "How Is Ambidexterity Initiated? The Emergent Charter Definition Process." *Organization Science*. 26.4. (2015): 1119-1139.

Examining the little-researched topic of how firms initiate ambidexterity, Zimmermann, et al. 2015 offers a bottom-up, process account of how focused (exploration/exploitation) organization units might transition towards pursuing an "ambidextrous charter" (i.e., a shared understanding of responsibility for both exploration and exploitation). The role of frontline managers within an emergent charter definition process is emphasized. A comparative case study of four alliance projects in the automotive industry informs the theorizing.