WINNING WITH TEAMS

- MASTER THESIS -

Ralph F. Oduber

Rotterdam School of Management/Erasmus University

WINNING WITH TEAMS

AN INPUT-PROCESS-OUTCOME PERSPECTIVE ON TEAM AMBIDEXTERITY: THE EQUIVOCAL NATURE OF TEAM TASK-RELATED DIVERSITY AND THE EFFECTS OF TEAM CONFIDENCE AND TEAM SHARED LEADERSHIP

- MASTER THESIS –

Ralph F. Oduber (0378537)

Rotterdam School of Management/Erasmus University
Burgemeester Oudlaan 50
3062 PA Rotterdam
The Netherlands

Rotterdam, July 10, 2016

Under the supervision of:

Prof. dr. Justin J.P. Jansen
Ass. Prof. dr. Raymond A.J.L. van Wijk

This work was submitted in fulfillment of the requirements for the degree of:

Master in Science of Business Administration
Parttime Master Bedrijfskunde

SUMMARY

Previous research has consistently shown that ambidextrous organizations - organizations that simultaneously pursue exploratory and exploitative activities - outperform those that are not. These studies have primarily focused on offering solutions at the macro-level of the organizational system which is surprising considering both ambidexterity being a multi-level concept and the rising importance of team-based structures for organizations today. This study advances the understanding of ambidexterity at the organizational work team-level by developing and empirically examining an IPO model on *how* organizational work teams actually achieve ambidexterity. Integrating ambidexterity and team effectiveness research, this study hypothesizes and finds from quantitative data on 47 organizational work teams from 16 organizations active across the full breadth of activities in the Dutch construction industry that team task-related diversity attributes (i.e. *team tenure*, *educational*, and *functional diversity*) affect *team ambidexterity* equivocally and that socio-psychological emergent states and processes (i.e. *team confidence* and *shared leadership*) both directly and indirectly increase teams' ambidextrous attainments. More specifically, team tenure diversity and team educational diversity are found to positively and negatively influence team ambidexterity respectively. No significant effect is found for team functional diversity. In addition, *team age* is found to (partially) mediate the relationships between team tenure diversity and team educational diversity indicating that time aids teams in coping with diversity. These results also provide solid ground for conceptualizing team ambidexterity as a process through which teams transform inputs into ambidextrous attainments by means of team emergent states and processes.

Keywords: Team ambidexterity; exploration; exploitation; team task-related diversity; team confidence; team shared leadership; construction industry.

TABLE OF CONTENTS

APPENDIX A   MEASUREMENTS

1 INTRODUCTION

1.1 Context

In today's ever dynamic competitive landscape, moving quickly on new market, technological, and process opportunities is top priority for organizations. 'Innovate or die!' is the new adage for corporate survival (The Boston Consulting Group, 2013). And this time, the upper echelon's trusted handbook of old-school strategic planning is of no help: too slow, too static, and too easily outmoded (Mintzberg, 2000; Martin, 2014). Today's markets are all about emergent strategy: agile, adaptable organizational responses to varieties of unanticipated events (Martin, 2014). To do so, organizations are increasingly reliant on their frontlines. Being closest to the action and build from a diversity of skills, expertise, and experience, organizational work teams are where strategic initiatives sprout, later to be picked up by the upper echelons and developed into new strategic direction for the organization as a whole (Burgelman, 1983; Floyd and Lane, 2001; Kozlowski and Bell, 2003; Kozlowski and Bell, 2008; Mintzberg *et al.*, 2009). However, that same frontline is also where today's money is made which is often the prerequisite condition for creating future opportunities in the first place. Exploring new businesses and markets pressures today's operations, especially when times are tough, and that is when things get tense (Birkinshaw and Gibson, 2004; Tushman *et al.*, 2011). So how to escape this seeming paradox? Since the mid-1990's, a growing body of literature suggests that successful organizations balance being both fully adaptable to future opportunities and efficiently aligned for today's challenges (Birkinshaw and Gibson, 2004; Gupta and Birkinshaw, 2013). An ability referred to as *organizational ambidexterity*: the simultaneous pursuit of exploratory and exploitative activities. (March, 1991; Gibson and Birkinshaw, 2004; Raisch and Birkinshaw, 2008; Birkinshaw and Gupta, 2013; O'Reilly and Tushman, 2013). Scholars have typically suggested both structural and contextual approaches to ambidexterity at the higher hierarchical levels of the organizations (Tushman and O'Reilly, 1996; Gibson and Birkinshaw, 2004; Haas, 2010; Birkinshaw and Gupta, 2013). However, as organizations are multi-level systems so is ambidexterity a multi-level challenge: every organizational entity needs to be 'linked in' (March, 1991; Edmondson, 2002; Kozlowski and Bell, 2003; Haas, 2010; Birkinshaw and Gupta, 2013). Solving it at the top, means pushing the 'dilemma' down to the frontlines (Birkinshaw and Gupta, 2013). Enter *team ambidexterity*: the ability of organizational work teams to engage in exploratory and exploitative activities simultaneously (Haas, 2010; Jansen *et al.*, 2016). How organizational work teams achieve this ability however, is still unclear.

1.2   Literature gaps, objective and research (sub-)questions

Research efforts in the ambidexterity field have largely attended to the higher hierarchical levels of the organization or business unit (Raisch and Birkinshaw, 2008; Raisch *et al.*, 2009; Simsek, 2009; Birkinshaw and Gupta, 2013; Junni *et al.*, 2013). Studies at the team- or individual-level are few and those that do mostly attend to top management team-phenomena (Lubatkin *et al.*, 2006; Jansen *et al.*, 2009; Kwee *et al.*, 2011) or manager characteristics (Mom *et al.*, 2007; Mom *et al.*, 2009). Organizational work teams - *'groups that exist within the context of a larger organization, have clearly defined membership, and share responsibility for a team product or service'* (Edmondson, 1999) - have especially been left uncovered which is surprising considering the meteoric rise of their importance to organizations today (Kozlowski and Bell, 2008; Mathieu *et al.*, 2008). As ambidexterity cascades down to the organizational work team-level, other antecedents than those needed at the macro-level become salient. In parallel to team effectiveness research, *how* teams actually transform inputs into ambidextrous outcomes by means of team processes and emergent states may be amongst the key issues for ambidexterity research at the team-level (Kozlowski and Bell, 2003; Mathieu *et al.*, 2008). As efforts to unfold the ambidexterity construct from such a process perspective are almost nonexistent (see Simsek, 2009, and Andriopoulos and Lewis, 2009, for notable exceptions), the present study develops and empirically tests an input-process-outcome (IPO) framework on *how* teams actually achieve ambidexterity. In doing so, this study advances the understanding of ambidexterity at the team-level in the following ways.

First, this study examines the relationship between team members' knowledge, skills and abilities (KSA's) and team ambidexterity. Simultaneously pursuing exploratory and exploitative activities requires the combination of inherently diverse team member attributes (Hambrick and Mason, 1984). However, diversity is a difficult card to play: although task-related background differences between team members broaden teams' problem recognition, evaluation and possible courses of action, they also promote conflict and incomprehension amongst team members (Van Knippenberg *et al.*, 2004; Cao *et al.*, 2010). Scholarly efforts in the field of diversity have so far produced anything from diversity being a blessing, a curse, and of no effect at all (Williams and O'Reilly, 1998; Pelled *et al.*, 1999; Kozlowski and Bell, 2003; Van Knippenberg *et al.*, 2004; Mathieu *et al.*, 2008). Building on information/decision-making theory, this study provides with a detailed understanding of the relationships between *team task-related diversity* attributes (i.e. *team tenure diversity*, *team educational diversity*, and *team functional diversity*) and team ambidexterity. In addition, time is often cited to play a critical role in the qualitative nature of teams as they mature (Kozlowski and Bell, 2003; Mathieu *et al.*, 2008). In support of this line of theorizing, this study finds *team age* to promote team

ambidexterity and (partly) overtake the effects of team task-related diversity attributes to team ambidexterity.

Second, ambidexterity research seems to be biased towards a sure role for leaders and managers. True, ambidexterity is a managerial capability (Birkinshaw and Gupta, 2013), but not all managerial capabilities are exclusive to managers. For example, the introduction of *contextual ambidexterity* made a very strong case for context instead of management as the key to ambidexterity at the business unit-level (Gibson and Birkinshaw, 2004; Birkinshaw and Gupta, 2013). Context is just as much created by top-down managerial actions as it is by bottom-up individual interactions (Birkinshaw and Gupta, 2013). This latter perspective is especially salient in the face of recent developments towards more diverse teams. Building on work on team emergent states and properties in team effectiveness research, this study examines the effects of two team-level mediators: *team confidence* and *team shared leadership*. Whereas team confidence refers to the team's collective belief that it can successfully perform its current tasks and be successful in any future challenge arising (Gully *et al.*, 2002; Kozlowski and Ilgen, 2006), team shared leadership refers to the distribution of leadership functions between team members (Carson *et al.*, 2007; Mathieu *et al.*, 2008). Findings suggest team-level mediators hold the promise to expand teams' repertoire of alternative problem identifications and potential courses of action and hence, team ambidexterity, while bringing out diversity's best.

Third, the few attempts to further understanding on ambidexterity at the organizational work team-level pinpoint teams operating in dynamic industries and tasked with innovative activities (see Kostopoulos and Bozionelos, 2011, and Jansen *et al.*, 2016, for example). Although ambidexterity is found to be most important in service and high-technology industries (Junni *et al.*, 2013), the reality is that a vast body of organizational work teams are active in more stable, traditional industries. However, even the most stable industries get hit by events - such as the 2008-2009 Global Financial Crisis and the 2009-2013 European Debt Crisis - that almost change the game overnight. Whole industries then need to reinvent business while squeezing out every drop of returns from refining existing competencies and hence, ambidexterity becomes key to their survival. Drawing from data from 47 organizational work teams from 16 organizations active across the full breadth of disciplines in the Dutch construction industry (i.e. (semi-) public contracting authority, architecture, contracting, specialist subcontracting, manufacturing/supplying, and advisory), this study not only responds to calls to incorporate teams active in a wider variety of industries in team ambidexterity research (Jansen *et al.*, 2016), it also provides with an industry-wide perspective on *how* teams achieve ambidexterity.

Hence, the following questions guided this research: *What is the effect of team task-related diversity on team ambidexterity in organizational work teams? What is the effect of team confidence*

on team ambidexterity and the relationship between team task-related diversity and team ambidexterity? What is the effect of team shared leadership on team ambidexterity and the relationship between team task-related diversity and team ambidexterity?

1.3   Audience, structure, and confidentiality

The present study's primary audience consists of prof. dr. Justin J.P. Jansen and ass. prof. dr. Raymond A.J.L. van Wijk, coach and co-reader respectively, together forming the Graduation Committee, and the Examination Board of Rotterdam School of Management, Erasmus University. This study's secondary audience concerns all managers and participants of the participating organizations in the research, general business practitioners, scholars, students and the likes interested in the concept of *ambidexterity* in practice. Chapter 1 of the report, this chapter, presents the background and positioning for the research, explaining its relevance, and the research's (sub-)questions. Literature review and conceptualization of the tested model are provided in chapter 2. Chapter 3 details the research's methodological design. Empirical findings are presented in chapter 4, each of the research's hypothesis addressed separately. Chapter 5 provides with the overall conclusion and discussion, the research's limitations, possible future research directions and implications for business practitioners. For reasons of confidentiality and commercial sensitivity, nothing in this report is traceable to the participating organizations. Raw, traceable data and a list of participating organizations and concerning number of valid respondents are available to the Graduation Committee and Examination Board of the Rotterdam School of Management, Erasmus University upon first request. Separate custom appendices are available for each of the participating organizations individually showing their scorings relative to the research's sample upon first request.

2 THEORETICAL REVIEW AND HYPOTHESIS

2.1 Ambidexterity

Since the mid-1990's, a vast body of research suggests that *organizational ambidexterity* aids organizations in attaining superior performance and sustained competitive advantage (Gibson and Birkinshaw, 2004; Junni et al., 2013; O'Reilly and Tushman, 2013). *Ambidextrous* organizations are found to outperform rivals on all such things as long term survival (Hill and Birkinshaw, 2012), sales growth (He and Wong, 2004; Lubatkin *et al.*, 2006), and financial performance (Uotila *et al.*, 2009). Although essentially being about the ability of organizations to manage two competing objectives equally well, organizational ambidexterity has come to refer specifically to the simultaneous pursuit of exploratory and exploitative activities (Birkinshaw and Gupta, 2013; O'Reilly and Tushman, 2013). Whereas exploratory activities concern experimenting with new technologies, knowledge and business models and are associated with search, variation, flexibility, and risk-taking, exploitative activities by contrast focus on improving organizations' current repertoire of activities, processes, and competencies and are associated with refinement, standardization, efficiency, and risk-avoidance (March 1991; Lewin *et al.*, 1999; Raisch and Birkinshaw, 2008). The rationale behind the suggested premiums is that ambidextrous organizations successfully manage to counterbalance the self-reinforcing nature of refining existing competencies with sufficient amounts of experimenting with new possibilities. As such, ambidextrous organizations avoid being overtaken by changing markets and technologies in the long run without being outran by competitors in the short (March 1991; Simsek, 2009; O'Reilly and Tushman 2013). Although at first glance it may seem easy to build ambidexterity into organizations - are they not just two simple activities -, doing so is paired with considerable trade-offs in the allocation of resources and the alignment of competences, processes, structures and cultures within organizations (March 1991; Tushman and O'Reilly, 1996; Tushman and O'Reilly, 1997; Raisch and Birkinshaw). Furthermore, organizations have a tendency to refine existing competencies over experimenting with new ones as the returns of the latter are often less certain, more remote in time, and more distant from organizations' current focus (March 1991). Amongst the key issues in ambidexterity research therefore is how organizations host these two distinct activities simultaneously (Raisch and Birkinshaw, 2008; O'Reilly and Tushman, 2013). Initially being introduced as a sequential process - organizations temporally alternating between exploration and exploitation (see Kwee *et al.*, 2011, for a longitudinal study on Royal Dutch Shell's strategic renewal behavior) - organizational ambidexterity nowadays is seen primarily as an integrative phenomenon wherein exploration and exploitation are hosted simultaneously. Organizations do so either structurally or contextually: structurally by means of separate units tasked with either one of both activities; contextually by

building a culture that allows workers to divide their efforts spend on either one of both autonomously (Birkinshaw and Gibson, 2004; Raisch and Birkinshaw, 2008; Birkinshaw and Gupta, 2013; O'Reilly and Tushman, 2013). Whereas structural ambidexterity assumes top management to decide who is tasked with what and how much resources will be allocated, contextual ambidexterity leaves it to the frontlines (Birkinshaw and Gibson, 2004). No organizational entity however, whether an individual, team or business unit, has exclusive rights to either exploration or exploitation (Birkinshaw and Gupta, 2013; Turner *et al.*, 2013). Therefore, scholars have more recently identified organizational ambidexterity as being a multilevel construct requiring every organizational entity to be 'linked-in' and decide about how to divide time and attention (March, 1991; Kozlowski and Bell, 2003; Mathieu *et al.*, 2008; Simsek, 2009; Birkinshaw and Gupta, 2013). Given the rising importance of team-based structures for organizations to survive under today's rapid market dynamics, this provokes questions about how the 'ambidexterity dilemma' is resolved at the organizational work team-level.

2.2   Team ambidexterity

Although ambidexterity research has mostly offered solutions at the macro- (i.e. structural ambidexterity) or micro-level (i.e. contextual ambidexterity), some first, careful inroads suggest that the concept of team ambidexterity - the ability of organizational work teams to engage in exploratory and exploitative activities simultaneously - may be salient for organizations to achieve ambidexterity (Haas, 2010; Birkinshaw and Gupta, 2013; Jansen *et al.*, 2016). Following recent critiques on ambidexterity's versatility as a concept however, clear, distinctive positioning of the concept of team ambidexterity is necessary before hypothesizing towards a model for how teams actually achieve ambidexterity in practice (Birkinshaw and Gupta, 2013; Junni *et al.*, 2013; O'Reilly and Tushman, 2013).

First, next to having added much to the understanding of the concept, recent years' proliferation of ambidexterity research has led to a wide variety of conceptualizations and operationalizations of the ambidexterity concept (Simsek, 2009; Uotila *et al.*, 2009; Birkinshaw and Gupta, 2013; Junni *et al.*, 2013; O'Reilly and Tushman, 2013; Turner *et al.*, 2013). Not only is this demonstrated by differences in both the duality measured (e.g. exploration/exploitation, adaptability/alignment) and the measurement itself (e.g. $X + Y$; $X - Y$; $X * Y$), but it becomes especially salient when looking at the measures used in ambidexterity research (Uotila *et al.*, 2009; Birkinshaw and Gupta, 2013). Table 2.1 - featuring the items used to measure ambidexterity in the top-7 cited empirical studies on ambidexterity based on an electronic search through Google Scholar (keyword: 'ambidexterity') - shows that ambidexterity measures tap into the likes of propensity, intentions, outcomes, capacity, and behaviors or any such combination of these categories (Birkinshaw and Gupta, 2013). Note that the level of analysis between these studies covers both firm- and business unit-level

Author(s)	Level of Analysis	Measure	Duality	Operationalization
He and Wong (2004)	Firm	Intention	Exploration	Objectives for undertaking innovation projects in the last 3 years:
				- introduce new generation of products.
				- extend product range.
				- open up new markets.
				- enter new technology fields.
			Exploitation	- improve existing product quality.
				- improve production flexibility.
				- reduce production cost.
				- improve yield or reduce material consumption.
Gibson and Birkinshaw (2004)	Business unit	Capacity	Alignment	- The management systems in this organization work coherently to support the overall objectives of this organization.
				- The management systems in this organization cause us to waste resources on unproductive activities. [reversed]
				-People in this organization often end up working at cross-purposes because our management systems gives them conflicting objectives.
			Adaptability	-The management systems in this organization encourage people to challenge outmoded traditions/practices/sacred cows.
				-The management systems in this organization are flexible enough to allow us to respond quickly to changes in our markets.
				-The management systems in this organization evolve rapidly in response to shifts in out business priorities.
Lubatkin, Simsek, Ling, and Veiga (2006)	Firm	Intention/action	Exploration	The firm is described as one that:
				- looks for novel technological ideas by thinking 'outside the box'.
				- bases its success on its ability to explore new technologies.
				- creates products or services that are innovative to the firm.
				- looks for creative ways to satisfy its customers'needs.
				- aggressively ventures into new market segments.
			Exploitation	- actively targets new customer groups.
				- commits to improve quality and lower cost.
				- continuously improves the reliability of its products and services.
				- increases the levels of automation in its operations.
				- constantly surveys existing customers' satisfaction.
				- fine-tunes what it offers to keep its current customers satisfied.
				- penetrates more deeply into its existing customer base.
Andriopoulos and Lewis (2009)	Firm		Exploration	- Focus on reputation building.
				- Risk-taking ensures long-term adaptability.
				- Probing new products/technologies surfaces future opportunities.
				- Ongoing experimentation extends firm knowledge base.
				- Personal expression, challenge, and pride motivate knowledge workers' creativity.
			Exploitation	- Ensure stable revenues via repeat clients.
				- Careful resource allocation fosters efficiency.
				- Achieving project goals fosters client satisfaction and loyalty.
				- Clients' requirements help projects fulfill market needs.
				- Well-defined development process empowers contribution.
				- Targets (deliverables, budgets, deadlines) encourage execution.

Author(s)	Level of Analysis	Measure	Duality	Operationalization
				- Explicit roles enable focus.
Jansen, Tempelaar, Van den Bosch, and Volberda (2009)	Firm	Propensity	Exploration	- Our organization accept demands that go beyond existing products and services.
				- We commercialize products and services that are completely new to our organization.
				- We frequently utilize new opportunities in new markets.
				- Our organization regularly uses new distribution channels.
			Exploitation	- We frequently make small adjustments to our existing products and services.
				- We improve our provision's efficiency of products and services.
				- We increase economies of scale in existing markets.
				- Our organization expands services for existing clients.
Tiwana (2008)	Team (alliance)	Outcome	Adaptability	Overall, this team has been able to:
				- manage successfully scope changes.
				- resolve unexpected problems.
				- deliver a relatively stable system to current requirements.
			Alignment	At the present time, this project:
				- is within budget.
				- is on schedule.
				- delivers ALL [emphasis added] desirable features and functionality.
				- meets key project objectives and business needs.
				- overall, is very successful.
Mom, Van den Bosch, and Volberda (2009)	Individual	Propensity	Exploration	Extent of last year's engagement in work related activities characterized as follows:
				- Searching for new possibilities with respect to products/services, processes, or markets.
				- Evaluating diverse options with respect to products/services, processes, or markets.
				- Focusing on strong renewal of products/services or processes.
				- Activities of which the associated yields or costs are currently unclear.
				- Activities requiring quite some adaptability of you.
				- Activities requiring you to learn new skills or knowledge.
				- Activities that are not (yet) clearly existing company policy.
			Exploitation	- Activities of which a lot of experience has been accumulated by yourself.
				- Activities which you carry out as if it were routine.
				- Activities which serve existing (internal) customers with existing services/products.
				- Activities of which it is clear to you how to conduct them.
				- Activities primarily focused on achieving short-term goals.
				- Activities which you can properly conduct by using your present knowledge.
				- Activities which clearly fit into existing company policy.

Table 2.1 Conceptualizations and operationalizations of ambidexterity

ambidexterity and although research on ambidexterity at the team-level still is few and far between, those studies that do address it show a similar pattern. While some use measures identical to measures used in team learning literature such as "Team members were systematically searching for new possibilities" and "The members of our team developed many new skills while performing their tasks" (Kostopoulos and Bozionelos, 2013; Jansen *et al.*, 2016), others combine both behavioral and intentional components such as: "My team implements most of my new ideas" and "When I share a new idea it gets a thorough review by my supervisor" (Nemanich and Vera, 2009). This myriad of operationalizations goes paired with the risk of equivocal, non-distinctive conceptualization of team ambidexterity as a construct.

Second, as ambidexterity cascades down to the organizational work team-level, other mechanisms than those at the macro-level become salient (Turner *et al.*, 2013). So far, much of the effort in ambidexterity research has evolved around *what* organizations do to achieve ambidexterity (i.e. the structures and contexts they put in place), far less around *how* ambidexterity unfolds as a process (i.e. how inputs are transformed into outputs) (Raisch, 2008; Raisch and Birkinshaw, 2008). As the essence of team work revolves around how teams transform inputs into outcomes by means of their processes and emergent states (Kozlowski and Bell, 2003; Mathieu *et al.*, 2008), team ambidexterity should essentially be looked at from a team-process perspective. In support of such theorizing, Simsek (2009) coined the possibility for a process perspective on ambidexterity by positioning the before discussed variety of conceptualizations, operationalizations, and measurements in ambidexterity research along an input-process-outcome framework. The small body of research suggesting the concept of team ambidexterity follow a similar pattern: inputs such as teams' use of external knowledge (Haas, 2010) and supportive leadership behavior (Jansen *et al.*, 2016) interact with processes and emergent states such as team distal and local learning (Wong, 2004), cohesion, efficacy (Jansen *et al.*, 2016), autonomy (Haas, 2010), psychological safety and task conflict (Kostopoulos and Bozionelos, 2013) to affect ambidextrous attainments which ultimately leads to (higher level) performance outcomes.

Taking this towards a model, as team ambidexterity may be best conceived using a process perspective, this study models team ambidexterity along an IPO framework. Following Simsek (2009) and in parallel to team-effectiveness research (see Beal *et al.*, 2003 and Mathieu *et al.*, 2008), the criterion side of such a model should be operationalized as *team ambidextrous attainments*, or *behaviors*, (e.g. the actual searching and/or experimenting with new ideas and possibilities or standardizing and/or refining tasks and work methods) which in turn lead to higher-level performance outcomes at the organizational-level such as long term organizational survival, sales growth, and financial performance. Access to cognitive resources is amongst teams' most vital inputs for achieving

ambidexterity (Hambrick and Mason, 1984; Bantel and Jackson, 1989; Ancona and Caldwell, 1992; Turner *et al.*, 2013). However, previous research has consistently found that diversity of task-related knowledge, skills, and abilities amongst team members acts as a double-edged sword: on the one hand *team task-related diversity* enables teams to access a greater set of cognitive resources and therewith increases their set of problem identifications and potential courses of action; on the other it promotes conflict and incomprehension amongst team members (Milliken and Martins, 1996; Williams and O'Reilly, 1998; Van Knippenberg *et al.*, 2004; Van Knippenberg and Schippers, 2007; Mathieu *et al.*, 2008). To reconcile the latter, teams require social skills such as negotiation and decision-making behaviors that enhance consensus (Ancona and Caldwell, 1992; Knight *et al.*, 1999; Turner, 2013). Studies in the field of team effectiveness have consistently found that emergent socio-psychological states such as *team confidence*, increase teams' information-sharing on the one hand and create strong, self-fulfilling cycles of team members' collective belief on the other that help teams bridge negative affective reactions from social categorization and diversity faultlines (Gully *et al.*, 2002). Furthermore, access to cognitive resources does not necessarily mean that these are put to use most effectively. Recent advances in the field of leadership suggest that *team shared leadership* is especially salient when team work is knowledge based as it expands teams' repertoire of problem identifications and potential courses of action (Wang *et al.*, 2014). Hence, this study examines the effects of team task-related diversity (i.e. *team tenure*, *educational*, and *functional diversity*) to team ambidexterity and the direct and interactive effects of team confidence and team shared leadership. The following sections elaborate towards hypothesis and a conceptual model for the research.

2.3   Team task-related diversity

Team performance is indisputably influenced by the attributes of team members (Williams and O'Reilly, 1998; Kozlowski and Bell, 2003). Gender (Williams and O'Reilly, 1998), ethnicity (Kwee *et al.*, 2010), educational background (Bantel and Jackson, 1989), functional background (Hambrick and Mason, 1984; Bantel and Jackson, 1989; Ancona and Caldwell, 1992; Bunderson and Sutcliffe, 2002; Kwee *et al.*, 2010), they all impact the processes and outcomes expected from teams and their effects run all the way up to the aggregate level of the organization (Milliken and Martins, 1996; Kozlowski and Bell, 2003; Mathieu *et al.*, 2008). Knowing the interactive effects of team member attributes, means knowing how to set-up the optimal team for whatever organizational challenge at hand (Kozlowski and Bell, 2003). As such, team diversity has been under the scrutiny of scholars for over half a century and amongst the most pressing issues in diversity research remains whether there is any value in diversity in the first place (Mathieu *et al.*, 2008). As diversity generally refers to any attribute people use to perceive others as being different from the self, an indefinite number of attributes are available for categorizing people (Williams and O'Reilly, 1998; Van Knippenberg *et al.*, 2004). Brought

back to what is most salient for organizational research, scholars generally distinguish between three categories: *demographic* (e.g. age, gender, ethnicity), *attitudinal* (e.g. attitudes, values, beliefs), and *task-related diversity* (e.g. organizational tenure, functional background, educational background) (Jackson *et al.*, 1995; Van Knippenberg *et al.*, 2004; Horwitz and Horwitz, 2007; Mathieu *et al.*, 2008; Hülsheger *et al.*, 2009; Joshi and Roh, 2009). So far, findings in any of these categories are mixed to say the least: both meta-analysis and review studies consistently report diversity as being a blessing, a curse, and of no effect at all (Milliken and Martin, 1996; Williams and O'Reilly, 1998; Pelled *et al.*, 1999; Webber and Donahue, 2001; Kozlowski and Bell, 2003; Van Knippenberg and Schippers, 2007; Mathieu *et al.*, 2008). To a great extent, these differences are the corollary of one of two theoretical positions from which diversity is mostly studied (Williams and O'Reilly, 1998; Horwitz and Horwitz, 2007). From an information/decision-making perspective, diversity is argued to aid teams as it increases their access to a greater variety of knowledge, skills and abilities, enhancing teams' creativity, innovation, and problem solving (Bantel and Jackson, 1989; Milliken and Martins, 1996; Williams and O'Reilly, 1998; Van Knippenberg *et al.*, 2004 Van Knippenberg and Schippers, 2007; Horwitz and Horwitz, 2007). Naturally, benefits coincide with the extent to which such cognitive diversity is useful and relevant to teams' tasks (Van Knippenberg and Schippers, 2007). By contrast, from a social categorization perspective, diversity is found to impair team performance since 'otherness' of team members often comes with conflict, dislike, and distrust (William and O'Reilly, 1998; Van Knippenberg and Schippers, 2007). What follows is a negative impact of diversity on all such things as conflict, cohesion, and communication between team members and hence team performance (Bantel and Jackson, 1989; Williams and O'Reilly, 1998; Pelled *et al.*, 1999; Horwitz and Horwitz, 2007). Paradoxically, amongst the central arguments in studies from an information/decision-making perspective is that it is exactly this 'conflict' that drives team members to solve this through agreement-seeking techniques such as elaboration of information processing and consensual decision-making which subsequently increase team performance (Knight *et al.*, 1999; Van Knippenberg *et al.*, 2004). The problem with this line of theorizing is that so far, there is no consistent evidence on the positive relationship between conflict and performance (Williams and O'Reilly, 1998; Van Knippenberg *et al.*, 2004). As such, the interaction between diversity, conflict, and performance remains a complex one as many, if not all, diversity attributes have equivocal corollaries (Pelled *et al.*, 1999; Van Knippenberg *et al.*, 2004).

This study's focus is on team task-related diversity - the extent to which team members' knowledge, skills, and abilities relevant to cognitive tasks at work vary (Simons *et al.*, 1999) - as this increases teams' set of cognitive resources offering the potential to enhance problem recognition, evaluation, and possible courses of action (Bantel and Jackson, 1989; Williams and O'Reilly, 1998; Simons *et al.*, 1999). Following previous research, this study uses *team tenure diversity*, *team*

educational diversity, and *team functional diversity* as proxies for the task-related diversity of skills, expertise and experience possessed by team members (Horwitz and Horwitz, 2007). Notwithstanding findings on the negative effects of team task-related diversity attributes to team performance (see Williams and O'Reilly, 1998, and Knight *et al.*, 1999, for example), team ambidexterity is an inherently different team outcome than regular, univariate team performance criteria (e.g. sales, turnover, profitability, quality, and satisfaction). As diversity's effects may vary depending on the teams' tasks (Kozlowski and Bell, 2003), this study argues that above all, the paradoxical nature of team ambidexterity may prosper from informational differences between team members. Hence, this study uses an information/decision-making perspective in building hypotheses for the before task-related diversity attributes. First, team members that join the team at various points in time differ from each other in terms of experience, networks and socialization to the team's *code* (e.g. beliefs, mores, routines, and practices) (March, 1991; Williams and O'Reilly, 1998; Heavey and Simsek, 2014). Team members high on team tenure - team members' length of service on the team - will know more, but that knowledge is likely to be already represented in the team code (March, 1991). Team members low on team tenure (i.e. newer to the team) may know less, but what they know is new and may offset teams' natural tendency to exploit over explore (March, 1991). Heterogeneity in team tenure may thus come with a wider variety of perspectives for teams with which to identify and solve both proximate and distal challenges (Williams and O'Reilly, 1998). Second, heterogeneity in team members' major fields of educational background (i.e. team educational diversity) provides teams with a solid understanding of multiple knowledge domains. Differences in educational background often depict differences in knowledge, cognitive style, and inclinations towards certain courses of action (Hambrick and Mason, 1984; Bantel and Jackson, 1989; Wiersema and Bantel, 1992). For example, technicians may tend to concretise whereas strategists may prefer abstraction. As such, diversity in educational specialization provides organizational work teams with both breadth and depth across knowledge domains, expanding teams' repertoire of problem identifications and solutions. Third, team members with different functional backgrounds are likely to approach and solve problems differently, each attending to different cues and leaning towards different courses of action (Bantel and Jackson, 1989). Functional experience guides mental frames. For example, top managers with throughput-oriented functional backgrounds (e.g. production/operation, finance, and accounting; see Hambrick and Mason, 1984) are more likely to pursue exploitative than explorative activities (Hambrick and Mason, 184; Kwee *et al.*, 2010). In support of such theorizing, Taylor and Greve (2006) find functional diversity within teams to increase both exploratory and exploitative activities. It follows that organizational work teams consisting of team members with a broad range of functional backgrounds may be able to better combine paradoxical course of actions than homogeneous teams (Heavey and Simsek, 2014). In synthesizing the before made assertions, this study continues with the expectation that the effects

of team tenure diversity, team education diversity, and team functional diversity to team ambidexterity may be hypothesized as follows.

Hypothesis 1ₐ   *Team tenure diversity is positively related to team ambidexterity.*

Hypothesis 1_b   *Team educational diversity is positively related to team ambidexterity.*

Hypothesis 1_c   *Team functional diversity is positively related to team ambidexterity.*

2.4   Team confidence

Research has consistently shown that collective team cognitive, motivational, and affective, states such as team confidence both directly and indirectly influence team outcomes (Cohen and Bailey, 1997; Marks *et al.*, 2001; Gilson and Shalley, 2004; Ilgen *et* al., 2005; Mathieu *et al.*, 2008). As team members interact, shared understandings and beliefs emerge that both act as inputs and shape the processes with which teams transform inputs into outcomes (Cohen and Bailey, 1997; Marks *et al.*, 2001). Team confidence can be categorized into task-specific (i.e. *team efficacy*) and generalized beliefs (i.e. *team potency*): whereas team efficacy refers to the team's collective belief that it is capable to successfully perform its specific tasks, team potency refers to the team's general belief that it can be successful in any case, no matter the task or context (Gully *et al.*, 2002; Kozlowski and Ilgen, 2006; Mathieu *et al.*, 2008). The distinction here is not just plain semantics. Research has shown that because of its task-specific nature, team efficacy is strongly influenced by task-specific characteristics, such as interdependency, whereas team potency is not (Gully *et al.*, 2002). As such, team efficacy may be more strongly related to exploitative than to explorative activities and team potency vice versa. For example, in examining boundary-spanning service teams high on task-variety, De Jong *et al.* (2005) find team potency to positively relate to service quality, but not to profitability (i.e. cost control and maximization of returns). Furthermore, Stajkovic *et al.* (2009) find from meta-analysis that team efficacy mediates between team potency and task performance, which hold considerable face validity for the before made claim: efficacy may pinpoint teams' general confidence beliefs to specific task performance. Overall, team efficacy is found to best predict specific team outcomes and team potency to best predict general ones (Gibson *et al.*, 2000). With this in mind, reports that team efficacy is not conducive to team ambidexterity (see Jansen *et al.*, 2016) may only be half of the story. How teams perceive the paradoxical nature of simultaneously pursuing explorative and exploitative attainments may impact whether teams embrace or reject it (Smith and Tushman, 2005). Teams believing they are equally capable of delivering value in their current task-environment as they are in creating value from changes in their broader ecosystem are more likely to look upon resulting contradictions as a lens instead of a label (Gibson and Birkinshaw, 2004; Smith and Tushman, 2005). As such, they may shape shared mental models in which performing explorative and exploitative activities are equally acceptable

(Simsek, 2009). It follows that teams high on team confidence (i.e. high on both team efficacy and team potency) may exhibit high levels of team ambidexterity, hence the following is hypothesized.

Hypothesis 2   Team confidence is positively related to team ambidexterity.

Furthermore, in addition to the effects of task-related beliefs, positive beliefs about the team itself are suggested to have positive effects on team performance as well (Gully *et al.*, 2002). Having access to a greater variety of KSA's doesn't necessarily mean that diverse teams are also able to exploit this potential. Social categorization and diversity faultlines end in conflict and incomprehension amongst team members if left unattended (Lau and Murnighan, 1998; Thatcher *et al.*, 2003; Van Knippenberg *et al.*, 2004; Homan *et al.*, 2007; Mathieu *et al.*, 2008). As team work involves complex interwoven mutual interpersonal processes, teams need social skills to favorably shape how cognitive resources are processed into certain team outcomes (Cohen and Bailey, 1997; Marks *et al.*, 2001; Gully *et al.*, 2002; Mathieu *et al.*, 2002; Turner *et al.*, 2013). Teams conditioned to believe that diversity pays are found to not only outperform teams that don't, but outperform homogeneous teams altogether (Homan *et al.*, 2007). Pro-diversity beliefs are also found to promote teams' elaboration of task-relevant information and hence, enabling them to make more effective use of their informational resources (Homan *et al.*, 2007). It follows that diverse organizational work teams high on team confidence hold the heartfelt belief that diversity pays and that "*the team* can do it". As such, team confidence may enact 'self-fulfilling spirals' (Gully *et al.*, 2002) that bring about all the good team task-related diversity has to offer while closing out any bad. It is therefore that the following is hypothesized.

Hypothesis 3_a Team confidence positively (negatively) moderates the relationship between team tenure diversity and team ambidexterity in such a way, that the positive (negative) effects of team tenure diversity to team ambidexterity are strengthened (weakened).

Hypothesis 3_b Team confidence positively (negatively) moderates the relationship between team educational diversity and team ambidexterity in such a way, that the positive (negative) effects of team educational diversity to team ambidexterity are strengthened (weakened).

Hypothesis 3_c Team confidence positively (negatively) moderates the relationship between team functional diversity and team ambidexterity in such a way, that the positive (negative) effects of team functional diversity to team ambidexterity are strengthened (weakened).

2.5   Shared leadership

There is a special role for leadership in the field of ambidexterity: managerial capability is the be-all and end-all in countering the self-reinforcing nature of explorative and exploitative activities (Birkinshaw and Gupta, 2013; O'Reilly and Tushman, 2013). It is through the intervention in the allocation of resources and the provision of legitimacy for paradoxical activities that managerial capability keeps organizations from either going down the 'competency' or 'failure trap' (O'Reilly and Tushman, 2008; O'Reilly and Tushman, 2013). As organizations become flatter and rely more heavily on team-based structures staffed with skilled, more highly educated professionals, leadership styles that bring decision-making to those closest to tasks may prove invaluable (Pearce, 2004; Carson *et al.*, 2007; Mathieu *et al.*, 2008). A growing body of research suggests that teams operating shared or distributed forms of team-based leadership outperform those who do not (Pearce, 2004; Nicolaides *et al.*, 2014). For example, shared leadership is found to be a better predictor of team effectiveness (Pearce and Sims, 2002; Nicolaides *et al.*, 2014), and revenue and employee growth (Ensley *et al.*, 2006) than vertical leadership. As opposed to 'vertical' or 'hierarchical' modes of leadership, shared leadership refers to the distribution of leadership functions across different team members (Carson *et al.*, 2007; Mathieu *et al.*, 2008). Whereas the more traditional modes of leadership presuppose the existence of an appointed or formal supervisory position, shared leadership is a group process best thought of as the 'serial emergence' of multiple leaders as teams progress (Pearce and Sims, 2002; Pearce, 2004; Bedeian and Hunt, 2006). Team members both 'lead' and 'follow', offering and accepting leadership to and from one another on issues such as direction, motivation and support (Pearce, 2004; Carson *et al.*, 2007). The actual leadership itself emerges from team members' collective logic on which team member's individual knowledge, skills, and abilities (KSA's) are best suited to address specific issues (Pearce and Sims, 2002; Mathieu *et al.*, 2008). In so doing, teams build a collective leadership network enabling them to tap into the full breadth of team members' KSA's which in turn affects both team and individual activities and outcomes (Carson *et al.*, 2007; Pearce *et al.*, 2014). This is not to say that organizations need to abandon authoritarian leadership altogether. Paradoxically, shared leadership may only prove effective if combined with vertical or hierarchical modes of leadership (Ensley *et al.*, 2006; Pearce *et al.*, 2014). For example, Taggar *et al.* (1999) found teams with high leadership levels amongst team members to outperform only when complimented with the emergence of a single leader featuring additional leadership capabilities. Mehra *et al.* (2006) find teams featuring what is called 'conjoint agency' - leadership centralized around a combination of only a few emergent and formally appointed leaders which synchronize their actions - tend to outperform both vertically and fully shared led teams. However, leading teams in a participatory system requires a completely different set of behaviors than in a hierarchical system: the main focus of such so-called '*SuperLeaders*' is theorized to be on leading team members to lead themselves, largely by means of

encouraging and facilitating instead of directing, commanding and reprimanding (Manz, and Sims, 1978; Manz and Sims, 1993). In support of this line of theorizing, Carson *et al.* (2007) find team coaching - capturing the before motivational and consultative behaviors - by an external leader to indeed be conducive to the emergence of shared leadership. On a final note, more recent thoughts on the (de-)merits of shared leadership concerns *what* it is that is shared. Whereas Perry *et al.* (1999) still propose careful identification of team members' skills and willingness to share transactional, transformational, directive, empowering, and social supportive leadership roles to constitute the 'right mix' between what is shared and what is vertically held, Wang *et al.* (2014) find from meta-analysis that teams sharing modern leadership roles (i.e. charismatic and transformational) outperform teams sharing traditional roles.

Theoretical and empirical efforts on how it is exactly that shared leadership impacts the combination of dual strategic agenda's is far and few between, but the scarce few inroads made recently offer a promising picture. For example, in building on previous findings by Lubatkin *et al.* (2006), Carmeli and Haveli (2009) argue that top management teams' '*behavioral integration*' (i.e. the extent of mutual and collective interaction such as information sharing, collaboration, and joint decision) and '*behavioral complexity*' (i.e. the ability to perform different types of leadership roles) give rise to a context conducive to organizational ambidexterity. Pearce *et al.* (2014) coin shared leadership to enable organizations to balance both economically viable and socially responsible strategies, ultimately leading to long run financial results. In support of this, Mihalache *et al.* (2014) contend shared leadership may shift team members' goal orientation from individual to collective interests. Furthermore, the Mihalache *et al.* (2014) study provides convincing empirical evidence on the relationship between shared leadership and ambidexterity: in studying top management teams, they find shared leadership to be conducive to ambidexterity through the underlying mechanisms of cooperative conflict and comprehensiveness of decision-making. Although care should be taken in translating results from one level of analysis (i.e. top management teams) to another (i.e. organizational work teams, this study argues that considering the mechanisms that drive the team shared leadership/performance relation (i.e. increased information processing, cooperative decision-making, and collective mental models), knowledge intensive organizational work teams may be subject to these same advantages which may allow for the coexistence of the different strategic courses of actions of exploration and exploitation. Hence, this study hypothesizes as follows.

Hypothesis 4   Team shared leadership is positively related to team ambidexterity.

Also, shared leadership promotes teams to be more exhaustive as to the information used when making decisions (Mihalache *et al.*, 2014). As more diverse teams come with a greater range of

cognitive resources, shared leadership aids in ensuring these cognitive resources are included in the decision-making processes and as such, a greater set of alternative problem identifications and potential courses of action are available to the team (Perry *et al.*, 1999; Pearce, 2004; Lubatkin *et al.*, 2006; Wang *et al.*, 2014). Consequently, shared leadership may be conducive to bringing together explorative and exploitative activities in teams, something that may otherwise be incompatible. In support of this line of theorizing, Mihalache *et al.* (2014) find decision-making comprehensiveness to fully mediate the positive relationship between shared leadership and ambidexterity. Furthermore, shared leadership enables teams to alternate leadership functions between team members based on who holds the cognitive resources that are key in addressing specific issues (Pearce, 2004; Ensley *et al.*, 2006). As such, shared leadership may substantiate the effects of team task related diversity on team ambidexterity: the simple availability of diverse knowledge, skills, and abilities is one thing, emphasizing some KSA's over others from situation to situation by assigning leadership authority to team member(s) differentially, may further enhance their performance effects. Also, shared leadership is closely linked to agreement seeking decision techniques which in turn lead to higher satisfaction and acceptance of decisions amongst team members (Knight *et al.*, 1999; Perry *et al.*, 1999). Shared leadership may therefore partially mitigate the conflict and lack of consensus that often go paired with diversity in teams (Knight *et al.*, 1999). With this in mind, the before hypothesized direct effects of team task-related diversity to team ambidexterity may only be part of the story. Team shared leadership may simultaneously strengthen team task-related diversity's merits and weaken potential demerits. It is therefore that the following is hypothesized.

> *Hypothesis 5$_a$*   *Team shared leadership positively (negatively) moderates the relationship between team tenure diversity and team ambidexterity in such a way, that the positive (negative) effects of team tenure diversity to team ambidexterity are strengthened (weakened).*

> *Hypothesis 5$_b$*   *Team shared leadership positively (negatively) moderates the relationship between team educational diversity and team ambidexterity in such a way, that the positive (negative) effects of team educational diversity to team ambidexterity are strengthened (weakened).*

> *Hypothesis 5$_c$*   *Team shared leadership positively (negatively) moderates the relationship between team functional diversity and team ambidexterity in such a way, that the positive (negative) effects of team functional diversity to team ambidexterity are strengthened (weakened).*

2.6   Conceptual Model

In summary, figure 2.1 shows the IPO-based conceptual model for this research. *Team tenure diversity*, *team educational diversity*, and *team functional diversity* serve as inputs for organizational work teams to achieve *team ambidexterity*. These task-related diversity attributes enable teams to access a greater variety of knowledge, skills, and abilities (KSA's), enhancing teams' problem identification and potential courses of action. As diversity is intertwined with social categorization and diversity faultlines that promote conflict and incomprehension amongst team members, teams need social skills in order to exploit the full potential of diverse cognitive resources. By creating self-fulfilling cycles of collective belief that '*the team can do it*', no matter the task or context, *team confidence* both directly affects team ambidexterity and moderates the relationship between team task-related diversity attributes and team ambidexterity. Furthermore, *team shared leadership* allows teams to emphasize some team members' KSA's over those of others from situation to situation, thus building upon each members' individual-level distinct expertise and experience when most salient. As such, team shared leadership is conducive to juxtaposing team exploratory and team exploitative activities enabling teams to progress towards the higher order state of being ambidextrous.
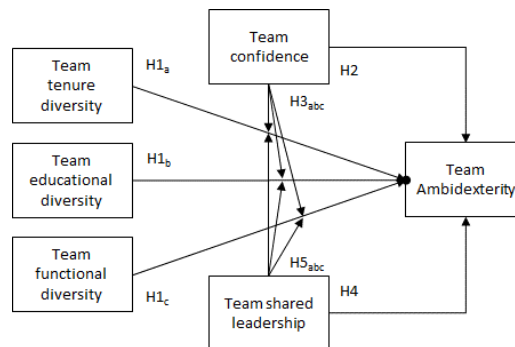

Figure 2.1   Conceptual model

3   METHODOLOGY

3.1   Research setting and sample

To empirically test the before hypothesized IPO model for team ambidexterity, data was obtained from organizational work teams operating in the Dutch construction industry. As ambidexterity is typically suggested to be more important for organizations operating in dynamic industries as opposed to those characterized by more stable environments, research on team ambidexterity is drawn to using samples from high-technology industries such as pharmaceutics and information and communication technology (see Kostopoulos and Bozionelos, 2011, and Jansen *et al.*, 2016 for example) (Junni *et al.*, 2013). However, even the most stable industries may get hit by events that almost change the game overnight as has happened to the Dutch construction industry following the 2008-2009 Global Financial Crisis and the 2009-2013 European Debt Crisis. Add to this a well over 5% contributory value to The Netherlands' GDP and it is easy to see the similarities with mature, manufacturing type industries the world over and the importance of sustainable performance of such industries to national and global economic prosperity. Furthermore, the Dutch construction industry, as are many incumbent manufacturing type industries, is typified by a monodisciplinary, technocratic personnel fleet which makes it especially salient to examine whether more diverse teams outperform those who are not. Participating companies were obtained through the personal network of the researcher: managers and professionals able to facilitate access to organizational work teams that operate in the proximity of product or factor markets were contacted by phone and send a brief summary of the research per e-mail when shown interest. After participation was solicited, quantitative cross-sectional data was collected by means of an online self-completion questionnaire (see Appendix A) under team members (i.e. managers and professionals) of organizational work teams within organizations. From the 625 managers and professionals that were invited per direct e-mail to take the survey, 362 completed the questionnaire representing a response rate of 57.9%. Cases were excluded from making the final sample upon: 1) negative identification of *organization name* and *team name*; 2) explanatory text remarks left by respondents in the 'other' text entry field under *team type* as some indicated that concerning respondents took the questionnaire with another organizational unit in mind then stated (such remarks included: "... I am deployed within the matrix organization, there is no steady team" or "I am currently not deployed in a team, so for matters of convenience I will use my previous project"); and 3) extreme divergence from the central tendency of team members' entries on *team size* not to be considered as representing a lower task or project entity within the team as this may also suggest another organizational unit in mind when taken the survey. Teams were excluded when they failed to meet a cut-off criterion of three or more respondents per team.

Furthermore, as some organizations in the sample were represented by both departments and their respective underlying teams or clusters, only the lowest organizational units (i.e. the teams or cluster) were included in the sample, hence 4 departments were excluded from the final sample. Finally, 2 organizations were excluded from the final sample as they proved absent of organizing work across teams: these 'team entries' represented the organizations as a whole. The final sample contains 244 respondents from 47 teams from 16 companies. Respondents have a mean team tenure of 3.8 years (s.d. = 3.7) and a mean organizational tenure of 8.4 years (s.d. = 7.8). This sample includes 43 team managers and 201 regular team members. Independent sample *t*-tests were performed to compare for differences between team managers and regular team members and showed no significant differences ($p < 0.05$) between both groups. Participating teams are active across the full breadth of disciplines throughout the industry's business chain: (semi-) public contracting authority (38.5%); architecture (1.2%); contracting (25.8%); specialist subcontracting (3.7%); manufacturing/supplying (9.4%); and advisory (21.3%). Regarding the nature of teams' activities, team type reports as follows: production (25.8%); service (including sales and maintenance) (21.7%); advisory (34.4%); and other (18.0%). The average team size is 16.83 (s.d. = 11.17) and mean team age since inception is 9.3 years (s.d. = 17.6). Measures and items as follows (see Appendix A for details).

3.2 Measurements

Dependent variable. Team Ambidexterity. In keeping with the before discussion on the ambiguous nature of the ambidexterity concept, the challenge for ambidexterity research is to operate measurements that unequivocally pinpoint the specific process element to be captured. As team ambidexterity concerns teams' exploratory and exploitative *attainments*, or *behaviors*, a two-dimensional scale with its origins in team learning literature was used containing five and four items for team exploratory attainments and team exploitative attainments respectively (Kostopoulos and Bozionelos, 2011; Jansen *et al.*, 2016). Example items for team exploratory attainments are 'team members were systematically searching for new possibilities' and 'team members offered new ideas and solutions to complicated problems'. Items used to measure team exploitative attainments included such things as 'team members performed routine activities while carrying out their tasks' and 'our team implemented standardized methodologies and regular work practices'. Each item was measured by a seven-point Likert-scale anchored by 1 = strongly disagree and 7 = strongly agree. Initial analysis for internal consistency (using Cronbach's alpha) on both scales yielded satisfactory results for team exploratory attainments (α = .873) but not for team exploitative attainments (α = .507) with only marginal improvements should one item be deleted. Exploratory factor analysis (EFA) (*Maximum Likelihood*; *Varimax Orthogonal Rotation* as this study views team exploratory and exploitative attainments as orthogonal dimensions which was further corroborated given the low factor

correlations (.085) following a check using *Direct Oblimin Oblique Rotation*; KMO = .872) was performed to further assess discriminant validity between both dimensions (i.e. factors) and respective item loadings for both factors. Most items loaded in support of their theoretical representation of either of both factors, however, team exploitative attainments items 1 and 4 loaded considerably on team exploratory attainments (.713 and .601) and not on team exploitative attainments (-.025 and .117). Following, internal consistency for team exploitative attainments was again assessed but now with items 1 and 4 deleted (α = .646). As a result, only items 2 and 3 were used to produce a measure for team exploitative attainments. Final EFA (KMO = .814) supported the underlying two-factor structure for team ambidexterity upon goodness of fit (χ^2/df = 2.11; *p* < .032), scree plot (inflection at third data point) and eigenvalues (> 1.0) analysis. The combined measure for team ambidexterity was computed using the product of both dimensions as team exploratory attainments and team exploitative attainments were viewed as separate, orthogonal dimensions. (Birkinshaw and Gupta, 2013; Junni *et al.*, 2013; Jansen *et al.*, 2016). This measure also represents the idea that it is high instead of balanced levels of both dimensions that give organizations performance advantages.

Independent variables. To measure *team tenure diversity*, team members were asked to indicate the number of years serving their current team (Harrison *et al.*, 1998). These data were then aggregated to the team-level using within-team standard deviation (Bedeian and Mossholder, 2000; Kirkman *et al.*, 2004). An alternative would be to use the commonly applied coefficient of variation (within-team standard deviation divided by its mean) but as differences in team tenure matter just as much when mean levels are high and low, doing so would introduce an unwanted scale in-variant effect (Bedeian and Mossholder, 2000; Harrison and Klein, 2007). *Team functional diversity* was measured by asking team members to indicate the number of years of work experience across the following functional categories: 1) sales; 2) marketing; 3) research and development; 4) engineering; 5) production; 6) purchasing; 7) distribution; 8) finance/accounting; 9) law; and 10) other. Responses were then assigned to three functional categories following previous work by Hambrick and Mason (1984): 1) output functions (i.e. sales, marketing and research and development); 2) throughput functions (i.e. engineering, production, purchasing, and distribution); and 3) peripheral functions (i.e. law, finance/accounting and other). Team functional diversity was then calculated by identifying the functional area that each team member had spent the greater part of his or her work experience in and computing these into a team-level measure using Teachman's entropy-based diversity index for each team as follows (Ancona and Caldwell, 1996; Harrison and Klein, 2007).

$$Team\ functional\ diversity = -\sum_{i=1}^{s} P_i\ (\ln P_i)$$

Herein, P_i represents the proportion of team members in the ith functional category as listed before and, for purpose of clarity, ln is the notation for natural logarithm. If a functional category was not represented within a team, the value assigned to that category was zero. The higher the index, the more evenly spread team members are across all three possible functional categories. For example, if a team consists of ten members and five of them have dominant work experiences in output functions, three in throughput functions, and two in peripheral functions, the team functional diversity of that team is 1.03. The maximum team functional diversity (i.e. 1.10) occurs when 3, 6, 9, . . . S possible team members within a team are evenly spread across all listed functional categories. *Educational Diversity* was measured by asking team members to indicate the educational field in which they had obtained their highest degree (Shin and Shou, 2007). Educational fields were pre-listed following the UNESCO ISCED-F (2013) classification for fields of education and training as follows: 1) education; 2) arts and humanities; 3) social sciences (incl. economics) journalism and information; 4) business, administration and law; 5) natural sciences, mathematics, and statistics; 6) information and communication technologies (ICTs); 7) engineering, manufacturing and construction; 8) agriculture, forestry, fisheries and veterinary; 9) health and welfare; and 10) services. To compute educational specialization scores per team, Teachman's entropy-based diversity index (see before mentioned formula) was used.

Moderating variables. As *team confidence* includes both *team efficacy* and *team potency* this study uses a composite measure computed as the mean of team member scores on both dimensions (Mathieu *et al.*, 2008). A two-item scale (α= .619; r_s = .463; p < .000) taken from Edmonson (1999) was used to measure team efficacy. Items included were 'achieving this team's goals is well within our reach' and 'this team can achieve its task without requiring us to put in unreasonable time or effort'. Item 3 was deleted from the original three-item scale (α= .649) as EFA (*Maximum Likelihood*; *Direct Oblimin Oblique Rotation* as correlations between both factors corroborated interdependence (-.560)) showed item 3 loaded considerably on the potency factor (.366) and less on efficacy (-.271). This was then corroborated following a check for face value. *Team potency* (α = .852) was measured using an eight-item scale as used by Gibson *et al.* (2000). Examples of the items included are 'my group has confidence in itself', 'no task is too tough for my group', and 'my group expects to have a lot of influence around here'. Seven-point Likert-scales were used for both anchored by 1 = strongly disagree and 7 = strongly agree. EFA (KMO = .853) provided mixed results for the proposed underlying two-factor structure (χ^2/df = 4.11; p < .000). Scree plot analysis indicated a one-item structure (inflection at second data point) whereas eigenvalues for the first two factors were above 1.0 (4.4, 1.2 respectively, where the third was 0.9) and explained 47.4% of variance hinting towards a two-factor structure. As the heart of the matter here is whether individual item scores should load directly (one-factor structure) or via the means of both underlying scales (two-factor structure) to a measure of team

confidence, this study accepts the two-factor structure as the aggregate measure of team confidence should represent both theoretical dimensions equally well. As such the aggregate measure of team cohesion was computed as the product of both team efficacy and team potency. To measure *shared leadership*, an eight-item scale (α = .883) was used based on Manz and Sims' (1987) Self-Management Leadership Questionnaire (SMQL) (Mihalache *et al.*, 2014). Items were adapted to suit the use at the team-level and included such things as 'team members jointly determine the implementation of new business' and 'team members call each other to make critical decisions'. Items were measured by a seven-point Likert-scale anchored by 1 = strongly disagree and 7 = strongly agree.

Control variables. To secure findings from alternative explanations, several control variables were put in place at the team- and firm-level. As larger teams may have more and more diverse resources and capabilities available (Bantel and Jackson, 1998) and hence, may be better equipped to engage in different learning activities simultaneously, *team size* was controlled for as the natural logarithm of the number of employees (Jansen *et al.*, 2016). *Team age* was included as the natural logarithm of the number of years since the teams' inception as more established teams may hinge toward exploitative efforts more as do less established teams (March, 1991). Also, larger teams are prone to coordination and interaction problems, conflict and process loss (Cohen and Bailey, 1997; Horwitz and Horwitz, 2007). *Team type* was included as the nature and function of teams may require different demands, tasks, and behaviors with regard to ambidextrous attainments. Dummies were included based on Sundstrom *et al.*'s (2000) categorization of work teams as follows: 1) production; 2) service; 3) management; 4) project; and (5) advisory teams. The category of action and performing teams was excluded from the listing. Finally, as team members servicing the organization longer may be more '*psychologically committed to the organizational status quo*' (Bantel and Jackson, 1989; March, 1991; Heavey and Simsek, 2014), *organizational tenure diversity* was included as the within-standard deviation of team members' number of years of work experience at their current organization.

3.3   Data validation and aggregation

To deal with non-normality of distributions in the data, numeric variables were entered as their logarithms as follows: lg10(X_i) for team size, team organizational tenure diversity, and team age; and lg10(X_i + 1) for team tenure diversity as a constant was needed to deal with zeros in the data. Dependent and independent variables all featured normal distributions following. Although visual analysis (using histograms and P-P plots) showed small indications of positively skewed distributions for team educational specialization diversity and team functional diversity, quantitative analysis of skewness and kurtosis proved to be non-significant (.25 and -.68 and .65 and -.285 for skewness and

kurtosis respectively producing *z*-scores below the threshold value of 1.96). These results answer for the use of the data for regression analysis.

As this study uses individual-level data to form higher level constructs, intraclass correlation (ICC) procedures were performed to test and justify the aggregation of team member scores to team-level constructs. ICC(1) provides an estimate of how much of the total variability is down to the variability between teams for each measure (Gilson *et al.*, 2005; Field, 2009; Klein and Kozlowski, 2000). ICC(2) provides an estimate for the reliability of average team scores (Gilson *et al.*, 2005). ICC(1) and ICC(2) results as follows: .559 and .856 for team exploratory attainments; .466 and .640 for team exploitative attainments; .399 and .590 for team efficacy; .366 and .827 for team potency; and .457 and .872 for team shared leadership. Lower ICC(2) results for team exploitative attainments and team efficacy are partly due to these variables consisting of two underlying items. Combined with *F* test results for ICC(1) and ICC(2) being significant ($p < .005$), this justifies the aggregation of team member scores to higher level constructs as detailed in the before paragraph (Klein and Kozlowski, 2000).

4 RESULTS

4.1 Analysis

Table 4.1 shows the descriptive statistics and correlations for the independent, dependent, and control variables. Results from regression analysis are presented in table 4.2. As a result of the logarithmic transformation of numeric variables described before, findings from regression analysis may be generalized as all study variables were entered having normal distributions. Regression analysis started with a null model (Model 1) using only the control variables. Except for *team age*, no significant effects were found and so to respect $n = 47$ and prevent overloading the procedure, Model 2 was constructed as the baseline model with only the task-related diversity variables entered. Team age and both team process variables were then entered sequentially to capture individual effects (Models 3^a, 3^b, and 3^c) following which all were entered simultaneously (Model 4). Interaction effects were then entered simultaneously to produce the full, clean model (Model 5). Concerning interaction variables were computed using the team-mean centered variants of each of the original variables. The maximum variance inflation factor (VIF) measured throughout the models is 2.863 and the lowest tolerance .347, both well within the respective thresholds of < 10 and > .2 indicating no concerns for multicollinearity following this computation (Field, 2009). R^2, representing the proportion of data explained per model, for Model 5 is sufficient at .685. F is 10.347 ($p < .001$) indicating sufficient predictive power for the model to be accepted as a proper predictor of team ambidexterity. Finally, Model 6 (non-significant) features the full model including control variables which proved to overload the model as expected.

4.2 Team inputs effects

Results for the different *team task-related diversity* attributes (hypothesis 1_a, 1_b, and 1_c) vary between being of positive, negative, and of no significant effect at all to team ambidexterity (see Model 2). Team tenure diversity (hypothesis 1_a) prove to be positively related to team ambidexterity ($\beta = .339$; $p < 0.05$) whereas team educational diversity is negatively ($\beta = -.291$; $p < 0.10$) (hypothesis 1_b). Results for team functional diversity (hypothesis 1_c) are found to be non-significant. As a result, hypotheses 1_a positing the positive effects of team tenure diversity to team ambidexterity is supported. Hypotheses 1_b and 1_c positing the positive effects of team educational diversity and team functional diversity to team ambidexterity respectively are not supported.

4.3 Team processes effects

The before theorizing about the central role of team emergent states and processes in how team inputs are employed to promote team ambidexterity suggests team confidence and team shared leadership

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1) Team ambidexterity	25.51	4.21	-														
2) Team size	1.08	.29	(.050)	-													
3) Team type: production	.19	.40	.137	.279	-												
4) Team type: service (incl. Sales	.23	.43	.076	(.083)	(.269)	-											
5) Team type: advisory	.36	.49	(.274)	(.022)	(.366)*	(.416)**	-										
6) Team type: other	.21	.41	.110	(.208)	(.253)	(.287)	(.391)**	-									
7) Team organizational tenure diversity	.69	.36	.033	.244	.106	(.172)	(.032)	.114	-								
8) Team tenure diversity	.49	.25	.365*	.218	.278	(.070)	(.176)	(.132)	.282	-							
9) Team educational diversity	.75	.42	(.336)*	.040	(.148)	.227	.227	.110	.186	(.095)	-						
10) Team functional diversity	.59	.36	(.122)	(.016)	.149	(.173)	(.045)	.089	.049	.076	.398**	-					
11) Team age	.74	.46	.486**	.220	.143	(.058)	(.083)	(.099)	.143	.679**	(.284)	.126	-				
12) Team confidence	24.02	5.13	.636**	(.253)	(.016)	.238	(.280)	.098	(.192)	.055	(.391)**	(.141)	.159	-			
13) Team shared leadership	4.71	.71	.524**	(.380)**	(.219)	.125	(.308)*	.442**	(.043)	(.062)	(.204)	(.167)	.076	.593**	-		
14) Team tenure div. x Team confidence	.07	1.31	.451**	.387**	(.026)	(.187)	.067	,141	.127	.271	(.283)	(.124)	.498**	.184	.128	-	
15) Team educational div. x Team shared leadership	(.06)	.26	(.095)	(.071)	.042	(.118)	(.039)	,128	(.033)	(.198)	.280	(.003)	(.338)*	(.251)	(.138)	(.279)	-

n = 47; Pearson correlation is reported

* = p < 0.05 (2-tailed); ** = p < 0.01 (2-tailed)

Table 4.1 Descriptive statistics and correlations

|	Model 1	Model 2	Model 3[a]	Model 3[b]	Model 3[c]	Model 4	Model 5	Model 6
Intercept	25.784***	25.099***	24.206***	9.603***	11.852***	7.280**	7.171**	6.858
Control Variables								
Team size	(.154)							(.079)
Team age	.508***		.387**			.309**	.242**	.250
Team type: production	(.010)							.218
Team type: service (incl. Sales	(.084)							.087
Team type: advisory	(-268)							.070
Team type: other[1]	-							-
Team organizational tenure diversity	(.024)							.037
Team inputs effects								
Team tenure diversity		.339**	.093	.376***	.330***	.154	.176	.114
Team educational diversity		(.291)*	(.174)	(.203)	(.058)	.014	(.016)	.042
Team functional diversity		(.032)	(.109)	.015	(.041)	(.077)	(.026)	(.052)
Team processes effects								
Team confidence				.590***		.427***	.451***	.423***
Team shared leadership					.508***	.246*	.245	.284*
Interaction effects								
Team tenure diversity x Team confidence							.227**	.293**
Team educational diversity x Team shared leadership							.236**	.227**
R^2	.319	.225	.294	.469	.520	.612	.685	.707
Adjusted R^2	.217	.171	.227	.419	.474	.554	.619	.592

n = 47; standardized coefficients are reported

* = $p < 0.10$; ** = $p < 0.05$; *** = $p < 0.01$

[1] = baseline group for dummy variables

Table 4.2 Results from regression analysis

may both have direct, mediating and moderating effects. Findings predominantly support such theorizing. First, in support of hypothesis 2, team confidence positively relates to team ambidexterity (see Model 3[b] β = -.590; $p < 0.01$). Second, although no positive relation between team educational diversity and team ambidexterity (hypothesis 1[b]) is found, the introduction of *team confidence* in the model does mitigate the negative effects of team educational diversity to team ambidexterity to such extend that mediation may be expected. Additional analysis of the relationship between team educational diversity and team confidence (β = -.391; $p < 0.01$) partially supports hypothesis 3[b] as team confidence mitigates the negative effects of team task-related diversity to team ambidexterity however, it does so as a mediator, not a moderator. Third, and finally, hypothesis 3[a] is supported as the interaction between team tenure diversity and team confidence strengthens the positive effect of team tenure diversity to team ambidexterity (see Model 5; β = .227; $p < 0.05$). Figure 4.1 features the plot of this interaction effect when only the values up to one standard deviation below (i.e. 'Low') and above (i.e. 'High') the mean for both team educational diversity and team shared leadership are taken. Given the lack of support for hypothesis 1[c], the interactive effects of team functional diversity and team confidence (hypothesis 3[c]) are non-relevant. Findings indicate *team shared* leadership to have a similar, but slightly weaker role in the model. In support of hypothesis 4, *shared leadership* is found to have a direct, positive effect to team ambidexterity (see Model 3[c]: β = .508; $p < 0.01$). Second, regarding the moderating effects of team shared leadership, hypothesis 5[b] is supported as the interaction between team educational diversity and team shared leadership is found to dampen the negative effects of team tenure diversity to team ambidexterity (see Model 5: β = .236; $p < 0.05$). The interaction plot featured by Figure 4.2 depicts this finding. No support is found for hypothesis 5[a] and 5[c].
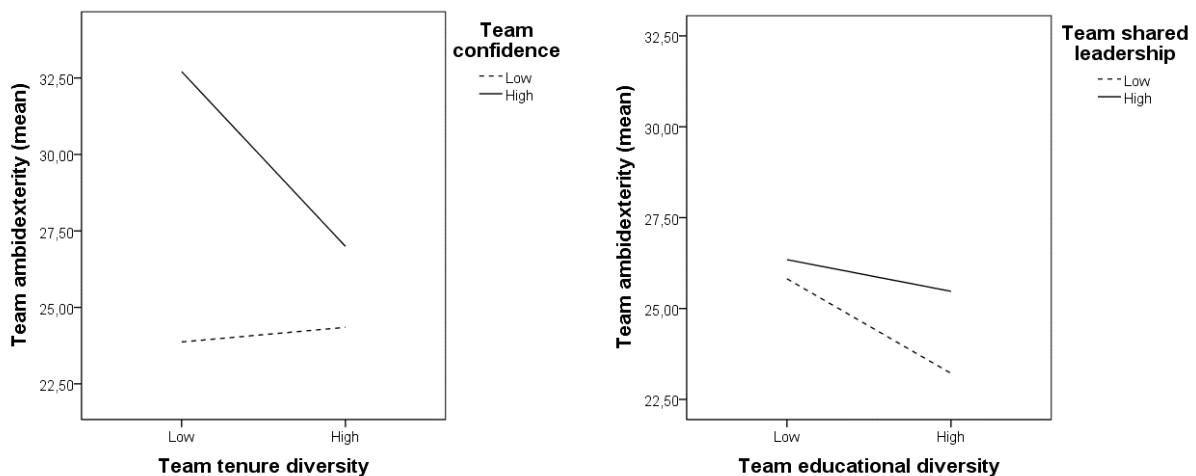
Figure(s) 4.1, 4.2   Interaction plots for team confidence and team shared leadership

4.4   Control variables

Following the significant effects of *team age* to team ambidexterity in between the control variables, detailed analysis suggests team age of being of special contributory value in teams' pursuit of ambidexterity. First, team age is positively related to team ambidexterity (see Model 3[a]: β = .387; $p <$ 0.05). Second, and most importantly, the effects of team tenure diversity and team educational diversity are (partly) made obsolete and insignificant with the introduction of team age to the model. Additional analyses of mutual effects suggest a strong mediating role of team age to team tenure diversity (β = .679; $p <$ 0.01) and a partial one to team educational diversity (β = -.284; $p <$ 0.10). Following theorizing on the qualitative change of team-level inputs as teams mature, this finding suggests that over time, teams may develop the skills and cohesive powers to overtake both the contributive and destructive effects of task-related diversity to team ambidexterity (Perry *et al.*, 1999; Van Knippenberg *et al.*, 2005; Taylor and Greve. 2006; Mathieu *et al.*, 2008; Jansen *et al.*, 2016). No significant effects of any of the other control variables are found.

4.5   Post-hoc analysis

Responding to calls to include multiple measures for ambidexterity (see Junni *et al.*, 2013, for example), post-hoc analysis is performed using an alternative measure of team ambidexterity computed as the sum of both team exploratory and exploitative attainments (Lubatkin *et al.*, 2006; Jansen *et al.*, 2009). Notwithstanding small variations, regression analysis gives similar but slightly weaker results: R^2 for the post-hoc equivalent for the before accepted Model 5 is sufficient at .659 as opposed to .685 for the model featuring the multiplicative measure for team ambidexterity. These results corroborate both this study's findings as the use of the multiplicative measure for team ambidexterity.

5   CONCLUSION AND DISCUSSION

5.1   Summary

Previous research has consistently shown that ambidextrous organizations - organizations that simultaneously pursue exploratory and exploitative activities - outperform those that are not. These studies have primarily focused on offering solutions at the macro-level of the organizational system which is surprising considering both ambidexterity being a multi-level concept and the rising importance of team-based structures for organizations today. This study advances the understanding of ambidexterity at the organizational work team-level by developing and empirically examining an IPO model on *how* organizational work teams actually achieve ambidexterity. Integrating ambidexterity and team effectiveness research, this study hypothesizes and finds from quantitative data on 47 organizational work teams from 16 organizations active across the full breadth of activities in the Dutch construction industry that team task-related diversity attributes (i.e. *team tenure*, *educational*, and *functional diversity*) affect *team ambidexterity* equivocally and that socio-psychological emergent states and processes (i.e. *team confidence* and *shared leadership*) both directly and indirectly increase teams' ambidextrous attainments. More specifically, team tenure diversity and team educational diversity are found to positively and negatively influence team ambidexterity respectively. No significant effect is found for team functional diversity. In addition, *team age* is found to (partially) mediate the relationships between team tenure diversity and team educational diversity indicating that time aids teams in coping with diversity. These results also provide solid ground for conceptualizing team ambidexterity as a process through which teams transform inputs into ambidextrous attainments by means of team emergent states and processes.

5.2   Theoretical implications

As ambidexterity cascades down to the organizational work team-level, the mechanisms for *how* ambidexterity is achieved change. Whereas ambidexterity research is generally drawn towards structural and contextual conceptualizations, studying ambidexterity at the team-level requires an inherently different perspective (Haas, 2010). Team work is rooted in the idea that teams interact to transform inputs into organizationally relevant outcomes (Marks *et al.*, 2001; Kozlowski and Bell, 2003; Mathieu *et al.*, 2008). Conceptualizing how ambidexterity is achieved at the organizational work team-level should therefore be guided by such a process perspective. Drawing on team effectiveness research, this study provides both theoretical and empirical ground for studying ambidexterity at the team-level around an IPO framework. Although first scholarly inroads into the concept of team ambidexterity partially support such a claim (see Haas, 2010, Kostopoulos and Bozionelos, 2013, and Jansen *et al.*, 2016 for example), full support comes from Taylor and Greve (2006) who model and find

both direct and interactive effects from both team-level inputs as well as *experience*-related variables to exploratory and exploitative outcomes. The before should also guide operationalization of the criterion-side of team ambidexterity models. As teams are nested in organizations, team ambidexterity is nested in organizational ambidexterity and hence team-level ambidextrous outcomes should lead to organizational-level ambidextrous outcomes which lead to higher-level performance outcomes such as growth and survival. If anything, team ambidexterity measures should therefore clearly tap into the actual team ambidextrous behaviors, or attainments such as the measures used in this study.

Contrary to expectations, this study fails to support the hypothesized overall positive relations between task-related diversity attributes and team ambidexterity. Despite the notion that team ambidexterity is an inherently different type of team performance outcome than regular, univariate ones, access to diverse cognitive resources by itself does not explain the full story on how teams may achieve the balancing of dual strategic courses of action. Several explanations may underlie these findings. First, as these findings are consistent with the generally accepted ambiguous effects of diversity to team performance, social categorization and diversity faultiness (Williams and O'Reilly, 1998; Pelled *et* al., 1999; Webber and Donahue, 2001; Van Knippenberg *et al.*, 2004; Van Knippenberg and Schippers, 2007; Mathieu *et al.*, 2008), this study may have understated the effects of social categorization and diversity faultlines versus the effects of teams' access to greater cognitive resources. Findings on the interactive effects of team confidence and team shared leadership and the mediating effects of team age support the notion that the teams in this study indeed need to overcome some foreignness before being able to profit from it. Future research should invest in more balanced theorizing on the effects of task-related diversity to team ambidexterity, integrating both information/decision-making and social categorization perspectives in building hypotheses. Second, as this study was situated in a specific industry, industry context may play a role in these findings (Joshi and Roh, 2009). The Dutch construction industry is generally typified as being traditional and heavily rooted in technocracy and it may be that under such conditions, diverse team members are indeed the odd men or women out. Differences in team subgroup (e.g. incumbent versus new members) size, and thus strength, is argued to hamper the vocalization, acceptance, and use of minority opinions (Lau and Murnighan, 1998). Also, turnover is highest with diversely distant team members which indicates conformity pressures with minority team members to incumbent teams' status quo (Harrison *et al.*, 1998). Taking this research to different industry settings may shed light on a possible moderating role of industry context on the effects of team task-related diversity to team ambidexterity.

This study's findings with regard to the effects of team confidence and team shared leadership unfold the multifaceted nature of team emergent states and processes. As socio-psychological team states literally emerge from team members' interactions, they become inputs by themselves, affecting

team processes with varying dynamics and multiple effect relations (Marks *et al.*, 2001). Consistent with previous research (see Knight *et al.*, 1999, Perry *et al.*, 1999, Carmeli and Haveli, 2009, Haas, 2010, and Mihalache *et al.*, 2014 for example), findings provide direct and indirect effects for both team confidence and team shared leadership. First, both are found to directly increase teams' ambidextrous attainments. Second, both play a vital role in enhancing team task-related diversity's effects to team ambidexterity: whereas team confidence propels the effects of team tenure diversity, team shared leadership suppresses most of the negative effects of team educational diversity. Third, and most interestingly, the effects of team confidence overpower those of team shared leadership and mitigate the negative effects of team educational diversity on team ambidexterity to the extent that these become insignificant. This advances the notion that teams' belief in that the team *as is* is up for any task whatsoever, primes teams with such strong self-fulfilling cycles of confidence that these may overtake the importance of the processes through which teams transform their inputs into performances attainments (Gully *et* al., 2002; Homan *et al.*, 2007). High levels of team efficacy and potency bridge the conflict and incomprehension amongst team members from social categorization and diversity faultlines to such extent that these become irrelevant. What remains is a social understanding from which teams can effectively build from their expanded set of cognitive resources towards attaining dual strategic course of action successfully. On a final note, and in following Knight *et al.* (1999), this study underpins that not chasing the potential benefits of task-related diversity because of the complexity of weaving it into teams and organizations would be a mistake. This study's full, clean model (see Table 4.2; Model 5) holds such explanatory power that the contributory value to team ambidexterity from the interplay between all variables found relevant are hard to deny. Team work is a complex mechanism in essence for which there is no shortcut towards excellence.

Although being amongst the control variables and hence, not explicitly hypothesized, *team age* (i.e. the length of years since the teams' inception) is found to play an important role in the overall model. First, team age is found to directly and positively relate to team ambidexterity. Second, (partly) overtaking both the positive and negative effects of team tenure diversity and team educational diversity to team ambidexterity respectively, team age acts as an important mediator between team task-related diversity and team ambidexterity. These findings are consistent with previous research suggesting time as a crucial element in studying team effectiveness. As team effectiveness is essentially a dynamic and adaptive process, teams go through subsequent developmental stages and episodic cycles as they mature (Kozlowski and Bell, 2003; Mathieu *et al.*, 2008). These developmental processes produce socio-psychological team states that literally emerge over time to '*become new inputs to subsequent processes and outcomes*' (Marks *et al.*, 2001). One especially salient team emergent state in this respect is *transactive memory system*: the combination of knowledge possessed by individual

team members and the interpersonal awareness at the team-level of who knows what (Wegner, 1987; Austin, 2003; Mathieu *et al.*, 2008). As opposed to sharing identical knowledge and experience, transactive memory systems enable team members to access and build upon each member's distinctive knowledge and expertise making learning a '*1+1=3*' (Van Knippenberg *et al.*, 2004; Kozlowski and Bell, 2003). Transactive memory systems have been found to enable top management teams to effectively bring together the different knowledge, skills, and abilities of team members in pursuit of ambidexterity, which may be the same for organizational work teams (Heavey and Simsek, 2014). Furthermore, as diverse team members' interact, initial social categorizations may be replaced by a more deeper-level understanding of each other as individuals and the contributory value of individual KSA's to the collective (Harrison *et al.*, 1998; Pelled *et al.*, 1999; Van Knippenberg *et al.*, 2004; Van Knippenberg and Schippers, 2007; Mathieu *et al.*, 2008). Time and experience in working together then allow teams to put their cognitive resources to effective use (Taylor and Greve, 2006; Van Knippenberg and Schippers, 2007). Hence more recently, team effectiveness study's started to adopt IMOI-models over IPO models which include the iterative, multiple effects amongst the underlying variables as teams progress in time (Ilgen *et al.*, 2005). On a final note regarding the interactive effects of team tenure diversity and team age: both are inherently different concepts. Whereas team tenure diversity reflects within-team differences in experience, knowledge, skills and abilities, team age relates to the possible existence of team 'codes' (e.g. beliefs, mores, routines, and practices) (March 1991). As such, this study may also provide an opening for the idea that teams high in team tenure diversity and team age may hold an ideal temporal dynamic between having developed a team code stable enough to deal with differences and adapting that code quick enough to overcome the 'competency trap' (March, 1991; Williams and O'Reilly, 1998).

5.3 Managerial implications

This study comes with two important corollaries for managerial practice. First, as organizations increasingly rely on team-based structures, the known, traditional recipes for leadership need to be questioned. Today's knowledge-intensive work makes it impossible for any one person to comprise every aspect of work and this is true across organizational functions and levels (Pearce, 2004). Top-down, 'boss'-centric models of leadership miss out on the ideas, initiatives and creativity that may exist there where the action is: the lower-hierarchical levels of the organization. (Senior) executives, managers, and business practitioners would do good in recognizing these limitations and accept that instead, today's leadership's primary aim should be to facilitate others to set course, combine collective knowledge, skills, and abilities, and be responsible for making decisions in their respective fields of action. Higher-level leadership should then be about capturing the foresight and solutions that spring and upscaling those into new organizational activities and directions. Second, recent years have

seen a meteoric rise in the attention for workforce diversity. While much of the public attention focused on women's equal access to job positions and salary, more industry-bound attention went out to breaking monocultures to overcome industry inertia through the introduction of 'different thinking minds' (i.e. educationally and functionally diverse staff) into workforces. However, (public) dialogue quite often circles around doing diversity 'for the sake of diversity'. This research's findings add to the growing understanding that diversity alone will not improve team performance, nor will it improve organizational performance, it will hamper it instead. Yes, diversity holds serious potential to increase teams' and organizations' repertoire of problem identifications, problem solving and courses of action to the extent that diverse organizational work teams can outperform non-diverse teams, but if not managed, dislike, distrust, incomprehension, and conflict are all there is in the waiting. (Senior) executives, managers and business practitioners should therefore be sensible about introducing diversity into their workforces: diverse teams need time, leadership responsibilities, and belief to make it work.

5.4   Limitations and future research

This study holds some limitations that may provide starting points for future research to further advance the understanding of team ambidexterity. First, whereas multiple studies have empirically established the direct relationship between organizational ambidexterity and organizational performance (see He and Wong, 2006; Lubatkin *et al.*, 2008; Uotila *et al.* 2009; Hill and Birkinshaw, 2012 for example), the link between team ambidexterity and subsequent performance outcomes at both the team or higher levels is so far only theoretically established (see Haas, 2010, Jansen *et al.*, 2016, for example). The present study is no different, using a self-reported measure of *team ambidextrous attainments* by both team managers and regular team members as the criterion. Recent critiques on the versatility of the ambidexterity concept make it especially salient for future research on team ambidexterity to empirically establish a relationship to higher-level performance outcomes. Objective measures of subsequent performance such as customer, market or financial performance, growth and survival rates may be incorporated into future studies on team ambidexterity. Second, the concept of team ambidexterity still is in its infant stage and hence, this study is to some extent exploratory. Although the hypothesized and empirically tested model is built on a strong foundation from previous research, other team inputs, processes, and emergent states may prove salient for understanding how organizational work teams achieve team ambidexterity. For example, globalization and aging considerably change nations' demography which in turn reflects the make-up of organizational work teams. While this study's focus is on task-related diversity attributes, it would be valuable to incorporate more visible, demographic diversity attributes such as age, gender, and ethnicity into team ambidexterity research. The same goes for including different team processes and

team emergent states. For example Jansen *et al.* (2016) found *supportive leadership behaviour* and *team cohesion* to have equivocal and positive effects on team ambidexterity respectively. Kostopoulos and Bozionelos (2013) found *team psychological safety* to directly relate to team exploration and exploitation and *team task conflict* to moderate this relationship. Opposed to these findings, the self-completion questionnaire used for this research also contained items on *educational level diversity*, *team transactive memory*, *team cohesion*, and *organizational supportive climate*, all which proved to be non-salient for building an empirically proven model on team ambidexterity although there is theoretical ground for incorporating these variables into team ambidexterity models. Third, future research may look into the exact relationship between vertical and shared leadership and team ambidexterity. Previous research on ambidexterity in top management teams and organizational work teams consistently find evidence for the contributory value of both. For example, Jansen *et al.* (2008) find transformational leadership to be conducive to the positive effects of team attributes to achieving organizational ambidexterity. Similar to this study's findings, both Lubatkin *et al.* (2006) and Mihalache *et al.* (2014) find *behavioural integration* – a construct containing similar mechanisms as those attributed to shared leadership - in top management teams to positively relate to organization ambidexterity. On the contrary, Jansen *et al.* (2016) find vertical, supportive leadership to both negatively and positively moderate between team emergent states and team ambidexterity. It follows that future research needs to respond to calls for research on how and under what conditions both vertical and shared leadership interact to affect team effectiveness, and more specifically, team ambidexterity (Pearce, 2004). Fourth, the present study is not the first to provide evidence for the importance of time in team ambidexterity research. Jansen *et al.* (2016) provide findings in similar fashion and its incorporation in studying team effectiveness has been argued to be a *condicio sine qua non* (Mathieu *et al.*, 2008). As teams need time to profit from the merits of diversity, future research may use longitudinal data or use a developmental perspective on how teams progress in achieving team ambidexterity as they mature over time. This may also capture data on speed and timing of team behaviors which is suggested to be especially salient in studying the adaptability in teams (Ilgen *et al.*, 2005). Fifth and finally, the nature of work teams has changed dramatically over recent years: team members today may be involved in different projects, multiple communities, virtual interaction, and the likes of cross-cultural and transnational teams (Kozlowski and Bell, 2003; Mathieu *et al.*, 2008). Other types of teams, task arrangements or modes of interaction may be incorporated to advance the findings of this research to other team contexts.

REFERENCES

Ancona, D.G. and Caldwell, D. F. (1992). Demography and Design: Predictors of New Product Team Performance. *Organization Science*, 3(3): 321-341.

Andriopoulos, C. and Lewis, M. W. (2009). Exploitation-Exploration Tensions and Organizational Ambidexterity: Managing Paradoxes of Innovation. *Organization Science*, 20(4): 696-717.

Austin, J. R. (2003). Transactive Memory in Organizational Groups: The Effects of Content, Consensus, Specialization, and Accuracy on Group Performance. *Journal of Applied Psychology*, 88(5): 866.

Bantel, K. A. and Jackson, S. E. (1989). Top Management and Innovations in Banking: Does the Composition of the Top Team make a Difference? *Strategic Management Journal*, 10(1): 107-124.

Bedeian, A. G., and Hunt, J. G. (2006). Academic Amnesia and Vestigial Assumptions of our Forefathers. *The Leadership Quarterly*, 17(2): 190-205.

Bedeian, A. G. and Mossholder, K. W. (2000). On the Use of the Coefficient of Variation as a Measure of Diversity. *Organizational Research Methods*, 3(3): 285-297.

Birkinshaw, J. and Gibson, C. (2004). Building Ambidexterity into an Organization. *MIT Sloan Management Review*, 45: 47-55.

Birkinshaw, J. and Gupta, K. (2013). Clarifying the Distinctive Contribution of Ambidexterity to the Field of Organization Studies. *Academy of Management Perspectives*, 27(4): 287-298.

Bunderson, J. S. and Sutcliffe, K. M. (2002). Comparing Alternative Conceptualizations of Functional Diversity in Management Teams: Process and Performance Effects. *Academy of Management Journal*, 45(5): 875-893.

Cao, Q., Gedajlovic, E., and Zhang, H. (2009). Unpacking Organizational Ambidexterity: Dimensions, Contingencies, and Synergistic Effects. *Organization Science*, 20(4): 781-796.

Cao, Q., Simsek, Z., and Zhang, H. (2010). Modelling the Joint Impact of the CEO and the TMT on Organizational Ambidexterity. *Journal of Management Studies*, 47(7): 1272-1296.

Carless, S. A., and De Paola, C. (2000). The Measurement of Cohesion in Work Teams. *Small Group Research*, 31(1): 71-88.

Carmeli, A., and Halevi, M. Y. (2009). How Top Management Team Behavioral Integration and Behavioral Complexity Enable Organizational Ambidexterity: The Moderating Role of Contextual Ambidexterity. *The Leadership Quarterly*, 20(2): 207-218.

Carson, J. B., Tesluk, P. E., and Marrone, J. A. (2007). Shared Leadership in Teams: An Investigation of Antecedent Conditions and Performance. *Academy of Management Journal*, 50(5): 1217-1234.

Chen, E. L. and Katila, R. (2008). Rival Interpretations of Balancing Exploration and Exploitation: Simultaneous or Sequential. *Handbook of Technology and Innovation Management*: 197-214.

Cohen, S. G. and Bailey, D. E. (1997). What Makes Teams Work: Group Effectiveness Research from the Shop Floor to the Executive Suite. *Journal of Management*, 23(3): 239-290.

Day, D. V., Gronn, P., and Salas, E. (2004). Leadership Capacity in Teams. *The Leadership Quarterly*, 15(6): 857-880.

Day, D. V., Gronn, P., and Salas, E. (2006). Leadership in Team-based Organizations: On the Threshold of a New Era. *The Leadership Quarterly*, 17(3): 211-216.

De Jong, A., De Ruyter, K., and Wetzels, M. (2005). Antecedents and Consequences of Group Potency: A Study of Self-Managing Service Teams. *Management Science*, 51(11): 1610-1625.

De Jong, A., De Ruyter, K., and Wetzels, M. (2006). Linking Employee Confidence to Performance: A Study of Self-Managing Service Teams. *Journal of the Academy of Marketing Science*, 34(4): 576-587.

Edmondson, A. (1999). Psychological Safety and Learning Behavior in Work Teams. *Administrative Science Quarterly*, 44(2): 350-383.

Edmondson, A. C. (2002). The Local and Variegated Nature of Learning in Organizations: A Group-Level Perspective. *Organization Science*, 13(2): 128-146.

Edmondson, A.C., Bohmer, R.M., and Pisano, G.P. (2001). Disrupted Routines: Team Learning and New Technology Implementation in Hospitals. *Administrative Science Quarterly*, 46: 685-716.

Ensley, M. D., Hmieleski, K. M., and Pearce, C. L. (2006). The Importance of Vertical and Shared Leadership within New Venture Top Management Teams: Implications for the Performance of Startups. *The Leadership Quarterly*, 17(3): 217-231.

Ensley, M. D., Pearson, A., and Pearce, C. L. (2003). Top Management Team Process, Shared Leadership, and New Venture Performance: A Theoretical Model and Research Agenda. *Human Resource Management Review*, 13(2): 329-346.

Field, A. (2009). *Discovering Statistics using SPPS.* London: Sage Publications

Floyd, S.W. and Lane, P.J. (2001). Strategizing throughout the Organization: Managing Role Conflict in Strategic Renewal. *Academy of Management Review*, 25(1): 154-177.

Gibson, C.B. and Birkinshaw, J. (2004). The Antecedents, Consequences, and Mediating Role of Organizational Ambidexterity. *Academy of Management Journal*, 47(2): 209-226.

Gibson, C. B. and Earley, P. C. (2007). Collective Cognition in Action: Accumulation, Interaction, Examination, and Accommodation in the Development and Operation of Group Efficacy Beliefs in the Workplace. *Academy of Management Review*, 32(2): 438-458.

Gibson, C. B., Randel, A. E., and Earley, P. C. (2000). Understanding Group Efficacy: An Empirical Test of Multiple Assessment Methods. *Group & Organization Management*, 25(1): 67-97.

Gilson, L. L., Mathieu, J. E., Shalley, C. E., and Ruddy, T. M. (2005). Creativity and Standardization: Complementary or Conflicting Drivers of Team Effectiveness? *Academy of Management Journal*, 48(3): 521-531.

Gilson, L. L., and Shalley, C. E. (2004). A Little Creativity Goes a Long Way: An Examination of Teams' Engagement in Creative Processes. *Journal of Management*, 30(4): 453-470.

Gully, S. M., Incalcaterra, K. A., Joshi, A., and Beaubien, J. M. (2002). A Meta-Analysis of Team-Efficacy, Potency, and Performance: Interdependence and Level of Analysis as Moderators of Observed Relationships. *Journal of Applied Psychology*, 87(5): 819-832.

Gupta, A. K., Smith, K. G., and Shalley, C. E. (2006). The Interplay between Exploration and Exploitation. *Academy of Management Journal*, 49(4): 693-706.

Haas, M.R. (2010). The Double-edged Swords of Autonomy and External Knowledge: Analyzing Team Effectiveness in a Multinational Organization. *Academy of Management Journal*, 53(5): 989-1008.

Hambrick, D. C. and Mason, P. A. (1984). Upper Echelons: The Organization as a Reflection of its Top Managers. *Academy of Management Review*, 9(2): 193-206.

Harrison, D. A. and Klein, K. J. (2007). What's the Difference? Diversity Constructs as Separation, Variety, or Disparity in Organizations. *Academy of Management Review*, 32(4): 1199-1228.

Harrison, D. A., Price, K. H., and Bell, M. P. (1998). Beyond Relational Demography: Time and the Effects of Surface- and Deep-level Diversity on Work Group Cohesion. *Academy of Management Journal*, 41(1), 96-107.

He, Z.L. and Wong, P.K. (2004). Exploration vs. Exploitation: An Empirical Test of the Ambidexterity Hypothesis. *Organization Science*, 15(4): 481-494.

Heavey, C. and Simsek, Z. (2014). Distributed Cognition in Top Management Teams and Organizational Ambidexterity: The Influence of Transactive Memory Systems. *Journal of Management*, 0149206314545652.

Hill, S. A. and Birkinshaw, J. (2014). Ambidexterity and Survival in Corporate Venture Units. *Journal of Management*, 40(7): 1899-1931.

Hiller, N. J., Day, D. V., and Vance, R. J. (2006). Collective Enactment of Leadership Roles and Team Effectiveness: A Field Study. *The Leadership Quarterly*, 17(4): 387-397.

Hoch, J. E., Pearce, C. L., and Welzel, L. (2010). *Is the Most Effective Team Leadership Shared*? Journal of Personnel Psychology. 9(3): 105–116.

Homan, A. C., Van Knippenberg, D., Van Kleef, G. A., and De Dreu, C. K. (2007). Bridging Faultlines by Valuing Diversity: Diversity Beliefs, Information Elaboration, and Performance in Diverse Work Groups. *Journal of Applied Psychology*, 92(5): 1189-1199.

Horwitz, S. K. and Horwitz, I. B. (2007). The Effects of Team Diversity on Team Outcomes: A Meta-Analytic Review of Team Demography. *Journal of Management*, 33(6): 987-1015.

Hülsheger, U. R., Anderson, N., and Salgado, J. F. (2009). Team-Level Predictors of Innovation at Work: A Comprehensive Meta-Analysis spanning Three Decades of Research. *Journal of Applied Psychology*, 94(5): 1128-1145.

Ilgen, D. R., Hollenbeck, J. R., Johnson, M., and Jundt, D. (2005). Teams in Organizations: From Input-Process-Output Models to IMOI Models. *Annual Review of Psychology*, 56: 517-543.

Jackson, S. E., May, K. E., and Whitney, K. (1995). Understanding the Dynamics of Diversity in Decision-making Teams. In Guzzo, R. A. and Salas. *Team Effectiveness and Decision Making in Organizations*, 7: 204-261. San Francisco: Jossey-Bass.

James, L. R., Demaree, R. G., and Wolf, G. (1984). Estimating Within-Group Interrater Reliability with and without Response Bias. *Journal of Applied Psychology*, 69(1): 85-98.

Jansen, J. J., George, G., Van den Bosch, F. A., and Volberda, H. W. (2008). Senior Team Attributes and Organizational Ambidexterity: The Moderating Role of Transformational Leadership. *Journal of Management Studies*, 45(5), 982-1007.

Jansen, J. J., Kostopoulos, K. C., Mihalache, O., & Papalexandris, A. (2016). A Socio-Psychological Perspective on Team Ambidexterity: The Contingency Role of Supportive Leadership Behaviors. *Journal of Management Studies*.

Jansen, J. J., Simsek, Z., and Cao, Q. (2012). Ambidexterity and Performance in Multiunit Contexts: Cross-Level Moderating Effects of Structural and Resource Attributes. *Strategic Management Journal*, 33(11): 1286-1303.

Jansen, J. J., Tempelaar, M. P., Van den Bosch, F. A., and Volberda, H. W. (2009). Structural Differentiation and Ambidexterity: The Mediating Role of Integration Mechanisms. *Organization Science*, *20*(4): 797-811.

Jansen, J. J., Volberda, H. W., and Van Den Bosch, F. A. (2005). Exploratory Innovation, Exploitative Innovation, and Ambidexterity: The Impact of Environmental and Organizational Antecedents. *Schmalenbach Business Review*, 57: 351-363.

Joshi, A. and Roh, H. (2009). The Role of Context in Work Team Diversity Research: A Meta-Analytic Review. *Academy of Management Journal*, 52(3): 599-627.

Junni, P., Sarala, R.M., Taras, V., and Tarba, S.Y. (2013). Organizational Ambidexterity and Performance: A Meta-Analysis. *Academy of Management Perspectives*, 27(4): 299-312.

Kearney, E., Gebert, D., and Voelpel, S. C. (2009). When and How Diversity Benefits Teams: The Importance of Team Members' Need for Cognition. *Academy of Management Journal*, 52(3): 581-598.

Kirkman, B. L., Tesluk, P. E., and Rosen, B. (2004). The Impact of Demographic Heterogeneity and Team Leader-Team Member Demographic Fit on Team Empowerment and Effectiveness. *Group & Organization Management*, 29(3): 334-368.

Knight, D., Pearce, C. L., Smith, K. G., Olian, J. D., Sims, H. P., Smith, K. A., and Flood, P. (1999). Top Management Team Diversity, Group Process, and Strategic Consensus. *Strategic Management Journal*, 20(5): 445-465.

Kostopoulos, K.C. and Bozionelos, N. (2011). Team Exploratory and Exploitative Learning: Psychological Safety, Task Conflict, and Team Performance. *Group & Organization Management*, 36(3): 385-415.

Kozlowski, S. W. J. and Bell, B. S. (2003). Work Groups and Teams in Organizations. In Borman, W.C., Ilgen, D.R., and Klimoski, R.J. *Handbook of Psychology: Industrial and Organizational Psychology*. 12: 333-375. New York: Wiley.

Kozlowski, S.W.J. and Bell, B.S. (2008). Team Learning, Development, and Adaptation. In Sessa, V.I., and London, M. (Eds.), *Group Learning*: 15-44.

Kozlowski, S. W. and Ilgen, D. R. (2006). Enhancing the Effectiveness of Work Groups and Teams. *Psychological Science in the Public Interest*, 7(3): 77-124.

Kwee, Z., Van den Bosch, F.A.J., and Volberda, H.W. (2011). The Influence of Top Management Team's Corporate Governance Orientation on Strategic Renewal Trajectories: A Longitudinal Analysis of Royal Dutch Shell plc, 1907-2004. *Journal of Management Studies*, 48(5): 984-1014.

Lau, D. C. and Murnighan, J. K. (1998). Demographic Diversity and Faultlines: The Compositional Dynamics of Organizational Groups. *Academy of Management Review*, 23(2): 325-340.

Lewis, K. (2003). Measuring Transactive Memory Systems in the Field: Scale Development and Validation. *Journal of Applied Psychology*, 88(4): 587-604.

Lubatkin, M. H., Simsek, Z., Ling, Y., and Veiga, J. F. (2006). Ambidexterity and Performance in Small-to Medium-Sized Firms: The Pivotal Role of Top Management Team Behavioral Integration. *Journal of Management*, 32(5): 646-672.

Lüscher, L. S. and Lewis, M. W. (2008). Organizational Change and Managerial Sensemaking: Working through Paradox. *Academy of Management Journal*, 51(2): 221-240.

Manz, C. C., and Sims Jr., H. P. (1987). Leading Workers to Lead Themselves: The External Leadership of Self-Managing Work Teams. *Administrative Science Quarterly*, 32(1): 106-129.

Manz, C. C., and Sims Jr., H. P. (1993). *Business Without Bosses*. New York: Wiley.

March, J.G. (1991). Exploration and Exploitation in Organizational Learning. *Organization Science*, 2(1): 71-87.

Marks, M. A., Mathieu, J. E., and Zaccaro, S. J. (2001). A Temporally Based Framework and Taxonomy of Team Processes. *Academy of Management Review*, 26(3): 356-376.

Martin, R. L. (2014). The Big Lie of Strategic Planning. *Harvard Business Review*, January/February: 3-8.

Mathieu, J., Maynard, M.T., Rapp, T., and Gilson, L. (2008). Team Effectiveness 1997-2007: A Review of Recent Advancements and a Glimpse into the Future. *Journal of Management*, 34(3): 410-467.

Mehra, A., Smith, B. R., Dixon, A. L., and Robertson, B. (2006). Distributed Leadership in Teams: The Network of Leadership Perceptions and Team Performance. *The Leadership Quarterly*, 17(3): 232-245.

Mihalache, O.R., Jansen, J.J.P., Van den Bosch, F.A.J., and Volberda, H.W. (2014). Top Management Team Shared Leadership and Organizational Ambidexterity: A Moderated Mediation Framework. *Strategic Entrepreneurship Journal*, 8(2): 128-148.

Milliken, F. J., and Martins, L. L. (1996). Searching for Common Threads: Understanding the Multiple Effects of Diversity in Organizational Groups. *Academy of Management Review*, 21(2): 402-433.

Mintzberg, H. (2000). *The Rise and Fall of Strategic Planning.* Pearson Education.

Mom, T. J., Fourné, S. P., and Jansen, J. J. (2015). Managers' Work Experience, Ambidexterity, and Performance: The Contingency Role of the Work Context. *Human Resource Management*, 54(S1): s133-s153.

Mom, T. J., Van Den Bosch, F. A., and Volberda, H. W. (2007). Investigating Managers' Exploration and Exploitation Activities: The Influence of Top-Down, Bottom-Up, and Horizontal Knowledge Inflows. *Journal of Management Studies*, 44(6): 910-931.

Mom, T. J., Van Den Bosch, F. A., and Volberda, H. W. (2009). Understanding Variation in Managers' Ambidexterity: Investigating Direct and Interaction Effects of Formal Structural and Personal Coordination Mechanisms. *Organization Science*, 20(4): 812-828.

Nicolaides, V. C., LaPort, K. A., Chen, T. R., Tomassetti, A. J., Weis, E. J., Zaccaro, S. J., and Cortina, J. M. (2014). The Shared Leadership of Teams: A Meta-analysis of Proximal, Distal, and Moderating Relationships. *The Leadership Quarterly*, 25(5): 923-942.

Oduber, R.P. (2015). *How to Become More Innovative from Alliance Portfolios: The Relationship between Alliance Portfolio Strategy and Business Unit Innovation.* Rotterdam School of Management, Erasmus University.

O'Reilly, C.A. and Tushman, M.L. (2013). Organizational Ambidexterity: Past, Present and Future. *Academy of Management Perspectives*, amp-2013.

Patterson, M. G., West, M. A., Shackleton, V. J., Dawson, J. F., Lawthom, R., Maitlis, S., Robinson, D.L. and Wallace, A. M. (2005). Validating the Organizational Climate Measure: Links to Managerial Practices, Productivity and Innovation. *Journal of Organizational Behavior*, 26(4): 379-408.

Pearce, C. L. (2004). The Future of Leadership: Combining Vertical and Shared leadership to Transform Knowledge Work. *The Academy of Management Executive*, 18(1): 47-57.

Pearce, C. L., and Manz, C. C. (2005). The New Silver Bullets of Leadership: The Importance of Self- and Shared Leadership in Knowledge Work. *Management Department Faculty Publications*, Paper 72

Pearce, C. L., and Sims Jr., H. P. (2002). Vertical versus Shared Leadership as Predictors of the Effectiveness of Change Management Teams: An Examination of Aversive, Directive, Transactional, Transformational, and Empowering Leader Behaviors. *Group Dynamics: Theory, Research, and Practice*, 6(2): 172.

Pearce, C. L., Wassenaar, C. L., and Manz, C. C. (2014). Is Shared Leadership the Key to Responsible Leadership? *The Academy of Management Perspectives*, 28(3): 275-288.

Pelled, L. H. (1996). Demographic Diversity, Conflict, and Work Group Outcomes: An Intervening Process Theory. *Organization Science*, 7(6): 615-631.

Pelled, L. H., Eisenhardt, K. M., and Xin, K. R. (1999). Exploring the Black Box: An Analysis of Work Group Diversity, Conflict and Performance. *Administrative Science Quarterly*, 44(1): 1-28.

Perry, M. L., Pearce, C. L., and Sims Jr., H. P. (1999). Empowered Selling Teams: How Shared Leadership Can Contribute to Selling Team Outcomes. *Journal of Personal Selling & Sales Management*, 19(3): 35-51.

Raisch, S. (2008). Balanced Structures: Designing Organizations for Profitable Growth. *Long Range Planning*, 41(5): 483-508.

Raisch, S. and Birkinshaw, J. (2008). Organizational Ambidexterity: Antecedents, Outcomes, and Moderators. *Journal of Management*, 34: 375-409.

Raisch, S., Birkinshaw, J., Probst, G., and Tushman, M. L. (2009). Organizational Ambidexterity: Balancing Exploitation and Exploration for Sustained Performance. *Organization Science*, 20(4): 685-695.

Shalley, C. E. and Gilson, L. L. (2004). What Leaders Need to Know: A Review of Social and Contextual Factors that Can Foster or Hinder Creativity. *The Leadership Quarterly*, 15(1): 33-53.

Shalley, C. E., Zhou, J., and Oldham, G. R. (2004). The Effects of Personal and Contextual Characteristics on Creativity: Where Should We Go From Here? *Journal of Management*, 30(6): 933-958.

Shin, S. J., and Zhou, J. (2007). When is Educational Specialization Heterogeneity related to Creativity in Research and Development Teams? Transformational Leadership as a Moderator. *Journal of Applied Psychology*, 92(6): 1709.

Simons, T., Pelled, L. H., and Smith, K. A. (1999). Making Use of Difference: Diversity, Debate, and Decision Comprehensiveness in Top Management Teams. *Academy of Management Journal*, 42(6): 662-673.

Simsek, Z. (2009). Organizational Ambidexterity: Towards a Multilevel Understanding. *Journal of Management Studies*, 46(4): 598-624.

Simsek, Z., Heavey, C., Veiga, J. F., and Souder, D. (2009). A Typology for Aligning Organizational Ambidexterity's Conceptualizations, Antecedents, and Outcomes. *Journal of Management Studies*, 46(5): 864-894.

Smith, W. K. and Tushman, M. L. (2005). Managing Strategic Contradictions: A Top Management Model for Managing Innovation Streams. *Organization Science*, 16(5): 522-536.

Srivastava, A., Bartol, K. M., and Locke, E. A. (2006). Empowering Leadership in Management Teams: Effects on Knowledge Sharing, Efficacy, and Performance. *Academy of Management Journal*, 49(6): 1239-1251.

Stajkovic, A. D., Lee, D., and Nyberg, A. J. (2009). Collective Efficacy, Group Potency, and Group Performance: Meta-Analyses of their Relationships, and Test of a Mediation Model. *Journal of Applied Psychology*, 94(3): 814-828

Sundstrom, E., McIntyre, M., Halfhill, T., and Richards, H. (2000). Work Groups: From the Hawthorne Studies to Work Teams of the 1990s and Beyond. *Group Dynamics: Theory, Research, and Practice*, 4(1): 44-67.

Taggar, S., Hackew, R., and Saha, S. (1999). Leadership Emergence in Autonomous Work Teams: Antecedents and Outcomes. *Personnel Psychology*, 52(4): 899-926.

Taylor, A. and Greve, H. R. (2006). Superman or the Fantastic Four? Knowledge Combination and Experience in Innovative Teams. *Academy of Management Journal*, 49(4): 723-740.

Thatcher, S. M., Jehn, K. A., and Zanutto, E. (2003). Cracks in Diversity Research: The Effects of Diversity Faultlines on Conflict and Performance. *Group Decision and Negotiation*, 12(3): 217-241.

The Boston Consulting Group. (2013). *The Most Innovative Companies 2013: Lessons from Leaders*. Boston: The Boston Consulting Group.

Tiwana, A. (2008). Do Bridging Ties Complement Strong Ties? An Empirical Examination of Alliance Ambidexterity. *Strategic Management Journal*, 29(3): 251-272.

Tushman, M.L., and O'Reilly, C.A. (1996). Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change. *California Management Review*, 38(4): 8-30

Tushman, M.L., and O'Reilly, C.A. (1997). *Winning through Innovation: A Practical Guide to Leading Organizational Change and Renewal*. Boston: Harvard Business School Press.

Turner, N., Swart, J., and Maylor, H. (2013). Mechanisms for Managing Ambidexterity: A Review and Research Agenda. *International Journal of Management Reviews*, 15(3): 317-332.

Uotila, J., Maula, M., Keil, T., and Zahra, S.A. (2009). Exploration, Exploitation, and Financial Performance: Analysis of S&P 500 Corporations. *Strategic Management Journal*, 30: 221-231.

Van Der Vegt, G. S. and Bunderson, J. S. (2005). Learning and Performance in Multidisciplinary Teams: The Importance of Collective Team Identification. *Academy of Management Journal*, 48(3): 532-547.

Van Knippenberg, D., De Dreu, C. K., and Homan, A. C. (2004). Work Group Diversity and Group Performance: An Integrative Model and Research Agenda. *Journal of Applied Psychology*, 89(6): 1008-1022.

Van Knippenberg, D. and Schippers, M. C. (2007). Work Group Diversity. *Annual Review of Psychology*, 58, 515-541.

Wang, D., Waldman, D. A., and Zhang, Z. (2014). A Meta-Analysis of Shared Leadership and Team Effectiveness. *Journal of Applied Psychology*, 99(2): 181-198

Webber, S. S. and Donahue, L. M. (2001). Impact of Highly and Less Job-Related Diversity on Work Group Cohesion and Performance: A Meta-Analysis. *Journal of Management*, 27(2): 141-162.

Wegner, D. M. (1987). Transactive Memory: A Contemporary Analysis of the Group Mind. In Mullen, B. and Goethals, G.R., *Theories of Group Behavior* (185-208). New York: Springer.

Wiersema, M. F. and Bantel, K. A. (1992). Top Management Team Demography and Corporate Strategic Change. *Academy of Management Journal*, 35(1): 91-121.

Williams, K. Y. and O'Reilly, C. A. (1998). Demography and Diversity in Organizations: A Review of 40 Years of Research. *Research in Organizational Behavior*, 20: 77-140.

Wong, S.S. (2004). Distal and Local Group Learning: Performance Trade-Offs and Tensions. *Organization Science*, 15(6): 645-656.

Yukl, G. (1989). Managerial Leadership: A Review of Theory and Research. *Journal of Management*, 15(2): 251-289.

APPENDIX A   MEASUREMENTS

Organizational Role

>   *Please indicate the role in the construction business chain of the organization you work at?*
>   .
>
>   - Contracting body;
>   - Architect;
>   - Construction company;
>   - Installation company;
>   - Subcontractor;
>   - Original equipment manufacturer (OEM)/supplier;
>   - Advisor;
>   - Other, namely … .

Team Size

>   *Please indicate the number of persons from which the team you work at consists.*

Team Age

>   *Please indicate the number of years of existence of the team you work at since its inception.*

Team Type

>   *Please indicate the nature of the team you work at?*
>   .
>
>   - Production team;
>   - Service team (including sales and maintenance);
>   - Management team;
>   - Project team;
>   - Advisory team;
>   - Other, namely … .

Organizational Tenure Diversity

>   *Please indicate the number of years of work experience at your current organization.*

Team Tenure Diversity

>   *Please indicate the number of years of work experience at your current team.*

Team Educational Specialization Diversity (UNESCO ISCED-F)

>   *Please indicate the educational field in which you have obtained your highest educational degree.*
>   .

- Education;
- Arts and humanities;
- Social sciences, journalism, and information;
- Business, administration and law;
- Natural sciences, mathematics, and statistics;
- Information and Communication Technologies (ICTs);
- Engineering, manufacturing and construction;
- Agriculture, forestry, fisheries and veterinary;
- Health and welfare;
- Services.

Team Functional Diversity (Hambrick and Mason, 1984)

Please indicate the number of years of work experience (in or outside your current organization) in each of the following functional areas.

- *sales;*
- *marketing;*
- *research and development;*
- *engineering;*
- *production;*
- *purchasing;*
- *distribution;*
- *finance/accounting;*
- *law;*
- *other.*

Team Ambidexterity (Kostopoulos and Bozionelos, 2011; Jansen *et al.*, 2016)

Team exploratory attainments

- Team members were systematically searching for new possibilities.
- Team members offered new ideas and solutions to complicated problems.
- Team members experimented with new and creative ways for accomplishing work.
- Team members evaluated diverse options regarding the course of their work.
- The members of our team developed many new skills while performing their tasks.

Team exploitative attainments

- The members of our team recombined existing knowledge for accomplishing work.
- Team members performed routine activities while carrying out their tasks.
- Our team implemented standardized methodologies and regular work practices.
- Team members improved and refined their existing knowledge and expertise while accomplishing work.

Team Confidence

Team efficacy (Edmondson, 1999)

- Achieving this team's goals is well within our reach.
- This team can achieve its task without requiring us to put in unreasonable time or effort.

- With focus and effort, this team can do anything we set out to accomplish.

Team potency (Guzzo *et al.*, 1993; Gibson *et al.*, 2000)

- My group has confidence in itself.
- My group believes it can become unusually good at producing high-quality work.
- My group expects to be known as a high-performing team.
- My group feels it can solve any problem it encounters.
- My group believes it can be very productive.
- My group can get a lot done when it works hard.
- No task is too tough for my group.
- My group expects to have a lot of influence around here.

Team Shared Leadership (Mihalache *et al.*, 2014)

- Team members jointly determine the implementation of new business.
- Team members are jointly responsible for setting strategic consensus.
- Team members collectively determine the planning of major operations.
- Team members encourage each other to high expectations in the work.
- Team members encourage each other to draw on common goals.
- Team members call each other to make critical decisions.
- Team members encourage each other to jointly evaluate business performance.
- Team members encourage each other to cooperate.