

[The Role of Human Resource and Organizational Factors in Ambidexterity](#)

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Abstract:

Ambidexterity is a growing field of management research. However, the role of human resources (HR) and organizational factors needs further exploration because of the fragmented nature of prior work and the subsequent lack of a unifying framework. Our review of 41 empirical studies identifies distinct research streams that relate to the effects of employee characteristics, leader characteristics, organizational structure, culture, social relationships, and organizational environment on ambidexterity. We discuss the most important findings within each stream, which contributes to the HR and ambidexterity literature by addressing the current state of our knowledge. To move forward research in this area, we identify important, yet underexplored areas in each stream. This contributes to the literature by highlighting specific gaps in our current knowledge that represent new avenues for future research. We also identify important interrelationships between different streams that need further clarification. We summarize our findings into an integrative model that elucidates the role of HR and organizational factors in ambidexterity. This contributes to a more comprehensive understanding of ambidexterity from the HR and organizational perspectives.

Keywords: organizational ambidexterity | exploration | exploitation | human resources | HR | culture | organizational structure | social relationships

Article:

Ambidexterity, referring to the ability of an organization to simultaneously exploit its existing capabilities and explore completely new ones (March, 1991), has emerged as an important topic in the management research (Junni, Sarala, Taras, & Tarba, 2013). While the growing body of literature on this topic has drawn on diverse theoretical perspectives, an important stream has emerged that focuses on the role of human resources (HR) and organizational factors in the development of ambidexterity (Ahammad, Lee, Malul, & Shoham, 2015; Gibson & Birkinshaw, 2004; Meglio, King, & Risberg, 2015; Patel, Messersmith, & Lepak, 2013). However, this stream of research tends to be fragmented, which has resulted in the lack of a unifying framework. Therefore, the aim of this paper is to review the prior empirical literature

that has examined the role of HR and organizational factors in ambidexterity.¹ We uncover the under-examined levels of analysis, identify major variables and research gaps within each stream of ambidexterity antecedents, and discuss important interconnections between the different streams. This allows us to establish both the state of our current knowledge important opportunities for further research. Our theoretical framework facilitates the integration of fragmented prior knowledge into a multilevel and multidisciplinary understanding of the HR and organizational antecedents of ambidexterity.

We began by searching the literature for studies that focused on ambidexterity. We selected the research area “business economics” in the Web of Science database and used the search term *ambidexterity*. Then, we manually reviewed the search results to identify empirical ambidexterity studies that focused on HR and/or organizational factors. We defined HR factors broadly as those focusing on employee characteristics, leader characteristics, and HR practices/systems. We defined organizational factors as those relating to organizational structure, culture, social relationships, and organizational environment. In quantitative studies, for a study to be included, we required that ambidexterity was included as a distinct variable that combined elements of exploration and exploitation or other two paradoxical elements that were explicitly referred to as ambidexterity. In qualitative studies, for a study to be included, we required an explicit discussion of ambidexterity. We also examined the reference lists of the identified studies to find any additional, relevant articles.

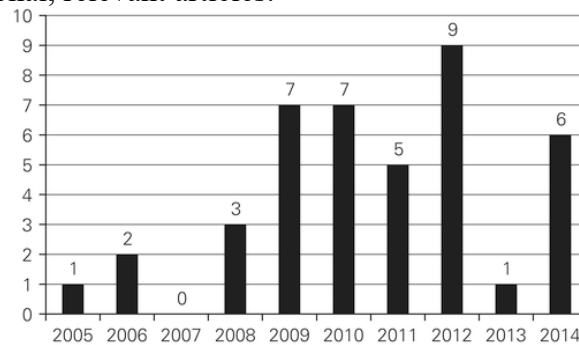


Figure 1. Number of Studies in the Sample per Year

The final collection of papers included in this review contained 41 studies. To examine the overall research interest in the HR and organizational aspects of ambidexterity in recent years, we mapped the number of studies per year. Figure 1 shows an increasing trend from 2005 to 2009 and a sustained interest in the topic from 2010 to 2014, apart from a dip in 2013. Overall, this is in line with the general growth of the ambidexterity research in recent years.

Figure 2 illustrates the distribution of studies based on the study method (quantitative/qualitative) and the level of analysis. Both quantitative and qualitative studies were well represented, although we found more quantitative studies (26 were quantitative and 15 qualitative). As Figure 2 depicts, most studies were at the more aggregate levels (21 at the firm level and 11 at the business unit level), which points to the tendency of examining ambidexterity as a firm or business unit phenomenon. We found significantly fewer studies at the individual (4 studies) and project/team levels (4 studies). Also, the interorganizational level remains underexplored (2 studies). This implies that to truly uncover ambidexterity as a multilevel phenomenon, we need

¹ We argue that HR should be considered within the broader organizational context, which includes sociocultural and structural aspects.

further research into the microfoundations of ambidexterity at the individual and project/team levels. In addition, we need further research into how ambidexterity could be achieved across traditional organizational boundaries in interorganizational contexts.

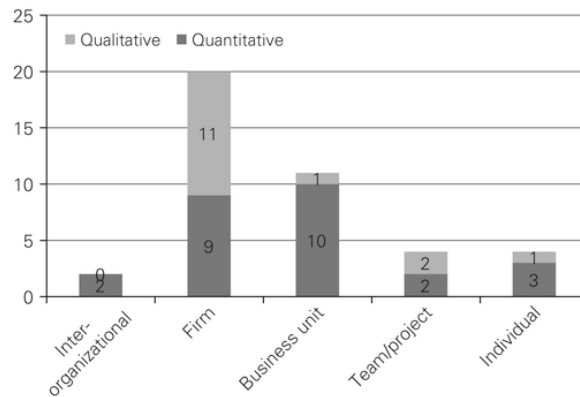


Figure 2. Number of Studies in the Sample per Research Method and per Level of Analysis

The next step consisted of classifying the studies into different streams based on the effects that were examined. Based on our definition of HR, we distinguished the following streams: employee characteristics, leader characteristics, and HR practices/systems. Based on our definition of organizational factors, we identified the following streams: organizational structure, culture, social relationships, and organizational environment. The number of studies examining each stream is presented in Figure 3,² which shows that the most researched streams related to leader characteristics, social relationships, organizational environment, and organizational structure, while HR practices/systems, culture, and employee characteristics have received significantly less attention. This implies that it is particularly the HR aspects that need further articulation in future studies. Further details about each study (level of analysis, data sources, key variables and key findings) are provided in Table I.

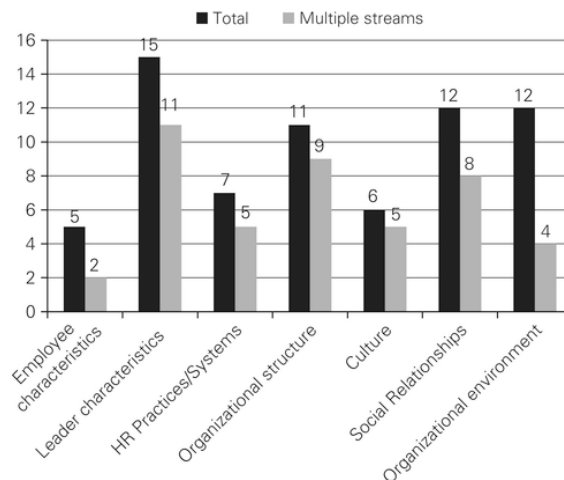


Figure 3. Number of Studies in the Sample per Research Stream

² It should be noted that if one study had multiple streams that were represented as distinct variables, the study was included in several categories. The column “Multiple Streams” in Figure 3 shows the number of studies in each stream that examined several factors.

Table I. Key Features of Studies on the Impact of Human Resource and Organizational Factors on Ambidexterity^a

Authors	Level of Analysis	Data Sources	Research Streams and HR/Organizational Antecedents	Key Findings
Jansen, Van den Bosch, & Volberda (2005)	Business unit level	Survey of unit managers in 363 firms in the financial services industry	Organizational structure (decentralization, formalization) Social relationships (connectedness)	The higher the decentralization and connectedness of units, the higher the unit's level of ambidexterity. Formalization has no effect on ambidexterity.
Beckman (2006)	Firm level	Longitudinal semistructured interviews of managers in high-tech firms	Leader characteristics (founding team composition)	Firms with founding teams whose members have worked at the same company engage in exploitation. Founding teams whose members have worked at many different companies encourage exploration. Firms whose founding teams are ambidextrous—that is, they have both common and diverse prior company affiliations—have higher levels of performance (firm growth measured as the number of employees).
Lubatkin, Simsek, & Veiga (2006)	Firm level	Survey of top management team (TMT) members in 139 SMEs in multiple industries	Social relationships (TMT behavioral integration)	TMT behavioral integration in SMEs is positively associated with the extent to which these firms pursue an ambidextrous orientation.
Ambos, Mäkela, Birkinshaw, & D'Este (2008)	Project level	Archival and survey data of 207 academic research projects in the UK	Employee characteristics (time spent in the current industry, seniority)	Employees that have spent less time in their current industry (i.e., academia) and are less senior (i.e., academic rank) produce the highest proportion of ambidextrous outputs (i.e., the commercialization of university research output).
Jansen, George, Van den Bosch, & Volberda (2008)	Business unit level	Survey of 305 senior team members in a European financial services firm	Leader characteristics (transformational leadership)	Senior team shared vision and contingency rewards are positively associated business unit ambidexterity.
			HR practices/systems (senior team contingency rewards)	Executive director's transformational leadership increases the effectiveness of senior team social integration and reduces the effectiveness of senior team contingency rewards on ambidexterity.
			Culture (senior team shared vision)	
			Social relationships (senior team social integration)	
Tiwana (2008)	Interorganizational level (project alliance)	Survey of 173 team participants in 46 project alliances in a US service conglomerate	Social relationship (network tie type)	Strong ties complement weaker “bridging” ties and indirectly enhance alliance ambidexterity through the mediating impact of knowledge integration (i.e., the extent to which individuals integrate and make use of their individual knowledge at the project level).
Andriopoulos & Lewis (2009)*	Firm level	Semistructured interviews with 86 individuals in 5 new product design	Employee characteristics (personal drivers)	Managing paradoxes (paradoxical leadership) is a key responsibility, not only of top management, but also across organizational levels. Paradoxical management approaches use differentiation and integration tactics to balance different paradoxes in the organization
			Leader characteristics (paradoxical leadership)	

Authors	Level of Analysis	Data Sources	Research Streams and HR/Organizational Antecedents	Key Findings
		consulting firms, archival data and observation	Organizational environment (paradoxical management approaches)	such as paradoxical personal drivers (discipline versus passion) at the employee level.
Chang, Yang, & Chen (2009)	Individual level	Survey of 292 academic researchers	Employee characteristics (technology transfer experience)	Employee technology transfer experience, patenting and licensing incentives, training in intellectual property rights, and networking capabilities (i.e., social relationships within and outside of the organization) increase the number of ambidextrous outputs (i.e., the commercialization of university research output).
			HR practices/systems (patenting and licensing incentives, training)	
			Social relationships (networking capabilities)	
Gulati & Puranam (2009)*	Firm level	Case study, using archival data, of a US firm operating in the computer networks industry	Organizational environment (compensatory fit)	The informal organization can compensate for the formal organization by motivating employee ambidextrous behavior that the formal organization does not emphasize, which enhances organizational ambidexterity.
Jansen, Tempelaar, van den Bosch, & Volberda (2009)	Firm level	Survey of 230 executive directors	HR practices/systems (contingency rewards)	Connectedness has a positive effect on organizational ambidexterity, whereas contingency rewards have no impact on it. Senior team social integration and cross-functional interfaces mediate the impact of structural differentiation on organizational ambidexterity.
			Organizational structure (structural differentiation)	
			Social relationships (connectedness, cross-functional interfaces)	
Mom, van den Bosch, & Volberda (2009)	Individual level	Survey of 716 managers in five firms	Organizational structure (manager's decision-making authority, formalization of a manager's tasks)	Manager's decision-making authority positively relates to this manager's ambidexterity while formalization of a manager's tasks has no impact on it. A manager's connectedness to other organizational members, and his/her participation in cross-functional interfaces positively relate to this manager's ambidexterity. Both cross-functional interfaces and connectedness positively moderate the decision-making authority–ambidexterity relationship and the formalization-ambidexterity relationship.
			Social relationships (connectedness, cross-functional interfaces)	
Nemanich & Vera (2009)	Team level	Survey of team members in 71 organizational teams	Leader characteristics (transformational leadership)	Transformational leadership and the development of a learning culture characterized by psychological safety, openness to diverse opinions, and participation in decision making promote ambidexterity at the team level.
			Culture (learning culture)	
O'Reilly, Harreld, &	Firm level	Case study, using archival data of a US-	Leader characteristics (senior-level sponsorship, dedicated leadership)	Firms are able to compete in mature businesses and technologies through exploitation and to enter new emerging businesses and technologies through exploration using the “Emerging Business

Authors	Level of Analysis	Data Sources	Research Streams and HR/Organizational Antecedents	Key Findings
Tushman (2009)*		based firm in the high-tech industry		Organization” (EBO) process, which is provided for the founding, development, and leadership of new growth businesses within mature organizations. Active and frequent senior-level sponsorship and dedicated leadership support the EBO process.
Taylor & Helfat (2009)*	Firm level	Case studies, using archival data, of two US firms in the high-tech industry	Leader characteristics (interunit leadership)	Middle managers play an important role in creating and maintaining linkages between organizational units responsible for developing the new technology (exploration) and units in charge of complementary assets (exploitation).
Andriopoulos & Lewis (2010)*	Firm level	Case study, using in-depth interviews of 114 employees across organizational levels in 7 US-based product design firms	Employee characteristics (personal drivers)	Managing paradoxes (paradoxical leadership) is a key responsibility, not only of top management but across organizational levels. Paradoxical management approaches use differentiation and integration tactics to balance different paradoxes in the organization such as paradoxical personal drivers (discipline vs. passion) at the employee level.
			Leader characteristics (paradoxical leadership)	
			Culture (diversity-cohesiveness)	
			Organizational environment (paradoxical management approaches)	
Cao, Simsek, & Zhang (2010)	Firm level	Survey of 122 high-tech SMEs	Leader characteristics (CEO-TMT functional complementarity)	CEO's network extensiveness positively impacts ambidexterity. CEO-TMT communication richness and power decentralization enhance this impact (moderation). CEO-TMT functional complementarity has no impact (direct or moderating) on ambidexterity.
			Organizational structure (CEO-TMT power decentralization)	
			Social relationships (CEO network extensiveness, CEO-TMT communication richness)	
Kauppila (2010)*	Firm level	Case study, using archival data, of a Finnish engineering firm	Organizational environment (ambidextrous organizational context)	A firm's ambidextrous organizational context enables it to be ambidextrous. An ambidextrous organizational context consists of a combination of employee and leader characteristics (employee and leader paradoxical thinking), HR practices (job rotation), organizational structure (matrix organizational structure, physical proximity), culture (shared customer-oriented culture), and social relationships (integrating partnership resources).
Smith, Binns, & Tushman (2010)*	Firm level	Case study, using interviews and observations of top managers, of 12 US	Social relationships (team/leader-centric approaches)	Both team-centric (i.e., the entire senior leadership team is responsible for managing the tension between exploration and exploitation) and leader-centric approaches (i.e., the CEO is responsible for integrating effort across exploration and exploitation)

Authors	Level of Analysis	Data Sources	Research Streams and HR/Organizational Antecedents	Key Findings
		firms operating in multiple industries		to managing the ambidexterity tensions are equally effective. Both approaches allow leaders to make dynamic decisions, build commitment, learn actively at multiple levels, and engage conflict. In contrast, a non-centric approach does not work, in which the ambidexterity tension is pushed down to lower levels without coordination across units.
Tiwana (2010)	Interorganizational level (outsourced IT development projects)	Survey of lead project managers for 120 outsources projects in US firms operating in multiple industries	Organizational environment (formal and informal control)	Formal and informal control mechanisms can simultaneously be complements and substitutes in system development ambidexterity: Informal control (i.e., clan control) strengthens the influence of formal behavioral control on interorganizational ambidexterity (complementary effect) but weakens the influence of formal outcome control mechanisms (substitutive effect).
Yu (2010)	Business unit level	Survey of 2306 employees in 267 branches of a retail bank	Employee characteristics (learning goal orientation, prove goal orientation, avoid goal orientation, self-efficacy, role ambiguity and role conflict) Leader characteristics (transformational leadership)	Employee characteristics influence business unit ambidexterity as follows: Learning goal orientation is positively related to ambidexterity, avoid goal orientation is negatively related to ambidexterity, self-efficacy is positively related to ambidexterity, and role stress (role ambiguity and role conflict) is negatively related to ambidexterity. Transformational leadership enhances the positive effect of a learning goal orientation, and reduces the negative effect of role conflict (moderation).
	Business unit level	Survey of branch managers, service officers and sales officers in 267 branches of a retail bank	Leader characteristics (transformational leadership) HR practices/systems (fairness of rewards) Organizational structure (empowerment) Social relationships (team support)	Fairness of rewards, transformational leadership, empowerment, and team support, as perceived by the employees, are positively associated with business unit ambidexterity.
Chang, Hughes, & Hotho (2011)	Firm level	Survey of TMT members in 265 SMEs in Scotland in manufacturing and service industries	Organizational environment (internal organizational structure)	An internal organizational structure that consists of high centralization and connectedness is positively associated with organizational ambidexterity.
Lin & McDonough (2011)	Business unit level	Survey of senior-level managers in 125 business units	Leader characteristics (strategic leadership) Culture (organizational knowledge-sharing culture)	Strategic leadership that is both internally and externally oriented (i.e., ambidextrous) is positively associated with a knowledge-sharing culture. Knowledge-sharing culture mediates the relationship between strategic leadership and ambidexterity.

Authors	Level of Analysis	Data Sources	Research Streams and HR/Organizational Antecedents	Key Findings
O'Reilly & Tushman (2011)*	Firm level	Semi-structured interviews with managers in 15 US-based firms in multiple industries	<p>Leader characteristics (senior leaders' ability to tolerance and resolve tensions)</p> <p>HR practices/systems (common fate reward system, relentless communication of an ambidextrous strategy)</p> <p>Organizational structure (structural differentiation)</p> <p>Culture (common identity and culture)</p>	Organizations are more ambidextrous when they (1) employ senior leaders that are able to tolerate and resolve tensions, (2) use HR systems that combine common fate rewards and relentless communication of an ambidextrous strategy, (3) use structural differentiation to separate exploratory and exploitative units, and iv) have a strong, common identity and culture that integrates these units.
Simon & Tellier (2011)*	Project team level	Case study, including 74 interviews and social network analysis, of 6 NPD projects in one French firm in the high-tech industry	Social relationships (social network configuration evolution)	Ambidexterity at the project level can be understood as a result of social network configuration evolution. The structure and dynamics of the social network influence the evolution of the level of exploration and exploitation of innovative projects: Project teams rely on different network structures and ties depending on whether the objective is to achieve exploration or exploitation. Social network configuration evolution can therefore be understood as temporal ambidexterity.
Chang & Hughes (2012)	Firm level	Survey of managing directors and chief product design managers in 243 firms in multiple industries	<p>Leader characteristics (top managers' risk tolerance and adaptability)</p> <p>Organizational environment (structural characteristics and contextual characteristics)</p>	Organizations led by top managers who are tolerant of risk and adaptable are more ambidextrous. Furthermore, organizational structures characterized by a high centralization and connectedness foster greater levels of ambidexterity. However, organizational contexts characterized by a supportive and dedicative social context and goal- and effort-based performance management have no impact on ambidexterity.
Chandrasekaran, Linderman, & Schroeder (2012)	Business unit level	Survey of 110 exploration and exploitation R&D projects nested in 34 business units (from 28 high-tech firms)	<p>Leader characteristics (senior manager decision-risk capability)</p> <p>Organizational structure (structural differentiation)</p> <p>Organizational environment (contextual alignment)</p>	Decision-risk capability among senior managers and contextual alignment are positively associated with unit-level ambidexterity competency. Structural differentiation does not affect ambidexterity competency.
Filippini, Güttel, & Nosella (2012)*	Firm level	Interviews with 23 firm members from 3 Italian firms in multiple industries	Organizational environment (ambidextrous knowledge management practices)	Ambidextrous knowledge management practices—consisting of highly educated and skilled employees, a participative leadership style, project-based working structures, and cultural values that show entrepreneurial orientation and openness to new technologies—create a better context for both exploratory and exploitative learning.

Authors	Level of Analysis	Data Sources	Research Streams and HR/Organizational Antecedents	Key Findings
Jansen, Simsek, & Cao (2012)	Business unit level	Survey of 305 senior team members in a European financial services firm	Organizational structure (structural differentiation, centralization)	Centralization has a negative moderating effect on the unit ambidexterity-performance relationship, whereas structural differentiation does not moderate this relationship.
Jasmand, Blazevic, & de Ruyter (2012)	Individual level	Survey of 119 employees in a service call center firm	Employee characteristics (locomotion orientation and assessment orientation)	Customer service representative's locomotion orientation facilitates ambidextrous behavior and interacts positively with an assessment orientation. However, team identification and bounded discretion impair this valuable interplay.
Prieto & Pérez Santana (2012)	Firm level	Survey of HR managers (or substitutes such as CEOs) from 189 firms	HR practices/systems (high-involvement HR practices)	High-involvement HR practices (ability-enhancing HR practices, motivation-enhancing HR practices, opportunity-enhancing HR practices) are positively related to a supportive social climate. A supportive social climate mediates the effect of high-involvement HR practices on ambidextrous learning.
Ramesh, Mohan, & Cao (2012)*	Project level	Case study, using on-site and phone interviews, and archival data, of 3 projects of firms operating in the US and India in multiple industries	Organizational environment (project context)	A project context, conceptualized similar to organizational context of Gibson and Birkinshaw (2004), but at the project level, enhances ambidexterity at the project level.
Turner & Lee-Kelley (2012)*	Firm level	Interviews with 16 managers of a UK-based firm in the high-tech industry	Organizational environment (intellectual capital architecture)	An intellectual capital architecture—characterized by a combination of generalist and specialist employees (employee characteristics), entrepreneurial and cooperative social relationships (social relationships), and organic and mechanistic organizational forms (organizational structure) fosters firm level ambidexterity.
Patel, Messersmith, & Lepak (2013)	Firm level	Survey of CEOs in 215 high-tech US SMEs	HR practices/systems (high performance work system)	A high-performance work system is positively associated with organizational ambidexterity.
Chebbi, Yahiaoui, Vrontis, & Thrasso (2014)*	Business unit level	Case study, using semi-structured interviews of 34 heads of departments and managers in a French firm in the high-tech industry	Organizational structure (structural differentiation, integrating linking mechanisms)	To become ambidextrous, multi business unit organizations need to use structural differentiation to create new structures for exploration and exploitation. Structural differentiation should be supported by the following linking mechanisms: inter-unit teams and senior manager coordination.
Halevi, Carmeli & Brueller (2014)	Business unit level	Survey of 245 TMT members (including the CEO of the SBUs) and 883 employees in 101	Social relationships (TMT behavioral integration)	TMT behavioral integration, defined as information sharing, joint decision making, and collaboration between TMT members, fosters ambidexterity on the business level.

Authors	Level of Analysis	Data Sources	Research Streams and HR/Organizational Antecedents	Key Findings
		Israeli small-sized strategic business units (SBUs)		
Hill & Birkinshaw (2014)	Business unit level	Interview and survey of senior managers in 95 corporate venture units in firms operating in multiple industries	Social relationships (relationship context)	Corporate venture units become ambidextrous by nurturing a supportive relationship context, defined by the strength of their relationships with three different sets of actors (parent firm executives, business unit managers, and members of the venture capital community).
Lewis, Andriopoulos, & Smith (2014)*	Firm level	Case studies, using 65 interviews with executives, from firms (5 cases) and a business unit (1 case) operating in multiple countries and industries	Leader characteristics (paradoxical leadership)	Paradoxical (ambidextrous) leadership enables strategic agility. Paradoxical leadership involves creating and maintaining paradoxical values (e.g., short- and long-term success), identifying and raising tensions, avoiding anxiety and defensiveness among organizational members, communicating a paradoxical “both/and” vision, and separating efforts to focus on different sides of a paradox.
Mihalache, Jansen, Van den Bosch, & Volberda (2014)	Firm level	Survey of TMT members in 202 Dutch firms operating in multiple industries	Organizational structure (centralization) Social relationships (TMT shared leadership, connectedness)	Centralization is negatively related to ambidexterity at the firm level. TMT shared leadership enhances organizational ambidexterity. TMT decision-making comprehensiveness and TMT cooperative conflict management style both mediate the positive relationship between TMT shared leadership and ambidexterity. Connectedness has a positive moderating effect on the TMT shared leadership-ambidexterity link, whereas centralization has no effect on this link.
Stokes et al.(2014)*	Individual level	Ethnographic case study involving 80 participants (operational and administrative staff) in a UK service firm	Employee characteristics (educational background, career ambitions)	Employees who have more “positivistic” backgrounds (e.g., in finance or accounting) are less willing to move toward exploration than employees with less “positivistic” background (e.g., marketing, HR). Furthermore, employees who have strong career aspirations are more concerned about balancing exploitation with more exploratory behavior, while those who favor the status quo focus more on exploitation.
Wang & Rafiq (2014)	Business unit level	Survey of company directors and senior managers of 150 UK and 242 Chinese high-tech firms	Culture (ambidextrous organizational culture)	An ambidextrous organizational culture, consisting of organizational diversity and a shared vision, is positively associated with contextual ambidexterity.

^a Denotes qualitative studies.

In the following sections, we will review each stream in more detail. We summarize the key findings, identify important research gaps, and provide suggestions for future research. Based on the review, we build an integrative model of the role of HR and organizational factors in ambidexterity, which incorporates the areas of agreement in terms of key variables that have been researched, and suggests areas that should be examined in further research. We conclude with a discussion on the contribution and implications of our model.

The Role of HR Factors in Ambidexterity

Employee Characteristics

Researchers have examined the premise that employee characteristics influence ambidexterity. This perspective, with its emphasis on individual antecedents of ambidexterity, is theoretically rooted in the HR literature that draws on organizational behavior and organizational psychology. In this section, we discuss the factors that have been the focus of this perspective, which broadly relate to employees' background, orientation, and cognition.

Regarding employees' background, Stokes et al. (2014) found that employees' *educational backgrounds* influenced their ability and willingness to behave ambidextrously. Employees who had more "positivistic" backgrounds (e.g., in finance or accounting) were less willing to move toward exploration than employees with less "positivistic" background (e.g., marketing, HR). Furthermore, Ambos, Mäkela, Birkinshaw and D'Este (2008) showed that *industry tenure* influenced OA: project teams with employees who had spent less time in their current industry and occupied less senior positions produced the highest proportion of ambidextrous outputs (i.e., commercialization of university research output). In contrast, Chang, Yang, and Chen (2009) found that prior experience in a specific type of task (i.e., *technology transfer experience*) increased the number of ambidextrous outputs (i.e., commercialization of university research output).

Regarding employee orientation, Jasmand, Blazevic, and de Ruyter (2012) established that employees' *locomotion orientation*—employees' preference for moving away from the current state—was an antecedent of employees' ambidextrous behavior at the individual level of analysis. Similar to this, Yu (2010) found that employees' *learning goal orientation*—the willingness to acquire new skills and to adjust to new situations—was positively linked to ambidexterity at the unit level. Jasmand et al. (2012) further discovered that if employees' locomotion orientation was combined with employees' *assessment orientation*—employees' preference for critical comparisons of alternative states—employees' ambidextrous behavior further increased. However, employee orientation could also have a detrimental effect on ambidexterity: Yu (2010) found that employees' *goal avoidance orientation* reduced ambidexterity at the unit level. He argued that high-performance-oriented employees might avoid challenging tasks because they want to avoid failure, which, however, is harmful for ambidexterity. Similarly, Jasmand et al. (2012) found that the positive effects of locomotion and assessment orientation were weaker if individuals *identified strongly with their team* and/or exercised *bounded discretion*, that is, strictly followed a routine approach to work tasks. Furthermore, Andriopoulos and Lewis (2009, 2010) focused on employee orientation in terms of employees' *personal drivers* and argued that employees' focus on discipline enhances

exploitation at the firm level, whereas employees' passion leads to increased firm-level exploration. A combination of both drivers would therefore enhance ambidexterity. In addition, Stokes et al. (2014) found that employees who had strong *career aspirations* were more concerned about balancing exploitation with more exploratory behavior, while those who favored the status quo preferred exploitation.

Concerning employee cognition, in terms of social cognition (e.g., perceptions and sensemaking), Yu (2010) showed that employees' *self-efficacy*, in terms of employees' beliefs in their capabilities, enhanced ambidexterity at the unit level. He also found that *role stress* could reduce ambidexterity: Employees' experiences of role ambiguity (i.e., employees did not know what was expected of them) and role conflict (i.e., employees felt that fulfilling the demands of one role contradicted with fulfilling the demands of another) reduced ambidexterity at the unit level (Yu, 2010).

In sum, previous research shows that employees' background, orientation, and cognition influence ambidexterity. Regarding background, the findings suggest that the effect on ambidexterity depends on the specific aspect of background that is being examined. Employees whose functional backgrounds are less positivistic (e.g., marketing vs. accounting), who are less institutionalized in the industry norms (e.g., shorter industry tenure), or who have prior experience in a specific task (e.g., technology transfer experience) may be more ambidextrous.

Concerning employee orientation and cognition, employees who are open for change and learning, are able to critically evaluate different approaches, and trust in their own capabilities can best respond to the challenges of ambidexterity. On the other hand, employees who avoid challenging tasks and whose role in the organization is not clear may be less able or less willing to behave ambidextrously. Also, identification with the team may make employees more consensus seeking, while employees' bounded discretion reduces their available routines and behaviors, which further reduces ambidexterity. Certain employee characteristics (e.g., focus on discipline) also drive exploitation, while others (e.g., focus on passion) drive exploration, which suggests that, in order to foster ambidexterity, both employee characteristics that support exploration and those that support exploitation need to be fostered.

In order for organizations to identify and develop employees capable of effectively functioning in an ambidextrous organization, we should further examine the role of employees in ambidexterity. Regarding employee background, it is important to examine not only the type of background as such (e.g., engineering vs. marketing), but also its breadth: for instance, an engineer with an MBA in marketing may be able to engage in the type of paradoxical thinking that ambidexterity requires. Thus, we propose that employees with *multilevel backgrounds* (e.g., multicultural, multifunctional, multifirm) may be more prepared to handle the ambidexterity challenge than employees with a narrow background. Also, we suggest a further emphasis on the impact of employee orientation, cognition, and personality because these may predict whether employees are able to manage tensions related to ambidexterity and to adjust to paradoxical situations. For instance, we might find nonlinear effects of intelligence: While a certain level of intelligence may be required to handle ambidextrous thinking, a very high intelligence may lead to a tendency to overthink and overanalyze, which may in fact reduce cognitive flexibility required for ambidextrous thinking. In addition, we might find that "*hybrid*" employee

orientations could be better suited for ambidexterity compared with “pure” orientations. For instance, employees who have both introversive (e.g., enjoy analytical thinking) and extroversive orientations (e.g., enjoy social connections) may be better able to handle both exploitative and explorative tasks. Finally, future studies should also aim to untangle how relatively static employee characteristics (e.g., intelligence) interact with more dynamic characteristics (e.g., emotions and perceptions) in influencing ambidexterity. In particular, the role of *emotions* has been neglected in the prior ambidexterity literature. It would therefore be important to examine how different kinds of emotions (e.g., positive vs. negative, passive vs. active) impact ambidexterity. Also, emotional intelligence could play an important role in ambidexterity by helping individuals to identify what emotions they are experiencing. To address the research gaps that we have identified, we call for more research that draws even deeper on the organizational behavior and organizational psychology literatures in order to understand in more detail the role of employee characteristics in ambidexterity. This is essential for a more detailed, theoretically grounded understanding of the microfoundations of ambidexterity.

Leader Characteristics

Prior research suggests that leaders are vital for the development and maintenance of ambidexterity throughout the organization. The theoretical underpinnings are leadership theories in specific and organizational behavioral theories in general. In the following discussion, we discuss factors that have been at the focus of this perspective, which in general relate to leader's background, cognition, and leadership style.³

Regarding leaders' backgrounds, ambidexterity researchers have focused on the impact of the leaders' work experience. More specifically, Beckman (2006) found that founding teams whose members had common previous affiliations, that is, the members had previously worked at the same company, tended to steer the company toward exploitation. In contrast, founding teams whose members had diverse affiliation, that is, the members had previously worked at different companies, tended to focus more on exploration. Furthermore, she found that firms with ambidextrous founding teams—the founding team members had both *common and diverse prior company affiliations*—performed better. Related to this, Cao, Simsek, and Zhang (2010) examined the influence of similarities in the CEO's and top management team (TMT) members' work experience in terms of *CEO-TMT functional complementarity*, measured as the overlap in their functional backgrounds. However, their data showed no direct or moderated effects of functional complementarity on firm level ambidexterity. Furthermore, Mom, Fourné, and Jansen (in press) examined the impact of managers' *work experience* on their ambidextrous behavior. Interestingly, they found that the effect of work experience depended on the type of work experience: Organizational tenure contributed to manager's ambidexterity, but functional tenure reduced it.

Prior research also suggests that leaders' cognition, in terms of cognitive capabilities, could influence ambidexterity. For instance, the *decision-risk capability* of senior managers, which refers to the managerial ability of risk evaluation in strategic choices (Chandrasekaran, Linderman, and Schroeder, 2012), has been linked to ambidexterity at the unit level because it

³ Factors that relate to leader's social relationships and networks will be discussed later under the “Social Relationships” section because of the close links of this body of work to social network theory.

may prevent managers from oversimplifying the strategic choice between exploration and exploitation. Furthermore, Chang and Hughes (2012) examined *risk tolerance and adaptability* of top managers as antecedents of ambidexterity. They concluded that when top managers were not afraid of taking risks and were willing to adapt to new conditions, ambidexterity increased at the firm level. Finally, O'Reilly and Tushman (2011) emphasized the ability of the senior leaders to *tolerate and resolve tensions* arising from managing explorative and exploitative units as a key to firm level ambidexterity.

Leadership style has also been found to influence ambidexterity. Nemanich and Vera (2009) found that *transformational leadership* promoted ambidexterity at the team level. Transformational leaders show individual consideration, stimulate intellectually, provide inspirational motivation, and exhibit idealized influence (Avolio, Walumbwa, & Weber, 1999), which may support team members' engagement in ambidexterity. Yu (2010) found that transformational leadership had a direct, positive impact on ambidexterity at the unit level. Yu (2010) extended on this by establishing that transformational leadership was an important moderator of employee characteristics: Transformational leadership enhanced the positive effect of employees' proven goal orientation and reduced the negative effect of employees' role conflict on ambidexterity at the unit level. Jansen, George, Van den Bosch, and Volberda (2008) provided further support for the moderating role of transformational leadership by showing that transformational leadership positively moderated the effect of senior team social integration and negatively moderated the effect of senior team contingency rewards on unit level ambidexterity.

In addition to transformational leadership, other leadership styles have been connected to ambidexterity. Lin and McDonough (2011) found that *strategic leadership*, which consists of both internally and externally oriented leader behaviors, promoted a knowledge-sharing culture, which in turn promoted innovation ambidexterity at the business unit level. Also, O'Reilly, Harreld, and Tushman (2009) found that active and frequent *senior-level sponsorship* combined with *dedicated leadership* at multiple levels was important for supporting ambidexterity at the firm level. Furthermore, *paradoxical leadership*, which entails the creation and maintenance of multiple paradoxes, has been found to contribute to ambidexterity at the unit and firm levels (Andriopoulos & Lewis, 2009, 2010; Lewis, Andriopoulos, & Smith, 2014). Finally, Taylor and Helfat (2009) showed that firm level ambidexterity required the ability to build and leverage organizational linkages and that leadership by middle managers, that is, *interunit leadership*, was essential in creating these linkages.

Taken together, previous research has shown that leaders are better able to handle the ambidexterity challenge as they gain broad knowledge (e.g., about the organization), but that leaders may become more rigid in their way of thinking as they gain narrow knowledge (e.g., about specific functions). This suggests that the effect of a leader's background is likely to be a complex one, and that prior studies have only begun to tap into this complexity. Also, ambidexterity requires leaders to have cognitive capabilities that allow them to evaluate risk in complex situations, to tolerate risks and tensions, and to adapt to changing conditions. This implies that ambidexterity may require specific cognitive capabilities. Regarding leadership style, transformational leadership has been positively linked to ambidexterity in several studies, but prior research is inconsistent in terms of whether its effect is direct or indirect. This may be driven by different levels of analysis in the studies conducted in this area. Perhaps the effect of

transformational leadership is indeed direct at the team level, as suggested by Nemanich and Vera (2009), where the leader influences the followers more directly. However, it is likely that the effects are more complex at the unit and firm levels. At these levels, the role of transformational leadership may be primarily in fostering employee characteristics that are conducive to ambidexterity and in mitigating those that are not, as suggested by Yu (2010). Alternatively, transformational leadership may moderate the influence of social relationships, such as senior team social integration, as suggested by Jansen et al. (2008). Another explanation is that the association between leadership and ambidexterity is more complex than the one proposed by the transformational leadership theory. Rather than engaging in transformational leadership, ambidexterity may require leaders to combine or switch between different kinds of leadership styles, such as internal and external orientations (Lin & McDonough, 2011) or paradoxical leadership styles (Andriopoulos & Lewis, 2009; 2010; Lewis et al., 2014).

In order for organizations to identify and develop leaders capable of leading ambidextrous organizations, we need further research on the role of leaders in ambidexterity. Regarding leader background, similar to our suggestions in the employee section, we propose that leaders' *multilevel backgrounds* may be beneficial for ambidexterity. In addition to broad educational experience, this includes broad work experience within and outside the current organization. For instance, prior expatriate assignments and job rotations in different units expose leaders to different functional and country units within the current organization, whereas external experience, in terms of prior experience in other organizations and other industries, allow for the integration of outside experience. We propose that multilevel backgrounds are likely to reduce leaders' path dependencies and thereby allow leaders to better understand complex and contradictory processes, which is essential for ambidexterity. In terms of leaders' cognition, it would be interesting to examine to what extent ambidextrous leadership can be taught and to what extent it is based on more static elements, such as the leader's personality and general intelligence. This has important implications for the HR function in terms of how to develop leader training and recruiting processes so that ambidextrous cognitive capabilities are developed and recognized. In addition, we need studies that combine work experience with cognitive characteristics. Previous leadership studies suggest that learning is generated when leaders acquire new experiences and possess the cognitive capabilities to learn from them (Zaccaro, Kemp, & Bader, 2004). Thus, we suggest that ambidexterity may result from the *combination of leaders' multilevel work experiences and cognitive capabilities*. We also noticed a lack of studies concerning leaders' orientations. However, based on the findings of the employee studies, leaders who are oriented toward short-term goals might focus more on exploitation, whereas leaders with a longer-term orientation and a drive for change might be more exploratory. Therefore, we propose that ambidexterity might require leaders who have *ambidextrous orientations*.

As another example, leader orientations stemming from *personal or political ambitions* could also drive leaders toward or away from ambidexterity. However, leaders' personal or political ambitions have been a rather neglected area in ambidexterity research. Therefore, future studies focusing on these aspects could make valuable contributions. Furthermore, a clear gap that we identified is a lack of research on leaders' *social intelligence*, defined as "the ability to understand the feelings, thoughts, and behaviors of persons, including oneself, in interpersonal situations and to act appropriately upon that understanding" (Marlowe, 1986, p. 52), and on the

related concept of *emotional intelligence*, defined as “the ability to perceive emotions, to access and generate emotions to assist thought, to understand emotions and emotional knowledge, and to regulate emotions” (Caruso, Mayer, & Salovey, 2002). Both could be helpful in resolving the social and emotional challenges related to ambidexterity.

HR Practices and Systems

The HR practices and systems perspective reflects the more operational view of human resource management and focuses on the impact of *individual HR practices* (e.g., compensation) and *HR systems* (i.e., combinations of horizontally aligned HR practices) on ambidexterity. The focus is on how to optimally configure HR practices and HR systems so that they facilitate ambidexterity. The HR practice view builds on the assumption that a specific HR practice can be configured independently of other HR practices, and focuses on examining the effects of individual HR practices. In contrast, the HR system view maintains that we need a bundle of congruent HR practices that in combination support ambidexterity (Lepak & Shaw, 2008; Wright, Coff, & Moliterno, 2014).

Regarding the effect of individual HR practices, prior studies have mainly examined the influence of rewards and incentives on ambidexterity, based on the logic that they influence ambidexterity by aligning the motivation of organizational members with the organizational goals. Jansen et al. (2008) found that the use of senior team *contingency rewards*—connecting senior team incentives, such as bonuses and profit sharing, to overall firm performance—was positively related to unit level ambidexterity. However, this finding was not confirmed in the study of Jansen, Tempelaar, van den Bosch, and Volberda (2009) that found a nonsignificant relationship between senior team contingency rewards and firm level ambidexterity. On the individual level, Chang et al. (2009) showed that incentives related to specific ambidextrous outputs—measured as *patenting and licensing incentives*—increased the number of these kinds of ambidextrous outputs (i.e., commercialization of university research output). Furthermore, from an employee perspective, Yu (2010) found that employee perceptions of reward systems as “*fair*” were positively related to unit-level ambidexterity. Chang et al. (2009) also showed that training can enhance firm-level ambidexterity: They found that *training* in intellectual property rights made individuals more likely to produce ambidextrous outputs (i.e., commercialization of university research output).

Concerning the role of HR systems in ambidexterity, Patel et al. (2013) examined the impact of a *high-performance work system*—that is, horizontally and vertically aligned employment practices that address both employee ability and motivation—on ambidexterity. They found that this kind of HR system had a positive effect on firm-level ambidexterity. Furthermore, the study by Prieto and Pilar Perez Santana (2012) showed that a *high-involvement HR system*, consisting of ability-enhancing HR practices, motivation-enhancing HR practices, and opportunity-enhancing HR practices, contributed to firm level ambidexterity through a more supportive social climate. The study of O'Reilly and Tushman (2011) also pointed to the importance of combining several HR practices. Although the authors did not explicitly discuss the HR systems view in their study, they proposed that a *common fate reward system* should be combined with *relentless communication* of an ambidextrous strategy in order to support firm

ambidexterity. This suggests the need to align multiple HR practices, such as reward systems and communication, in order to achieve ambidexterity at the firm level.

Thus, regarding HR practices, prior research seems rather consistent in terms of the potential positive effect of rewards and incentives. Performance-based rewards and incentives tied to the overall firm performance are important at the managerial level because they align managers' interests with the goals of the organization, including ambidexterity. Perceived fairness of the rewards/incentives and linking them to specific ambidextrous outputs is particularly important at the employee level. At the HR system level, HR systems that are aligned around high-performance or high-involvement practices can support ambidexterity because they enhance both employee ability and motivation for ambidexterity.

Taken together, much remains to be learned concerning the role of HR practices and systems in ambidexterity. We were surprised to find so few studies with a clear focus on these important operational aspects of HR. The focus in these few studies so far has been on rewards and incentives, which are likely to influence ambidexterity through their effect on organizational members' motivation for ambidexterity, but the role of HR practices that influence organizational members' ability for ambidexterity remains underexplored. For example, *selecting* and *retaining* employees and managers with the cognitive ability to handle paradoxical situations and conflicting demands could increase ambidexterity at the individual level. This could be further reinforced with the HR practice of *training* that addresses cognitive aspects such as paradoxical thinking. Hence, it would be interesting and important for HR-oriented studies to examine the role of HR practices in supporting not only organizational members' motivation for ambidexterity, but also their ability for ambidexterity. Furthermore, we need more studies that take the HR systems approach and further examine the horizontal fit between HR practices in terms of *complementarities* between different HR practices (e.g., training that develops capacity for ambidexterity, combined with incentives that encourage individuals to behave ambidextrously, combined with opportunities, such as job rotation, to do so). The effectiveness of these kinds of configurations of ambidexterity-enhancing HR practices should be examined at different firm levels and in different industry and country contexts to establish any important boundary conditions for their effectiveness. Finally, an important aspect of the HR system that remains neglected in the ambidexterity research is the impact of *HR flexibility* on ambidexterity. While the studies on HR systems indicate that congruence between different HR practices is important for achieving ambidexterity, it is possible that the flexibility of the HR system—i.e., the extent to which the bundle of HR practices can be applied broadly or can easily be reconfigured (Wright & Snell, 1998)—could also facilitate ambidexterity by enhancing the adaptability of the HR system.

Having reviewed the HR factors and their impact on ambidexterity, we will now move on to look at the role of organizational factors in ambidexterity. These are important in creating an organizational context in which ambidexterity can thrive.

The Role of Organizational Factors in Ambidexterity

Organizational Structure

Organizational structure has been argued to be a key component in building ambidexterity. This research stream builds on organization theory, particularly on control and coordination. In the following, we discuss the effect of organizational structure on ambidexterity and distinguish three key aspects: structural separation, (de)centralization, and formalization.

Prior work suggests that *structural separation* of exploratory and exploitative units can play an important role in ambidexterity. O'Reilly et al. (2009) described the emerging business organization process at IBM that allowed for ambidexterity at the firm level: A key aspect of this process was structurally separating new growth businesses from more mature business units, so that these growth businesses could focus on exploration and not be affected by the traditional path-dependency of the more mature units. Furthermore, O'Reilly and Tushman (2011) suggested that firms should use separate structures for exploratory and exploitative units, and then align these units with, for example, a firm-wide common identity and culture. This suggests a close link between structural separation and culture/identity aspects.⁴ However, several quantitative studies have failed to link structural separation to ambidexterity. Chandrasekaran et al. (2012) did not find a significant relationship between structural separation and ambidexterity at the unit level. Also, Jansen, Simsek, and Cao (2012) found that structural differentiation had no effect on the unit ambidexterity-performance relationship. A possible explanation is that the structural separation-ambidexterity relationship could be more complex than suggested in these studies. For instance, Jansen et al. (2009) found that the effect of structural differentiation on ambidexterity was indirect, through senior team social integration and cross-functional interfaces. Chebbi, Yahiaoui, Vrontis, and Thrassou (2015) echo this finding in their descriptive case study by showing that ambidexterity was achieved by creating new structures for exploration and exploitation while simultaneously linking these units through interunit teams and coordination by senior managers.

Another area of interest has been the impact of (de)centralization of decision making on ambidexterity. Mom, Van Den Bosch, and Volberda (2009) established that *managers' decision-making authority*, that is, the extent to which managers were allowed to decide on how and which tasks to perform and the extent to which they were able to solve problems and set goals, enhanced managers' ambidexterity. On the unit level, Yu (2010) found that employee *empowerment*, measured as the extent to which employees were responsible for how to set their goals, how to organize their work and how to make day-to-day business decisions, was positively related to branch ambidexterity. Similarly, Jansen, Van den Bosch and Volberda (2005) found that *decentralization of the unit*, defined as the extent to which authority was delegated to lower levels of an organization, supported the unit's ambidexterity. Mihalache, Jansen, Van den Bosch, and Volberda (2014) further substantiated the positive effect of decentralization by finding that *centralization*—the opposite of decentralization—was negatively related to ambidexterity at the firm level. Also, Jansen et al. (2012) found that centralization had a negative effect on the unit ambidexterity-performance relationship. However, Cao et al. (2010) did not find a moderating effect of CEO-TMT *power decentralization*—measured as the CEO's power within the TMT in key decision areas—and CEO network extensiveness on ambidexterity. Similarly, Mihalache et al. (2014) did not find a moderating effect of *centralization* and the indirect relationship between top management team shared leadership

⁴ Factors that relate to culture/identity will be discussed later under the “Culture” section.

and ambidexterity. These findings indicate that the impact of centralization on ambidexterity is direct instead of indirect.

Another aspect of organizational structure that has been examined is the level of formalization, which refers to the degree to which rules, procedures, instructions, and communication within an organization are written down (Jansen et al., 2005). It has been suggested that formalization could have a positive effect on ambidexterity by enhancing exploitative learning (Jansen et al., 2005) or a negative effect by reducing managers' flexibility (Mom et al., 2009). However, prior research has failed to establish a direct empirical link between formalization and ambidexterity. Mom et al. (2009) found that *formalization of managers' tasks* did not influence managers' ambidexterity. Similarly, the relationship between *formalization* and unit ambidexterity was not significant in the study of Jansen et al. (2005). Mom et al. (2009) suggest that the relationship between formalization and ambidexterity is more complex: they found that formalization in combination with strong social relationships,⁵ that is, managers participated in cross-functional interfaces and were highly connected to members across the organization, had a positive impact on ambidexterity.

In conclusion, structural separation has been suggested as a way through which especially large, mature, multiunit organizations could achieve ambidexterity. While this argument is rather well established in several qualitative studies, prior quantitative studies have failed to establish a direct link between structural separation and ambidexterity. Rather, the evidence so far suggests that the effect of structural separation is in combination with other variables, such as culture or social relationships. Regarding decentralization, its positive effect has been firmly established in the ambidexterity literature at multiple levels (individual, unit, and firm). A possible explanation for the positive effect between decision-making autonomy and ambidexterity is the increase in flexibility that autonomy provides: As suggested by Mihalache et al. (2014), decentralization may increase flexibility at the operational level, which allows the firm to respond to emerging opportunities faster. Decentralization may also facilitate ambidextrous behavior at lower hierarchical levels. Concerning formalization, even if theoretically plausible, prior research provides no empirical support for a direct, causal link between formalization and ambidexterity. Instead, the effect of formalization is in combination with other variables, such as social relationships (Mom et al., 2009).

While these findings provide a starting point for understanding the role of organizational structure in ambidexterity, several areas need more attention. First, we need further understanding of the *impact mechanisms of structural separation and decentralization* on ambidexterity. One area to examine concerns the organizational integration mechanisms that tie a structurally separate unit to the larger organization. The empirical evidence in this area remains largely based on case studies. Another area to examine is whether the positive effect of decentralization is through an *increased motivation for ambidexterity* throughout the organization or whether it is through an *increased capacity for ambidexterity* in terms of delegating the ambidexterity dilemma to lower organizational levels where it can be solved more effectively. Further, the role of formalization remains unclear. It could be that the effect of formalization depends on the types of routines and processes that are being formalized. For

⁵ Factors that relate to social relationships and networks will be discussed later under the "Social Relationship" section because of the close links of this body of work to network theory.

instance, formalization of all work processes and output requirements could create rigidity and path dependencies that stifle the explorative side of ambidexterity. On the other hand, if the firm manages to establish *ambidextrous routines* that facilitate the organizational members in managing tensions between exploration and exploitation, formalization could be beneficial for ambidexterity.

Organizational specialization—an important dimension of organizational structure—remains unexplored. Should organizational tasks be broken down into narrow job descriptions that require employees with specialist skills, or would more flexible “generalist” job descriptions that require employees with more general skills lead to more ambidexterity? Theoretically, both approaches could enhance ambidexterity: If a firm, unit or team has several kinds of specialists, some employees could focus more on exploitation whereas others could explore, and together they would make the organization more ambidextrous. However, employees with more general skills might be able to balance between exploration and exploitation and achieve ambidexterity at the individual level, which would in aggregate contribute to firm level ambidexterity. This remains an important research question for empirical research.

Finally, the organizational design literature has presented *self-organization* as an alternative to hierarchical organization structure. Self-organization allows organizational members to dynamically form collaborative networks through self-selection in order to solve organizational problems as they arise (Fjeldstad, Snow, Miles, & Lettl, 2012). It is likely that self-organization could enhance ambidexterity because it relies on integration in terms of shared goals and resources, but also on differentiation in terms of decentralization and self-selection, which would allow organizational members to choose where to focus their efforts and to switch more easily between exploration and exploitation in response to changing circumstances.

Culture

Drawing on research in the area of culture and identity, prior ambidexterity research has identified culture as a critical determinant. Culture consists of shared agreements and social expectations and thereby has been argued to function as an effective social control system that supports ambidexterity (O'Reilly & Tushman, 2011). More specifically, O'Reilly and Tushman (2011) showed that a strong, *common identity and culture*, achieved through the articulation of common vision and values throughout the organization, can help the firm integrate explorative and exploitative units, which contributes to ambidexterity at the firm level. Furthermore, Jansen et al. (2008) showed that senior management plays an important role in the articulation of vision and values. They found that the *senior management's shared vision*—defined as the senior team's collective goals and shared aspirations—was conducive for ambidexterity at the unit level.

However, Wang and Rafiq (2014) argue that a shared vision is not enough for ambidexterity at the unit level because too much unity may stifle creativity. They found that a shared vision should be combined with the support for organizational diversity, defined as organizational values and norms that encourage and tolerate differences. Together, a shared vision and support for organizational diversity resulted in an *ambidextrous organizational culture*. Similarly, Andriopoulos and Lewis (2010) found that balancing cultural diversity and cohesiveness was necessary to achieving firm level ambidexterity. The aspect of diversity is also present in the

concept of *learning culture* by Nemanich and Vera (2009), which consists of openness to diverse opinions, psychological safety, and participative decision making. Nemanich and Vera (2009) found that this kind of learning culture contributed to ambidexterity at the team level. Finally, Lin and McDonough (2011) found that a *knowledge-sharing culture*—which is characterized by the values of tolerance to uncertainty, openness to challenge, and trust—contributed to ambidexterity at the firm level.

In conclusion, prior studies suggest that a cohesive culture integrates people from diverse backgrounds and/or from structurally separate units around a shared vision and values, which ultimately contributes to ambidexterity at higher organizational levels. However, it is important that the culture includes values that encourage diversity, psychological safety, and trust, otherwise the explorative side of ambidexterity will suffer.

While these are important findings, our review reveals that there is still a significant gap in our knowledge regarding the role of culture in ambidexterity. More specifically, we need to know more about the role of *cultural similarity vs. diversity* in ambidexterity. While a strong culture can provide unity, it can also repress creativity and different opinions. Thus, we would expect that some level of diversity is needed for ambidexterity. Considering the multilevel nature of ambidexterity, it is also likely that the level of cultural similarity vs. diversity varies across different units and groups. An important question is whether cultural diversity at lower levels—which may be required for ambidexterity—needs to or can be controlled with overarching firm-wide values and norms, as suggested by O'Reilly and Tushman (2011).

In line with Wang and Rafiq (2014), we consider this as the cultural paradox of ambidexterity: how can organizations design a culture that supports differences and unity simultaneously, so that there is an emphasis on both creativity (exploration) and on implementation (exploitation)? We propose that a paradoxical culture could be sustained by emphasizing unity at the firm level while allowing units and groups to have different subcultures. Alternatively, this paradoxical culture could be supported by a firm-wide culture in which some values support differences and others support unity. Here, we see an opportunity for ambidexterity studies to delve deeper into the culture literature, which increasingly sees culture as a multilevel phenomenon. Another important area is to look further into the link between *cultural types* and ambidexterity. The culture literature provides several different cultural frameworks that could be tested in the ambidexterity context. For instance, Cameron and Quinn (1999) propose clan, adhocracy, hierarchy, and market cultures as the main types of organizational culture. It would be interesting to examine how these relate to ambidexterity. This would give managers more concrete guidance in terms of how to build a culture that supports ambidexterity at different organizational levels. We suggest that an ambidextrous culture could feature elements from several cultural types.

Further, *cultural change* processes need more attention. Particularly if ambidexterity requires a shifting emphasis over time between the ratio of exploration and exploitation, one needs to understand how cultural change can help move the organization between the two. Finally, the lack of cultural examinations at the *interorganizational level* is notable. However, the interorganizational literature on phenomena such as mergers and acquisitions suggests that cultural differences and cultural integration (e.g., Sarala & Vaara, 2010) can play an important role in dynamic inter-organizational contexts.

Social Relationships

An important stream in the ambidexterity literature has to do with the effect of social relationships on ambidexterity. The studies in this perspective build on network and organization theories. The underlying argument is that the interaction between different individuals, units, or firms can contribute to ambidexterity through increased cooperation and subsequent exposure to different perspectives. Accordingly, the main themes that emerged from this perspective related to relationships within the top management teams, relationships between managers and the rest of the organization (manager's connectedness, cross-functional interfaces), and the relationship context (relationships within and across organizations).

Concerning relationships within the top management team, Lubatkin, Simsek, Ling, and Veiga (2006) showed that *TMT behavioral integration*—consisting of collaborative behavior, information exchange, and joint decision-making within the top management team—resulted in an increase in the firm's ambidextrous orientation. Halevi, Carmeli, and Brueller (2015) confirmed this finding by linking top management team behavioral integration to ambidexterity at the unit level. They found that this link was particularly strong in dynamic environments. Similar to this, Jansen et al. (2009) found that *senior team social integration*—that is, the attraction of the senior management members to their group, their satisfaction with group members, and the social interaction among team members—enhanced ambidexterity. Further, Mihalache et al. (2014) found that *TMT shared leadership*, in which the CEO and the top management team members shared the responsibility and tasks of leadership, was an important facilitator of ambidexterity at the firm level, with top management team cooperative conflict management (i.e., taking into account the wishes of others) and top management team decision-making comprehensiveness (i.e., applying complex criteria for decisions) both mediating this positive relationship. However, Smith, Binns, and Tushman (2010) found that both *team-centric* (i.e., the entire senior leadership team was responsible for managing the tensions between exploration and exploitation) and *leader-centric approaches* (i.e., the CEO was responsible for integrating effort across exploration and exploitation) to managing the ambidexterity tensions were equally effective. Both approaches allowed leaders to make dynamic decisions, build commitment, learn actively at multiple levels, and to engage conflict. In contrast, what did not work was a non-centric approach in which the ambidexterity tension was pushed down to lower levels without coordination across units.

Furthermore, relationships between the managers and the rest of the organization influence ambidexterity. Mom et al. (2009) showed that managers' *connectedness*—the size and density of the managers' informal networks of direct contacts across the organization—promoted managers' ambidexterity. Although an earlier study of Jansen et al. (2005) did not find a link between connectedness and ambidexterity at the unit level, such a link was established in a later study of Jansen et al. (2009) at the firm level. Mihalache et al. (2014) extended on this by showing that connectedness also has a moderating effect because it enhances the positive indirect relationship between top management team shared leadership and ambidexterity at the firm level. In addition, Mom et al. (2009) found that managers' participation in *cross-functional interfaces*—such as liaison personnel, task forces, and teams—contributed to managers' ambidexterity. However, Jansen et al. (2009) showed that, at the firm level, the positive role of

cross-functional interfaces was particularly in mediating the relationship between structural differentiation and ambidexterity (Jansen et al. 2009). In other words, cross-functional interfaces essentially functioned as social integration mechanisms between structurally separate units. Also, Chang et al. (2009) found that *networking capabilities*, including relationships within and outside of the firm, increased the number of ambidextrous outputs.

Finally, relationship context, that is, relationships within and across organizations, may be required for ambidexterity. Hill and Birkinshaw (2014) showed that corporate venture units became more ambidextrous when they had a strong *relationship context*, which consisted not only of close relationships with parent firm executives and other business unit managers, but also of close relationships with members of the venture capital community. Similarly, Cao et al. (2010) linked *CEO's network extensiveness*—CEO's contacts with non-top-management-team members in and outside of the firm—to increased ambidexterity at the firm level. The effect was even stronger when CEO and the top management team had close interaction, in terms of rich communication. On the unit level, Yu (2010) found that *team support*, measured as the extent to which team members supported of each other, was positively related to branch ambidexterity. Furthermore, Tiwana (2008) found that in interorganizational project teams, *strong ties*—close social interaction, trust, respect, and friendship—helped to integrate *bridging ties*—diverse experiences, backgrounds, and expertise—so that ambidexterity was realized at the interorganizational level.

While most work on social relationships has tended to be rather static, Simon and Tellier (2011) offered a more dynamic perspective by pointing out that one should also look at the evolution of the relationships. They described ambidexterity at the project team level as resulting from *social network configuration evolution*, consisting of changes in network structures and network ties depending on the type of innovation required.

Taken together, the work on the effect of social relationships on ambidexterity suggests that social relationships are crucial. Social relationships within the top management team tend to facilitate cooperation and help the team to manage tensions related to ambidexterity. Managers' social relationships with other organizational members across functions, units, and hierarchical levels, which result from connectedness and participation in cross-functional interfaces, also facilitate ambidexterity. Furthermore, social relationships across different organizations may be required for ambidexterity.

In terms of further research, we need more studies on the mechanisms through which social relationships influence ambidexterity. The first mechanism is *conflict*. Close social interaction between organizational actors, especially when they have diverse backgrounds, can result in conflict rather than cooperation. Conflict can be disruptive and demotivate individuals from achieving challenging organizational goals, including ambidexterity. On the other hand, conflict could also generate ambidexterity if it disrupts path dependency and tendencies for group thinking: Jasmand et al. (2012) found that consensus seeking can impede ambidexterity by reducing the willingness of individuals to seek out diverging ideas, which reduces creativity. Thus, we need to understand what the “optimum” level of conflict is and the conditions under which conflict becomes disruptive for ambidexterity.

The effect of conflict on ambidexterity could also depend on the type of conflict. Conflict stemming from differences of opinion related to how to complete a specific task or process could increase ambidexterity by requiring individuals to defend their innovative ideas. However, personal conflicts might demotivate individuals from seeking out new innovative solutions if they focus on winning personal battles rather than on finding the best organizational solutions. The second underexplored mechanism through which social relationships influence ambidexterity is *trust*. While trust has been included in some of the conceptualizations of ambidexterity antecedents, for instance, it is an aspect of strong ties (Tiwana, 2008) and of social context (Gibson & Birkinshaw, 2004; discussed further in the following section), the role of interpersonal trust in ambidexterity requires further examination. This also points to the interconnections between organizational structure and social relationships: If the organizational structure generates a high level of trust in the system—for instance, there are clear rules and norms concerning how to collaborate and members who diverge from these rules are excluded (Fjeldstad et al., 2012)—interpersonal trust may become less important.

Finally, the roles of *politics* and *power* in social relationships have been neglected in the ambidexterity literature. While political tactics can be disruptive and dysfunctional, they can also have constructive effects (Steensma & Van Milligen, 2003). For instance, “hard” political tactics, such as coalition formation around those who support exploration and those who support exploitation, may hinder ambidexterity. However, when individuals use “soft” political tactics, such as rationalization or inspirational appeals (Steensma and Van Milligen, 2003), they may create constructive dialogues that help resolve ambidexterity tensions. Concerning power, heterarchical power structures—power shifting among organizational members over time—have been linked to enhanced creativity (Aime, Humphrey, Derue, & Paul, 2014), which could potentially contribute to ambidexterity through exploration. More work is needed to find out how power dynamics impact ambidexterity over time.

Organizational Environment

Within this category we identified variables that were formed as combinations of different organizational factors or as combinations of HR and organizational factors. Thus, these variables could not be classified using any single above-mentioned category. The underlying argument in this stream is based on congruence theory in the sense that it is the existence and mutual interdependence of multiple elements that form a broad *organizational environment* that contributes to ambidexterity. The more basic conceptualizations combine different organizational factors (organizational structure, culture, and/or social relationships). For instance, Tiwana (2010) examined the combination of *formal and informal control*. He found that informal control combined with formal behavioral control resulted in a higher level of interorganizational ambidexterity. However, informal control combined with formal outcome control weakened the effect of formal outcome control.

Furthermore, the concept of *internal organizational structure* in the study of Chang, Hughes, and Hotho (2011), which is referred to as *structural characteristics* in the study of Chang and Hughes (2012), consists of factors related to organizational structure (i.e., high centralization) and to social relationships (i.e., connectedness). This type of organizational environment that addressed both structure and social relationships contributed to higher ambidexterity at the firm

level. Also, Gulati and Puranam (2009) focused on the role of *compensatory fit* in ambidexterity. In compensatory fit, the formal (e.g., organizational structure) and informal organizations (e.g., culture) are inconsistent in a sense that they support different types of employee behavior; however, it is the combinations of these inconsistent organizational factors that ultimately contribute to ambidexterity (Gulati & Puranam, 2009).

The more complex conceptualizations include variables formed as a combination of HR and organizational variables. For instance, Gibson and Birkinshaw (2004) examined the effect of *organizational context*, which consists of a performance management context aimed at increasing discipline and stretch and a social context aimed at creating employee support and trust. This conceptualization combines traditional HR aspects (performance management, employee support) with social relations (trust). Gibson and Birkinshaw (2004) found that organizational context facilitated unit ambidexterity. This was further tested by Chandrasekaran et al. (2012), who called Gibson and Birkinshaw's (2004) organizational context “contextual alignment” and found that contextual alignment enhanced firm ambidexterity competency when ambidexterity competency was measured as a combination of exploration and exploitation. However, the effect was negative when ambidexterity competency was measured as the balance between exploration and exploitation. Ramesh, Mohan, and Cao (2012) examined this at the project level and found that *project context*—conceptualized similar to Gibson and Birkinshaw (2004), but at the project level—contributed to ambidexterity at the project level. Project context, in turn, was a result of balanced practices, which were conceptualized as combinations of structural (formal structures, but with flexibility), cultural (cohesive, but distributed teams), and relational aspects (trust, but verify). However, at the firm level, Chang and Hughes (2012) did not find that a supportive and dedicative social context combined with a performance management context, which corresponds to the *organizational context* measure of Gibson and Birkinshaw (2004), had any impact on ambidexterity.

Researchers have also investigated other types of contexts: Andriopoulos and Lewis (2009, 2010) examined the effect of *paradoxical management approaches*, which consisted of the use of both differentiation and integration tactics. Differentiation tactics included organizational structural factors (such as temporally and structurally separating work modes), whereas integration tactics included cultural factors (such as paradoxical vision), employee, and relationship aspects (socializing practical artists). They further showed that ambidexterity at the firm level results from the use of these types of paradoxical management approaches. Also, the concept of *ambidextrous knowledge management practices* by Filippini, Güttel, and Nosella (2012)—consisting of employee characteristics (highly educated and skilled employees), leader characteristics (participative leadership style), organizational structure (project-based working structures), and culture (cultural values related to entrepreneurial orientation and openness to new technologies)—was found to create an organizational environment that supported both exploratory and exploitative learning.

In addition, Kauppila (2010) described an *ambidextrous organizational context* as a combination of employee and leader characteristics (employee and leader paradoxical thinking), HR practices (job rotation), organizational structure (matrix organizational structure, physical proximity), culture (shared customer-oriented culture), and social relationships (integrating partnership resources). He suggested that it is this kind of organizational context that supports ambidexterity

at the firm level. Finally, Turner and Lee-Kelley (2012) conceptualized *intellectual capital architecture* as consisting of employee characteristics (e.g., combinations of employees with generalist and specialist skills), social relationships (e.g., entrepreneurial and cooperative social relationships), and organizational structure (e.g., organic and mechanistic organizational forms), and argued that this kind of architecture fosters firm-level ambidexterity.

In conclusion, understanding ambidexterity may require understanding complex, multidimensional variables as antecedents of ambidexterity. These variables combine different elements into an organizational environment that as an entity supports ambidexterity. An important area for future research involves examining the combined effects of ambidexterity antecedents. One way of doing this is through the creation of further concepts that inherently consist of several different dimensions, in line with the studies that were discussed in this section. Another way of examining the combined effects of ambidexterity antecedents is by including multiple, separate variables that stem from different streams, which is discussed further below.

Interconnections between the Streams

In Table II, we mapped the interconnections between the different streams, in terms of the types of factors that have been examined within the same study.⁶ In general, we can note a tendency to include variables related to both organizational structure and social relationships. We can also note a tendency to examine variables related to leader characteristics together with those related to organizational structure and culture. However, to highlight some of the important gaps that are central for HR, we lack studies that would examine the role of employee characteristics in combination with HR practices/systems, social relationships, and organizational structure.⁷ For instance, employee characteristics in terms of employee emotions could interact with HR practices as shown by George and Zhou (2002) who found that negative emotions actually fostered creativity when perceived recognition and rewards were high and when individuals were able to identify their emotions. However, these kinds of combined effects have not been examined in relation to ambidexterity.

As another example, employee social intelligence could influence ambidexterity through social relationships. If ambidexterity is influenced by social relationships at multiple levels as prior studies suggest, social intelligence may be an important antecedent for the ability to build social relationships. Furthermore, employee characteristics may interact with elements of the organizational structure. For instance, decentralized decision making may require employees who are able and willing to take initiative.

As a final point, while a few studies have included both leader and employee characteristics, the antecedents included in these models tend to be different for leaders and employees. However, we would expect some ambidexterity antecedents at the individual level to be universal (e.g., individual orientations) and thus apply to both leaders and employees. This points to the need to

⁶ While not all of these studies contain interactions of the variables, inclusion of variables from the different streams acknowledges that antecedents of ambidexterity need to be considered at multiple levels.

⁷ To some extent, these have been examined in the organizational environment stream that combines multiple dimensions into one concept. Those connections are discussed in the “Organizational Environment” section.

understand the commonalities and differences between leader and employee antecedents of ambidexterity.

Table II. Interconnections between the Research Streams

	Employee Characteristics	Leader Characteristics	HR Practices/Systems	Organizational Structure	Culture	Social Relationships
Employee characteristics						
Leader characteristics	3					
HR practices/systems	0	3				
Organizational structure	0	5	3			
Culture	1	5	2	1		
Social relationships	0	3	3	7	1	
Organizational environment	2	4	1	2	1	0

A Model of HR and Organizational Antecedents of Ambidexterity

The role of HR and organizational antecedents in determining ambidexterity is illustrated in Figure 4.

The figure provides examples of key variables that have been examined, categorizes them into HR and organizational antecedents, and points to unexamined, yet important, gaps within each category. Overall, we maintain that HR factors are key drivers of ambidexterity. We suggest that employee characteristics that support employee ability and motivation to engage in ambidextrous behavior increase ambidexterity. We further suggest that leader characteristics that support leaders' ability and motivation to effectively manage the ambidexterity challenge at different levels enhance ambidexterity. Further, we argue that HR practices and HR systems play a key role in motivating employees and leaders to engage in ambidexterity and in helping to develop ambidextrous abilities of employees and leaders.

Furthermore, we maintain that key organizational factors related to organizational structure, culture, and social relationships have an important role in influencing ambidexterity. We propose that the role of organizational structure in ambidexterity is to facilitate ambidexterity at lower organizational levels through, for example, decision-making autonomy and structural separation. The role of culture is to promote a shared purpose that unites the organization around key core values and supports both exploration and exploitation while social relationships facilitate interaction within and across individuals, groups, units, and even organizations.

We further argue that an additional element that contributes to ambidexterity is the congruence between the different antecedents in terms of an organizational environment that consists of multiple dimensions that support ambidexterity. Our key message is that ambidexterity is achieved when both HR and organizational factors work in concert to support ambidexterity.

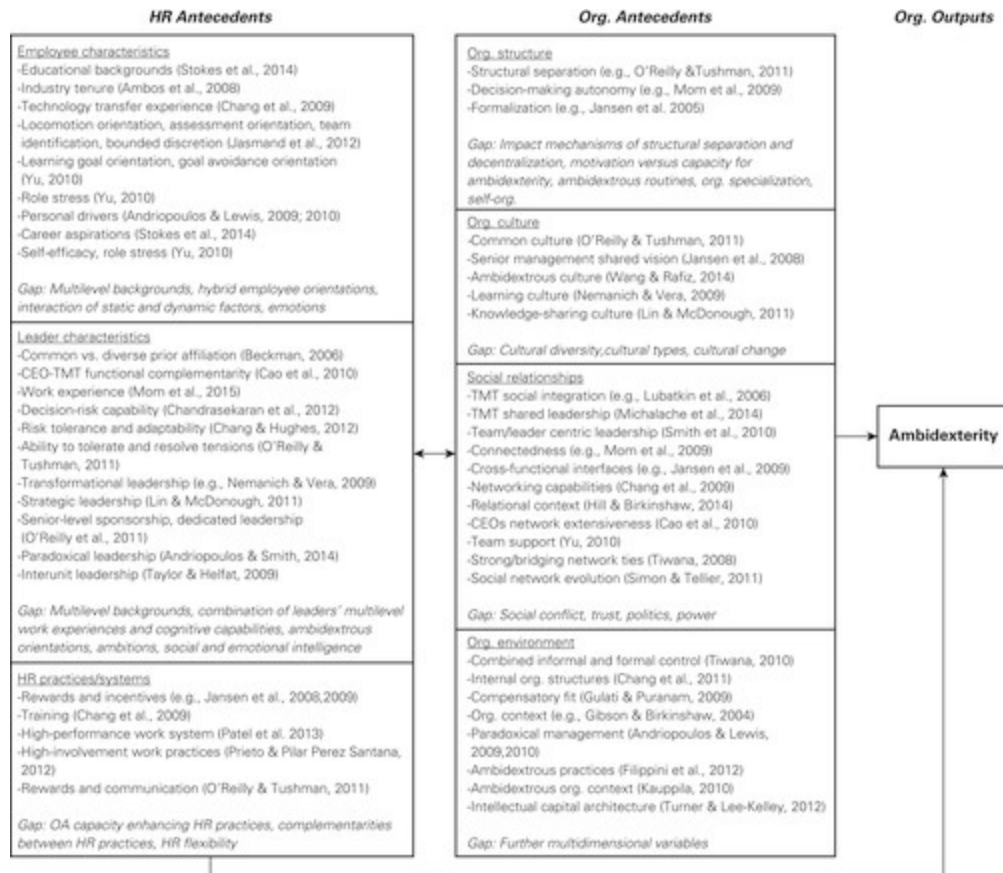


Figure 4. An Integrative Model of the HR and Organizational Antecedents of Ambidexterity

Conclusions

Ambidexterity is an important determinant of firm performance (Jurni et al., 2013). However, our understanding of the antecedents of ambidexterity remains incomplete. Particularly our knowledge concerning the role of HR and organizational factors in determining ambidexterity is still very fragmented. This is due to the fact that organizational ambidexterity is, by its very nature, a multilevel phenomenon and thereby research on ambidexterity draws on multiple disciplines and theoretical perspectives. Thus, understanding ambidexterity requires a multidisciplinary understanding of multiple theories that cut across the traditional micro/meso/macro levels of study. Yet integrative models that combine the role of HR antecedents with those of organizational antecedents are rare.

To shed more light into the complex phenomenon of ambidexterity, we reviewed empirical studies that have examined HR and/or organizational antecedents in ambidexterity. This allowed us to contribute to the literature in several ways. First, we contribute by pointing out specific research gaps in terms of under examined levels of analysis, which include individual, project/team, and interorganizational levels. Second, we contribute by identifying the major variables within each stream of ambidexterity antecedents and by discussing their effects on ambidexterity. Third, we contribute by identifying specific gaps within each stream. For instance, regarding HR practices, while our review showed that we have a basic understanding of the role of reward and incentive systems in influencing the motivation for ambidexterity, we

need further work on understanding how HR can contribute to ability for ambidexterity through, for instance, the development of ambidextrous skill sets. Also, the role of HR flexibility remains unexplored. These examples point to some of the important missing linkages between the HR and ambidexterity literatures where we believe that the ambidexterity literature could be further advanced by incorporating established concepts from the HR literature.

Fourth, we discuss the interconnections between the different streams and bring attention to under examined linkages, which relate to, for instance, the combined effects of employee characteristics and social relationships. This facilitates the integration of prior knowledge that tends to be fragmented due to the multidisciplinary nature of ambidexterity. We emphasize the importance of moving toward a system-oriented thinking in terms of understanding the more complex complementary effects and any possible substitutive effects between the HR and organizational antecedents of ambidexterity. This will also help us to further understand the organizational boundary conditions considering the role of HR in ambidexterity. For instance, a specific HR practice that rewards the acquisition of ambidextrous skills sets may only work when it is embedded in a culture that values learning and change. Understanding the interconnections between the different HR and organizational elements will avoid oversimplifications and overgeneralizations of the findings from the extant research.

To conclude, we believe that understanding the role of HR (employees, leaders, HR practices/systems) in combination with organizational factors (organizational structure, culture, social relationships, organizational environment) at multiple levels of analysis is crucial for understanding how ambidexterity is created and supported at multiple organizational levels. We hope that our review is a further step in the creation of a multilevel understanding of ambidexterity, which has been continuously called for in prior research.

Biographies

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He is a Fellow of the British Psychological Society and an Academician of the Academy of Social Sciences. Prof. Cooper is past president of the British Academy of Management and one of the first UK-based Fellows of the (American) Academy of Management. In 2001, he was awarded a CBE in the Queen's Birthday Honours List. In June 2014, he was awarded a Knighthood for his services to social science.

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⁸ Asterisk (*) indicates that the study was part of our sample of empirical studies.

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