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Chukwuemeka Kevin Echebiri

PhD Dissertation

Employee-Driven Innovation

An empowerment-based view

PhD in Innovation in Services – Public and Private (INSEPP)
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Ph.d.-avhandlinger i innovasjon i tjenesteyting i offentlig og privat sektor (INTOP)

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Dedication

To my late parents Mr B. C. Echebiri and Mrs Roseline Echebiri whom I fondly miss.

Abstract

The participation of employees in the innovation process has become a focus of various research streams. Previous studies show that the assumption that innovation requires specific skills is no longer tenable in today's modern organizations. This dissertation focuses on the involvement of employees without innovation-specific functions in the framework of employee-driven innovation (EDI) using empowerment as my lens. In most organizations, these employees constitute a significant proportion of the workforce, and understanding how to harness their creative potential should be an advantage to the majority of organizations. The overarching aim of this dissertation is to gain more knowledge about EDI and empowerment-related approaches that can stimulate it.

To address these issues, I conducted three empirical studies that resulted in the four appended papers. Paper I focuses on the conceptualization and operationalization of EDI. Paper II examines the link between structural empowerment and EDI and how psychological empowerment mediates this relationship. Paper III concerns how leadership behaviours relate to EDI and the mediating role of leader–member exchange. Paper IV investigates individual-level antecedents of EDI.

Based on the findings, EDI was operationalized as a second-order reflective construct consisting of three dimensions/stages: emergence and search for ideas, idea generation, and idea development and implementation. It was also found that various empowerment approaches, namely structural empowerment, empowering leadership behaviour, psychological empowerment and self-leadership can foster EDI. Therefore, my original contributions to the EDI literature are twofold: (1) the employee-driven innovation scale and (2) empowerment-related approaches that stimulate EDI. Across all three studies, employee empowerment can be viewed as an approach to stimulate EDI. Through various employee empowerment practices, organizations enable employees to participate in the innovation process. Employees who were not overtly assigned innovation-specific functions are given the licence to venture into a more innovation-specific role through these empowering practices. This dissertation shows that organizations can foster EDI through a range of empowering practices.

Sammendrag

Medarbeideres deltakelse i innovasjonsprosesser, såkalt medarbeiderdrevet innovasjon, har i økende grad blitt et tema innen innovasjonsforskningen. Studier viser hvordan antakelsen om at innovasjon krever spesifikke evner eller arbeidsroller ikke lenger gjelder i moderne organisasjoner. Denne avhandlingen fokuserer på hvordan ansatte som ikke innehar innovasjonsspesifikke roller og funksjoner kan bli involvert i innovasjonsaktiviteter, der jeg bruker myndiggjøring (empowerment) som et perspektiv. Ansatte som ikke har dedikerte innovasjonsroller utgjør en vesentlig andel av arbeidsstyrken i de fleste organisasjoner, og evnen til på fange opp disse ansattes kreative potensial kan brukes til fordel for organisasjonen. Det overordnede målet med denne avhandlingen er å fremskaffe mer kunnskap om medarbeiderdrevet innovasjon og hvordan myndiggjørings-relaterte tilnærminger kan brukes for å stimulere slik innovasjon.

For å utforske temaet har jeg gjennomført tre empiriske studier som har resultert i fire publiserte artikler. Artikkel 1 fokuserer på konseptualisering og operasjonalisering av medarbeiderdrevet innovasjon. Artikkel 2 utforsker koblingen mellom strukturell myndiggjøring og medarbeiderdrevet innovasjon, samt hvordan psykologisk myndiggjøring påvirker denne koblingen. Artikkel 3 handler om hvordan ledelse forholder seg til medarbeiderdrevet innovasjon og hvordan relasjonskvaliteten mellom ledere og ansatte medierer dette forholdet. Artikkel 4 undersøker individuelle drivere for medarbeiderdrevet innovasjon.

Ut fra funnene har medarbeiderdrevet innovasjon blitt operasjonalisert som et refleksivt konstrukt som består av tre dimensjoner/faser. Disse er fremvekten av og søken etter ideer, idé generering samt utvikling og implementering. Funnene viser videre at ulike myndiggjørings-tilnærminger – herunder strukturell myndiggjøring, myndiggjørende ledelse, psykologisk myndiggjøring og selvledelse, kan fremme medarbeiderdrevet innovasjon. Avhandlingen har bidratt til litteraturen om medarbeiderdrevet innovasjon på to måter: a) en skala for måling av medarbeiderdrevet innovasjon (EDIS), og b) undersøkelse av ulike myndiggjørings-relaterte tilnærminger som kan stimulere medarbeiderdrevet innovasjon. Gjennom myndiggjørende praksiser kan organisasjoner invitere ansatte til å ta del i innovasjonsprosesser. Ansatte som ikke eksplisitt har innovasjon som sitt ansvar kan få muligheten til å utforske innovative løsninger. Denne avhandlingen viser at organisasjoner kan fremme medarbeiderdrevet innovasjon gjennom en rekke myndiggjørende praksiser og tilnærminger.

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"Whatever the mind can conceive and believe, it can achieve" Napoleon Hill

My PhD is unique in several ways! First, as a long journey that indeed began even before the actual beginning. I have always wanted to do a PhD, but I realized the challenges ahead that this involved. I took a job in a bank in Nigeria when I finished my bachelor's degree and set a savings plan that I adhered to for nearly six years. In 2012, I took the next step and moved to Bodø for my master's degree. When I completed my programme, I returned to my home country in August 2014. At that time, I could never have envisaged what lay ahead of me. Between 2014–2016, I submitted over 67 PhD applications and got called in for an interview six times. In one particular school, I was ranked first in both evaluation and interview, but the Dean decided to change the ranking and hired candidate number two. However, that move turned out to be a blessing in disguise. I learned very early in life that winners never quit and a quitter never wins. Well, that is history today I am "PhinisheD". More importantly, I have taken my place in history as the first non-European to undergo doctoral training at INSEPP.

I would like to express my sincere gratitude to the Inland Norway University of Applied Sciences, and in particular INSEPP, and Prof. Martin Rønningen, for giving me the opportunity to realize my dream. Beyond the initial experience of getting a position, I have very been fortunate to find myself among folks who in different ways inspired and helped me to aspire higher. So in advance, to those I cannot mention—thank you! It has been a rich, rigorous and rewarding experience, and sometimes frustrating when the moments of flow freeze. At some point, the journey was made even more difficult commuting between two campuses because I wanted to learn as much Norwegian as possible. Although it was a challenging journey, I have learned that optimism and positivity, most times prevail over pessimism.

My sincere gratitude goes to my two supervisors, Associate Professors Stein Amundsen and Marit Engen. When you both interviewed me on 26 September 2016, I had no inkling that we would be working together. I was lucky to have had two great and complementary individuals as my supervisors. I am grateful for your guidance, and for the confidence you had in me from the beginning until the end of my journey. You enabled and empowered me to believe that I have the ability and that I would succeed. I will remain forever grateful to you both. To all at INSEPP, especially those ahead of me, it felt warm arriving in your midst at the peak of winter in early February 2017. To those who were exceptionally close, with whom I shared my

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Above all, I thank God Almighty for the gift of life and this rare privilege.

Ekene dịrị Chineke!

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I. Echebiri, C., Engen, M. and Amundsen, S. (2021) 'Employee-driven innovation: conceptualisation, scale development and preliminary validation', *Int. J. Entrepreneurship and Innovation Management*, Vol. 25, Nos. 2/3, pp.233–255. doi**:** 10.1504/IJEIM.2020.10036012

II. Echebiri, C., Amundsen, S. and Engen, M. (2020). Linking structural empowerment to employee-driven innovation (EDI): The mediating role of psychological empowerment. *Administrative Sciences.* Vol. 10, No. 3, pp. 1–20. https://doi.org/10.3390/admsci10030042

III. Echebiri, C.K. and Amundsen, S. (2021). The relationship between leadership styles and employee-driven innovation: The mediating role of leader-member exchange. *Evidence-based HRM.* Vol.1 No.1, pp. 63-77. doi: https://doi.org/10.1108/EBHRM-10-2019-0091

IV. Echebiri, C.K. (2020). An empirical study into the individual-level antecedents to employee-driven innovation. *Technology Innovation Management Review*. Vol. 6, No. 6, pp. 42–52. http://doi.org/10.22215/timreview/1367

"A journey of a thousand miles begins with a single step." Lao Tzu

1 Introduction

1.1 Introducing the theme

Innovation has traditionally been categorized as a closed process that demands special skills (Deslée & Dahan, 2018; Haapasaari, Engeström, & Kerosuo, 2017); therefore, it is restricted to a small group of employees assumed to possess this know-how, such as research and development (R&D) staff and specially assigned units (Haapasaari et al., 2017; Kurz, Husig, & Dowling, 2018; Masumba, 2019; Teglborg-Lefèvre, 2010). However, this approach to innovation has the potential to exclude the possibility of employees throughout the organization (i.e. employees with non-innovation-specific functions) to engage in innovation activities. In this vein, Kesting and Ulhøi (2010) argue that organizations should not restrict innovation to any category of employees, but rather, all employees should be regarded as innovation assets or capital.

Ideally, employers and managers in most organizations should regard their employees as their most valuable assets (Divya & Suganthi, 2018; Gabčanová, 2011; The Economist, 2019) and recognize all employees as an essential source of innovative ideas (Bäckström & Lindberg, 2018; Lotz, 2018; Xin, 2016). In recognition of this approach, innovation management has gradually expanded from having a predominately centralized R&D focus to putting greater emphasis on creative efforts outside R&D departments, and non-innovation-specific functions (Bäckström & Bengtsson, 2019; Høyrup, 2012). Thus, the focus on employee involvement in innovation has evolved through different concepts over the last few decades, such as high-involvement innovation (e.g. Bessant & Caffyn, 1997; Tidd & Bessant, 2013), practice-based innovation (Ellström, 2010; Melkas & Harmaakorpi, 2012), innovative work behaviour (e.g. Bos-Nehles, Bondarouk, & Nijenhuis, 2016; De Jong & Den Hartog, 2010; Scott & Bruce, 1994; Tuominen & Toivonen, 2011), shop-floor innovation (Axtell et al., 2000) and lately employee-driven innovation (EDI) (e.g. Bäckström & Lindberg, 2019; Felstead, Gallie, Green, & Henseke, 2020; Parjanen, Saunila, Kallio, & Harmaakorpi, 2020; Price, Boud, & Scheeres, 2012; Smith, Ulhøi, & Kesting, 2012).

Overall, these concepts commonly acknowledge that there are many internal actors in the innovation process (Engen, 2016; Laviolette, Redien-Collot, & Teglborg, 2016; Renkema, 2018), including employees outside the R&D department. Naidoo, Hewitt, and Bussin (2019) argue that employees play a critical role in building an innovative workplace. Employees are the ones who innovate rather than the organization because they are the people who hold and process new ideas (Van de Ven, 1986). However, the roles of employees in the innovation process differ depending on the organization's innovation approaches.

In this dissertation, I examine the participation of employees in the innovation process, which is captured in the framework of EDI. At its core, EDI emphasizes the importance of involving employees in the innovation process, which implies viewing them as actors in the entire process, that is, in the generation of creative ideas and in the development and implementation of those ideas in an organization (Holmquist & Johansson, 2019; Kesting & Ulhøi, 2010; Kristensen, 2018; Smith et al., 2012). Considering employees as actors in EDI is about facilitating their participation in the processes by enabling and empowering them to engage in innovation processes. Before I elaborate more on what this implies, I will give a brief background and motivation for studying EDI.

1.2 Background and motivation

EDI dates back to the 1970s from the domains of workplace development, basic agreements and participatory design in the literature from Nordic countries (Bäckström & Lindberg, 2018; Hansen, Amundsen, Aasen, & Gressgård, 2017). It is worth noting that the labour/trade unions played a significant role in shaping the pragmatic nature of EDI in both the foundational and modern phases (Alasoini, 2011; Wihlman, Hoppe, Wihlman, & Sandmark, 2014). As part of the basic agreement and broader union policies, the labour/trade unions canvassed for greater industrial democracy in the workplace, more workers' control, improved working conditions, and greater collaboration between employees and managers (Alasoini, 2011; Hansen et al., 2017; Høyrup, 2010; The Danish Confederation of Trade Unions (LO), 2007; Wihlman et al., 2014).

In its modern form, EDI can be traced back to a report published by the Danish Confederation of Trade Unions (Landsorganisationen i Danmark, LO) in October 2007. The report highlights the need for employee involvement in the innovation process, among other points. Around the same time, the Norwegian government recognized the role of employee involvement as an

essential policy on innovation through a White Paper on Innovation (The Norwegian Ministry of Trade and Industry, 2008: Report no. 7, 2008-2009). Nevertheless, one may argue that EDI, as it is broadly defined today and as a research stream, can be attributed to Kesting and Ulhøi's (2010) conceptual paper, "*Employee-driven innovation: extending the license to foster innovation*". In 2012, the book "*Employee-driven innovation: a new approach*" edited by Høyrup et al. was published. Reflecting the diversity of interest in EDI, its broad scope and applicability, the chapters in this edited collection were contributed by scholars from a wide variety of backgrounds and disciplines, including political science, education, psychology, organizational learning, innovation and entrepreneurship, among others. Together, these two works have remained the major pioneering sources in EDI research and have become the most important reference points for EDI research to date.

In this dissertation, I understand EDI to mean the participation of *non-innovative-specific employees*,[1] later referred to as "employees", in the generation and implementation of new ideas—whether absolutely or relatively new products, services and processes—who are not explicitly required to do so based on their regular job descriptions (Høyrup, 2012; Kesting & Ulhøi, 2010). The term *non-innovative-specific employees* implies that these employees do not have any formal responsibility to engage in innovation activities as part of their formally assigned roles. Nevertheless, the nature of their jobs in the workplace puts them in a vantage position in the organization to acquire in-depth and context-dependent knowledge (Billett, 2012; Kesting & Ulhøi, 2010).

My motivation for this dissertation is drawn from the theoretical and empirical need to further understand and explain how to involve employees in the innovation process (Høyrup, Redien-Collot, & Teglborg-Lefèvre, 2018; Parjanen et al., 2020). This is based on the understanding that no one has a monopoly of creativity and knowledge, but everyone has the potential to spot new opportunities. It is therefore argued that employees represent a potential pool of creative ideas (Kesting & Ulhøi, 2010). Indeed, employees can be better placed than their managers to become sources of creative ideas through, for example, their interactions with users and their networks outside the organization (Renkema, 2018; Rocha, 2010; Saari, Lehtonen, & Toivonen, 2015). Hence, EDI is based on "the fundamental assumption that employees have competencies and ideas that will strengthen an organisation's overall capacity to innovate" (Amundsen,

[1] I use the term non-innovative-specific employees here; however, various terms have also been used to describe this group, such as ordinary employees (e.g. Kesting & Ulhøi, 2010; Høyrup, 2012), non-managerial and non-R&D employees (e.g. Bäckström & Bengtsson 2019) or regular employees (e.g. Renkema, 2018).

Aasen, & Gressgård, 2014, p. 25). When these employees are excluded from innovation activities, their knowledge and experiences are omitted. EDI focuses on how an organization can utilize the knowledge, skills and experiences of employees to drive innovation, thereby expanding the source of innovation beyond solely R&D or specialized functions (Bogers et al., 2017). In the following section, I briefly focus on measuring EDI, which is the first gap identified in EDI research.

1.3 Measurement of EDI

Research interest on EDI has evolved gradually over the last decade (e.g. Kristiansen & Bloch-Poulsen, 2010; Lotz, 2018; Miao & Ji, 2020; Parjanen et al., 2020; Wihlman et al., 2014). The initial studies clustered around conceptual papers that attempted to conceptualize and theoretical underpin EDI (e.g. Buhl, 2018; Høyrup, Møller, & Sø Rocha, 2010; Kesting & Ulhøi, 2010). In more recent times, EDI studies have become more empirical, including a wide range of perspectives (e.g. Askjær, 2018; Bäckström & Lindberg, 2019; Halford, Fuller, Lyle, & Taylor, 2019; Holmquist & Johansson, 2019; Miao & Ji, 2020). As a growing area of research, the question of which factors or approaches through which employees could be encouraged to participate in EDI is not understood fully and deserves more attention (Hansen et al., 2017; Høyrup et al., 2018).

However, enhancing knowledge in any research field calls for greater understanding of the antecedents, large call investigations and greater methodological choices (Clauss, 2017). Amundsen et al. (2014) note that the predominant focus of EDI studies has been more on qualitative parameters, which still seems valid today. Most qualitative EDI studies are often based on single case studies (e.g. Deslée & Dahan, 2018; Holmquist & Johansson, 2019; Wihlman et al., 2014), which could have limited generalizability. This limitation might be attributed to the unavailability of a measurement instrument for the construct. This lack of a scale to measure EDI has hampered research from the quantitative perspective where a measurement instrument is required. What this underscore is the necessity to develop a measurement instrument for EDI. Therefore, to develop an EDI scale, it was necessary to begin with a theoretical conceptualization of the construct's dimensions.

Earlier studies provide some initial insights into the conceptualization and operationalization of EDI (e.g. Deslée & Dahan, 2018; Renkema, Meijerink, & Bondarouk, 2018; Saari et al., 2015). Renkema et al. (2018) identify five phases of EDI: that is, the emergence and development of an idea, followed by the communication of the idea and its establishment and implementation.

Through their qualitative approach, Renkema et al. (2018) provide an operationalization of EDI by demonstrating how it unfolds in phases/stages. This work represents the most in-depth understanding of EDI phases. However, this is not a scale to measure EDI, even though it offers valuable insights into the possible dimensions of the construct and lays a foundation for developing a quantitative measurement instrument for EDI. The scale development process is a quantitative venture that follows specific procedures (Hinkin, 1995; Worthington & Whittaker, 2006).

Accordingly, this dissertation builds on and departs from previous studies by adopting a quantitative approach to studying EDI. I start by developing a measurement instrument. By beginning with a measurement instrument, I will be able to understand the latent structure of EDI more deeply and create measurement items for measuring the construct and thereby complement the existing studies. The measurement instrument is used as a point of departure to understand how EDI can be facilitated through different empowerment practices. An EDI scale may guide further research in an unambiguous direction and promote more research work by expanding the methodological choices for studying EDI. Measurement instruments are a central part of science that contribute to the legitimacy and development of a research field (Tay & Jebb, 2017). Before I put forward the main research questions (RQs), I will introduce and argue for empowerment as a perspective from which EDI can be studied.

1.4 Empowerment as a perspective to EDI

Research indicates that EDI is contingent upon certain favourable conditions in the organization that recognize innovation and enable employees to innovate (Amundsen et al., 2014; Haapasaari et al., 2017; Voxted, 2018; Wihlman et al., 2014). Kesting and Ulhøi (2010) argue, "for 'employees', to drive innovations largely means participating in those organizational decision-making procedures by which innovations are triggered and determined" (p. 68). Generally, scholars and practitioners agree that innovation is not something that occurs naturally; that is, it can only happen if a climate for innovation is created and nurtured (e.g. Masumba, 2019; Saari et al., 2015). This participation in innovation builds on employee involvement initiatives at work, which can be related to what is usually referred to as workplace empowerment (Wilkinson, 1998).

Workplace empowerment is mainly about the increased participation and involvement of employees through approaches such as decentralization of power, autonomy and delegation of

authority (Amundsen & Martinsen, 2014; Conger & Kanungo, 1988; Wong & Kuvaas, 2018) based on the premise that empowerment initiatives will enhance organizational outcomes (Lashley, 1999; Maynard, Gilson, & Mathieu, 2012). My choice of empowerment as a perspective to study EDI is based on the understanding of empowerment as an enabling process (Cheong, Spain, Yammarino, & Yun, 2016; Conger & Kanungo, 1988), which spurs proactive behaviours (Knol & Van Linge, 2009) through power-sharing arrangements, greater employee involvement and granting more autonomy and responsibility to the employees (Spreitzer, 1995; Thomas & Velthouse, 1990; Wong & Kuvaas, 2018). The premise is that an organization becomes more effective and less restrictive if more of its members are empowered (Kanter, 1977); therefore, empowered employees are likely to exhibit a more significant influence on decision-making latitudes and meaningfulness at work (Lashley, 1999; Weidenstedt, 2017).

EDI arises from employees' proactive behaviours within their work practices (Buhl, 2018), but similar to other strands of innovations arising from work practices, EDI can be stimulated if organizations provide the structures and relationships to support such behaviours and activities (Jensen, Johnson, Lorenz, & Lundvall, 2007). As studies suggest, a key element in understanding an innovation process is to consider the factors that stimulate or stifle the development of the innovation process (Van de Ven, 1986). While unleashing the innovative potential within a workforce presents organizations with opportunities to expand their innovation capability (Dorenbosch, Engen, & Verhagen, 2005), it comes with challenges for both employees and organizations (Birkinshaw & Duke, 2013; Wihlman et al., 2014). This is even more pertinent with EDI because the employees are expected to take on more significant innovation roles to create new products, processes and services (Alasoini, 2012; Felstead et al., 2020; Sorensen, Ussing, Wandahl, & Christensen, 2018). By engaging in innovation, employees may find themselves in conflict with the established order in the organization (Hansen et al., 2017; Teglborg-Lefèvre, 2010). This is because employees are primarily expected to focus on performing existing practices rather than developing new ones (Amundsen et al., 2014; Renkema et al., 2018; Wihlman et al., 2014).

Additionally, the participation of employees in innovation could be limited by the organization's context and structures (Voxted, 2018; Aaltonen & Hytti, 2014), which includes the organization's formal structures and management practices. Employees work in a context that involves multiple actors and stakeholders, and expecting them to drive innovation might be challenging in such a practice-regulated environment with its attendant limited resources (Taylor, Fuller, Halford, Lyle, & Teglborg, 2020). Even when organizational structures are

designed to support EDI, the way employees perceive and interpret these structures affect their participation in EDI. This shows that EDI processes involve a combination of factors and resources that reside at different levels in the organization but must work in tandem with one another (Lempiälä, Yli-Kauhaluoma, & Näsänen, 2019).

Consequently, stimulating EDI calls for organizations to reconsider their strategy on how to accelerate the participation of their employees in the process successfully. This implies encouraging employees to engage in innovation without losing sight of their specifically assigned duties. However, there is still the challenge of bringing employees to the innovation springboard in addition to their regular work tasks (Bäckström & Bengtsson, 2019; Bäckström & Lindberg, 2018). This calls for management to facilitate a favourable climate for EDI (Hansen et al., 2017; Parjanen et al., 2020; Voxted, 2018) that enables and heightens employees' proactive behaviours. This suggests that empowerment could be essential in promoting EDI and that leaders have a role in promoting empowerment because they are the ones who direct the involvement of their employees in an organization. The participation and involvement of employees in innovation activities based on certain favourable conditions is central to EDI, which is related to the empowerment perspectives at work.

EDI entails the active participation of employees throughout the innovation process (Bäckström & Lindberg, 2018; Deslée & Dahan, 2018; Smith et al., 2012). Through certain practices, the management can encourage or discourage the participation of employees in the innovation process (Saari et al., 2015). The role of management is considered crucial, because even when every member of an organization has the potential to contribute to innovation, this potential can only be maximized if organizations involve and empower their workforce (Renkema, 2018; Van de Ven, 1986).

Although existing studies have provided some direction for how EDI can be stimulated (Bäckström & Lindberg, 2019; Gressgård, Amundsen, Aasen, & Hansen, 2014; Holmquist & Johansson, 2019; Xin, 2016), scholars have paid very little attention to empowerment as the perspective through which employees' participation in EDI could be realized, nor to the role of leadership and individual dispositions, such as self-leadership. I argue that the current research literature does not fully consider the complexity of involving employees in the innovation process. Therefore, there are opportunities to learn from taking different approaches to EDI, such as the empowerment perspective. It is also based on this understanding that Høyrup et al. (2018) calls for more research to increase our understanding of managerial dimensions that impact employees' participation in EDI.

Based on this reasoning, I propose that empowerment could be a promising perspective from which to study and understand EDI. Furthermore, the relationship between empowerment and EDI stretches across different levels; thus, applying empowerment as a perspective to EDI could aid in the understanding of how EDI could be stimulated. Therefore, I argue that empowerment provides a theoretically relevant perspective to explore employee participation in innovation from both organizational and individual levels in a more holistic manner. Empowerment is distinctively linked to the crucial aspects of intrinsic motivation that drive individuals towards innovation (Boulu-Reshef, Holt, Rodgers, & Thomas-Hunt, 2020; Spreitzer, 1995). Hence, in my dissertation, I will look at EDI through the lens of empowerment as practices to stimulate EDI.

1.5 Main research aim and questions

In summary, the gaps that this dissertation seeks to address are twofold: namely, the development of a measurement instrument to measure EDI and exploration of empowerment as a perspective to better understand how to stimulate EDI. Following from the above, the main aim of this dissertation is to gain more knowledge about EDI using empowerment as a perspective. To achieve this aim, I address the following main RQs.

RQ1 *How can employee-driven innovation be conceptualized and measured?*

RQ2 *In what ways do various empowerment-related factors influence employees' capacity to engage in employee-driven innovation?*

These two main RQs are examined based on three different studies, which form the empirical data that are used in four appended papers. Each study on its own contributes to answering the research questions and addressing the main aim of this dissertation. Studies 1 and 2 focus on the conceptualization and operationalization of the EDI construct and examine the relationship between two main approaches to empowerment (structural and motivational) and EDI. Study 3 investigates the association between different leadership behaviours and EDI and individual-level antecedents to EDI.

Because the empirical data for the three studies come from three service organizations, the scope of this dissertation is limited to the service sector. I chose the service sector as the context for the empirical papers, even though I draw from the general innovation literature as the background to position employees as contributors to innovation. Globally, services today account for a significant proportion of economic activities (Cadwallader, Jarvis, Bitner, &

Ostrom, 2009), comprising 70% of all total employment in developed economies (Gallouj, 2010). Thus, services will remain the primary driver of global employment in the near future. This suggests that the service sector will likely attract more people; therefore, understanding how to harness the creative potential of this workforce will remain key to innovation.

1.6 Dissertation structure

The dissertation consists of this summary (kappa) arranged in five chapters (1–5) and the four appended papers (I–IV).

Chapter 1 introduces the topic of this dissertation and situates it in the broader innovation literature. It summarizes the gaps that this work aims to address and outlines the main research aim and questions. Chapter 2 presents the theoretical framework and a review of the literature. The sub- research questions in this research study are also stated in this chapter. In Chapter 3, I present the research methodology used, while Chapter 4 gives an overview of the empirical findings. Chapter 5 synthesizes the contributions of the dissertation and includes practical implications and recommendations for future research.

"Whatever the mind can conceive and believe, it can achieve" Napoleon Hill

2 Theoretical perspectives

This chapter discusses the key theoretical framework for this dissertation.

2.1 Definition of innovation

Since Joseph Schumpeter first introduced the concept of "innovation" to economic theory in the late 1920s (Crossan & Apaydin, 2010), the innovation landscape has expanded beyond his original focus on new products related to economic benefits (Schumpeter, 1934;1983). Indeed, innovation research has evolved into a significant area of scholarship with several strands within the last century (Randhawa & Scerri, 2015). One of the many consequences of this evolution is the diversity of the definitions of innovation (Baregheh, Rowley, & Sambrook, 2009; Crossan & Apaydin, 2010).

Baregheh et al. (2009) identify over 60 definitions of innovation, which represents the diversity and spread of innovation research, including business and management, economics, organizational studies and entrepreneurship, technology, and science, among others. Accordingly, they propose a multistage definition of innovation. They define innovation as the processes through which organizations transform ideas into new/improved products, services or processes to advance and compete more successfully in the marketplace. Crossan and Apaydin (2010) describe innovation as the:

> production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems. It is both a process and an outcome (p. 1155).

Furthermore, Crossan and Apaydin (2010) recognize among other notions that innovation could be internally conceived or externally adopted because it goes beyond creative processes and includes applicability and value creation. In the absence of a unified description of innovation, existing definitions reflect the perspectives of researchers, practitioners and policymakers (Baregheh et al., 2009).

Despite the diversity of definitions, a commonality in most of the definitions of innovation is the aspect of development and implementation of something new and value-added. These aspects of development and implementation play a central role and are the distinguishing factors between an invention and an innovation. Although both concepts reflect new ideas, an invention is the first occurrence of a new idea, whereas innovation must lead to implementation (Engen, 2016). Scholars such as Høyrup (2010) argue that newness and value are the fundamental criteria for innovation; that is, an idea does not necessarily have to be absolutely new. It could be the adoption and/or adaptation of an existing idea in a new context or setting (Hughes, Lee, Tian, Newman, & Legood, 2018). This perspective suggests that innovation could be subjective because the perception of whether an innovation is new or not depends on the people and context in question (Renkema, 2018).

Inspired by Crossan and Apaydin (2010), I understand innovation in this dissertation to mean a new idea adopted, or new in the form of a product, a process or a service, or a combination of any of these, that creates value for one of the stakeholders when implemented in an organization. In the following section, I examine different approaches to understanding employees in innovation processes. I propose that the perspectives of formal and informal knowledge may be particularly valuable for linking employees' work behaviour with innovation processes.

2.2 Linking work behaviour and innovation

In their classic paper, Jensen et al. (2007) identify two ideal forms of knowledge and modes of innovation. The first mode, science, technology and innovation (STI), depends on the production and use of codified scientific and technical knowledge, otherwise known as formal knowledge. The STI mode primarily aims at generating new ideas and innovations of a technological nature developed by R&D departments and functional units. The concept is based on the classic assumption that innovation requires specific skills. The STI mode is commonly associated with a top-down view in which management decides how innovation is organized in a carefully articulated manner.

In contrast to this view is the perspective that relies on an experienced mode of learning known as doing, using and interacting (DUI) (Jensen et al., 2007). The DUI mode is considered an alternative but complementary approach to the STI mode. The DUI mode is built on the practice-based perspective stream of research (e.g. Brown & Duguid, 1991). This perspective

acknowledges the importance of knowledge from informal processes, meaning that it relies on initiatives from various work practices and therefore is associated with the bottom-up approach to innovation. The DUI mode recognizes innovation as being dependent on employees' resources and actions shaped by a combination of their experiences and interactions in the organization (Lundvall, 2010; Shore et al., 2009). Thus, it is often tacit and locally developed and "can be intentionally fostered by building structures and relationships, which enhance and utilize learning by doing, using and interacting" (Jensen et al., 2007, p. 684). This is also why empowerment can be useful for understanding EDI as will be discussed subsequently. The DUI mode thus offers an alternative view that can be essential for understanding EDI, in that employees' contributions to innovation are contingent upon how their innovation activities are embedded within their work practices (Høyrup, 2010).

Empirical studies show that both the STI and DUI modes are essential and that firms that combine these two modes of innovation can be more successful when it concerns improving their innovation capacity (e.g., Isaksen & Nilsson, 2013). As noted previously, the central notion of the DUI mode is that employees possess knowledge and skills that should be considered as innovation assets (Jensen et al., 2007). In the following, I discuss the EDI literature and synthesize its research stream.

2.3 EDI

Employee participation in organizational processes is a widely discussed phenomenon in a variety of disciplines, such as human resource management, psychology, economics, and strategy and technology management. Employees can participate in innovation by improving already existing products and services or designing new ones (Bäckström & Bengtsson, 2019; Lotz, 2018). However, their participation in innovation-related activities is what Kesting and Ulhøi (2010) describe as key to understanding EDI and also what differentiates EDI from other forms of organizational participation, such as employee voice (Kesting, Song, Qin, & Krol, 2015). Some scholars argue that EDI implies a more influential role for employees in the innovation process (Amundsen et al., 2014). EDI is thus described as the democratization of innovation (Hansen et al., 2017). Furthermore, Hansen et al. (2017) point out that employees' involvement entails the modification of managements' prerogative and decision-making structure. The consequence here is that certain decision-making rights are ceded to the employees directly, whereby individual employees are allowed to influence their workplace and work practices, or indirectly, whereby they exercise their influence through their

representatives. In essence, the argument by Hansen et al. (2017) lies squarely within the scope of empowerment in the workplace. This point will be addressed later in this chapter.

Recently, the phenomenon of EDI has attracted increasing attention and is studied in numerous fields (e.g. Bäckström & Lindberg, 2019; Holmquist & Johansson, 2019; Renkema, 2018). Described as a new research-based knowledge located within international and interdisciplinary research (Høyrup et al., 2018), EDI is characterized as an umbrella concept that covers a wide range of issues and processes (Høyrup, 2012). "All kinds of innovations are the concern of EDI as long as they break with existing routines and practices, and are beneficial for employees and management in the workplace" (Høyrup, Redien-Collot, & Teglborg-Lefèvre, 2018, p. 318).

In the literature, a significant proportion of empirical studies appear to focus on studying EDI from the perspectives of services and front-line employees. However, EDI is not peculiar to services or front-line employees alone, but also includes manufacturing sectors, processes and back-office employees (e.g. Lempiälä et al., 2019; Voxted, 2018). For instance, Voxted (2018) investigates how shop-floor employees developed new solutions to improve production flow in a manufacturing company. The crux of EDI builds on employees who may come up with creative ideas arising from their daily jobs that could lead to an improvement in the products, services offered and/or work processes (Felstead et al., 2020). However, this innovative contribution is generally beyond the scope of their regular duties (Kurz et al., 2018; Lempiälä et al., 2019) and is based on the direct participation of employees (Kesting, Song, Qin, & Krol, 2015).

The starting point for EDI is employees' internal desire for creativity, learning and development (Alasoini, 2013). As a result of this contribution made outside their regular activities (Høyrup, 2012; Kesting & Ulhøi, 2010), EDI is regarded as an extra-role behaviour (Buhl, 2018; Renkema et al., 2018). This is unlike employees in R&D and other innovation-specific roles whose job descriptions involve innovation, and who are therefore in-role innovators (Buhl, 2018). Extra-role behaviour such as EDI places employees in a precarious position as they are faced with the challenge of doing their jobs based on the established processes and procedures in the organization, and simultaneously learning and being innovators as they perform their work.

Several reasons and assumptions have been advanced for EDI. First, the changes in modern work–life and organizations have created the need for present-day employees to expect to take charge of their development and career (Kesting & Ulhøi, 2010; Price et al., 2012). There is

also a realization that managers and innovation experts are not warehouses of knowledge and creativity. Everyone in the organization may possess or develop the potential for creative thinking and can contribute to innovation in some way (Lempiälä et al., 2019; Aaltonen & Hytti, 2014). Employees' creative skills are thus embedded in learning processes that occur during their daily work activities (Høyrup et al., 2018). Today, there are more educated and knowledgeable employees in a wide variety of organizations (Kesting & Ulhøi, 2010). As Darsø (2012) suggests, employees with knowledge, skill and competence are the most crucial innovation component for the creation and development of innovative ideas. Therefore, through EDI, employees' potential can be made visible, recognized and exploited to the advantage of both the organization and its employees (Kesting & Ulhøi, 2010).

In the conceptualization of EDI, it is essential to recognize that it can be conceptualized narrowly or broadly. A narrow conceptualization implies that EDI is understood to be a bottom-up process, while a broader conceptualization implies a combination of bottom-up and top-down processes. Høyrup (2012) distinguishes three orders for EDI: the first order refers to a purely bottom-up process, while the second order is a mixture of bottom-up and top-down processes, and the third order is a purely top-down process whereby management invites employees to participate in innovation. In contrast to this categorization, Bäckström and Lindberg (2019) assert that EDI is primarily conceptualized as a bottom-up perspective because the foundation for successful EDI rests with the employees.

I view EDI as a bottom-up approach to innovation for two reasons. First, employees typically work at the bottom of the organizational pyramid. Second, even when management initiates or invites employees to participate, this is merely an inspiration to get involved in innovation. The concrete steps, from the emergence and search for an idea, are carried out by these employees with mere support from the management. In this way, EDI as an approach implies that employees are seen as the actual starting point in the innovation process (Hansen et al., 2017; Laviolette et al., 2016).

However, the core of EDI is that employees' resources, ideas, creativity, competence and problem-solving abilities *drive* innovation (Høyrup, 2010). Smith et al. (2012) emphasize that "to drive means both coming up with an idea and being involved in its implementation. It means more than just an inspiration" (p. 225). Indeed, it implies that employees who come up with creative ideas participate in their further development and implementation (Bäckström & Lindberg, 2018; Smith et al., 2012; Xin, 2016). I conclude my discussion on EDI with a synthesis of EDI research.

2.3.1 Synthesis of EDI research

To gain a broader view of how EDI has evolved, I performed a search of key EDI studies using the ISI Web of Science and Google Scholar from 2007 to 2020. I chose 2007 because it is the year that is associated with the beginning of modern EDI as a stream of research. I used the term *employee-driven innovation* and restricted my searches to predominately journal articles in the English language. However, I included one book chapter and a conference paper that I considered very important because of their contributions to EDI research. Based on my analyses, the research stream of EDI can be divided into three broad categories: articles dealing with the conditions that foster EDI, EDI processes and EDI outcomes. These studies provide a deeper understanding of EDI from different perspectives and settings. Nevertheless, there is no clear boundary between these three strands. Indeed, some papers overlap in one or more aspects in some form. Here, I briefly summarize the main themes of the synthesized studies (a full summary is presented in Appendix 1).

The first strand focuses on the conditions for EDI. These studies examine factors that support EDI in various domains within the organization. Some studies suggest that organizational characteristics may foster or hamper EDI. First in this group are earlier conceptual papers that discuss and propose the factors that drive EDI (Kesting & Ulhøi, 2010; Smith et al., 2012). Others include articles that link EDI to workplace learning and suggest that learning is essential for EDI (Askjær, 2018; Høyrup, 2010). Some empirical studies also shed light on management practices that facilitate EDI. Their findings show that management and/or leadership are vital for EDI (e.g. Hansen et al., 2017; Klapalová, 2018; Voxted, 2018; Wihlman et al., 2014). In particular, the role of managers is crucial for EDI, as managers create a work environment that is supportive for EDI. At the same time, managerial qualities are not always inherent but are learned with experience or over time (Hansen et al., 2017). Miao and Ji (2020) highlight how a top manager with little firm-specific knowledge could become a barrier to EDI. Overall, these studies provide insights into fostering EDI and dominate the literature. However, the numerous factors that foster EDI are at different levels in the organization and I have not found any overarching approach to EDI.

The second strand focuses on EDI processes in the organization. These papers address the processes of how creative ideas emerge and become implemented in the case organizations. They reveal that employee engagement in innovation activities emerges in different shapes and forms. Renkema et al. (2018) distinguish three routes through which initiatives emerge: namely, the organizational, formalized system or project initiative routes. Voxted (2018) uses a training

programme to involve shop-floor workers in developing new solutions. Bäckström and Lindberg (2019) examine how integrating web-based tools in daily work routines and tasks ensures employee involvement in practice. Other approaches include the co-design (Askjær, 2018), interventionist (Holmquist & Johansson, 2019; Haapasaari et al., 2017) and gaming approaches (Sorensen et al., 2018).

The third strand involves those works that demonstrate EDI as an outcome at the strategic level. These studies explicitly demonstrate EDI outcomes at different levels in the organization, such as work processes (e.g. Deslée & Dahan, 2018; Renkema et al., 2018) and organizational development (e.g. Lotz, 2018; Renkema et al., 2018). Deslee and Dahan (2018) elucidate these outcomes in terms of improvement in quality of service, improved working conditions and a resulting patent. Lotz (2018) find that a group of employees learned and developed a global training system that supported the overall standardization process in a multinational company.

However, despite this increasing academic attention being given to EDI over the past decade, scant research has been carried out on the quantitative measurement of the EDI construct. As previously stated, earlier qualitative studies provide relevant insights. Renkema et al. (2018) suggest that EDI comprises five phases, while others summarize EDI stages as three phases (Bäckström & Lindberg, 2019; Deslée & Dahan, 2018). Despite the progress in conceptualizing EDI and identifying its dimensions, it still lacks items to measure these dimensions. An important step in the conceptualization of a construct is to uncover the dimensions of that construct. Another crucial part is to create items to tap into these latent constructs. Furthermore, these studies suggest that EDI is a multidimensional construct, but this has not been subjected to a validation process and the psychometric properties have not yet been tested.

There is thus a clear need to complement existing studies and further investigate the EDI construct from the perspective of developing a quantitative measurement instrument for the construct. As previously stated, this will pave the way for quantitative studies in EDI that require an appropriate measurement instrument. Such studies will enable scholars to empirically test models and uncover specific factors that positively associate with EDI. Paper I addresses these issues and adds value to future quantitative EDI research through a preliminary validation of a measure for the EDI construct (RQ1).

As noted, management support is a precondition for employee participation in the innovation process because employees need what (Kesting & Ulhøi, 2010) call a “license” to venture out of their defined roles (p.75). Previous studies suggest that harnessing the creativity of

employees depends on the prevailing strategies where EDI strategies rest upon the active participation of employees in the entire innovation process (Bäckström & Lindberg, 2018; Smith et al., 2012). This brings to the fore the place of empowerment in enabling EDI. As such, it could be argued that both empowerment and EDI build on the same principle regarding subordinates' importance and greater participation in organizational processes. I now discuss empowerment in the workplace and subsequently link it to EDI.

2.4 Empowerment in the workplace and its main approaches

The general idea of empowerment is to authorize and increase the power of the under-represented (Bartunek & Spreitzer, 2006; Lincoln, Travers, Ackers, & Wilkinson, 2002). Empowerment emerged in the management literature in the mid-1980s with an emphasis on promoting productivity through approaches such as the participation of employees in decision-making and taking greater responsibility in the workplaces (Amundsen, 2014; Bartunek & Spreitzer, 2006; Humborstad, 2011; Spreitzer, 1996).

To empower has more to do with the transfer of power to another than influencing another and work designs that arise from empowerment approaches are characterized by autonomy, self-leadership, the delegation of responsibility and decision-making authority, among other things (Amundsen & Martinsen, 2015). Through empowerment, employees are encouraged to make certain decisions without recourse to their supervisors so that organizational dynamics are initiated at the bottom (Humborstad, Humborstad, Whitfield, & Perry, 2008). This occurs when the hierarchy that exists in an organization is flattened, which results in increased employee participation (Kanter, 1977). The discussion around empowerment touches upon the core of EDI as I will discuss in detail in the next section.

Over the years, two dominant approaches to employee empowerment have emerged gradually (Amundsen, 2019; Maynard et al., 2012; Seibert, Wang, & Courtright, 2011): that is, the *social-structural* and *motivational* approaches. Conceptually, social-structural empowerment comprises both social and structural empowerment (Amundsen, 2014). While the social-structural approach focuses on the organizational/contextual factors, the motivational approach is concerned about empowerment at the individual level. However, empowering practices associated with each perspective differ from each other (Amundsen, 2014; Humborstad, 2011). For my dissertation, I investigate empowerment from all three approaches (social, structural and motivational) as doing so allows me to explore the relationships that various empowering

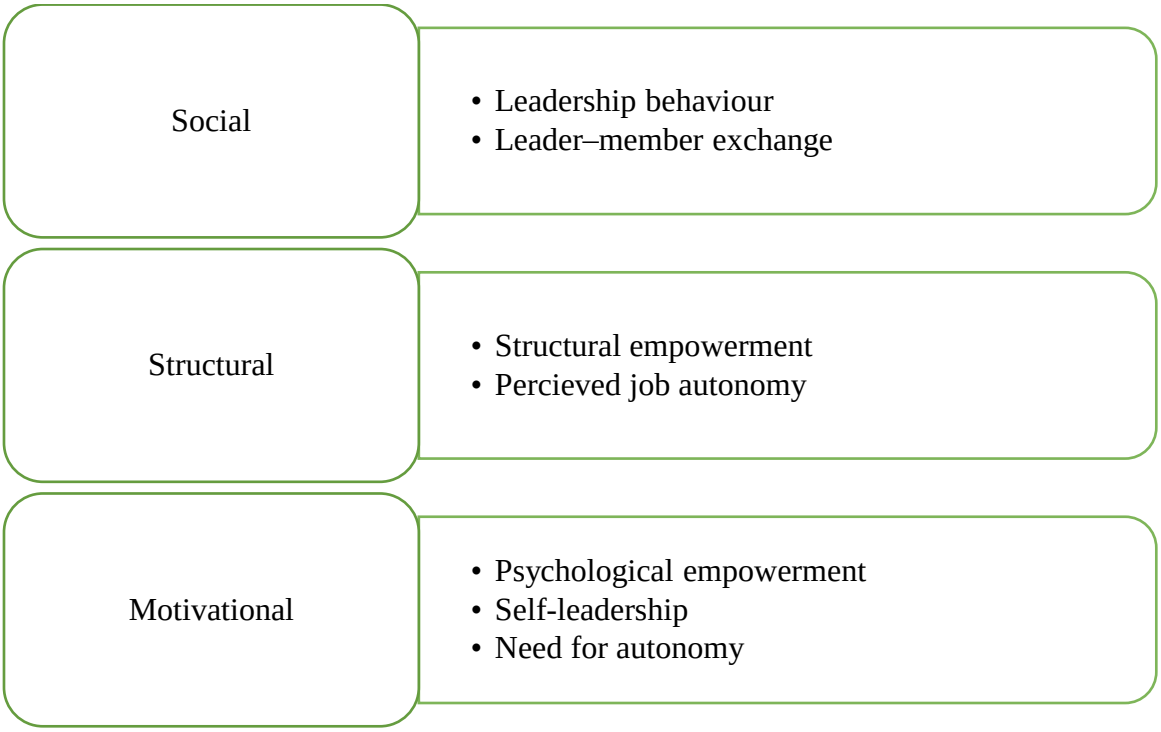
practices associated with each approach have with EDI more closely. Therefore, these three approaches influenced my choice of diverse research constructs based on the existing empowerment literature. My goal is to explore how empowerment practices at the organizational and individual levels correlate with EDI and also to understand if some empowering approaches and practices are more important for EDI than others. The different empowerment approaches and constructs in this dissertation are primarily chosen to investigate the empowerment perspectives to EDI (RQ2). Additionally, the empowerment constructs are also used to further validate the EDI scale (RQ1). Each of these empowerment approaches is discussed next.

The *social* approach, alternatively called the relational approach in the literature, focuses on the relationship between leaders and subordinates in which, for example, the leader's behaviour influences empowerment responses within employees (Amundsen, 2014). My focus here is to study how specific leadership behaviours and the quality of the relationship that exists between a leader and the subordinate correlate with EDI. I studied empowering leadership behaviour and leader–member exchange (LMX).

Next, the *structural* approach is connected to job designs and characteristics. This approach focuses on organizational structures and designs that transfer authority and responsibility down the organizational hierarchy (Maynard et al., 2012; Spreitzer, 1996). Here, I concentrated on how structural empowerment and perceived-job autonomy encourage or discourage EDI.

The *motivational* approach of empowerment is an individual's experience of feeling enabled, as pioneered by Conger and Kanungo (1988). My attention here is on psychological empowerment, self-leadership and need for autonomy. The various approaches and research constructs are summarized in Figure 1. I now elaborate more on the approaches and research constructs beginning with the social approach.

Figure 1: Empowerment approaches and research constructs



2.4.1 The social approach

Under the social perspective, I discuss the leadership literature more broadly. I present the notion of empowering leadership and examine directive leadership, which was chosen to highlight and contrast empowering leadership behaviour with less-empowering leadership behaviour. I conclude this section with a discussion of LMX theory.

Leadership is one of the most important phenomena in management research and practice (Hughes et al., 2018). Leadership refers to the influence on the attitudes and behaviours within groups and between groups to achieve goals (Bass & Stogdill, 1990). A leader plays a critical role in stimulating innovation (Islam, Tariq, & Usman, 2018; Scott & Bruce, 1994) and is regarded as a crucial predictor of innovation (Hughes et al., 2018). Crossan and Apaydin (2010) consider that the role of leadership is crucial for spearheading innovation as a process until innovation is achieved. Thus, the kind of leaders an organization has and the type of leadership behaviour exhibited by these leaders can stimulate specific positive or negative outcomes among subordinates (Hughes et al., 2018).

Leadership behaviours

Leadership theories are broadly divided into two major approaches: trait and behavioural approaches. The trait approach is based on the assumption that specific attributes are associated

with individual leaders, while the behavioural approach emphasizes what leaders and managers do (Amundsen, 2014; DeRue, Nahrgang, Wellman, & Humphrey, 2011). For my dissertation, I focused on behavioural approaches to leadership, as understanding leaders' behaviours determines how to harness them to improve upon individual and organizational outcomes (Divya & Suganthi, 2018). Research suggests that each leadership style has its attendant strengths and weaknesses, which determine the way leaders influence innovation (Kesting, Ulhøi, Song, & Niu, 2015). Therefore, the correlations between each leadership style and innovation range from positive to negative (Rosing, Frese, & Bausch, 2011). This suggests that different leadership styles will likely have different impacts on employees' behaviours and attitudes, which in turn influences the climate for innovation management. The impact each style has on innovation depends on the context, the culture of the organization in question and possibly also the stage of innovation (Kesting, Ulhøi, et al., 2015).

For instance, in a longitudinal study consisting of 60 teams, Lorinkova, Pearsall, and Sims (2013) find that groups led by a directive leader performed better than teams led by an empowering leader in the short run; however, teams led by an empowering leader performed better in the long run. In my view, this example illustrates that there is no one size fits all for leadership style and innovation. Nonetheless, empirical studies on the relationship between leadership behaviours and EDI remain scarce even though this has been suggested in the literature (e.g. Smith et al., 2012). I now focus on the specific leadership behaviours investigated in my dissertation more broadly.

In this regard, I compare empowering and directive leadership styles to understand which style has the greater likelihood of stimulating EDI. As I explained earlier, my choice of empowering leadership was influenced by the empowerment perspective that I adopted in this dissertation. Empowering leadership, as will be discussed in the next section, fits within the broad understanding of the social empowerment approach (Lee, Willis, & Tian, 2017; Wong & Kuvaas, 2018) as I stated above. Conversely, the directive leadership style was selected because of its contrasting nature to empowering leadership behaviour and the notion of empowerment in general (Yun, Neck, Cox, & Sims, 2006). In Paper III, I address the relationship between leadership styles and EDI. First, I examine empowering leadership behaviour.

Empowering leadership

Empowering leadership is generally defined as "behaviours that share power with subordinates" (Vecchio, Justin, & Pearce, 2010, p.531) and is based on theories of participation and self-

management (Sims, Faraj, & Yun, 2009), following the general idea of empowerment at work (Amundsen, 2014). Several attributes such as power sharing and leadership by example distinguish empowering leadership behaviours from other leadership styles. By sharing power with their subordinates, an empowering leader involves them in the organizational processes (Amundsen & Martinsen, 2014; Lorinkova et al., 2013; Wong & Kuvaas, 2018), resulting in the subordinates having the freedom and ability to make independent decisions (Cheong, Yammarino, Dionne, Spain, & Tsai, 2019; Slåtten, Svensson, & Sværi, 2011). An empowering leader involves the subordinates in decision-making through approaches such as coaching, informing, showing concern for subordinates (Boulu-Reshef et al., 2020; Fernandez & Moldogaziev, 2013) and self-confidence (Sims et al., 2009). These empowering leadership behaviours enhance the meaningfulness of work (Amundsen & Martinsen, 2014) and encourage followers to take the initiative to manage and control their behaviours (Yun et al., 2006). In the most recent conceptualization of empowering leadership, Amundsen and Martinsen (2014) identify two dimensions of empowering leadership as autonomy and development support. What these two dimensions have in common is "the leader's genuine interest in subordinates' motivation and development to work autonomously within the framework of the organization's goals and strategies" (Amundsen & Martinsen, 2014, p. 506).

Several empirical studies across different cultures and organizations suggest the positive impact of empowerment on organizational outcomes. For example, the study by Byun, Dai, Lee, and Kang (2016) involving 224 participants in South Korean firms shows that there is a positive relationship between empowering leadership and employee creativity. In two Norwegian studies (N = 233 and 161), Amundsen and Martinsen (2015) find empirical support that links empowering leadership to subordinates' work effort and creativity. In their meta-analysis, Lee et al. (2017) find evidence that suggests that empowering leadership has a positive effect on performance, organizational citizenship behaviour and creativity at both the individual and team levels. However, despite the numerous outcomes attributed to an empowering leadership style, it could sometimes be counterproductive, a term described as a burdening process of empowerment. Specific empowering leadership behaviours are sometimes said to negatively affect followers when such behaviour leads to increased job tension and reduced job performance (Cheong et al., 2016). Perhaps the possibility for empowerment to become a burden makes it important to empirically investigate empowering leadership in the context of EDI. I now turn my attention to directive leadership behaviour, a leadership style that is less

empowering. However, discussing it here does not mean that it is part of the social empowerment approach.

Directive leadership

Directive leadership refers to the leader's use of positional power, which is characterized as behaviours aimed at structuring subordinates with clear directions about goals and performance standards (Lorinkova et al., 2013; Martin, Liao, & Campbell, 2013). Directive leadership is linked to path-goal theory (House, 1996), which is "a dyadic theory of supervision" (p. 325). Therefore, directive leadership behaviour seeks to provide subordinates with the details, directions and expectations that they follow in making decisions (Polston-Murdoch, 2013). This happens through the reliance on positional power, which is sometimes referred to as coercive power. It is typically associated with descriptions such as direction, command, intimidation and reprimands as a primary mechanism to influence subordinates (Pearce et al., 2003; Sims et al., 2009). Unlike empowering leadership as described above, directive leadership makes the leader the main focus in the decision-making authority (Lorinkova et al., 2013) and much more predisposed to seek compliance from followers with respect to directives and goals (Boulu-Reshef et al., 2020).

Considering the behaviours ascribed to this leadership style and the possible outcomes, such as diminishing followers' self-leadership and limited input in the decision-making process (Yun et al., 2006), a negative effect on employees with a high need for autonomy may occur (Boulu-Reshef et al., 2020; Lee et al., 2017). Therefore, it is argued that this leadership style is contrary to the notion of empowerment (Yun et al., 2006). In their study, Martin et al. (2013) find that even though both empowering and directive leadership styles increased work unit core task proficiency, only the former increased proactive behaviours. Leaders that specify goals and directions for subordinates in advance and rewards and punishment (Lorinkova et al., 2013; Martin et al., 2013) are more likely to limit their subordinates' autonomy (Yun et al., 2006) and hinder their initiatives (Lee et al., 2017). Based on the above discussion, I argue that this type of leadership style may not be ideal for EDI to thrive. As a final point under the social perspective, I now discuss LMX.

LMX

The LMX theory focuses on the dyadic relationship that exists between leaders and each of their followers (Atitumpong & Badir, 2018; Dulebohn, Bommer, Liden, Brouer, & Ferris, 2011)

and was introduced initially as a vertical dyad linkage model (Schyns & Day, 2010; Uhl-Bien, 2006). Based on this theory, leaders develop differing relationships with each of their followers (Kuvaas, Buch, Dysvik, & Haerem, 2012). As such, the quality of the relationship between the leader and subordinate will have a substantial influence on whether leadership behaviours lead to favourable subordinate outcomes or not (Harris, Li, & Kirkman, 2014). This relationship ranges from one that is purely based on employment contracts (i.e. low-quality LMX) to one that goes beyond the employment contract, which is characterized by mutual trust, respect and reciprocal influence (i.e. high-quality LMX) (Graen & Uhl-Bien, 1995; Volmer, Spurk, & Niessen, 2012). Thus, a high-quality relationship will lead to a positive outcome and a low-quality relationship will lead to a negative outcome (Atitumpong & Badir, 2018; De Jong & Den Hartog, 2007). Where high-quality LMX exists, subordinates will have more opportunities to discuss new ideas, get regular feedback and gain from their supervisors' expertise (Atitumpong & Badir, 2018). On this basis, I consider LMX to be a socially empowering characteristic exhibited by subordinates, depending on how each employee subjectively perceives and interprets the quality of his/her relationship with their leader.

Empirical studies have linked high LMX with increased innovative behaviour (Javed, Khan, & Quratulain, 2018) and a positive relationship with citizenship behaviours (Ilies, Nahrgang, & Morgeson, 2007) and task performance (Martin, Guillaume, Thomas, Lee, & Epitropaki, 2016). Convincing evidence from a meta-analysis, including some mentioned here, suggests that LMX can be a mediator, antecedent or moderator (e.g. Dulebohn et al., 2011; Gottfredson & Aguinis, 2017). In this dissertation paper, LMX was investigated as a mediation mechanism between empowering and directive leadership behaviours and EDI. I view LMX in the context of EDI as the rating of the relationship between the leader and follower (Hughes *et al.*, 2018) and how the quality of this relationship influences employees' motivation to engage in EDI.

Above I discussed the social aspects of empowerment. I now continue with the *structural* part of this approach, beginning with structural empowerment.

2.4.2 The structural approach

Structural empowerment

Structural empowerment focuses on organizational conditions (Kanter, 1977). Maynard et al. (2012) suggest that structural empowerment revolves around job designs and their characteristics with a central focus on the transition of authority and responsibility from upper

management to employees. Kanter (1977)'s seminal book *Men and women of the corporation* is often described as the classic study in the development of structural theory. She argues that organizational characteristics are the main determinants of empowerment (Laschinger, Finegan, Shamian, & Wilk, 2004; Orgambídez-Ramos & Borrego-Alés, 2014) and that an employee's ability to complete his/her tasks is affected by both formal job characteristics and informal alliances (Laschinger et al., 2004).

The focus of structural empowerment is on the structures that exist within the organization that empower employees (O'Brien, 2010; Weidenstedt, 2017). Kanter (1977) argues that power does not necessarily come from formal authority, as exercised by the giving of orders. Instead, employees' empowerment comes through access to the power tools, namely opportunity, information, support and resources. This implies that empowerment for the employees lies in enabling them to carry out the tasks more meaningfully and effectively rather than just ceding authority to them to act (Fernandez & Moldogaziev, 2011; Humborstad, 2011). When employees have increased access to work empowerment structures, they are more likely to experience a feeling of personal empowerment (Laschinger et al., 2004). This in turn increases opportunities for innovative behaviour (Singh & Sarkar, 2019).

Perceived job autonomy

Perceived job autonomy refers to "the degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used in carrying it out" (Hackman & Oldham, 1975, p. 162). At its core is the notion of perceived control concerning one's job; that is, the extent to which individual employees understand that they have the freedom to make decisions and carry out their tasks as granted by their supervisors or work environment (Morrison, Cordery, Girardi, & Payne, 2005; Ng & Feldman, 2014; Smith et al., 2012). Ng and Feldman (2014) argue that individuals react positively to job autonomy when their jobs hold high levels of autonomy and they have a greater tendency to display more favourable job attitudes and job behaviours. Empirical studies suggest that perceived job autonomy is crucial and positively linked to a variety of work outcomes (De Spiegelaere, 2014; Ng & Feldman, 2014), such as employee performance, job involvement and innovative behaviours (Breaugh, 1985).

When a workplace environment provides a reasonable level autonomy, it allows employees to have a significant level of discretion on how to plan and execute their job tasks (Morgeson & Humphrey, 2006). Having a higher level of job autonomy means that employees assume greater

responsibility for their own decisions and initiatives, thus depending less on their supervisors (Hackman & Oldham, 1975; Yun et al., 2006). The extent that employees believe they can have a considerable impact on their work environment will influence how they react to it (Spector, 1986). This has an impact on the ability of employees to generate creative ideas because employees with high task autonomy are much more inclined to generate more creative ideas than those who do not (Smith et al., 2012; Zhou, 1998).

Therefore, giving employees more autonomy in their job will encourage them to go beyond their assigned roles and responsibilities (Axtell & Parker, 2003). Consequently, when a job is designed and structured in a manner that provides employees with high levels of autonomy, it will result in increased opportunities for EDI.

2.4.3 The motivational approach

Psychological empowerment

Spreitzer and Doneson (2005) define psychological empowerment as "a set of psychological conditions necessary for people to feel in control of their own destiny" (p. 314). Psychological empowerment was first introduced by Conger and Kanungo (1988), but has its foundation in social psychological theory based on personal development (Amundsen, 2014). Hence, it is described as an individual's perception of empowerment (Spreitzer, 1995). Psychological empowerment is less about the actual transition of authority and responsibility (Amundsen, 2014; Maynard et al., 2012), and more about employees' perceptions or cognitive states regarding empowerment (Maynard et al., 2012; Menon, 2001).

Psychological empowerment manifests in task assessments that enhance the worker's intrinsic motivation, that is, meaning, competence, self-determination and impact (Spreitzer, 1995; Thomas & Velthouse, 1990). Together, these four cognitions contribute additively to an overall and unitary second-order construct of psychological empowerment (Laschinger, Finegan, Shamian, & Wilk, 2001; Seibert et al., 2011). Meaning reflects how one feels that one's work is personally important (Knol & Van Linge, 2009). Competence refers to the belief in one's ability to successfully perform one's job (Laschinger et al., 2001) and is comparable with what Conger and Kanungo (1988) call self-efficacy. Even though Spreitzer uses the term "self-determination", it is used interchangeably with autonomy (e.g. Laschinger et al., 2001). Thus, autonomy/self-determination is about how employees perceive that they are free to choose how to initiate and carry out their tasks (Laschinger et al., 2004). Impact represents the degree to

which one views one's behaviour as making a difference in work outcomes (Spreitzer, 1995). Spreitzer's scale has become the dominant scale used to measure psychological empowerment.

Research suggests that psychological empowerment is a reaction to social-structural empowerment (Spreitzer, 1995). This perspective is supported by a number of empirical findings. For instance, Laschinger et al. (2001) find evidence to support psychological empowerment as an intervening variable between structural empowerment and employee effectiveness. Laschinger et al. (2004) show that perceived structural empowerment had direct effects on changes in psychological empowerment. Amundsen and Martinsen (2015) demonstrate that psychological empowerment is a mediator that links empowering leadership with employee work outcomes, such as creativity and work effort. In their meta-analysis, Seibert et al. (2011) report a significantly positive relationship between individual-level psychological empowerment and high-performance managerial practices, including structural empowerment.

On this basis, psychological empowerment was investigated as a reaction to structural empowerment, such that when employees psychologically interpret their jobs and job tasks positively, they have a higher tendency to influence work outcomes (Laschinger et al., 2001; Spreitzer, 1995), which enhances their motivation to engage in EDI.

Self-leadership

I understand self-leadership to mean the influence one exerts on oneself to establish the self-direction and self-motivation to perform (Houghton, Dawley, & DiLiello, 2012; Manz, 1986; Stewart, Courtright, & Manz, 2019; Williams, 1997). The primary focus of the concept is at the individual level, but it has also been extended to group-level analysis (Stewart, Courtright, & Manz, 2011). Self-leadership is rooted in several related theories of self-influence, including self-regulation, self-control, intrinsic motivation and self-management (Carmeli, Meitar, & Weisberg, 2006; Houghton & Neck, 2002; Neck & Houghton, 2006; Yun et al., 2006), and is hence described as self-empowerment. Although self-leadership is related to self-management, the latter relies on "extrinsic motivation and focus on behaviour". Conversely, self-leadership "incorporates intrinsic motivation and has an increased focus on the cognitive process" (Manz, 1991, p. 17). Self-leadership can be driven by internal or external forces (Stewart et al., 2011), where the internal forces originate from within the individual and the external forces emanate from contextual factors, ultimately influencing the exercise of self-leadership (Stewart et al., 2019).

Over time, three distinct but complementary strategies of self-leadership have emerged (Houghton et al., 2012; Prussia, Anderson, & Manz, 1998): behaviour-focused strategies, natural reward strategies and constructive thought pattern strategies (Houghton et al., 2012; Manz, 1992). Behaviour-focused strategies deal with behaviours that are targeted at self-discipline (Manz, 1992) and include behaviours such as self-observation, self-goal setting, self-correction, self-reward and self-cueing (Houghton, Carnes, & Ellison, 2014). The essence of these strategies is for one to become aware of them in order to develop behavioural management for necessary but unpleasant tasks (Neck & Houghton, 2006). Natural reward strategies focus on how individuals find enjoyment in a given activity, resulting in an incremental improvement in feelings of competence and self-determination (Houghton et al., 2012). This can occur in two ways, either by incorporating a more pleasant and enjoyable feature in a given activity or by moving attention away from the unpleasant aspects of the activity (Neck & Houghton, 2006). Constructive thought pattern strategies are internal and deal with directing thoughts in desirable ways (Manz, 1992), the idea being to channel thought patterns in a more optimistic and positive manner, which then impacts on performance positively (Houghton et al., 2012).

Self-leadership is vital for employees' performance in an empowering organization (Manz, 1986). The specific mention of empowering an organization is not in any way accidental. Instead, it shows that employee empowerment has a critical role in developing self-leadership capabilities. In an organization where employee empowerment abounds, self-leadership becomes a useful tool to achieve self-direction and motivation to perform well (Norris, 2008). Neck, DiLiello, and Houghton (2006) suggest that organizations should entrench the culture of self-leadership because self-leaders have a higher potential for innovation and creativity, especially when accompanied with a perception of strong supervisor and organizational support.

In general, self-leadership is beneficial at the individual level but depends on the context at the team level (Stewart et al., 2011; Stewart et al., 2019), related to higher individual performance (Neck & Manz, 1996), and is significantly associated with creativity (Amundsen & Martinsen, 2015). In summary, in their literature review, Stewart et al. (2011) and Neck et al. (2006) both show a positive correlation between self-leadership and several outcome variables. A number of empirical studies suggest that employees who exhibit self-leadership attributes are more likely to participate in innovation activities than those who are not self-leaders (Carmeli et al., 2006; Norris, 2008; Prussia et al., 1998), which also translates to EDI.

Need for autonomy

The need for autonomy refers to "a trait, predisposition, or an individual difference variable that refers to a personal need or eagerness to express one's initiative in doing one's job" (Yun et al., 2006, p. 377). Autonomy is a feeling in which individuals experience that one's thoughts, feelings and actions are self-governed based on one's volition (Legault, 2016). This implies the tendency for individuals to choose the activities that they want to engage in (Norris, 2008).

The need for autonomy is linked to self-determination theory (SDT), which is considered a macro theory of human motivation and focuses on issues such as personality development, self-regulation and universal psychological needs, among others (Deci & Ryan, 2008b). According to SDT, the need for autonomy, competence and relatedness represents three basic psychological needs that play a vital role in autonomous motivation (Deci & Ryan, 2008b; Ryan & Deci, 2000). Unlike other contemporary theories of motivation that see motivation as a unitary construct, the starting point for SDT is to distinguish various types of motivation (Deci & Ryan, 2008b).

Among other things, SDT explains the motivation behind choices that an individual makes without external influence or interference. It centres around the differentiation between autonomous and controlled motivation (Deci & Ryan, 2008a), suggesting that they differ concerning both their underlying regulatory processes and their accompanying experiences. Furthermore, behaviours are characterized depending on whether they are shaped by autonomous versus controlled motivation (Gagné & Deci, 2005). Individuals who are autonomously motivated experience volition, whereas those who are control motivated are pushed towards experiencing thinking and behaving in a certain way (Deci & Ryan, 2008b). In essence, the need for autonomy is considered an essential factor in determining the extent to which an individual experiences a sense of self-determination and intrinsic motivation (Neck et al., 2006).

Although self-leadership as discussed above and the need for autonomy are related, the need for autonomy is a latent trait usually manifested in attributes such as self-leadership (Yun et al., 2006). Employees whose need for autonomy are met appear to be more likely to take responsibility, participate in decision making, and practice self-leadership strategies (Norris, 2008; Ryan, Kuhl, & Deci, 1997) show more interest and engagement (Legault, 2016). In this dissertation, the need for autonomy was studied as predictor to both self-leadership and EDI.

There is also the question of how the social-structural and motivational approaches are related. I address this issue next.

2.5 The relationship between the empowerment approaches

As I said earlier, empowerment research has converged around two main approaches, that is, the social-structural and motivational approaches. The social-structural approach to empowerment deals with the conditions in the work environment that enable empowerment such as policies, structures and practices (Amundsen & Martinsen, 2015; Seibert et al., 2011; Spreitzer & Doneson, 2005). The motivational approach to empowerment represents employees' perception and interpretation of empowerment (Conger & Kanungo, 1988; Laschinger et al., 2001; Spreitzer, 1996).

In the early empowerment research literature, social-structural empowerment was assumed to be indicators of empowerment that enable employees. Today, these factors are regarded as antecedents of motivational empowerment (Seibert et al., 2011; Spreitzer & Doneson, 2005). Motivational approaches to empowerment are the employees' interpretation of social-structural empowerment (Amundsen & Martinsen, 2015; Camilla & Krishna, 2015; Corsun & Enz, 1999), as it underscores employees' reactions to social-structural empowerment conditions (Knol & Van Linge, 2009; Laschinger et al., 2004).

Therefore, social-structural empowerment in this dissertation is considered as management practices (e.g. structural empowerment and empowering leadership) that lead to individual perceptions of empowerment through employees' cognitions (e.g. psychological empowerment, self-leadership). These motivational aspects of empowerment are regarded as important empowering characteristics with subordinates that have the potential to convey the effect of empowerment practices at the organizational level on subordinate outcomes (Amundsen & Martinsen, 2014). These manifest in the ways employees act that directly or indirectly affect EDI.

In summary, the social-structural and motivational approaches of empowerment are complementary. Social-structural empowerment focuses mainly on the organizational (macro) level, whereas the motivational perspective focuses on the individual (micro) level (Humborstad, 2011; Weidenstedt, 2017). They do not necessarily show an either/or approach to empowerment. Both are important for enabling individuals and enhancing organizational performance (Wong & Kuvaas, 2018).

2.6 Linking empowerment to EDI

The link between empowerment and EDI resides in empowerment as an enabling process (Conger & Kanungo, 1988; Corsun & Enz, 1999) and as the basis for proactive behaviour (Knol & Van Linge, 2009). This is important in the context of EDI because employees work in organizations with structures, procedures and rules that can impede employees' creativity and potential for innovation (Pierce & Delbecq, 1977; Taylor et al., 2020). To an extent, employees' creative behaviour is determined by the factors that shape the innovation climate (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Sorensen et al., 2018). Jensen et al. (2007) argue that innovation arising from work practices can be enhanced if organizations build structures and relationships that support them.

Regarded as an extra-role behaviour (Buhl, 2018), EDI builds on employees' proactive actions, which are determined, shaped and constrained by their workplace context (Bindl & Parker, 2011). Studies highlight the importance of focusing on motivational factors that enhance employees' proactivity (Parker, 2000) as a relevant innovation driver (Dorenbosch et al., 2005). Scholars argue that a vital element of this proactive motivation is how employees show concern for issues or problems beyond their primary roles. Employees tend to engage in innovation when they exhibit more concern and ownership of the workplace's problems (Parker, Wall, & Jackson, 1997). Therefore, empowerment as an enabling process entails building conditions for heightening employees' motivation for task accomplishment by enhancing self-efficacy (Conger & Kanungo, 1988) and, in turn, increasing work performance (Cheong et al., 2016). "Empowered individuals do not wait passively for the work environment to provide direction; instead, they take a proactive approach toward shaping and influencing their work environment" (Spreitzer, De Janasz, & Quinn, 1999, p. 513).

Through empowerment practices, an organization enables employees to improve the effectiveness of their formally assigned work roles and further promote the proactive behaviours necessary to motivate employees into innovative behaviours (Cheong et al., 2016; Spreitzer, 1995). As stated previously, employees cannot drive or fully engage in innovations processes unless they participate in those organizational decision-making procedures by which innovations are triggered and determined (Kesting & Ulhøi, 2010). An organization can harness its employees' innovative potential if they involve their employees in organizational processes and provide them with more autonomy (Neves, Pires, & Costa, 2020), which is achieved through employee empowerment (Spreitzer, 1995). Organizations may not be successful with

innovation if they cannot lift their employees to the threshold where they become attentive to new ideas, needs, problems and opportunities that trigger innovation (Van de Ven, 1986). Empirical evidence suggests that empowerment can positively enhance an organization's innovativeness by creating an innovation climate for employees (Fernandez & Moldogaziev, 2013).

Employees who feel empowered through greater autonomy and participation in decision-making are more likely to show superior outcomes, develop their subordinates' potential, increase organizational effectiveness (Wong & Kuvaas, 2018) and significantly affect organizational outcomes (Menon, 2001). Granting autonomy and discretion about decisions would allow employees to initiate innovation and act on decisions in a novel and creative manner (Humborstad, 2011). When power and authority are shared with employees, they can make decisions or influence how they perform their jobs (Lashley, 1999). Employees can also be empowered to engage in innovation by providing them with the information, support, opportunities and resources to enable them to initiate and act on their ideas more effectively (Fernandez & Moldogaziev, 2013). It is argued that innovation is a function of context whereby innovative behaviours are engendered by these structural conditions (Kanter, 1988; Knol & Van Linge, 2009).

The literature acknowledges the leaders' crucial role as being the most salient in determining empowerment (Arnold, Arad, Rhoades, & Drasgrow, 2000; Martin et al., 2013; Sims et al., 2009) because they are the ones who energize and empower their followers (Menon, 2001). Considering EDI, the employees' participation is dependent upon management enabling and motivating them to participate in innovation. Previous studies have highlighted that EDI needs management (e.g. Kurz et al., 2018; Voxted, 2018) because regular employees cannot implement innovation on their own (Saari et al., 2015). The empirical findings by Brandi and Hasse (2012) indicate that leaders play a crucial role in transforming creative ideas initiated in the workplace into innovation. In their conceptual paper, Smith et al. (2012) identifies four main factors found to be significant for the development of EDI: management support, employee autonomy, cooperation and organizational norms for exploration. They further argue that management support is understood as the most important factor.

2.7 Research map and overall research model

I sum up my discussion on the theoretical perspectives with Figure 2 below. The figure primarily serves as a research map, but it also functions as an overall research model. As a

research map, I use Figure 2 to show the connections between the empirical papers in a single model. The research map links the four appended papers (Papers I–IV) together, as demonstrated in the dissertation. On the left of EDI (in the centre of Figure 2 highlighted in green), the focus is mainly on contextual factors. In contrast, on the right, the focus is predominately on individual-level variables. The contextual/organizational level is connected to management and the higher levels in the organization. In contrast, the individual revolves around employees. The organizational-level factors activate specific responses or behaviours among the employees that ultimately trigger EDI.

As an overall research model, I use the model to summarize the potential relationships that the various research constructs have with EDI as tested in the different empirical papers (Papers II–IV). However, this model does not show all the parts (direct relationships) that were tested in all the empirical papers as these are specified in details in the various papers. The model and the parts do not suggest a causal link, but rather correlations between factors. As previously stated, all but one of the factors are inspired by the empowerment perspective in this dissertation. In Paper II, psychological empowerment was investigated as a mediator between structural empowerment and EDI based on the premise that psychological empowerment is a reaction to structural empowerment (Laschinger et al., 2001; Spreitzer, 1995).

LMX was tested as a mediation mechanism between empowering leadership and EDI and directive leadership and EDI in Paper III. I argue that employees would react more willingly regarding EDI to a leader's actions characterized as empowering rather than directive. As such, EDI being an extra-role behaviour may not likely be imposed on employees. Instead, they can be enhanced through supportive leadership behaviours as exhibited by an empowering leader. Therefore, empowering leadership behaviour is more likely to result in a high-quality relationship (Anand, Vidyarthi, & Rolnicki, 2018; Dulebohn et al., 2011) and positively influence EDI. Conversely, directive leadership behaviour will result in low-quality relationships (Martin et al., 2016; Yun et al., 2006) and negatively impact EDI.

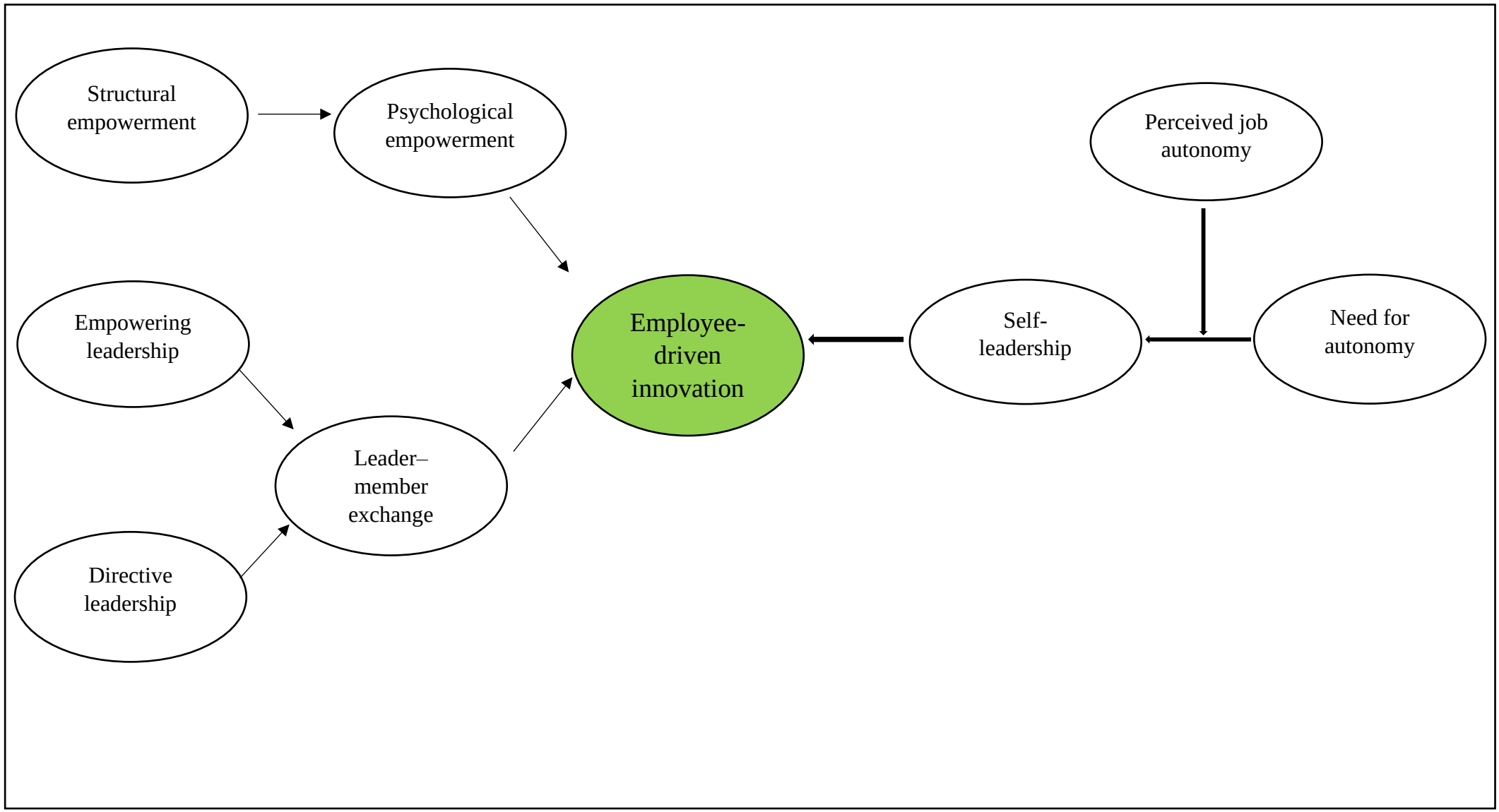
In Paper IV, self-leadership was tested as a mediator between the need for autonomy and EDI, while perceived job autonomy was investigated as a moderator between self-leadership and EDI. The premise for this is because self-leaders are considered a manifestation of the need for autonomy (Yun et al., 2006). Employees who are self-leaders are more likely to take responsibility (Norris, 2008), which increases the likelihood of participating in EDI. However, perceived job autonomy can influence the relationship between self-leadership and EDI (Dhar, 2016). This relationship will be stronger with higher perceived job autonomy and weaker with

lower perceived job autonomy. Table 1 summarizes the research constructs and their empirical positions.

Table 1: Research constructs and their empirical position

Papers	Constructs	Empirical position
II, III & IV	EDI	Outcome variable
II	Structural empowerment Psychological empowerment	Direct relationship Mediator
III	Empowering leadership Directive leadership LMX	Direct relationship Direct relationship Mediator
IV	Need for autonomy Self-leadership Perceived-job autonomy	Direct relationship Mediator Moderator

Figure 2: Research map and overall model



2.8 Sub-research questions (SRQs)

Based on my presentation of the theoretical perspectives, the following research sub-questions (SRQs) emerged.

SRQ1 How can EDI be conceptualized, operationalized and measured?

SRQ2 What is the relationship between structural empowerment and EDI, and how does psychological empowerment mediate this relationship?

SRQ3 What is the relationship between empowering and directive leadership styles and EDI, and how does LMX mediate these relationships?

SRQ4 What is the relationship between the need for autonomy, self-leadership and EDI, and how does perceived job autonomy moderate the relationship between self-leadership and EDI?

"When the mind is thinking it is talking to itself" Plato

3 Research methodology

In this chapter, I present and explain the methodological choices and designs for the empirical studies.

3.1 Methodological foundation

In research, certain ontological and epistemological assumptions are presumed (Gelo, Braakmann, & Benetka, 2008; Mehmet & Jakobsen, 2017). Epistemology deals with the study of the nature of knowledge (Mehmet & Jakobsen, 2017) while ontology concerns the study of the nature and characteristics of reality (Mehmet & Jakobsen, 2017; Moses & Knutsen, 2012). Methodology refers to the combination of methods and procedures employed to enquire into a specific situation (Easterby-Smith, Thorpe, Jackson, & Jaspersen, 2018). The methodological positions explain the procedures and nature of data collection and analysis during the research process.

Broadly, there are two leading contrasting epistemological positions in scientific research traditions (Gelo et al., 2008): positivism and constructivism (Easterby-Smith et al., 2018). Positivism represents the traditional form of research, typically seen as an approach to quantitative research; in contrast, constructivism is usually an approach to qualitative research (Creswell & Creswell, 2018). Based on the positivist view, it is assumed that the social world exists externally and should be measured through objective methods. On the other hand, constructivists believe that reality is determined by people rather than objective and external factors (Easterby-Smith et al., 2018; Gelo et al., 2008).

"Quantitative and qualitative research approaches differ in terms of how data are collected and analysed" (Gelo et al., 2008, p. 268). A quantitative research approach relies on the use of numerical data and statistical analysis. Conversely, the qualitative approach relies on verbal data such as texts, pictures and subjective analysis (Gelo et al., 2008; Saunders & Lewis, 2012; Silverman, 2011). Qualitative approaches are inductive as they involve moving from specific observations to broader generalization. Typically, qualitative methods are data-driven, focusing

on hypothesis generation and exploratory analysis (Gelo et al., 2008). In contrast, quantitative approaches are deductive, theory-driven and involve hypothesis testing, which implies explaining the relationships between variables (Gelo et al., 2008; Saunders & Lewis, 2012). Based on my stated research questions and aim, I followed a positivist tradition, which also influenced the choices I made subsequently.

3.2 Research design and context

Research design implies a general plan that explains and justifies the data that are to be collected, how and from where, as well as the analysis procedures (Easterby-Smith et al., 2018; Gelo et al., 2008; Iacobucci & Churchill, 2010). According to Gelo et al. (2008), research design links the philosophical foundations and the methodological assumptions of the research approach to its research method. The choice of research design depends on several factors, including the goals of the study, how much research exists on the topic already, the duration and level of the study, and the researcher's interest, training and experience (Saunders & Lewis, 2012).

Both the theoretical dimensions of EDI and the hypotheses in my dissertation were deductively derived from theories and I used empirical data to confirm or reject the hypotheses. Accordingly, I adopted a quantitative approach based on the positivist tradition as explained in the preceding section. For my research purpose, it was important for me to adopt a design that would enable me to acquire substantial quantitative information from respondents, whereby I could use measurement instruments that tap into the latent variables. However, this cannot be achieved without a reliable measurement instrument for the EDI construct.

In the absence of a quantitative measurement instrument for EDI, it was necessary to begin by developing a quantitative instrument for this construct. The existing investigations into EDI represent the theoretical conceptualization of the construct without items/indicators, whereas indicators/items are essential for quantitative empirical studies. As a latent variable, EDI can only be measured indirectly through items/indicators (Creswell & Creswell, 2018). This requires operationalizing the theoretically derived EDI dimensions into measurable items/indicators and applying a scale validation process to assess the latent structure of the construct based on the quantitative data generated from the respondents. Based on the developed instrument, I statistically analysed the relationship between EDI and empowerment-related factors. Nonetheless, developing an EDI instrument is a goal in itself as this closes a gap

in the literature. The remaining research constructs have well-established measurement instruments.

Therefore, considering the aim and duration of my dissertation, I chose cross-sectional/cross-lagged designs over longitudinal designs for the three empirical studies as they offered me the needed breadth of quantitative information necessary to adequately address my research questions within a reasonably shorter time frame. Cross-sectional designs involve the collection of information at one point in time while longitudinal designs emphasize collecting the same variables from the same respondents at several points in time. It was also not my intention to investigate development over time to adequately address my research questions, but only the covariation between constructs. However, cross-section studies might suffer from common method bias (MacKenzie & Podsakoff, 2012). Nevertheless, this concern was addressed through some research design remedies and will be discussed subsequently.

Studies 1 and 2 were based on two cross-sectional studies. In Study 3, I adopted a cross-lagged design in a single study whereby the independent and dependent variables were separated in time. I did this to minimise the effect of common method bias as will be discussed later (Conway & Lance, 2010). Data were collected using a survey methodology with preferred items that were intended to tap into the constructs of interest. The choice of surveys was for several reasons. Data collection procedures such as questionnaires are deemed most appropriate in these kinds of studies due to their ability to acquire substantial quantitative information from respondents. Survey-based data collection offers a researcher the advantage of achieving a high response rate at a relatively lower cost and in a shorter time frame (Creswell & Creswell, 2018; Iacobucci & Churchill, 2010).

I chose Likert-type scales for my surveys, as they are recommended for measuring latent variables, easy to understand and do not compel respondents to answer specific questions if they do not want to (Joshi, Kale, Chandel, & Pal, 2015). The surveys for Studies 1 and 2 were rated on a 7-point Likert-type scale (1 = strongly disagree to 7 = strongly agree). I began with a 7-point Likert-scale to offer the respondents more response options (Leung, 2011). However, I changed this in Study 3 and measured the surveys on a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree). The decision to change to a 5-point Likert-type scale was based on my experience with Studies 1 and 2. I realized that doing this might reduce the time it took to complete the survey, thereby improving the response rate without impacting the reliability of the instruments. In addition, the literature indicates that there is no significant difference between the two types of scales (Leung, 2011). Similarly, both scales enabled me to give my

respondents room to take a neutral position between disagreement and agreement on specific questions because they have midpoints (Chyung, Roberts, Swanson, & Hankinson, 2017).

The surveys were designed and administered on two online platforms, Checkbox[2] and Nettskjema.[3] Checkbox was used for Studies 1 and 2, while Nettskjema was used for Study 3. The choice of the two software packages was in line with the approved guidelines for data collection from Inland Norway University of Applied Sciences and the Norwegian Centre for Research Data (NSD). Because Nettskjema replaced Checkbox from 2019 (Innafor, 2019), this explains why Checkbox was used for Studies 1 and 2 and Nettskjema for Study 3.

The surveys were administered to employees in three service contexts: one public and two private sector organizations in Norway. The choice of the service sector was primarily influenced by the service-oriented focus of the doctoral programme[4] I was enrolled into and the importance of this sector. The Norwegian service sector is well developed. It contributes 56.8% of gross domestic product and employs over three-quarters of the population (78.9%),[5] representing a growth of 2.9% since 2015.[6] The choice of these three organizations was based on their interest in enhancing the engagement of employees in innovation processes and my access to these organizations. However, empowerment as an enabling process and employees' innovation activities arising from their work activities is not peculiar to only the service sector. Nevertheless, the service sector offers an interesting setting for exploring empowerment and EDI. In the face of rising competition, demand for better services, employees need more latitude in doing their jobs (Boshoff & Allen, 2000).

Study 1 was conducted in the Norwegian Welfare and Labour Administration (NAV), which is responsible for public labour and welfare services. The setting for Study 2 was Nordic Choice Hotels, who operate over 200 hotels in the Nordic region. Study 3 was carried out in a commercial bank.[7] Whereas the private sector is more profit driven, the public sector is largely driven by public value (Boyne, 2002; van den Bekerom, van der Voet, & Christensen, 2021). I used a combination of data from both public and private sector organizations to enable me obtain perspectives from both sectors and run multi-group analyses as discussed later in this chapter. Studies 1 and 2 formed the bases for Papers I and II while Study 3 was the basis for

[2] https://www.checkbox.com/
[3] https://www.uio.no/english/services/it/research/sensitive-data/use-tsd/datacollection/nettskjema/index.html
[4] https://eng.inn.no/study-opportunities/catalogue/economics-management-and-innovation/phd-innovation-in-services-in-the-public-and-private-sectors-insepp
[5] https://www.nordeatrade.com/no/explore-new-market/norway/economical-context
[6] https://www.worldatlas.com/articles/the-economy-of-norway.html
[7] The commercial bank requested not to be identified.

Papers III and IV. Table 2 summarizes the central aspects applied in each of the four empirical papers.

Overall, the methodological choices outlined above afforded me the possibility to adequately investigate the research questions in my dissertation. The quantitative methods, particularly the use of surveys and statistics, fit better in the scale development and understanding correlational mechanisms (Easterby-Smith et al., 2018). I would neither have been able to develop a quantitative measurement instrument for EDI without adopting some of these specific approaches nor would I have been able to test my hypotheses as I did in the various empirical studies. Through these methods and techniques, I was able to generate more knowledge about the items to measure the various EDI dimensions, assess their psychometric properties and the factors that associate with EDI and thereby advance the understanding of EDI.

Table 2: Overview of the central aspects of the four papers

Paper	Purpose of the study	Respondents/Samples	Context	Data collection	Measures	Main analyses
I	To conceptualize, operationalize and preliminarily validate a scale to measure EDI	288	Public (NAV) and private sector organization (hotel)	Cross-sectional, survey	Emergence of an idea, idea search, idea generation, idea communication, idea development, idea prototyping, and implementation	EFA, CFA, multigroup analysis and second-order CFA
II	To develop and test a model linking structural and psychological empowerment to EDI	Study 1: 228 Study 2: 60	Study 1: Public sector organization (NAV) Study 2: Private sector organization (hotel)	Cross-sectional, survey	EDI, structural empowerment, psychological empowerment	CFA, SEM and mediation
III	To explore the relationship between different leadership styles and EDI and the mediating role of LMX	315	Private sector organization (a bank)	Cross-lagged, survey. Independent and dependent variables separated in time (T1 and T2)	Empowering leadership, directive leadership, LMX, EDI	CFA, SEM and mediation
IV	To determine the association between individual-level variables and EDI	315	Private sector organization (a bank)	Cross-lagged, survey. Independent and dependent variables separated in time (T1 and T2)	Self-leadership, EDI, need for autonomy, perceived job autonomy	CFA, SEM, mediation and moderation

Notes:

- The surveys for Papers I and II were conducted at the same time, while the data for Papers III and IV were collected in two phases, with independent and dependent variables separated in time.
- There was a time lag of 10 days between time one (T1) and time two (T2).
- EFA, exploratory factor analysis; CFA, confirmatory factor analysis; SEM, structural equation modelling.

3.3 Reliability of measures and validity of findings

The consideration of reliability and validity is necessary for quantitative research as these are taken to be the two most essential elements in quantitative research. Reliability deals with the quality and accuracy of the research instrument (Drost, 2011; Heale & Twycross, 2015) while

validity is about the legitimacy of findings (Venkatesh, Brown, & Bala, 2013). Reliability and validity are ways through which a researcher demonstrates and communicates the rigour of research processes and the trustworthiness of results (Roberts & Priest, 2006). The need for validity and reliability is attributable to the quantification of human behaviour using a measurement instrument (Drost, 2011).

3.3.1 Reliability of the constructs

The techniques used to assess reliability are broadly divided into stability and consistency reliability (Drost, 2011; Mohajan, 2017). Stability is further categorized into test–retest reliability and parallel-form reliability. Consistency is subdivided into internal consistency and split-half reliability (Mohajan, 2017).

I assessed the reliability of my measures based on internal consistency, and subsequent discussion here will focus on this. Internal consistency refers to the reliability of the test components. Therefore, it aims to demonstrate how consistent and well the instrument and questions measure a particular construct (Drost, 2011). The coefficient alpha is the most commonly used method to assess internal consistency as popularized by Cronbach in 1951, and thereby typically referred to as Cronbach's alpha (Drost, 2011; Gerbing & Anderson, 1988; Roberts & Priest, 2006). In addition to Cronbach's alpha, Raykov's factor reliability coefficient (Raykov & Shrout, 2002) has become an alternative to Cronbach's alpha or is used in addition. Raykov's reliability coefficient (RRC) is "commonly seen as more accurate than Cronbach's alpha" based on confirmatory factor analysis (CFA) (Mehmet & Jakobsen, 2017, p. 304). The general consensus is that .70 is the acceptable minimum for both Cronbach's alpha and RRC (Taber, 2018); however, this does not necessarily mean that lower values of alpha should be taken as an absolute indication of an unsatisfactory instrument (Taber, 2018).

In addition to Cronbach's alpha and RRC, composite reliability was used to assess the internal consistency of the scales in Study 2 in Paper II. The computation of composite reliabilities was in line with recommended guidelines for studies using partial least squares structural equation modelling (PLS-SEM) (e.g. Hair, Risher Jeffrey, Sarstedt, & Ringle, 2019; Venturini & Mehmet, 2019). When considered across the four papers in this dissertation, internal consistency reliabilities were satisfactory. Cronbach's alpha coefficients for most constructs ranged from moderate to excellent, while RRC reliabilities for most of the constructs were above the required minimum. Despite this, common method bias remains a threat to validity,

and this issue will be addressed later in this chapter. Table 3 summarizes the values for Cronbach's alpha, RRC and composite reliability for all the constructs as applied in the four papers.

Table 3: Reliabilities for the constructs used in this dissertation

Paper	Construct	Dimensions	Cronbach's alpha	Raykov's reliability	Composite reliability
I	Employee-driven innovation	Emergence and search for ideas Idea generation Idea development and implementation	.85 .87 .91	.86 .87 .92	
II	Employee-driven innovation	Emergence and search for ideas Idea generation Idea development and implementation	.89 .88 .92	.87 .88 .92	.85
	Structural empowerment	Opportunity Information Support Resources	.90 .80 .85 .74	.87 .79 .85 .74	.90
	Psychological empowerment	Meaning Competence Autonomy Impact	.87 .87 .90 .94.	.87 .85 .90 .94	.82
III	Employee-driven innovation	Emergence and search for ideas Idea generation Idea development and implementation	.76 .70 .84	.70 .84 .81	
	Empowering leadership		.75	.81	
	Directive leadership		.76	.80	
	Leader–member exchange		.79	.80	
IV	Employee-driven innovation	Emergence and search for ideas Idea generation Idea development and implementation	.76 .70 .84	.70 .84 .81	
	Self-leadership	Behaviour awareness and volition Task motivation Constructive cognition	.63 .80 .63	.64 .63 .60	
	Perceived job autonomy Need for autonomy		.77 .80	.80 .81	

3.3.2 The validity of the research findings

According to Venkatesh et al. (2013), validity in quantitative research can be categorized as *design validity* (i.e. internal and external validity), *measurement validity* (e.g. construct validity) and *inferential validity* (e.g. statistical conclusion validity). Internal validity refers to whether the observed co-variation between independent and dependent variables reflects a causal relationship, while external validity is the extent to which the results of a research study can be generalized across time, settings and organizations (Shadish, Cook, & Campbell, 2002). Internal and external validity will be discussed subsequently. "Traditionally, support for the validity of instruments has been determined by examining construct, content, and criterion-related concepts" (DeVon et al., 2007, p. 155), otherwise called measurement validity. I discuss the specific aspects that are most relevant to this dissertation, particularly construct validity, criterion-related validity, internal validity and external validity.

Construct validity

Construct validity answers the question concerning whether the instrument measures the construct it purports to measure (Bagozzi, Yi, & Phillips, 1991; DeVon et al., 2007; Garver & Mentzer, 1999; Iacobucci & Churchill, 2010). It is supported if the instrument's items are related to its operationally defined theory and concepts (DeVon et al., 2007). As previously stated, most of the instruments are well-established measures of their respective constructs; they all showed construct validity across all studies as shown later in this chapter. I will focus my discussion here on the construct validity of the EDI scale. As noted, I employed a deductive approach during the scale development process. EDI was theoretically conceptualized as a foundation for scale development, in addition to the examination of previous qualitative studies in which EDI was studied. This resulted in the identification of seven dimensions of EDI that were operationalized into 4-5 item scales, where some of the items were adopted from related scales (e.g. De Jong & Den Hartog, 2010; Lukes & Stephan, 2016) and others were newly created. The new items were generated through group discussions with colleagues. The instrument was then subjected to a pilot study, and based on the feedback, the items were revised before the survey was launched.

The CFA of the theoretically derived first-order measurement model (i.e. emergence of an idea, idea search, idea generation, idea communication, idea development, idea prototyping and idea development) produced a combination of acceptable and unacceptable fit indices. It also did not demonstrate adequate discriminant and convergent validity. Furthermore, the CFA revealed

high intercorrelation between some factors. For instance, the correlation between the emergence of an idea and idea search was .89, idea implementation and idea development .98, idea prototyping and idea implementation .90, and idea development and idea communication .81. As a result, a step was taken backwards in the scale development process to elucidate the underlying dimensions of EDI. Scholars have suggested that one approach to achieve this is exploratory factor analysis (EFA) (Acock, 2013; Mehmet & Jakobsen, 2017), which is a useful approach in the early stages of scale development and has been widely applied (e.g. Amundsen & Martinsen, 2014; Clauss, 2017).

A combination of EFA and CFA clearly showed that EDI, based on my data, is a second-order reflective construct made up of three dimensions: emergence and search for ideas (four items), idea generation (three items), and idea development and implementation (six items), and thus measured with a total of 13 items. The CFA was performed using a cross-validation sample. The second-order reflective construct was further employed in Papers II–IV.

When considered across the four papers, the CFA of EDI showed satisfactory model fit. All the items loaded significantly on their respective constructs (range .49–.90, $p < .001$). Campbell and Fiske (1959) suggest that construct validity can be assessed through an examination of convergent and discriminant validity. Garver and Mentzer (1999) define convergent validity as "the extent to which the latent variables correlate to items designed to measure that same latent variable", while discriminant validity refers to "the extent to which the items representing a latent variable discriminate that construct from other items representing other latent variables" (p. 35).

The discriminant and convergent validity can be assessed based on several approaches such as average variance extracted (AVE) analysis (Fornell & Larcker, 1981), the multitrait-multimethod (MTMM) correlation matrix (Campbell & Fiske, 1959), CFA MTMM (Bagozzi et al., 1991), and more recently the heterotrait-monotrait (HTMT) ratio of the correlations approach proposed by Henseler, Ringle, and Sarstedt (2015). In this dissertation, AVE analysis was used to assess both convergent and discriminant validity (Hair et al., 2019). Ideally, an AVE value larger than .50 is evidence of convergent validity (Fornell & Larcker, 1981; Mehmet & Jakobsen, 2017). AVE values that are larger than the squared correlation among latent variables is an indication of discriminant validity (Fornell & Larcker, 1981). In line with this rule of thumb, all constructs in Paper I showed evidence of construct validity. In Paper II (Studies 1 and 2), all constructs also demonstrated construct validity. In Papers III and IV, all

constructs showed evidence of construct validity except emergence and search for ideas. This is understandable since the EDIS is a newly developed scale and requires continued validation. However, the EDIS was not checked for its discriminant validity compared with the most closely related scale for innovative work behaviour.

Criterion-related validity

Criterion validity is seen as a more reliable form of validity than content validity. Criterion-related validity is also related to construct validity in the sense that it is used to establish evidence of construct validity. This is done by assessing how well a measure correlates with, and predicts, an outcome or a predictor variable (Roberts & Priest, 2006). Criterion-related validity can be established by (1) the concurrent validity, and (2) the predictive validity (Kimberlin & Winterstein, 2008; Mohajan, 2017). What differentiates them is "in terms of whether the test and criterion data are collected at the same time" (Messick, 1980, p. 1016) (i.e. concurrent), or whether the measure is assessed before the criterion in time (i.e. predictive). Between the two, predictive validity is often regarded as more powerful (Amundsen, 2014). In this dissertation, both predictive validity and concurrent validity were assessed. Considered across all four papers, the EDIS showed both concurrent and predictive validity, demonstrating concurrent validity with psychological and structural empowerment, as well as showing predictive validity with empowering leadership, LMX and self-leadership.

Internal validity

According to Shadish et al. (2002), internal validity concerns the extent to which the relationship between the independent and dependent variables reflects a causal relationship. Three conditions must be satisfied before such a claim can be made: (1) the cause precedes the effect; (2) the cause and the effect occur together; and (3) there is no contrary explanation for the observed co-variation (Shadish et al., 2002). Based on these conditions, coupled with the designs employed in this dissertation, I cannot draw causal conclusions about the relationship between my predictors and EDI; instead, the findings only suggest that the variables are correlated.

External validity

External validity refers to the applicability of the research findings to other populations and other situations (Drost, 2011; Roberts & Priest, 2006; Winter, 2000), and is hence referred to as generalizability. It is a broad concept that has been addressed from several perspectives,

including both theoretical and empirical statements (Amundsen, 2014). Winter (2000) notes that the degree to which research work is believed to be generalizable is a factor that clearly distinguishes qualitative and quantitative research approaches.

To a large extent, the method of sample selection has the potential to enhance external validity. Owing to the difficulty of conducting a census that involves the entire population of interest, sampling has become a crucial element in research design (Iacobucci & Churchill, 2010). In quantitative research, the sampling procedure should be aimed at choosing random samples that represent the population so that the results can be generalizable (Gelo et al., 2008). Ideally, this can be achieved through probability sampling that offers each individual in the population an equal probability of being selected (Creswell & Creswell, 2018). However, sometimes, it may be difficult or impossible to obtain a random sample (Creswell & Creswell, 2018), and in reality, various forms of non-probability sampling are employed, although non-probability sampling methods also have their shortcomings.

All the samples that were used in this dissertation were based on a non-probability sampling approach, which may have impaired the external validity. Notwithstanding, the strength in the external validity is that the samples were drawn from both the public and private sectors. Likewise, it is also important to note that all the data used in the four papers were gathered from Norwegian organizations, which may limit the generalizability of the results to non-Norwegian organizations. The Norwegian working environment, as in the rest of Scandinavia, is known for its flatter structure that may support EDI and empowerment.

Considered across all four papers, the EDIS was employed in three work settings: a public organization, a hotel and a bank. In Paper I, three sets of multigroup analyses were performed to examine whether the model was psychometrically equivalent across groups within the same sample (i.e. a combined sample from public and private organizations). Overall, the majority of the parameters tested were equal across user contact, organizational affiliation and job category, suggesting that the measurement model of EDI was stable and replicable. In general, the EDIS was stable and consistent, which gave preliminary evidence for promising external validity of the EDIS. Concerning the external validity of the relationship between variables, the predictive power of structural and psychological empowerment was consistent in both studies in Paper II.

3.4 Common method variance

Common method variance (CMV) arises when self-report questionnaires are used to collect data at the same time from the same participants (Chang, Witteloostuijn, & Lorraine, 2010; Conway & Lance, 2010; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). According to Podsakoff et al. (2003), CMV is a "variance that is attributable to measurement method rather than to the constructs they measure" (p. 879). CMV arises from four primary sources: common rater effect, item presentation, the context in which items are placed and the measurement context (Chang et al., 2010; Williams & McGonagle, 2016).

The key to controlling common method bias is to identify what the measures of the predictor and criterion variables have in common and eliminate or minimize bias through the design of the study (Podsakoff et al., 2003). The literature highlights two options: *ex ante* and *ex post* approaches (Chang et al., 2010; Conway & Lance, 2010; Podsakoff et al., 2003). *Ex ante* remedies are implemented at the design stage of the study, whereas *ex post* remedies are performed after the study has been conducted and typically involve statistical controls (Chang et al., 2010; Podsakoff et al., 2003). Chang et al. (2010) emphasized that "the obvious strategy is, of course, to avoid any potential CMV in the research design stage" (p. 179). *Ex ante* remedies include using different sources for dependent and independent variables, using time lags to separate independent and dependent variables, counterbalancing question order, and ensuring respondent anonymity and confidentiality; the latter can help reduce rater's evaluation apprehension (Podsakoff et al., 2003). Possible *ex post* remedies include Harman's single factor test, the partial correlation procedure and the use of marker variables, among others (Chang et al., 2010; Podsakoff et al., 2003).

In this dissertation, all the surveys that the empirical analyses were based upon used ratings from the same source, which might be a source of common method bias. To control and minimize method bias, several *ex ante* remedies were implemented. In all four papers, the surveys started with a cover letter in which respondents were assured of their anonymity and confidentiality. The literature suggests that protecting the anonymity of the respondents can help to minimize both evaluation apprehension and response bias (Podsakoff et al., 2003). In addition, the order of the items for each survey was counterbalanced. This procedure is suggested as a remedy to neutralize bias in item embeddedness or question context (Conway and Lance, 2010). Additional steps were taken in Papers III and IV. As noted, the variables were separated in time by collecting data in two waves. For Paper III, exogenous variables,

which included empowering leadership and directive leadership were measured at T1, whereas the endogenous variables LMX and EDI were measured at T2. In Paper IV, self-leadership and the need for autonomy were measured at T1 whereas EDI and perceived job autonomy were measured at T2. There was a time lag of 10 days between T1 and T2.

3.5 Data analyses techniques

Data analysis refers to the processes and procedures aimed at inspecting, editing, sorting, transforming and modelling empirical data to understand a particular phenomenon, improving decisions or suggesting conclusions (Iacobucci & Churchill, 2010). It has to do with the processes and procedures deployed by the researcher to examine the data to address the research questions and test the hypotheses (Gelo et al., 2008). Ideally, the data analyses techniques depend on the nature of the study. Each method of analysis has multiple approaches, encompassing diverse techniques in different research traditions and paradigms (Tafesse, 2014). Because the empirical studies were based on quantitative datasets, it was natural to employ statistical techniques. Consequently, the remainder of the discussion here will focus on methods that are strictly for analysing quantitative data.

A mixture of techniques and analyses was deployed, including correlation analysis, EFA, CFA, multigroup analysis, SEM, mediation analysis and moderation analysis. The discussion here will be limited to EFA, CFA, SEM and mediation analysis because they were the most important techniques employed in this dissertation.

EFA was employed only in Paper I. It is a commonly used procedure in scale development to analyse the relationships in extensive data (DeVon et al., 2007). Mehmet and Jakobsen (2017) note that EFA is used primarily for two reasons: to examine the dimensionality of a set of variables and to reduce a large number of variables down to a meaningful and manageable number of factors. In Paper I, EFA was employed to reduce the item pool and to identify the dimensions of EDI. EFA helps researchers identify the various factors that define the construct of interest and usually precedes CFA in scale development (Brown, 2014; Mehmet & Jakobsen, 2017). “CFA is a type of SEM that deals specifically with measurement models; that is, the relationship between the observed measures or indicators and latent variables or factors” (Brown, 2014, p. 1). In scale development, CFA is almost always used to examine the factor structure of the instrument (Brown, 2014; Mehmet & Jakobsen, 2017). Apart from the psychometric evaluation of a test instrument, CFA is used for construct validation, method

validation and measurement invariance evaluation, and is used as a precursor to SEM (Acock, 2013; Brown, 2014). Unlike in EFA, the number of factors and the pattern of indicator factor loadings are specified in advance (Mehmet & Jakobsen, 2017). Accordingly, CFA was used to assess the latent structure and measurement invariance of the EDIS in Paper I.

SEM has emerged as one of the advanced statistical techniques in the social sciences. It combines aspects of factor analysis and regression, thereby allowing for assessment of measurement theory and structural theory (Hair, Hult, Ringle, & Sarstedt, 2017). SEM is based on the general linear model approach. It has several advantages over traditional techniques such as regression analysis, among others, and the specification of constructs measured by multiple observed variables and estimation and removal of measurement error associated with constructs (Amundsen, 2014). This dissertation relied on variables measured indirectly by indicators, which justified the use of SEM. SEM can be co-variance-based SEM (CB-SEM) or PLS-SEM. CB-SEM is more popular and therefore more widely used in the social sciences. However, the use of PLS-SEM is gaining ground, especially with the availability of PLS-SEM software. Unlike CB-SEM, PLS-SEM is especially useful when the sample size is small (Hair et al., 2019; Wong, 2019).

Naturally, a SEM model is made up of two components: the measurement model and the structural model. The measurement model states the number of factors and their relationship with the indicators. The structural model specifies how the factors relate to one another. In Papers II–IV, the measurement models were validated using CFA while SEM was used to test the structural models. Except for Study 2 in Paper II, where PLS-SEM was used due to the limited number of participants, all other analyses were performed based on CB-SEM.

In Papers I and IV, SPSS and Stata were used for the analyses; in Paper II, Stata was deployed, and in Paper III, AMOS was used. Several model fit indices were evaluated: (a) test statistics, degrees of freedom and significance level for the chi squared test; (b) the root mean square error of approximation (RMSEA) and 90% confidence intervals (CIs), with values of .05 indicating a close fit (Acock, 2013) and values <.10 an acceptable fit (Mehmet & Jakobsen, 2017); (c) the standardized root mean square residual (SRMR) with values ≤.10 indicating a good fit (Mehmet & Jakobsen, 2017); and (d) the comparative fit index (CFI) and the Tucker–Lewis index (TLI) with values >.90 generally indicating an acceptable fit (Acock, 2013). In Study 2 in Paper II, the criteria outlined by Hair et al. (2019) were used for the evaluation of the model. These include indicator loadings, composite reliability, Cronbach's alpha, AVE and R^2.

As a final point, I will mention mediation analysis as Papers II–IV involved this type of analysis. Mediation occurs when the research questions seek to understand better how some independent (X) variable influences some dependent (Y) variable, through some mediating (M) variable (Mathieu & Taylor, 2006). To test the mediation, the models were examined for the three necessary conditions of mediation: (1) a significant association between independent and dependent variables; (2) a significant association between independent and mediating variables; and (3) a significant association between mediating and dependent variables (Baron, Kenny, & Reis, 1986; Mathieu, DeShon, & Bergh, 2008; Mathieu & Taylor, 2006). In Papers II and IV, the mediation tests were performed based on Monte Carlo replications in Stata. Monte Carlo replication is considered a good alternative to bootstrapping as it takes less time and is still acceptable (Jose, 2013; Mehmet & Jakobsen, 2017). The number of Monte Carlo replications was set to 5,000. In Paper III, the test of the indirect mediation effect was performed using a bias-corrected bootstrap procedure in AMOS. The number of bootstrap samples was set to 2,000.

3.6 Ethical considerations

Before the commencement of data collection, the project was reported to the NSD. The Centre approved the data collection before starting the project. Moreover, the first page of the survey contained a cover letter addressed to respondents that explained the research process. Respondents were limited to adults over 18 years who were required to give consent before they could access the survey.

"Employees are your most valuable asset" Carlos Ghosen

4 Empirical papers

In this chapter, I summarize the four empirical papers.

4.1 An overview of the appended papers

Table 4: Summary of the appended papers

Paper	Title	Contributions	My contributions	Status of the papers
I	Employee-driven innovation: Conceptualization, scale development and preliminary validation	Conceptualization, scale development and preliminary validation of an EDI scale	This paper was co-authored with Assoc. Professors Marit Engen and Stein Amundsen. I contributed significantly to all parts of the paper (conceptualization, design, data collection, analyses and revision). I did the main part of the writing and revisions. I am the first author.	Published
II	Linking structural empowerment to employee-driven innovation: The mediating role of psychological empowerment	We empirically tested a model that linked structural and psychological empowerment to EDI. It was found that both structural and psychological empowerment had a direct positive relationship with EDI. In addition, psychological empowerment mediated the association between structural empowerment and EDI	I co-authored this paper with Assoc. Professors Stein Amundsen and Marit Engen. I contributed significantly to all parts of the paper and did the main part of the writing and revisions. I am the first author.	Published
III	The relationship between leadership styles and employee-driven innovation: The mediating role of LMX	We established that various leadership styles have a positive or negative association with EDI and that LMX mediates the relationship between leadership styles and EDI	This article was co-authored with Assoc. Professor Stein Amundsen. I contributed significantly to all parts of the paper (conceptualization, design, data collection and analyses) and did the main part of the writing.	Published
IV	An empirical study into the individual-level antecedents to EDI	It was found that the need for autonomy had a direct positive relationship with self-leadership and an indirect association with EDI through self-leadership. Self-leadership had a direct positive relationship with EDI	I am the sole author	Published

4.2 Paper I

Echebiri, C., Engen, M. and Amundsen, S. (2021) 'Employee-driven innovation: conceptualisation, scale development and preliminary validation', *Int. J. Entrepreneurship and Innovation Management*, Vol. 25, Nos. 2/3, pp.233–255. doi**:** 10.1504/IJEIM.2020.10036012

The primary purpose of this paper was to elucidate the dimensions of EDI and develop an instrument to measure EDI that achieves good reliability and validity. The initial dimensions of EDI were deductively established and include the emergence of ideas, idea search, idea generation, idea communication, idea development, idea prototyping and idea implementation. During the initial validation process using EFA, some of the theoretical dimensions merged. Dimensions associated with the initial stages merged while the dimensions related to implementation phases combined into one factor. The emergence of idea and idea search merged into one dimension that was later named "emergence and search for ideas". Idea development, idea prototyping and idea implementation loaded into one dimension that was then labelled "idea development and implementation". Idea generation was retained as a dimension while idea communication was dropped.

Further analyses using CFA showed that a three-factor model performed better than one- and two-factor models and was sufficiently distinct to justify a multidimensional model. Together, these dimensions contributed to an overall construct of EDI. The developed instrument was called the employee-driven innovation scale (EDIS).

4.3 Paper II

Echebiri, C., Amundsen, S. and Engen, M. (2020). Linking structural empowerment to employee-driven innovation (EDI): The mediating role of psychological empowerment. *Administrative Sciences.* Vol. 10, No. 3, pp. 1–20. https://doi.org/10.3390/admsci10030042

In this paper, two independent studies were conducted to investigate how the two main approaches to empowerment (structural and psychological empowerment) related to EDI, and also how psychological empowerment operated as a mediation mechanism between structural empowerment and EDI. Study 1 was performed in a public sector organization and Study 2 was conducted in a private sector organization. The results in the two studies demonstrated that both structural empowerment and psychological empowerment had a positive, statistically

significant relationship with EDI. Additionally, psychological empowerment partially mediated the relationship between structural empowerment and EDI. The mediation role of psychological empowerment is a well-established mechanism in the literature (e.g. Amundsen & Martinsen, 2015). The findings in this paper not only give further empirical support to the mediating role of psychological empowerment (Camilla & Krishna, 2015; Zhang & Bartol, 2010) but now primarily extend it to EDI. Similarly, the findings showed that structural empowerment can also enable EDI directly without going through psychological empowerment as a mediating mechanism. Furthermore, the supplementary multigroup analysis showed that there was no significant difference between employees employed in the private sector and those employed in the public sector.

4.4 Paper III

Echebiri, C.K. & Amundsen, S. (2021). The relationship between leadership styles and employee-driven innovation: The mediating role of leader–member exchange. *Evidenced-Based HRM.* Vol.1 No.1, pp. 63-77. doi: https://doi.org/10.1108/EBHRM-10-2019-0091

The overall aim of this paper was to contrast two leadership styles on EDI. It addresses the question of how leadership styles associate with EDI. Previous studies had proposed that leadership behaviours have a role in EDI (Amundsen et al., 2014; Smith et al., 2012), but this has remained untested. We developed a model that linked empowering leadership and directive leadership to EDI with LMX as the mediator. The findings showed that the two leadership styles had different associations with EDI. Empowering leadership had a direct positive relationship with EDI whereas the hypothesized direct negative relationship between directive leadership and EDI was not supported by the data. Additionally, the relationship between leadership behaviour was negatively or positively mediated by the quality of the relationship between leaders and their subordinates. Directive leadership had a negative association with LMX and an indirect negative effect on EDI through LMX. The results provide the first empirical support to the proposition of Smith et al. (2012) indicating the vital role of the leader's support in enabling EDI.

4.5 Paper IV

Echebiri, C.K. (2020). An empirical study into the individual-level antecedents to employee-driven innovation. *Technology Innovation Management Review*. Vol. 10, No. 6, 41–51. doi: http://doi.org/10.22215/timreview/1367

While Papers II and III focused mainly on organizational-level factors (e.g. leadership style, structural empowerment), Paper IV concentrated primarily on the individual-level variables that could serve as drivers for EDI. It aimed to understand how self-leadership associates with EDI and also mediates the relationship between the need for autonomy and EDI, and additionally to determine the moderating role of perceived job autonomy between self-leadership and EDI. It proposed that this relationship would be stronger with high perceived job autonomy and weaker with low perceived job autonomy. The findings show that the need for autonomy had an indirect effect on EDI through self-leadership, and self-leadership had a positive association with EDI and the various stages of EDI. The data did not support the moderating role of perceived job autonomy.

4.6 The connections between the SRQs and the appended papers

The four papers described above contributed to addressing the main research questions and more specifically, as demonstrated in Table 5, to each of one of the four SRQ. Paper I contributed to the first main research question (RQ1) and Papers II–IV to the second main research question (RQ2).

Table 5: The link between the SRQs and the papers

Sub-research questions	Paper
SRQ1: How can EDI be conceptualized, operationalized and measured?	I: Employee-driven innovation: conceptualization, scale development and preliminary validation
SRQ2: What is the relationship between structural empowerment and EDI, and how does psychological empowerment mediate this relationship?	II: Linking structural empowerment to employee-driven innovation: The mediating role of psychological empowerment
SRQ3: What is the relationship between empowering and directive leadership styles and EDI, and how does LMX mediate these relationships?	III: The relationship between leadership styles and employee-driven innovation: the mediating role of leader–member exchange
SRQ4: What is the relationship between need for autonomy, self-leadership and EDI, and how does perceive job autonomy moderate the relationship between self-leadership and EDI?	IV: An empirical study into the individual-level antecedents to employee-driven innovation.

5 Concluding discussion

In this final chapter, I present the key contributions, implications and limitation of this dissertation.

The main aim of this dissertation was to gain a greater understanding of EDI using empowerment as a lens. Specifically, the dissertation focused on the two main research questions: "RQ1: *How can employee-driven innovation be conceptualized and measured?*" and "RQ2: *In what ways do various empowerment-related factors influence employees' capacity to engage in employee-driven innovation?*" EDI is about the active participation of employees in the generation and implementation of new ideas (Holmquist & Johansson, 2019; Kesting & Ulhøi, 2010). Their innovation activities are linked to their knowledge arising from their work practices (Høyrup, 2010).

As I argued previously, more research is required for a better understanding of the EDI construct and the factors that could encourage employees to engage in innovation activities. It is important for organizations to identify and harness these latent innovation assets and for employees to enhance their skills and contribute more to organizational processes. To achieve this aim and address the main research questions in this dissertation, three empirical studies were conducted, which resulted in the four appended papers. In Paper I, EDI was conceptualized and operationalized, and an instrument to measure the construct was developed. I placed the scale as the starting point for the other three papers, through which I studied how different empowerment-oriented constructs were related to EDI (Papers II–IV).

5.1 Theoretical contributions

In this section, I discuss my theoretical contributions as framed around two themes: 1) the employee-driven innovation scale (EDIS), which addresses RQ1, and 2) empowerment-related factors that foster EDI, which mainly answers RQ2. These two broad themes were derived from the knowledge presented in the four appended papers. I start by discussing the scale.

5.1.1 EDIS

The first theoretical contribution is the conceptualization and operationalization of EDI. Building on earlier qualitative studies (e.g. Renkema et al., 2018; Wihlman et al., 2014), EDI was conceptualized as comprising seven dimensions: emergence of an idea, idea search, idea generation, idea communication, idea development, idea prototyping and idea implementation. During the scale validation process, emergence and search for ideas were merged, idea generation remained as a dimension, and idea prototyping, idea development and implementation were merged into one factor. Idea communication overlapped with some of the other EDI dimensions. The initial phase was labelled "emergence and search for ideas", followed by the "idea generation" phase, and the implementation phase was named "idea development and implementation". These three dimensions represent the phases/stages in an EDI process. The new scale was called the EDIS, a second-order reflective construct made up of 13 items. The EDIS was then used in Paper II and a new study that formed the basis for Papers III and IV. Therefore, Papers II–IV also contributed to the further validation of the scale.

Items were generated at both individual and group levels. Items that started with "I" and "we" ended up at different ends of EDI during the validation process. Thus, items for the initial stages began with "I", indicating that these stages are typically individualistic. Items for idea development and implementation began with "we", suggesting that at this stage, innovation goes beyond an individual and becomes a group or collective process. Arguably, ideas may also emanate from a group within an organization that might lead to the question of why "we" could not have been used in the early stages. However, even when ideas emerge from a group or a unit, the micro process of EDI starts with an individual. In this dissertation, I take the position that EDI processes typically start with an employee who perceives an opportunity, encounters or experiences a problem, which triggers other activities that eventually lead to innovation. This is also in line with Høyrup (2012) who argues that EDI begins at the job and worker levels. The process appears to begin at the individual level and as an outcome measured at the group, team or organizational levels (De Spiegelaere, 2014). This finding agrees with the existing literature, which suggests that different innovation phases belong to different organizational domains. Typically, the initiation phases belong to the individual domain while implementation phases belong to the organizational domain (Axtell et al., 2000).

In the literature, EDI is considered as both a process and an outcome (Høyrup, 2012). From the perspective of EDI as a process, the merging of related dimensions may not be so surprising.

Rather, the validation process demonstrates the interactive nature of EDI and the innovation processes in general. Service innovations are generally known to be highly interactive, more incremental and entail interactions involving different actors in the organization (Fuglsang & Nordli, 2018). As employees work together, they communicate among themselves, discuss and share their individual ideas back and forth, thereby demonstrating the iterative nature of workplace innovation. This occurs through both formal and informal channels such as emails, team meetings and lunch breaks.

Communication that takes place during the process is not limited to any particular phase, which also explains why idea communication was merged into the other dimensions/phases. Communication is more general and important in many of the other phases. Simultaneously, the various EDI phases may occur even without employees recognizing them as unique phases. It is also implausible that employees consciously decide to end one activity before starting another in the innovation process.

Therefore, the merged EDI dimensions demonstrate how the employees' activities are interconnected. In this way, the findings based on the validation process in Paper I are in line with the existing literature that shows that innovation processes are not always sequential but rather are complex and intertwined (Engen, 2016; Wihlman et al., 2014). Even when EDI begins at the job and worker levels, the literature shows that the social process of innovation means that individual employees cannot create innovation single-handedly, it involves several actors, including employees and their managers (Høyrup, 2012; Sundbo, 2003).

This dissertation has also contributed significantly to the literature through the process of scale development. As noted previously, most EDI studies are predominately qualitative based on case studies (e.g. Lempiälä et al., 2019; Sorensen et al., 2018). The developed scale has the potential to contribute to quantitative EDI research in the future, thereby expanding the scope of methodological choices for EDI researchers. The scale may serve as an inspiration to other scholars to develop and test more models involving a wider variety of predictors, mediators and moderators of EDI. The availability of a scale for a construct is an essential consideration in quantitative research designs. If there is no appropriate measurement instrument for EDI, quantitative empirical endeavours are impossible. Having a measurement instrument is an essential part of science and contributes to the legitimacy and development of a research field (Tay & Jebb, 2017).

To my knowledge, Paper I was the first scale development study in the context of EDI. To date, knowledge of our understanding of EDI phases/dimensions has not been advanced in this manner. However, earlier qualitative studies such as Renkema (2018) and Bäckström and Lindberg (2019) provide valuable insights that I have built upon in my research. Therefore, the conceptualization and operationalization of EDI as a multidimensional construct consisting of emergence and search for ideas, idea generation, and idea development and implementation measured with 13 items has contributed to the innovation literature. In a nutshell, through EDIS, I contributed to both methodological development as well as empirical knowledge within the EDI research literature.

In the next section, I discuss empowerment as an approach to EDI, which addresses RQ2. All the different aspects of empowerment (social, structural and motivational) offer insights into fostering EDI.

5.1.2 Empowerment as an approach to EDI

The second main theoretical contribution of this dissertation is to underpin employee empowerment as a valuable theoretical lens to understand and leverage EDI. By conceptualizing EDI using empowerment, I have contributed to both EDI and empowerment literature.

As I argued in the introductory chapter, empowerment may offer a relevant perspective from which to investigate employees' involvement in EDI more holistically at both the organizational and individual levels. I frame this by suggesting *empowerment as an approach to EDI*. Empowerment theory was not initially developed for or within innovation, although previous studies suggest this link (e.g., Fernandez & Moldogaziev, 2013; Spreitzer et al., 1999). However, both empowerment and EDI conceptually build on the same ideological basis for increased employee participation in the workplace.

As previously explained, EDI focuses on harnessing the innovative potential of employees in the workplace (Båckstrom & Lindberg, 2018; Gressgård et al., 2014). Earlier EDI literature, particularly Kesting and Ulhøi (2010) and Smith et al. (2012), suggests that employees' involvement in innovation is dependent on their participation in the decision-making processes through which innovation is initiated. This implies giving employees the 'tools' to engage in and develop their own innovation activities. My research extends the conceptual framework for EDI drivers by theoretically coupling employee empowerment to EDI, a further contribution to

innovation literature. There have been calls for more research focused on understanding managerial practices that strengthen employees' assumption of more innovative roles (e.g., Høyrup et al., 2018). I have contributed to this dialogue by empirically demonstrating how various empowerment practices at both the macro level (e.g., leadership behaviours) and the micro level (e.g., self-leadership) enhance employees' role in innovation. Consequently, EDI–empowerment relationships exist at different levels in an organization and each level is as important as any other. My dissertation has contributed to the body of research by elucidating these relationships.

Similarly, through empowering practices, employees are inspired to take on more active roles in the innovation process. My dissertation has shown that this involvement happens when empowering practices, such as the way managers act towards their employees as well as access to structures that exist in an organisation's policies and procedures, encourage employees to conceptualize and develop new ideas. This implies that the innovative potential that lies within individual employees could be harnessed better in an empowering work environment. Facilitating employees' roles in innovation processes through empowerment entails *licensing* and expanding employees' responsibilities, whereby innovation becomes part of their activities. The innovation role of employees as a response to empowerment initiatives shapes and determines the extent of employees' participation in the process. Therefore, my findings contribute to empowerment literature by extending our knowledge regarding empowerment as an enabling process and basis for proactive behaviour (Cheong et al., 2016; Conger & Kanungo, 1988) to EDI.

As discussed in Chapters 1 and 2, empowerment involves increasing the participation of employees in decision-making and sharing responsibility with employees about how their work is conducted (Arnold et al., 2000; Lashley, 1999). The empowerment approach to EDI represents an important way of understanding how and what stimulates employees' involvement in the organization and of recognizing employees as important actors in the innovation processes. On this basis, organizations strive to build a work environment that involves employees in such processes. Therefore, employee empowerment as an approach to EDI involves much more than just sharing power and decision-making authority; it is about giving employees a more holistic sense of enablement regarding innovation activities. This includes communicating with employees about the vision and strategic direction of the organisation, expectations about innovation, opportunities and resources needed to explore creative ideas and mechanisms for transmitting and following up creative ideas.

These findings align with previous studies indicating that organizations can consciously heighten innovation activities that are based on informal processes and work practices by building structures and relationships that support innovation (Jensen et al., 2007). Thus, through empowerment, innovation activities are devolved down the ladder of organisational hierarchy by developing employees' capacity to participate in the innovation process.

Based on my findings, employee empowerment as an approach to EDI implies that organizations can stimulate employees' participation in innovation processes from two levels, each with a distinct set of factors: (1) organizational-level factors and (2) individual-level motivational factors. The former concerns organizational and managerial arrangements and practices while the latter refers to the individual characteristics of employees arising from empowering actions in the workplace. Next, I discuss the organizational-level factors that support EDI.

Organizational-level factors that stimulate EDI

The organizational level refers to management practices that aim to empower and enable employees to react in specific ways or exhibit empowering characteristics. Papers II and III indicate that both empowering leadership behaviour and structural empowerment show potential for stimulating EDI. These are classified as social-structural empowering practices and are largely contextual. First, leaders influence the context in which employees perform their job and can significantly inspire creativity and innovation (De Jong & Den Hartog, 2007; Kesting, Ulhøi, et al., 2015; Somech, 2006). Leadership behaviours that enable EDI are behaviours exhibited by leaders that enhance the generation and implementation of new ideas. Leaders scrutinize ideas and act as a bridge between employees and the organization (Renkema et al., 2018; Wihlman et al., 2014). When a new idea is proposed, the managers are likely the first to know and their actions or inactions could determine if such proposals succeed or fail.

My findings in Paper III demonstrate that specific types of leadership behaviours can enhance employees' participation in innovation activities, which agrees with previous findings (Hansen et al., 2017). Employees who consider their leaders to be empowering are more likely to engage in EDI than those whose leaders are seen as less empowering. What this means is that the attributes and effectiveness of organizational leadership are crucial success factors for enabling EDI. Through the attributes associated with an empowering leader, such as mentoring, coaching, participative decision-making and enhancement of self-confidence, they enable their subordinates to take initiative and become more proactive (Arnold et al., 2000). Employees

then reciprocate by bringing into play their initiatives, problem-solving skills and positive opportunistic thinking (Sims et al., 2009), and engage in EDI.

Conversely, through the use of directive approaches, such as being instructive and a rigid adherence to the rules, my findings indicate that directive leadership behaviour is more likely to undermine proactive behaviour (Lempiälä et al., 2019) and is therefore contrary to the notion of employee empowerment (Yun et al., 2006). Paper III suggests that directive leadership behaviour is a less-promising strategy when it comes to stimulating innovation among employees. Instead, it diminishes employee autonomy, leaves little or no room for delegation of authority and may negatively impact creativity and undermine employees' participation in innovation processes.

The findings about leadership behaviours in Paper III support the perspectives of scholars who argue that empowering leadership is most effective at influencing work behaviours that require creativity or proactivity (e.g. Lee et al., 2017). Moreover, it suggests that scholars should consider social aspects of empowerment when studying EDI. In general, knowledge about how specific leadership behaviours could enhance or hinder EDI has remained underexplored. Taken together, the contrasting relationship between the two leadership behaviours and EDI provides further empirical support to propositions that suggest that a leader's empowering support is crucial for EDI (Smith et al., 2012).

Second, LMX refers to the quality of the relationship between a leader and followers as influenced by the actions of the leader (Kuvaas & Buch, 2018). Theoretically and empirically, there is support for LMX as a mediation mechanism in the literature (Dulebohn et al., 2011; Gottfredson & Aguinis, 2017) and in this dissertation, empirically extended to EDI as demonstrated in Paper III. My findings indicated that LMX partially mediated the relationship between empowering leadership and EDI. This means that a high-quality relationship is more likely to develop between a leader and a follower if the leader is perceived to be more empowering. Furthermore, my findings indicated that directive leadership behaviour resulted in a low-quality relationship and negatively impacted EDI. This suggests that employees' involvement in innovation requires a certain type of relationship between managers and subordinates, as discussed in Paper III. This result supports previous studies that re-emphasizes that employees' roles and relationships with managers in innovation activities are an important success factor, as they are crucial for facilitating the processes (Engen & Magnusson, 2015; Saari et al., 2015).

Additionally, this highlights the need for collaboration between employees and their managers for EDI to be successful. Managers should also work with their employees, provide them with direction about the vision and mission of the organization and also foster collaboration among employees themselves. Having a high-quality relationship in this sense entails that both parties have expectations, and there is mutual trust and understanding. When employees come up with ideas, this is accompanied by some potential risks of negative exposure or indifference that could discourage them from participating in innovation processes in the future. A low-quality relationship could make employees less open to sharing and discussing their ideas. However, where the relationship between an employee and the manager is perceived as supportive for innovation, this could serve as a form of motivation for EDI (Smith et al., 2012). The relationship that develops between employees and their superiors is largely influenced by the behaviour exhibited by the leader (De Jong & Den Hartog, 2007). The literature indicates that a high-quality relationship will result in a superior outcome and a low-quality relationship will result in an inferior outcome (Gottfredson & Aguinis, 2017; Hughes et al., 2018). In other words, the perception of the relationship that develops between a leader and their employees can shape the employees' behaviours and attitudes towards EDI either negatively or positively.

Third, structural empowerment focuses on the organizational conditions that facilitate the actual transition of authority and responsibility to its members. Structural empowerment derives from the structures that exist within an organization including, for example, formal organizational policies, job designs and processes (Maynard et al., 2012; Wilkinson, 1998). My findings in Paper II suggest that an employee empowerment approach that aims to increase access to these structures has the potential to trigger EDI. Various practices and policies that are aimed at sharing information, access to resources, access to opportunities and access to support are more likely to support EDI. (Kanter, 1977) highlights the importance of access to these structures and suggests that a work environment that provides access to these structures is important for organizational outcomes.

EDI involves employees that mostly work in organizations characterized by rules and procedures, which might hamper use of discretionary power and autonomy. Therefore, empowerment as an approach begins with identifying the existing and potential obstacles that may hinder employees' participation in innovation activities in the first place. These obstacles could be in the form of organizational policies, contexts, structures or work designs that form barriers to employees getting involved in innovation activities (Pierce & Delbecq, 1977). Employees' participation in innovation processes depends on the extent to which the structures

within the context of their jobs allow them to participate. Eliminating these obstacles might indicate to employees that they have management support to go beyond their assigned duties. This finding supports previous studies that suggests that organizational structures can increase the likelihood of EDI (Renkema et al., 2018).

Most importantly, the shifting focus of innovation from a solely R&D function towards a more influential role for employees has necessitated an expansion of the core role of employees. This also calls for a shift towards creating and nurturing an innovation-oriented climate for employees. It requires a proportionate change in both the structures of the organizations and a change in the type of leadership behaviour they adopt. Thus, leaders play an essential role in using empowerment interventions to enable and increase their employees' engagement in EDI.

Having discussed the organizational-level factors that support EDI, I now turn to individual-level factors as the final part of my theoretical contributions and further address the second main research question.

Individual-level factors that support EDI

At the individual level, Papers II and IV show that psychological empowerment and self-leadership had positive associations with EDI and also acted as mediation mechanisms for EDI. Psychological empowerment is considered a reaction to social-structural empowerment (Seibert et al., 2011). The positive association between structural empowerment and psychological empowerment supports the notion that increasing access to workplace empowerment structures, such as access to support and resources, enhances employees' experiences of feelings of personal empowerment to engage in innovation activities (Laschinger et al., 2001). The findings from Paper II indicate that when employees perceive the climate of innovation in terms of supportive and enabling structures, they interpret it as psychologically empowering, which positively impacts on EDI.

Furthermore, self-leadership was found to have a direct relationship with EDI, as well as operating as a mediating mechanism between the need for autonomy and EDI, as demonstrated in Paper IV. Employees with a higher need for autonomy are more likely to develop their self-leadership skills (Yun et al., 2006). The findings from Paper IV demonstrate that employees who are self-leaders are more likely to engage in EDI than those who are not.

These findings are significant for the following reasons. First, psychological empowerment and self-leadership are regarded as empowering characteristics of employees in the sense that they

transmit the effect of empowering practices at the organizational level to the individual level (Amundsen & Martinsen, 2014). This also demonstrates the interdependence of social-structural empowerment and the motivational aspects of empowerment. Both psychological empowerment and self-leadership (self-empowerment) are examples of the motivational/individual perspective of empowerment.

Second, psychological empowerment and self-leadership underscore the importance of intrinsic motivation in innovation processes. Intrinsic motivation explains how people are motivated to do something because they find it enjoyable and meaningful (Gagné & Deci, 2005). The literature indicates that it is intrinsic motivation that stimulates creativity, which is important for innovation, rather than extrinsic motivation (Amabile, 1988; Amabile et al., 1996). This means that employees' participation in EDI must be intrinsically driven by individual employees (Lempiälä et al., 2019; Renkema, 2018). In the context of EDI, this matters because employees' engagement in innovation activities goes beyond their job descriptions. Therefore, it is not sufficient for organizations to provide the enabling structures and environment for innovation. It is important that employees are intrinsically motivated and elect to participate (Billett, 2012), which gives employees a sense of ownership and involvement in the process (Aasen, Amundsen, Gressgård, & Hansen, 2012). For organizations, forcing employees to assume roles as innovators can even lead to counterproductive effects (Kesting & Ulhøi, 2010).

Third, my finding suggest that it is not only essential for organizations to create an empowering environment for employees to innovate, but it is important to understand how employees respond. This is because the diversity of empowerment practices could lead to differences in the perception and interpretations of these practices among employees.

Summing up the theoretical contributions

By theoretically underpinning EDI in empowerment and empirically demonstrating how empowering practices and principles at different levels can influence the participation of employees in innovation processes, I have contributed towards building EDI theory. I have contributed by deepening our knowledge as to how employees can become active participants in innovation. That is, by taking employee empowerment as an approach to foster EDI, my studies have shown that employees need to be stimulated from a holistic perspective. The structural contexts are critical, as are the social factors. But more importantly, employees must perceive these aspects as adequate to spur their EDI (Lempiälä et al., 2019). By grouping the empowering factors into their organizational and individual levels, this dissertation has

contributed to the literature by highlighting explicit antecedents of EDI in terms of predictors and mediators, and also implicit antecedents, such as intrinsic motivation. Therefore, empowering strategies have the potential to contribute to developing an integrated EDI theory and thereby lead to a more comprehensive understanding of EDI. I suggest that the empowerment perspective provides an alternative approach to studying and understanding EDI. The combination of EDI and empowerment is a unique contribution of this research to the field.

5.2 Practical implications

The findings in this dissertation have several practical implications. First, employees constitute the majority of workers in most organizations and represent an essential pool of ideas that is sometimes overlooked. Hence, organizations can become more innovative by harnessing the diverse creative potential of these employees. Stimulating employees' engagement in innovation activities involves a combination of organizational-level factors, such as leadership behaviours and structural empowerment, and individual-level factors, such as psychological empowerment and self-leadership. However, diversifying an organization's innovation capabilities requires a synergy of both levels. My studies also demonstrate that empowering management strategies such as leadership behaviours are possible ways in which organizations could accomplish this synergy. The findings support previous studies that show that managers play an important role in enabling employees to engage in innovation (Saari et al., 2015; Voxted, 2018). This calls for organization leaders and managers to understand the particular approaches to harness the creative potential of their employees. Through empowering management practices, organizations create what Amundsen et al. (2014) describe as "favourable conditions" for EDI that trigger employees to participate in EDI. Favourable conditions imply a wide range of factors, such as the context in which employees perform their jobs, job designs, and the kind of leaders that employees have, among others. As stated in the theoretical contributions, some EDI phases are more individualistic than others. The initial phases, such as emergence and search for ideas, require that employees have the time and access to opportunities, while the implementation phases may require more resources and collaboration at the group/team level. Overall, high levels of management support will result in higher employee engagement in innovation activities (Kesting & Ulhøi, 2010).

Second, organizations should encourage empowering leader behaviours such as autonomy and developmental support. This should be an important consideration for human resource management units in training their leaders and managers. Empowering behaviours positively

impact the relationship between leaders and their subordinates, as suggested in previous studies (Martin et al., 2016). These behaviours provide greater autonomy at work and foster employee participation in organizational processes (Cheong et al., 2019), which are essential factors in EDI. My findings also indicate that empowering leadership behaviours are not limited to any particular stage in the process but are necessary at all stages of EDI. The indirect negative relationship between EDI and directive leadership behaviour points to the ineffectiveness of reliance on strict command and control behaviours and may not support EDI. Indeed, behaviours associated with directive leaders may discourage EDI. Organization leaders should be aware that they can foster or hinder innovation potential among their subordinates, given that they are the ones who can facilitate an innovation climate that is supportive of EDI (Engen & Magnusson, 2018; Kurz et al., 2018). Even when structural empowerment supports EDI, it is the responsibility of leaders to make these structures visible and accessible for their employees (Lempiälä et al., 2019). In other words, their actions can create specific reactions oriented towards innovation. Where the aim is to enhance EDI, directive tendencies should not be the approach adopted by leaders.

Third, organizational-level factors that support EDI may encourage employees to participate in EDI, but how they experience and interpret these conditions is essential (Lempiälä et al., 2019). Therefore, facilitating EDI through employee empowerment depends on how employees perceive their organization and leaders as supportive. Organizations should be aware that individual motivational factors, such as self-leadership and psychological empowerment, are equally important. When an empowering leader encourages their subordinates to use their initiative and problem-solving skills, the subordinates learn to develop self-leadership skills through these behaviours (Sims et al., 2009). Previous studies indicate that employees could be trained to enhance their self-leadership skills and thereby improve their work outcomes (Carmeli et al., 2006; Neck, Stewart, & Manz, 1995). Organizations that want to involve their employees in the innovation process must be aware of the importance of self-leadership skills. Again, developing self-leadership skills among employees will enable organizations to rechannel limited leadership time and other resources to where they are needed more. More importantly, in today's knowledge-based society, employees may not necessarily be led as before. Instead, more attention may be focused on enhancing their behaviour-focused strategies, natural reward strategies and constructive thought strategies that contribute to self-leadership skills. While having self-leaders is beneficial, managers should also be open to accommodating dissenting ideas that may not go down well with them (Hansen et al., 2017). Similarly, it is

equally important to point out that not all employees will engage in EDI, no matter how empowering the organization is perceived to be, because not all employees will be able to develop the appropriate motivation. The challenge might be how to identify and focus on those employees who have the potential to engage in EDI, rather than having a blanket expectation across the board within an organization.

5.3 Limitations and suggestions for further research

This dissertation contributes to a better understanding of EDI by using empowerment as an approach. In this section, I address some limitations from three interlinked broad perspectives, methodological, contextual and conceptual, and also include some suggestions for further research.

5.3.1 Methodological limitations

First, the procedures adopted for the scale development and preliminary validation fulfil most of the requirements for scale development. Notwithstanding, several scholars (e.g. Hinkin, Tracy, & Enz, 1997) have argued that the process of scale development and validation is continuous. Therefore, continued refinement and validation of the new EDIS is an essential recommendation for future studies. This is important for several reasons. It is necessary to test the stability and generalizability of the EDIS further. In addition, future validation studies should draw independent samples from various rating sources, organizations and cultures beyond what was done in this dissertation. The discriminant validity of the scale should also be tested in relation to the most closely related constructs, such as innovative work behaviour. Furthermore, I acknowledge that EDI and innovative work behaviour are closely related and their dimensions have overlapping characteristics. However, differentiating them depends on the perspectives of the researchers and it is sometimes difficult to isolate them from each other (Renkema et al., 2018).

Second, since Paper II was based on cross-sectional studies and relied on data gathered from the same source at a single point in time, the estimated correlations between variables might suffer from common method bias (Chang et al., 2010). Although some *ex ante* remedies were implemented to minimize these effects, it is not certain that these remedies were entirely successful. I recommend that future studies should adopt more robust controls for common method bias, such as separation of the independent and dependent variables. Also, the sample

size in Study 2, Paper II (N = 60) was relatively small. Although all three organizations expressed an interest in EDI, only organizations 1 and 3 provided their employees with more resources in terms of access to laptops and time to complete the surveys. This might not have been the case in organization 2 where employees had limited access to laptops and needed to complete the surveys in their free time. It appears that these factors had an effect on the response rate in Study 2. Nevertheless, the multigroup analyses did not reveal any significant difference between Studies 1 and 2. Future studies should be based on relatively larger sample sizes. Furthermore, due to the design of the studies, the correlations between variables cannot be interpreted as causal relationships. Future work might assess causal relationships by adopting appropriate study designs.

Third, both quantitative and qualitative approaches have their distinct merits. While certain insights were gained through the quantitative approach adopted here, it is important to recognize that other insights were not accessible. As the validation process demonstrated, the iterative and interactive nature of innovation processes means that certain aspects may not be covered via a scale measurement. For instance, a deeper understanding of these empowering initiatives could have been revealed through in-depth interviews with employees. The quantitative approach adopted for this dissertation did not allow me to obtain insights into innovation that emerged in my focus organizations. Although a quantitative approach complemented previous findings, future studies might benefit from a mixed-method approach.

5.3.2 Contextual limitations

The four appended papers were based on three studies conducted in service organizations. Future studies should expand beyond the scope of this dissertation and examine data from other sectors. The findings reported here could differ in others sectors. Similarly, Norway, like the rest of Scandinavia, has distinct structures that tend to support employee empowerment and EDI. It is broadly understood that Scandinavian leaders encourage and involve their employees in decision-making (Hansen et al., 2017). Relatively flat structures characterize the work environment and there is also a short power distance between leaders and employees. Thus, Scandinavian employees have access to their leaders. This approach is rooted in a long tradition in Scandinavian working life, where the involvement of employees in development activities has been central (Hansen et al., 2017; Aasen et al., 2012). This has clear parallels with the empowerment perspective at work and these factors are likely to support EDI. Therefore, I recommend replication studies in countries with work environments and cultures distinct from

Norway and Scandinavia that are characterized by stronger hierarchical structures and higher power distance.

Finally, despite the numerous benefits of EDI, futures studies should consider if EDI is always good for organizations and their employees. In certain contexts, organizations need to accept whether they want their employees to make changes in their workplaces and the extent to which this should be allowed. These important issues were not addressed in my studies but could be considered in future research.

5.3.3 Conceptual limitations

Empowerment as an approach to EDI is one of the numerous ways to study EDI, as shown across the appended papers. This approach has added and expanded current knowledge, but it does not preclude the exploration of other approaches. Future studies could therefore focus on other possible approaches to EDI, such as sense-making and sense-giving (Gioia & Chittipeddi, 1991; Sharma & Good, 2013). In this dissertation, the empowerment approach influenced the selection of research constructs.

In terms of leadership behaviours, only two were studied here. Each leadership behaviour has its advantages and disadvantages, and it is logical to recommend that future studies should expand the scope of leadership styles to be covered. The broad scope of EDI means that no leadership behaviour has all the answers. Sims et al. (2009) argue that the choice of leadership style largely depends on the situation. The impact of leadership style on innovation could depend on the industry, organization and stage of innovation (Kesting, Ulhøi, et al., 2015). Therefore, empowerment should not be regarded as a universal approach to all EDI endeavours in all organizations and all circumstances.

Finally, participating in innovation may involve responsibility for employees. Not all employees can be expected to respond positively to exhibiting self-leadership or empowering leadership behaviour. Although empowering leadership may be considered enabling, a specific leadership behaviour might induce tension and thus burden subordinates (Cheong et al., 2016). Future studies could consider how this extra-role behaviour might weigh on job descriptions or elements such as job satisfaction and employee loyalty.

5.4 Conclusion

To summarize, this dissertation set out to understand how EDI can be conceptualized and measured, and the ways in which various empowerment-related factors influence employees' capacity to engage in EDI. Based on the knowledge gained from the three empirical studies and the resulting four papers, I have addressed these questions using an employee-driven innovation scale (EDIS) and proposed that employee empowerment is a useful and expedient approach to EDI. As a final comment, organizations can foster EDI through a range of employee empowerment practices.

“*It is finished” The Gospel of John 19:30*

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Appendix

Appendix I

Author(s)& (year)	Primary focus and/or main findings	Category	Study type	Participants	Context of study
Conceptual papers					
Buhl, A. (2018)	The author develops a process framework and toolbox for validation and refinement of Green Product Innovation among employees.	Journal article	Conceptual	N/A	N/A
Smith, P., Ulhøi, J., & Kesting, P. (2012)	The paper maps the primary antecedents of EDI based on an expansion of Kesting and Ulhøi's (2010) paper. These include leader support, autonomy, collaboration and organizational norms of exploration.	Journal article	Conceptual	N/A	N/A
Kesting, P. & Ulhøi, J. (2010)	This is the first paper to give a systematic overview of the grand structure of EDI and identified five main drivers of EDI as management support, decision structures, incentives, environment for ideation, and corporate culture and climate.	Journal article	Conceptual	N/A	N/A
Høyrup, S. (2010)	The paper links EDI to workplace learning, where workplace learning includes a broad range of learning forms, consisting of both institutionalized and informal learning, learning by participation, reflection and experimentation.	Journal article	Conceptual	N/A	N/A
Empirical studies					
Flocco, N., Canterino, F., & Cagliano, R. (2021)	The authors explores the role of plural leadership in EDI	Journal article	Qualitative	Semi-structured interviews with 34 informants from different hierarchical levels in the case organizations.	Multiple case studies involving eight cases

Parjanen, S. M., Saunila, M., Kallio, A., & Harmaakorpi, V. (2020)	The paper identifies the factors of innovativeness and study how these factors could be affected by an employee-driven innovation (EDI) process.	Journal article	Quantitative	Two surveys involving 226 responses in the first round and 155 responses in the second round.	A public social and healthcare services organization in Finland
Taylor, R., Fuller, A., Halford, S., Lyle, K., & Teglborg, A. C. (2020).	The authors investigates the process through which employees innovate without the resources that support policy implementation.	Journal article	Qualitative	40 interviews in addition to over 60 hours of observation data across our three cases.	UK public healthcare
Felstead, A., Gallie, D., Green, F., & Henseke,(2020)	They provide insights into the ways and extent to which employees innovate, and the correlates of this behaviour. They find that employee involvement, the nature of workplace support, and development and performance management are important factors.	Journal article	Mixed methods	3306 respondents interviewed of whom 2882 completed the survey	Skills and Employment Survey 2017 (SES2017) involving workers in Britain
Miao, Z. Z., & Ji, H. Y. (2020)	The authors investigate the challenges of introducing EDI in state-owned enterprises (SOEs) in China. They find that certain attributes of top managers could be the difference that makes EDI successful or unsuccessful.	Journal article	Qualitative	12 respondents	2 SOEs in the Chinese automotive industry
Holmquist, M. & Johansson, A. (2019)	This article identifies a method that can generate creative ideas among employees. This can happen through an intervention approach.	Journal article	Qualitative	Personal assistants and their unit managers	Home service in a Swedish municipality
Bäckström, & Lindberg (2019)	The study highlights the use of a web-based innovation platform and the roles middle managers play in facilitating the involvement of their local employees in EDI activities.	Journal article	Qualitative	20 interviews with 10 employees	2 offices of a global IT firm located in Sweden
Halford, S., Fuller, A., Lyle, K., & Taylor (2019)	Based on two case studies, they find that the organization of care can be both part of the problem and, potentially, part of the solution.	Journal article	Qualitative	34 in-depth interviews in addition to close observations of daily activities	2 case studies in the health care sector in the UK
Lempiala, T., & Yli-Kauhaluoma, S. (2019)	The study highlights how teams with similar structural support and resources could differently perceive the ability to engage in EDI.	Journal article	Qualitative	Two teams of approximately 10 people in the same organization	Large industrial organization that offers components and systems to the construction and engineering industries

Askjær, M. (2018).	The paper focuses on co-designs as an approach to encourage employee learning and innovation.	Journal article	Qualitative	8 prison officers participated in an exploratory study	Danish prison service
Deslee, C., & Dahan, A. (2018).	The authors examine the tension arising from EDI in bureaucracy and discuss the nature and potential of such tensions. Employees initiated and implemented a cargo reservation system to meet customer demand, and dry-running compressors for high-speed trains that resulted in a patent and noise reduction breakers.	Journal article	Qualitative	20 interviews involving innovators, managers and leaders	Multicase studies in the French National Railway Company
Klaalova, A. (2018).	The author identifies management characteristics that distinguish firms whose employees participate in the innovation processes from the perspective of reverse supply chain management.	Journal article	Quantitative	232 firms across the service sector and manufacturing sector	Reverse logistics management in the Czech and Slovak Republics

Kurz, V., Husig, S., & Dowling, M. (2018).	The main goal of this paper is to develop and test an integrative model of EDI that involves different intra-organizational drivers. The results show that the most important factors for EDI are an appropriate job design that includes autonomy and innovativeness as job requirements, supervisor support, culture and group support.	Journal article	Quantitative	Survey data from 103 respondents	Employees from German companies from different industries
Sorensen, H., Ussing, L. F., Wandahl, S., & Christensen, R., M. (2018).	The aim of this research is to identify the specific mechanisms that are key to implementing an innovation process model when conducting employee-driven innovation in a governmental client organization.	Journal article	Qualitative	A gaming approach among 38 participants	Danish governmental client organization
Voxted, S. (2018).	The author identify five factors that are crucial for employees' ideas to become implemented	Journal article	Qualitative	13 participants and their production manager from the production units in the organization	Manufacturing production
Lotz, M. M. (2018)	The author identifies three interrelated routines that set off recursive learning and employee-driven innovation (EDI) among employees. These routines are a) an organisational form of global communities of practice; b) a 'cookbook' representing a set of guidelines to ensure a common approach to the sharing of best practices; c) a set of governance procedures to support continual improvements.	Journal article	Qualitative	Triangulation between three different data sources: talk, participant observation in meetings and documents analysis	A longitudinal case study in a multinational corporation operating in the medical industry

Kristensen, C. J. (2018)	This article explores the collaboration between middle managers and employees in innovation processes.	Journal article	Qualitative	Seven in-depth individual interviews, one group interview, an extensive document study (500–600 pages), and a limited number of observations.	Two case studies of a public frontline institution
Renkema, M., Meijerink, J., & Bondarouk, T (2018)	The authors distinguish three routes through which EDI initiatives emerge: the organizational route, the formalize-system route and the project initiative route. They find that EDI could be in the form of work contents, organizational development and work processes.	Conference paper	Qualitative	40 interviews, document analysis and observations	A single multilevel case study at a highly formalized company, a medical laboratory in the Netherlands
Haapasaari, A., Engeström, Y., & Kerosuo, H. (2017	The main finding in this study is that innovation initiatives follow different paths along which the processing and outcomes varied.	Journal article	Qualitative	Change laboratory intervention sessions and follow-ups, team meetings and 6 interviews	Postal service
Hansen, K., Amundsen, O., Aasen, T. M. B., & Gressgård, L. J. (2017)	The authors lay out some management practices for promoting EDI. Although they find that there is no best practice for EDI, they sum their findings into the five most important factors related to management: work autonomy, support for employees, informality, diversity of promotion and de-emphasizing of organizational structures.	Book chapter	Qualitative	48 respondents were interviewed	Managers, employees and union representatives in 20 Norwegian enterprises

Laviolette, E. M., Redien-Collot, R., & Teglborg, A.-C. (2016)	The study focuses on how EDI supports a firm's absorptive capacity.	Journal article	Abductive approach	A combination of documentary analysis, participatory observations, 10 individual interviews and a group interview	A single case study of a chemical plant
Saari, E., Lehtonen, M., & Toivonen, M. (2015)	The paper examines the actors and activities that coordinate bottom-up and top-down initiatives and promote their development into innovations. The results highlight the central role of middle managers and provide new knowledge regarding their bridging activities in innovation.	Journal article	Qualitative	23 informants/actors involved in innovation processes: policy-makers, service directors, managers, supervisors and employees	2 case studies in the context of children's day care services in Finland

Watanabe, K., Fukuda, K., & Nishimura, T. (2015)	The authors propose a technology-assisted design methodology to promote EDI in services.	Journal article	Qualitative	N/A	An elderly care facility located in the Noto area of Japan
Wihlman, T., Hoppe, M., Wihlman, U. & Sandmark, H (2014)	This study explores the barriers and opportunities for participation in innovation experienced by employees. The study identifies three main themes and subthemes that impact EDI. These include development (learning and creative process), support (innovation process and leadership) and organizational culture (attitudes and communication).	Journal article	Qualitative	27 semi-structured interviews	Employees in welfare service units in 4 municipalities in Sweden
Aaltonen, S., & Hytti, U (2014)	The paper focuses on the barriers to innovation in the bakery sector.	Journal article	Qualitative	Ethnographic case study	Medium-sized bakery in Finland
Amundsen, O., Aasen, T. M., & Gressgard, L. J. (2014)	The study aims to address the need for organizations to prepare for open innovation approaches such as EDI. They suggest a systematic introduction of EDI practices.	Journal article	Qualitative	48 informants	Employees and leaders from 20 Norwegian enterprises
Gressgård, L. J., Amundsen, O., Aasen, T. M., & Hansen, K. (2014)	This paper investigates how organizations use information and communications technology (ICT)-based tools in their innovation work.	Journal article	Qualitative	In-depth interviews with employees, managers and union representatives from 20 organizations focusing on EDI	8 organizations from different industries in both the private and public sectors
Kristiansen, M., & Bloch-Poulsen, J. (2010)	The article focuses on employee-driven innovation in teams (EDIT). The authors argue that innovative potential could be fostered through what they describe as dialogic helicopter team meetings (DHTM) with a dissensus approach.	Journal article	Qualitative	18 teams participated in an action project	1 public and 2 private organizations in Denmark
Teglborg-Lefèvre, A.-C. (2010).	The study demonstrates that there are various approaches to employee-driven innovation.	Journal article	Qualitative	Interviews with EDI managers or managing directors followed by a group interview with a sample of 8–12 people involved in a structured approach to EDI	6 case studies

Note: N/A = Not applicable

Appended papers

Paper I[1]

Echebiri, C., Engen, M. and Amundsen, S. (2021) Employee-driven innovation: conceptualisation, scale development and preliminary validation. *Int. J. Entrepreneurship and Innovation Management*, Vol. 25, Nos. 2/3, pp.233–255. doi**:** 10.1504/IJEIM.2020.10036012

[1] Due to copyright restictions, the appended version of this paper is authors' accepted manuscript.

Employee-driven innovation: Conceptualization, scale development and preliminary validation

Abstract

Although there has been increasing interest in employee-driven innovation research, the literature is still fragmented. The purpose of this paper is to clarify the construct of employee-driven innovation (EDI) and to develop an instrument that can be used to measure it. We adopted an integrative approach to scale development by incorporating existing scales from concepts related to EDI. Based on a combined exploratory factor analysis (N = 144) and confirmatory factor analysis (N = 144) approach, we identified three dimensions of EDI, emergence and search for ideas, idea generation and idea development and implementation. The instrument showed sufficient reliability and validity (i.e. content, construct, convergent, and discriminant validity).

Keywords: Employee-Driven Innovation, conceptualization, scale development, validation

1. Introduction

The innovation pull has prompted innovation research on finding new models that would allow organizations to accelerate innovation by utilizing diverse types of knowledge (Alasoini, 2013; Høyrup, 2012). Among other outcomes, this has highlighted the need to harness all potential sources of knowledge, including employees, throughout the organization (Engen & Magnusson, 2015; Montani, Odoardi, & Battistelli, 2014). Consequently, research focusing on employee involvement in innovation has evolved over the last decade under different labels: high-involvement innovation (e.g. Tidd & Bessant, 2013), practice-based innovation (Ellström, 2010; Melkas & Harmaakorpi, 2012), innovative work behaviour (e.g. Scott & Bruce, 1994; Tuominen & Toivonen, 2011) and employee-driven innovation (e.g. Høyrup, 2012; Kesting & Ulhøi, 2010). What the different concepts and frameworks have in common is that ordinary employees—those not explicitly assigned to innovation tasks, like those in the R&D department—are considered valuable assets for an organization's innovation activities (Kesting & Ulhøi, 2010). Employees may acquire in-depth and context-dependent knowledge (Engen & Magnusson, 2015; Gressgård, Amundsen, Aasen, & Hansen, 2014; Kesting & Ulhøi, 2010), and when they are excluded from innovation activities, that knowledge is lost.

In this paper, we examine the concept of employee-driven innovation (EDI). Despite the growing interest in the topic, research on EDI is still scarce, and the underlying dimensions of the concept remain unknown (Høyrup, 2010; Kesting & Ulhøi, 2010). As shown above, the research field bears the imprint of being scattered; because the topic of EDI has been elucidated from a diversity of concepts and perspectives, the existing literature is somewhat fragmented. To clarify the underlying concepts of EDI, we argue that its theoretical basis needs further investigation and better positioning. According to Gressgård et al. (2014), the predominant focus in research has been on qualitative parameters, and few studies have taken a quantitative approach to EDI. Moreover, most publications on EDI are based on single or multiple case studies (e.g. Saari, Lehtonen, & Toivonen, 2015; Teglborg-Lefèvre, 2010; Wihlman, Hoppe, Wihlman, & Sandmark, 2014), which provide insights of limited generalizability.

To our knowledge, there has been no previous attempt to develop a scale for measuring EDI. An EDI scale may guide further research in an unambiguous direction and enable adequate research work in the field. Developing reliable and valid measures is a central part of science that contributes to the legitimacy and development of a research field (Dawis, 1987; Tay & Jebb, 2017). Therefore, the aim of this paper is to establish the dimensions of EDI and to develop an instrument that achieves good reliability and validity. To do so, we follow the procedure for scale development (Hinkin, 1995; Hinkin, Tracy, & Enz, 1997; Tay & Jebb, 2017) and examine the following aspects: (1) definition and conceptualization of the concept of EDI, including the dimensions; (2) development of scale items; and (3) validation of the scale. The validation process was conducted using exploratory factor analysis (EFA) followed by confirmatory factor analysis (CFA) and a multi-group CFA. EFA reveals the factor structure of latent constructs, while CFA is a type of structural equation modelling used during the process of scale development to examine the latent structure of an instrument (Acock, 2013; Mehmet & Jakobsen, 2017).

Thus, the contributions of this paper are twofold: 1) a theoretical conceptualization of the construct of EDI and 2) the development and preliminary validation of a scale to measure the construct.

The remainder of the paper is organized as follows. We first describe the step-by-step approach used for scale development. Next, we conceptualize the construct and its dimensions, distinguishing it from similar constructs that have previously been operationalized and for

which scales have been developed. Subsequently, we describe the procedures for item generation and the data collection before introducing the data analyses and results. Finally, the proposed scale for EDI and its limitations are discussed.

2. Scale development procedure

Based on several studies (Dawis, 1987; Hinkin et al., 1997; Tay & Jebb, 2017), we adopted a deductive approach to develop an EDI scale: "In most situations where some theory exists, the deductive approach would be most appropriate" (Hinkin et al., 1997, p. 3). A deductive approach requires a clear understanding of the phenomenon to be investigated as well as an adequate review of the literature to inform the theoretical conceptualization of the construct (Hinkin, 1995; Hinkin et al., 1997). Besides, we referred to previous studies that involved scale development (e.g. Amundsen & Martinsen, 2013; Clauss, 2017; De Jong & Den Hartog, 2010; Kim, Ritchie, & McCormick, 2012). Figure 1 summarizes the major steps followed in this study.

Figure 1: approximately here

2.1 Defining EDI

The term 'innovation' refers to the processes and procedures that introduce new ideas into practice (Baregheh, Rowley, & Sambrook, 2009; Crossan & Apaydin, 2010). As such, innovation is often described as the implementation of novel and useful ideas that create value for a beneficiary (Eurich & Langer, 2015; Reade & Lee, 2016; Van de Ven, 1986). Whereas early innovation research was primarily aimed at new ideas and innovations of a technological nature developed by R&D departments, it is now more often recognized as being dependent on resources and actions shaped by experience and interactions throughout an organization (Lundvall, 2010; Shore et al., 2009). As noted, this has led to a focus on the potential of ordinary employees to contribute to innovation (Engen & Magnusson, 2015; Price, Boud, & Scheeres, 2012).

The premise for employees' contribution to innovation is based upon how their innovation activities are embedded within their work practice. According to Brown and Duguid (1991), working, learning and innovating are closely related; learning is seen as a bridge between work and innovation. A work process can be defined as a set of recurrent actions performed—perhaps using tools or machines—to accomplish a task, and thus to achieve a given result (Ellström, 2010). Routines and experiences are shared through these processes; learning and knowledge may thereby be developed. Through these same processes, employees' reflections on their practices may lead them to amend established routines. Differences from the accepted manner of working require variation from standard practices or formal routines, consequently leading to change or innovation. When the change is part of regular work performance (e.g. from sharing accounts of the change), it is absorbed into work practices and informs production logic. Thus, innovation may be described as a cycle of learning whereby deviations from routines may spur the learning process and the development of practices (J. S. Brown & Duguid, 1991; Ellström, 2010; Nonaka, 1994), and where the employees' resources—their ideas, competences and problem-solving abilities—drive innovation (Saari et al., 2015).

EDI is often characterized as a broad concept, emphasizing that the sources and drivers of innovation and its processes revolve around ordinary employees (Høyrup, 2012; Saari et al., 2015). Høyrup (2012) defines EDI as

> "the generation and implementation of new ideas, products, and processes – including the everyday remaking of jobs and organizational practices – originating from the interaction of employees, who are not assigned to this task. The processes are unfolded in an organization and may be integrated in cooperative and managerial efforts of the organization. Employees are active and may initiate, support or even drive/lead the processes" (p. 8).

This definition of the concept is comprehensive, as it refers to employees being involved in management-driven processes and a mix of bottom-up and top-down processes, as well as employee-initiated changes in work practices. The author refers to these processes as the first, second and third orders of EDI (Høyrup, 2012, p. 9 - 10). These 'three orders' of EDI imply that employees may be involved in innovation processes in different ways and that ideas may emerge and be developed in various ways. From a bottom-up perspective, EDI can be characterized as a spontaneous, disorganized process initiated and driven by ordinary employees (De Spiegelaere, 2014; Engen & Magnusson, 2018). From a top-down perspective, EDI can take the form of management-led processes that are pre-planned and formalized, in which managers invite employees to participate and contribute ideas (De Spiegelaere, 2014; Engen & Magnusson, 2018; Høyrup, 2012). However, to draw a meaningful distinction between specifically employee-driven innovation and other innovation processes, we rely on the original definition of the concept: "where new ideas, products and processes are initiated and implemented by a single employee or by the joint effort of two or more employees" (Kesting & Ulhøi, 2010, p. 66). This definition does not exclude co-operation between employees and other staff, such as middle managers (Saari et al., 2015); nonetheless, it emphasizes the original definition and core of EDI, namely that employees who are not assigned to innovate are enabled to initiate and act on their knowledge to engage in innovative activities (Kesting & Ulhøi, 2010).

Next, to assist the theoretical conceptualization, we consider the relationship between EDI and similar concepts.

2.1.1. EDI and innovative work behaviour

As noted, several concepts are related to EDI, such as practice-based innovation, high-involvement innovation and innovative work behaviour (IWB). While these concepts shed more light on different perspectives and explain employees' involvement in innovation, IWB is the closest and most mature concept, having a well-developed and validated scale. Consequently, we draw on IWB as part of the process to further conceptualize EDI and develop its dimensions.

IWB is defined as employee behaviour in a role, or within a group or organization, intended to generate, introduce and/or apply ideas, processes and procedures to make organizations more effective (Bos-Nehles, Bondarouk, & Nijenhuis, 2016; De Spiegelaere, 2014). Like EDI, IWB is a broad construct that focuses on the innovative abilities of employees in an organization. We recognize that some of the dimensions of the two constructs overlap, yet there are differences that distinguish the two.

IWB is often referred to as a two-stage process involving problem recognition and idea generation by individuals and their implementation by organizations (Bos-Nehles et al., 2016; De Spiegelaere, 2014; Messmann & Mulder, 2012). This implies a distinction between employees who have new ideas and those responsible for their implementation. Once an idea is generated, a champion is appointed to implement it (De Jong & Den Hartog, 2010; Lukes & Stephnan, 2016), which indicates that the employees who generate the ideas are not necessarily involved in the implementation process. In contrast, EDI focuses on ideas initiated, driven and

implemented by employees (Høyrup, 2012; Kesting & Ulhøi, 2010; Xin, 2016). This suggests that ordinary employees who initiate new ideas are involved in their implementation across the organization (Renkema, 2018; Renkema, Meijerink, & Bondarouk, 2018; Smith, Ulhøi, & Kesting, 2012). According to De Spiegelaere (2014), IWB is individual behaviour assessed on an individual level, while EDI is both a behaviour and an outcome measured at a higher level, such as the unit, team, department or organization.

2.1.2. Dimensions of EDI

As a point of departure, we examined previous qualitative studies of EDI (e.g. Price et al., 2012; Renkema, 2018; Saari et al., 2015; Wihlman et al., 2014), and adopted the procedures they described. From this, we identified the following seven dimensions of EDI: *emergence of ideas*, *idea search*, *idea generation*, *idea communication*, *idea development*, *idea prototyping and idea implementation*. In the IWB literature, several subdimensions have been developed. These include two dimensions (idea generation and idea implementation), three dimensions (idea generation, idea championing and idea implementation) or four subdimensions (idea generation, idea development, idea championing and idea implementation) (Bos-Nehles et al., 2016; De Jong & Den Hartog, 2010; Messmann & Mulder, 2012; Scott & Bruce, 1994). As noted, some of these dimensions overlap with those of IWB. We discuss each EDI dimension further below.

Emergence of an idea

The first dimension of the EDI process begins with the emergence of an idea. The literature indicates that innovation commences with problem recognition (Abstein & Spieth, 2014; De Jong & Den Hartog, 2010; Scott & Bruce, 1994). De Jong and Den Hartog (2010) argue that an innovation process in its early stages is often serendipitous; an opportunity emerges, a problem arises, or a performance shortcoming is recognized. In IWB, the generation of an idea is recognized as the first dimension. However, idea generation is a rather broad term, as it covers both generating ideas and recognizing problems (De Jong & Den Hartog, 2008). This is consistent with empirical findings on EDI, in which innovative ideas start with an employee recognizing a problem or an opportunity (Price et al., 2012; Saari et al., 2015; Teglborg-Lefèvre, 2010). Hence, we suggest that the emergence of an idea is a separate and first dimension of EDI.

Idea search

An idea search involves scrutiny and an examination in pursuit of something (Schilling & Green, 2011). According to Schilling and Green (2011), an idea search involves "the process of exploring different potential solutions to a problem" (p. 1323). When a problem or opportunity is recognized, employees do not typically propose an immediate solution (Lukes & Stephnan, 2016). Instead, they search for new ideas in their environment, which then triggers innovation activity (Lukes & Stephnan, 2016; Saari et al., 2015).

Idea generation

Idea generation is the outcome of a breakthrough in an idea search (Schilling & Green, 2011) that triggers innovation activity (Lukes & Stephnan, 2016). It involves proposing new and specific ideas for products, processes and services that may allow an opportunity to be exploited or a problem to be solved (Messmann & Mulder, 2012). According to De Jong and Den Hartog (2010), idea generation primarily concerns reorganizing or combining information and concepts to resolve difficulties or improve performance.

Idea communication

Because ordinary employees work in a context where they cannot change or implement policies on their own, they must communicate and share their ideas with their colleagues, supervisors

or line managers (Lukes & Stephnan, 2016). Communication within EDI processes does not necessarily have to be formal or follow strict organizational procedures. It could be informal discussions and/or meetings where an idea is discussed and evaluated, or feedback is given (Deslee & Dahan, 2018; Renkema et al., 2018).

Idea development
This next stage in the EDI process is what we call idea development, which precedes actual implementation. Idea development involves more people, such as colleagues and supervisors (Renkema et al., 2018). The idea is weighed, improved upon or dropped entirely in relation to the problem at hand or a perceived opportunity (Deslee & Dahan, 2018; Saari et al., 2015). In some cases, the policy position and available resources of the organization could come into play with a decision over implementation.

Idea prototyping
Idea prototyping entails producing, testing and modifying a prototype of the model of the product, technology or process (Bos-Nehles et al., 2016; Scott & Bruce, 1994). This is the phase when the new idea is put into practice or piloted (Saari et al., 2015; Wihlman et al., 2014). At this stage, the idea has not been routinized, and if it fails, the idea could just as well not go beyond the prototype phase. Implementation can only take place following successful prototyping.

Idea implementation
Idea implementation is typically complex (Smith et al., 2012). This is the stage where a prototyped idea is routinized in the organization. When a new idea is implemented, it results in a new way of performing a task, process or service (Renkema et al., 2018; Smith et al., 2012), which then becomes part of the normal work practice of the organization (De Jong & Den Hartog, 2010; Wihlman et al., 2014).

Table 1 summarizes the seven dimensions described above.

Table 1 approximately here

2.2. Generation of an initial pool of items

We created a pool of 32 items to capture these seven dimensions of EDI. As some relate closely to IWB, we incorporated existing items from related scales where dimensions overlapped. For the emergence of an idea, we created five new items. For idea search, three new items were developed, and one was adopted and modified from Lukes and Stephnan (2016). For idea generation, two new items were adopted from George et al. (George, Zhou, & Murphy, 2001), one item each from Lukes and Stephnan (2016) and De Jong and Den Hartog (2010), and one newly created item. For idea communication, five new items were developed. For idea development, one item was adopted from Lukes and Stephnan (2016) and three new items were created; for idea prototyping, one item was taken from De Jong and Den Hartog (2010) and three new items created; and for idea implementation, we used one item from Lukes and Stephnan (2016) and four newly developed items.

3. Data collection

3.1. Survey design

We designed a survey instrument using Checkbox, which is an online tool for data collection. For each item, we used a Likert scale from 1 (entirely disagree) to 7 (entirely agree). A pretest

was carried out among the PhD students at the Centre for Innovation, Inland School of Business and Social Sciences, Lillehammer and randomly selected employees in participating organizations. A total of 30 respondents participated in the pretest and sent feedback on the survey. The items were then improved based on the feedback before the full survey was conducted.

3.2. Participants

The survey was sent to a contact person in the Norwegian Welfare and Labour Administration (NAV) and the HR officer for the Nordic Choice hotel group. The contact people then forwarded the survey to their employees, with a recommendation from the leaders to the employees to respond. We chose both organizations on the basis that they have an express focus on EDI. NAV is a public organization responsible for public labour and welfare services. Nordic Choice is one of the largest hotel groups in the Nordic region, and it bases its operations on three equal bottom lines: people, planet and profit. Our choice of both the private and public sectors enables us to detect any significant differences in EDI between employees in the two sectors.

A total of 662 employees received the survey (460 in NAV and 202 in Nordic Choice). After two reminders, 288 participants (44%) completed the survey (NAV = 228, Nordic Choice = 60). Of the respondents, 33% were males and 67% females. As for educational level, 3% had a junior secondary education, 18% had completed a senior secondary education, 61% had completed at least a bachelor's degree and 18% had a master's degree or higher. Of the respondents, 69% were employees whose role required direct contact with clients/customers. In addition, 27% were leaders, and 73% were subordinates in their organizations, with ages ranging from 21 to 68 years.

3.3. Response bias

To address the response bias normally associated with studies that rely on self-reported data, particularly in surveys (Chang, Witteloostuijn, & Lorraine, 2010; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), we implemented some procedural remedies at the research design stage (Conway & Lance, 2010). The surveys started with a cover letter assuring respondents of their anonymity and confidentiality. The literature suggests that protecting the anonymity of the respondents can reduce both evaluation apprehension and response bias (Podsakoff et al., 2003). Second, we counterbalanced the order of the items from the seven theoretical dimensions of EDI. "Counterbalancing the order of questions relating to different scales and constructs makes CMV less likely, as the respondent cannot then easily combine related items to cognitively 'create' the correlation needed to produce a CMV-biased pattern of responses" (Chang et al., 2010, p. 180, p. 180). This procedure is suggested as a remedy to neutralize bias in the embeddedness of items or context of questions (Conway & Lance, 2010).

4. Data analysis

Our analysis was conducted following these steps: (1) merging the two datasets (NAV and Nordic Choice); (2) managing missing data and calculating means and standard deviations; (3) conducting CFA for the theorized EDI model; (4) randomly dividing the original sample into two; (5) using the first subsample to conduct EFA with principal axis factoring and Promax oblique rotation; (6) performing cross-validation of the EFA solution with CFA on the second subsample, using maximum likelihood estimation and testing a second-order reflective model; and (7) performing multi-group analysis to establish construct validity regardless of

organizational affiliation (NAV or Nordic Choice employees), category of employees (leaders and followers in the various organizations) and user contact (those who deal with customers and those who do not).

As recommended by Mehmet and Jakobsen (2017), we reported multiple goodness-of-fit indices for CFA, as the chi-square test is known to be sensitive to sample size. These include: (a) test statistics, degrees of freedom and significance level for the chi-square test; (b) RMSEA (root mean square error of approximation) and 90% CIs, with values of .05 indicating a close fit (Acock, 2013) and values < .10 an acceptable fit (Mehmet & Jakobsen, 2017); (c) SRMR (standardized root mean square residual), with values ≤ .1 indicating a good fit (Mehmet & Jakobsen, 2017); and (d) CFI (comparative fit index) and TLI (Tucker–Lewis index), with values > .90 generally indicating an acceptable fit (Acock, 2013).

EFA was performed using IBM SPSS version 24.0 (IBMCorp, 2016); CFA was performed using Stata version 15.1 (StataCorp, 2017).

4.1. Merging of datasets, management of missing data and normality of subsamples

We merged the two datasets by adding one dataset into another. We screened for missing values using SPSS MVA and detected no missing values. This is because all the items were compulsory, and a respondent could only submit if all the questions were answered. In addition, we only exported responses that were complete. Univariate skewness and kurtosis were all within the cut-off values of ± 1.0, as suggested previously (Amundsen & Martinsen, 2013).

4.2. Analysis of the theoretical EDI measurement model

We began our model analysis by calculating the coefficient alphas, mean values and standard deviations of the seven dimensions with all sample data (N = 288). The range for the mean was 3.73–6.13, which indicates that the seven dimensions of EDI differed across respondents. The standard deviations were from .72 to 1.68, indicating that variability in the responses was moderate. The alpha coefficients ranged from .70 to .90.

The CFA on our proposed seven-factor first-order measurement model (i.e. emergence of an idea, idea search, idea generation, idea communication, idea development, idea prototyping and idea implementation) yielded a mixture of acceptable and unacceptable indices: $\chi^2(1397, N = 288) = 7194$, $p < .001$; RMSEA = .087 (CI .90 = .08–.09); CFI = .86; TLI = .84; SRMR = .07. Furthermore, the average variance extracted (AVE), used to assess discriminant and convergent validity was problematic. When AVE values are greater or equal to a squared correlation, there is a problem with discriminant validity (Fornell & Larcker, 1981; Mehmet & Jakobsen, 2017). In addition, when the values are < .50, there is a problem with convergent validity (Fornell & Larcker, 1981; Mehmet & Jakobsen, 2017). In this case, neither conditions were adequately met, as we had AVE values of .41–.72, and squared correlations such as .64, .70 and .92. Likewise, the factor intercorrelation between some factors was very high. For example, the correlation between emergence for an idea and idea search was .89, between idea implementation and idea development was .98; it was .90 between idea prototyping and idea implementation and .81 between idea development and idea communication. Consequently, we decided to perform an EFA to determine the underlying factors of EDI, as the CFA for our theoretical model did not exhibit sufficiently accurate psychometric properties. It is recommended that EFA should precede CFA in scale development (Mehmet & Jakobsen, 2017).

4.3. Calibration and validation subsamples

Before performing EFA and CFA, we divided our original sample randomly into two equal subsamples, which yielded an EFA calibration sample (n = 144) and a CFA cross-validation sample (n = 144). Factorability was assessed in accordance with the Bartlett test of sphericity (Bartlett, 1950) and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy (Kaiser, 1974). Accordingly, Bartlett's test [$\chi^2(3740, n = 144), p < .001$] supported the view that factor analysis was the correct choice, whereas the KMO test yielded a value of .91, well above the recommended level of .60. We also conducted three independent *t*-tests to detect differences between our EFA and CFA subsamples, using the demographic variables of gender, education and organization. These tests revealed no significant differences between the two subsamples. Table 2 shows the items in their original wording, with the means and standard deviations for both subsamples.

Table 2 approximately here

4.4. EFA with the first subsample using oblique rotation and principal axis factoring

We performed EFA on the calibration subsample. Because we consider EDI to be multidimensional, principal axis factoring was used for extraction (T. A. Brown, 2014). Promax rotation (kappa = 4) was selected owing to the expected correlations between the factors. The factors to be retained in the model were identified through a combination of a variety of methods. These methods included (i) a rule whereby the eigenvalue is greater than one; (ii) a scree test (Cattell, 1966); (iii) parallel analysis (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Mehmet & Jakobsen, 2017); (iv) approximate simple structure (Fabrigar et al., 1999), and from (v) the interpretability of the factors obtained and their theoretical sensitivity (Mehmet & Jakobsen, 2017).

We started by leaving the number of factors unfixed. Six factors had eigenvalues greater than one, with both the scree test and parallel analysis suggesting three or four factors be retained. Taken together, these methods suggested 3–6 factors. We decided to fix the number of factors at six, five, four and three, in this order, to see whether we could obtain a simple structure. Based on this and theoretical sensitivity, we decided to retain three factors and repeated the EFA. The literature suggests that only items with loading of .32 should be interpreted (Tabachnick & Fidell, 2007), although there is a general inclination to retain items with loadings of ≥ .50 in some studies. Comrey and Lee (1992) proposed using more stringent cut-offs: .32 (*poor*), .45 (*fair*), .55 (*good*), .63 (*very good*) or .71 (*excellent*) (Comrey & Lee, 1992; Tabachnick & Fidell, 2007). We decided to perform the EFA in four steps.

In the first step, we set our cut-off size to retain items with loadings of ≥ .50. Here, 25 items were retained, and the following items were deleted in this order: 1, 2, 11, 4, 18, 16 and 9. Next, we repeated the analysis and increased the cut-off size to .63. Consequently, items 25, 3 and 10 were also deleted in step 2. We repeated the analysis and set the cut-off size at .71, which represents an excellent range, as suggested by Comrey and Lee (1992) and Tabachnick and Fidell (2007). Subsequently, items 21, 26, 30 and 15 were all deleted. Item deletions were done sequentially, and the analysis was repeated at each step, as the omission of a single item may change the entire loading structure (Amundsen & Martinsen, 2013). Complex items that differed by < .30 in the absolute values of their loadings on two factors were also removed. In the third step, 11 items loaded on Factor 1, four items on Factor 2 and three items on Factor 3. To obtain a more balanced factor solution in the final step, we decided to delete some items of Factor 1. We retained the items with the highest loadings from the original dimensions that merged into the factor (i.e. idea development, idea prototyping and idea implementation). Based

on this procedure, items 31, 20, 6, 7 and 12 were also deleted. We ended with Factor 1 having six items, Factor 2 with four items and Factor 3 with three items. Based on the items that loaded on each factor, we called Factor 1 *idea development and implementation*, Factor 2 *emergence and search for ideas* and Factor 3 *idea generation*. Table 3 shows the EFA of EDI (n = 144) in all four steps with pattern matrix and communalities.

Table 3 approximately here

5. Assessment of the latent structure

5.1 CFA cross-validation of the EFA solution

We conducted several CFAs on the raw validation subsample scores. For comparison, we tested a single-factor model constraining all 13 items to load onto the same latent factor. The resulting model fitted the data poorly, and this disproved the view that the 13 items measured a single undifferentiated construct. Next, we tested three hypothesized two-factor models, constraining items to load on designated latent factors. We merged Factors 1 and 2, 1 and 3 and 2 and 3, respectively. We did so to demonstrate that a two-factor model is inferior to a three-factor model. These models fitted the data to a moderate extent at best. The best fit, achieved by merging Factors 1 and 2, is reported in Table 4. Finally, we conducted a three-factor model CFA whereby items were allowed to load on their respective latent factors, as captured in the final stage of the EFA procedure. The analyses of the three-factor CFA model showed that the measurement model fitted the data very well, with the following fit indices: $\chi^2(62, n = 144) = 116.39$, $p < 0.001$; RMSEA = .08 (CI .90 = .06–.10); CFI = .95; TLI = .94; SRMR = .05 (Table 4).

Table 4 approximately here

As shown in Table 5, the standardized factor loadings ranged from .67 to .89, which is well above the recommended minimum of .40 (Mehmet & Jakobsen, 2017). The factor/scale reliability for the three factors was computed with a Raykov's reliability coefficient, with values of .86, .87 and.92, where 0.7 is regarded as the minimum level of reliability (Mehmet & Jakobsen, 2017). The Cronbach alphas for the three factors were computed with values of .85, .87 and .91. Table 5 confirms that the loadings were all above the minimum level of .70. Moreover, the AVE values were all > .5, thereby indicating no problem with convergent validity (Fornell & Larcker, 1981; Mehmet & Jakobsen, 2017). The AVE values were also larger than the squared correlation between latent variables, indicating discriminant validity (Fornell & Larcker, 1981).

Table 5 approximately here

5.2 Test of the second-order reflective model

We tested a second-order model in which items loaded on the first-order factors, and the first-order factors were used as indicators for the second-order EDI factor. All of the first-order factors loaded well on EDI, thus indicating an acceptable second-order factor structure, which also confirms that EDI is a second-order reflective construct. The overall goodness of fit was above the recommended minimum (Figure 2).

Figure 2: Second-order CFA

5.3 Further validation using multi-group analysis

As an additional test of the validity of the new EDI scale, three sets of multi-group analyses were performed using Stata. This was done to ascertain the psychometric equivalence of the model across groups. First, a configural model was established (equal form), and this was used as a baseline model. Second, metric invariance (equal loadings) was assessed, with loadings constrained to calculate their degree of similarity across groups. This was followed by more restricted tests of equal intercepts, equal error variance and equal factor means. Discrepancies between the nested models were measured using a standard chi-square difference test and differences in CFI values. It has been reported that $\Delta CFI \leq -.01$ supports the acceptance of the null hypothesis of invariance (Cheung & Rensvold, 2002).

The results reported in Table 6 show no significant inconsistencies between groups and acceptable model fit, apart from the test of equal error variance across user contact and job category and equal factor means in the job category. Overall, the majority of the parameters tested were equivalent across user contact, organization affiliation and job category, from which we assume that the EDI measurement model is stable and will prove replicable. Hence, these results establish the factor validity of the scale because the EFA revealed a parsimonious as well as theoretically satisfactory three-factor structure for the EDI construct that was confirmed by CFA. We named the resulting instrument the *employee-driven innovation scale* (EDIS).

Table 6 approximately here

6. Conclusion and limitations

The primary aim of this research was to conceptualize EDI, establish its dimensions and develop a reliable and valid instrument to measure it. We theorized that EDI consists of seven dimensions. During the validation process, the emergence of an idea and idea search merged into one dimension, whereas idea development, idea prototyping and idea implementation loaded onto one dimension. Idea generation was retained as a dimension, while idea communication was dropped entirely.

Initially, idea communication spread into other dimensions, and because we increased the cut-off size for item retention, it was dropped entirely. This finding was contrary to our expectation. However, this can be explained in terms of the nature of communication in the workplace. Communication occurs throughout the EDI process. Employees who are predominately involved in EDI may constantly communicate with their colleagues, supervisors or unit managers at all stages of innovation (Engen & Magnusson, 2015). Therefore, communication can be seen as seen to be part of the EDI process. Given that the emergence of an idea and idea search represent the initiation phase of EDI, it is not surprising that they merge. An employee could search for a solution as an idea emerges. Similarly, idea development, idea prototyping and idea implementation merged into one dimension, and represent aspects of EDI tied to the later stages of the innovation process that involve acting on an idea.

Overall, the convergence of related EDI-activities (dimensions) seems to be both theoretical and practically meaningful. This is because some of these stages of the innovation process sometimes occur simultaneously and because it involves the same employees or group of

employees who may not be conscious of the back-and-forth movement between activities and/or the transition from one activity to another; in other words, these stages may overlap from time to time. Again, this finding agrees with previous research, which indicated that the innovation process does not have to be sequential (Wihlman et al., 2014).

Our analyses show that a three-factor model was superior to the alternatives and is sufficiently distinct for a multidimensional model to be justified. Similarly, second-order CFA demonstrated that the three dimensions formed an overall EDI construct. Accordingly, we conceptualized EDI as a multidimensional construct consisting of emergence and search for ideas, idea generation, and idea development and implementation measured with 13 items. Together, these dimensions form an overall construct of employee-driven innovation.

Our findings are valuable for both academic research and practical implications. From a theoretical and conceptual standpoint, we believe that our study supplements the growing EDI literature, in particular with this first scale development study of EDI. Our study establishes the various dimensions of EDI and the items that measure them. We have thus elucidated the structure of EDI, thereby contributing conceptually and methodologically to employee-driven innovation research.

Overall, the steps reported in this study fulfil the requirements of scale development. Nevertheless, there are inevitably some limitations and thus, recommendations for future research. First, the stability and generalizability of the EDIS require further testing with samples from other sources, organizations and cultures beyond those in this study. For example, it is unclear how the EDIS will perform in different cultures, given that Scandinavian countries are generally egalitarian societies with relatively flat organizational structures and a low power distance. Second, because idea communication was a redundant dimension based on the current findings, we believe this is a relevant direction for future research. Third, the EDIS should be tested for its relationship with relevant antecedent variables, such as leadership behaviours, employee empowerment etc. Fourth, the discriminant validity of the EDIS in relation to other relevant innovation scales is another area for further research. Fifth, the survey used for this study was from a single source, which raises concerns about response bias. This is also a limitation of the current study despite all the measures taken to minimize and control response bias. Finally, the development and validation of scales are a continuous process that requires retesting and replication in a systematic manner (Hinkin et al., 1997). What has been achieved through this study is a first step, which future work should aim to improve upon.

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Figure 1: Scale development procedure

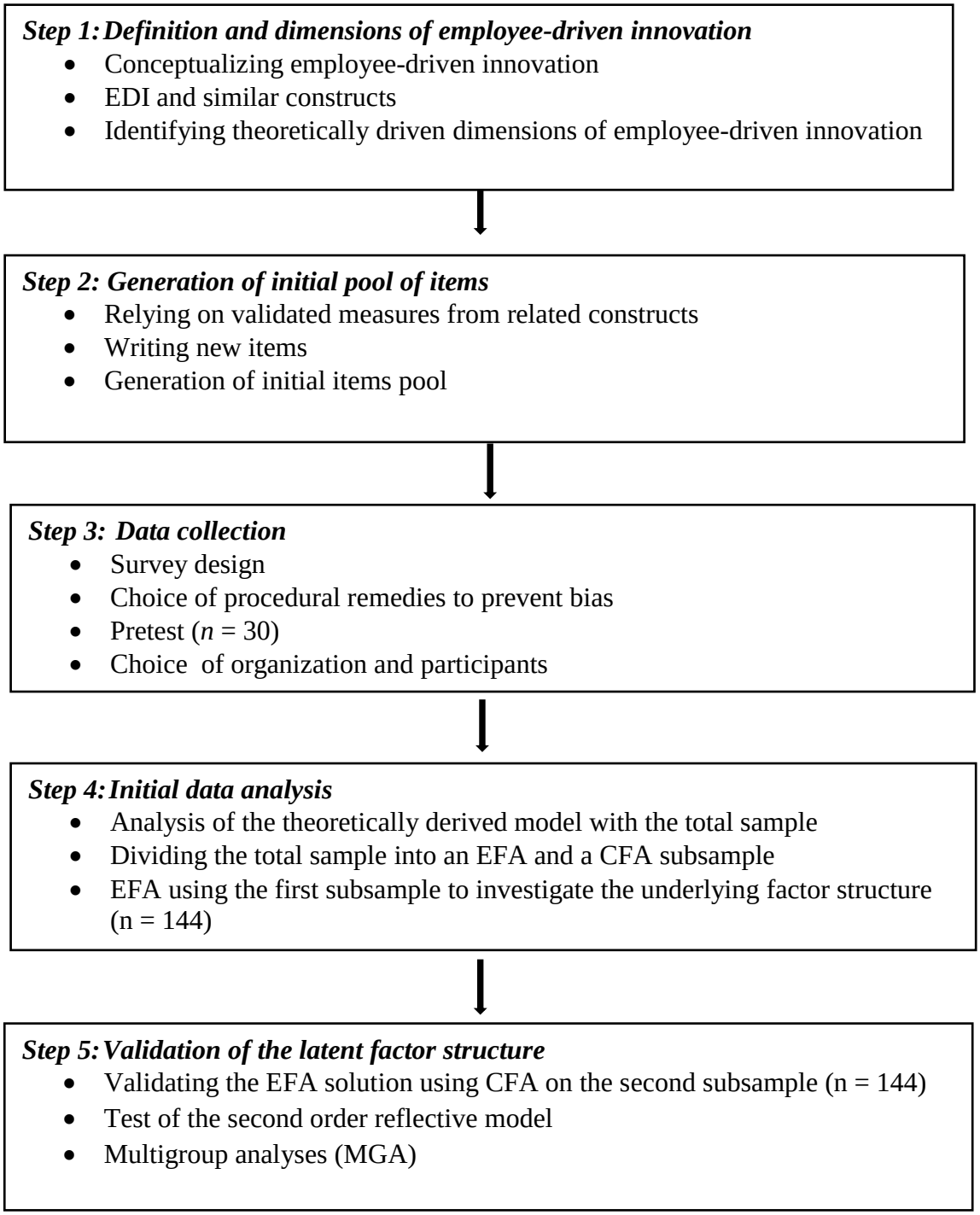
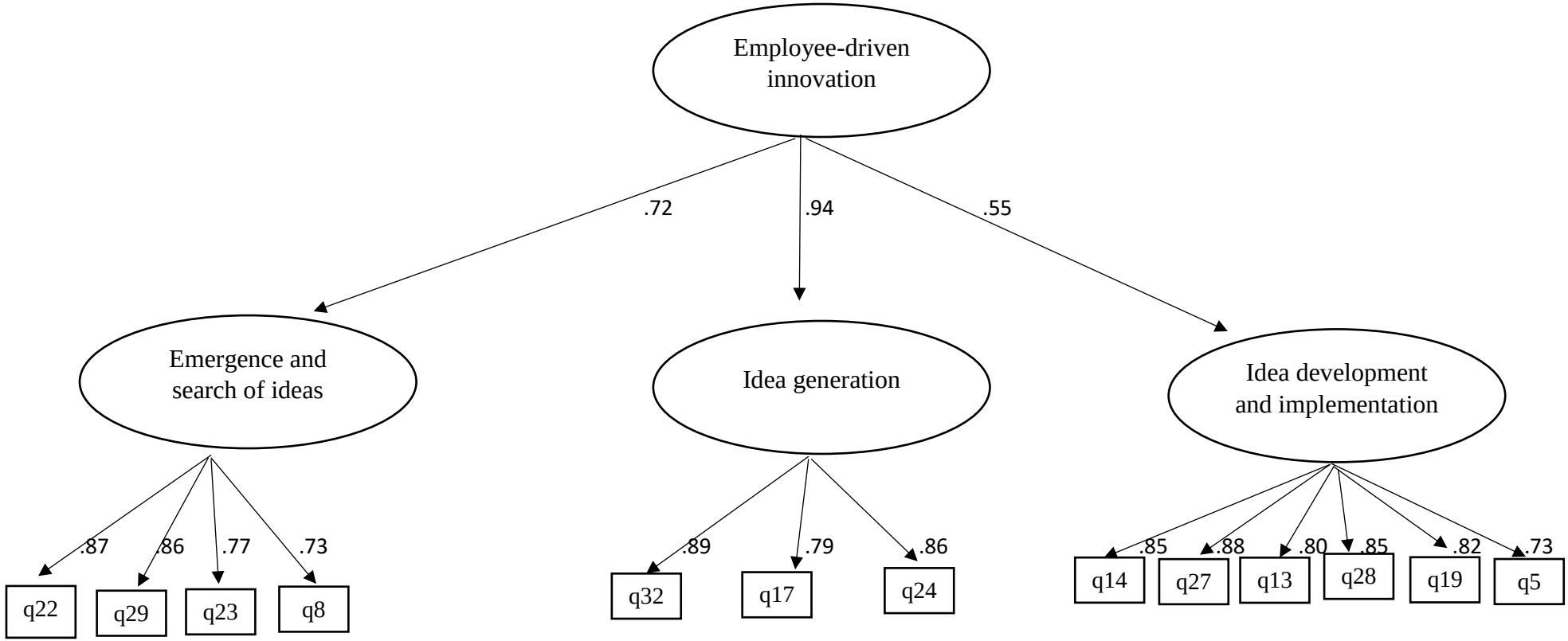


Figure 2: Secondorder CFA of employee-driven innovation



Notes: $\chi 2$(df): 152(62), RMSEA: .08 (CI .90 = .06 - .10), CFI: .96, TLI: .94, SRMR: .04

Table 1: Summary of the dimensions

Dimension	**Description**	**Reference**
Emergence of ideas	A new idea emerges from an employee's perception of a problem or recognition of an opportunity.	Saari et al. (2015)
Idea search	Searching for a solution to an identified problem or recognized opportunity	Lukes and Stephnan (2016)
Idea generation	It involves creating and suggesting new ideas	De Jong and Den Hartog (2010)
Idea communication	Includes discussion of the idea with colleagues and/or managers, in both formal and informal arenas.	Lukes and Stephnan (2016); Deslee (2018)
Idea development	It involves the evaluation of the new idea and decision making to actualize and implement the idea.	Deslee (2018) Renkema et al. (2018)
Idea prototyping	Idea prototyping is when a new idea is put into practice for the first time.	Wihlman et al. (2014)
Idea implementation	Idea implementation is when an idea is adopted as a new work routine or process.	Smith et al. (2012) Wihlman et al. (2014)

Table 2. Descriptive statistics and wording for Employee-Driven Innovation items for EFA and CFA subsamples

Item number and wording	Dimension	EFA subsample		CFA subsample	
		M	SD	M	SD
1. I look for opportunities for improvements in my practice/daily work	Emergence of idea 1	6.17	.99	6.11	.94
2. I can identify when there are problems with a daily routine/practice	Emergence of idea 2	5.92	1.03	5.90	.99
3. I am able to recognize new opportunities in my daily work	Emergence of idea 3	5.36	1.03	5.41	1.14
4. I recognize when there is an opportunity for improvement with a practice	Emergence of idea 4	5.60	1.06	5.60	.96
5. I always identify when there is need for changes in the practice	Emergence of idea 5	5.70	1.03	5.56	1.03
6. I can search for solutions for the challenges and opportunities I encounter	Idea search 1	6.50	.75	6.5	.71
7. When I recognize an opportunity or a problem, I search for solutions	Idea search 2	6.11	.95	6.08	.94
8. I search for how things are done elsewhere to get an idea for my own work	Idea search 3	5.40	1.38	5.40	1.24
9. I am able to search for solutions to identified problems	Idea search 4	5.90	1.00	5.80	.95
10. I try to come with new ways of doing things at work	Idea generation 1	5.90	1.11	5.73	1.04
11. I suggest new ways of performing work tasks	Idea generation 2	5.62	1.12	5.67	1.10
12. I often come up with creative solutions to problems at work	Idea generation 3	4.83	1.33	4.96	1.25
13. I am good to generate original solutions for problems	Idea generation 4	4.93	1.30	5.03	1.27
14. I come up with creative ideas that might improve the daily work	Idea generation 5	4.86	1.40	5.03	1.31
15. When I have a new idea, I communicate it to my superiors.	Idea communication1	5.52	1.44	5.69	1.34
16. I always discuss my ideas with colleagues	Idea communication2	6.02	1.10	5.99	1.07
17. I always report new ideas to my superior	Idea communication3	5.04	1.39	5.22	1.34
18. We have procedures for communicating new ideas	Idea communication4	3.78	1.86	3.81	1.76
19. We are always required to communicate new ideas	Idea communication5	5.00	1.67	4.90	1.71
20. We develop new idea before implementation	Idea development 1	4.81	1.56	4.74	1.44
21. When someone has a new idea, it is evaluated before implementation	Idea development 2	5.26	1.45	5.14	1.47
22. There is a process for developing ideas in the department/unit	Idea development 3	4.76	1.57	4.86	1.34
23. We have routines for developing idea before implementation	Idea development 4	3.67	1.78	3.80	1.55
24. We develop suitable plans and schedules for the implementation of new ideas	Idea prototyping 1	4.45	1.60	4.25	1.51
25. We systematically implement innovative ideas into work practices	Idea prototyping 2	4.30	1.69	4.17	1.53
26. We contribute to the implementation of new ideas	Idea prototyping 3	4.18	1.60	4.40	1.55

27. We are good at implementing new ideas	Idea prototyping 4	4.36	1.54	4.47	1.58
28. The ideas we come up with that become implemented lead to changes in the work practice.	Idea implementation 1	5.03	1.43	5.00	1.41
29. When a developed idea is put into practice, it becomes part of the routine	Idea implementation 2	4.83	1.44	5.04	1.40
30. Implemented ideas changes the way we carry out tasks	Idea implementation 3	4.90	1.45	4.99	1.24
31. Implemented ideas becomes part of the routine	Idea implementation 4	4.67	1.57	4.82	1.41
32. New ideas lead to changes in the way we do our job	Idea implementation 5	4.79	1.86	4.84	1.46
Univariate skewness range		.00 - .85		.00 - .95	
Univariate kurtosis range		.00 - .91		.00 - .96	

Table 3. Exploratory Factor Analysis of initial and final set Employee Driven Innovation (n = 144)

Item number and dimension	Stage 1 EFA(item=25)				Stage 2 EFA (items =22)				Stage3 EFA (items = 18)				Final EFA (items= 13)		
	Factor 1	Factor 2	Factor 3	h^2	Factor 1	Factor 2	Factor 1	h^2	Factor 1	Factor 2	Facto	h^3	Factor 1	Factor 2	Factor 3
	Pattern matrix				*Pattern matrix*				*Patter matrix*						
14 Idea imp. 2	**.88**	.15	-.21	.78	**.89**	.10	-.18	.70	**.88**	.10	-.16	.68	**.88**		
27 Idea pro. 4	**.86**	-.34	.09	.81	**.84**	-.05	.12	.81	**.83**	-.07	.15	.80	**.86**		
13 Idea pro. 2	**.84**	.05	-.18	.75	**.83**	.02	-.15	.70	**.82**	-.00	-.10	.65	**.84**		
28 Idea imp. 4	**.83**	.06	-.04	.73	**.83**	.02	.00	.76	**.80**	.03	.01	.73	**.83**		
19 Idea dev 3	**.80**	.13	-.06	.81	**.82**	.10	-.04	.79	**.82**	.04	.02	.77	**.80**		
31 Idea imp. 5	**.77**	-.13	.24	.82	**.76**	-.12	.23	.79	**.75**	-.11	.23	.76			
26 Idea dev. 4	**.76**	-.19	.06	.72	**.70**	-.15	.08	.56							
20 Idea pro 3	**.76**	.02	-.06	.65	**.74**	-.02	00	.64	**.73**	-.03	.03	.57			
6 Idea pro 1	**.74**	-.02	.03	.66	**.77**	-.03	-.01	.64	**.77**	-.04	.04	.63			
7 Idea imp 1	**.74**	.03	.00	.66	.77	.00	-.02	.66	**.76**	.01	-.01	.64			
5 Idea dev 1	**.73**	**.**17	-.12	.72	**.76**	.15	-.15	.70	**.77**	.10	-.09	.68	**.73**		
12 Idea dev 2	**.72**	.08	.00	.70	**.74**	.07	-.03	.68	**.75**	.04	.01	.66			
21 Idea imp 3	**.72**	.13	.07	.78	**.71**	.09	.11	.77							
30 Idea comm. 5	**.70**	-.18	.30	.75	**.68**	-.17	.31	.72							
25 Idea comm. 5	**.61**	-.19	.10	.68											
22 Emergence 4	.05	**.93**	-.07	.78	0.7	**.91**	-.08	.76	.10	**.86**	-.06	.70		**.86**	
29 Emergence 5	-.05	**.75**	.17	.70	-.05	**.80**	.10	.66	-. 3	**.81**	.07	.65		**.81**	
23 Idea search 4	-.05	**71**	.19	.71	-.06	**.75**	.17	.70	-.05	**.79**	.13	.69		**.79**	
8 Emergence 2	-.02	**.68**	.06	.55	.00	**.72**	-.02	.55	.03	**.73**	-.04	.53		**.73**	
15 Emergence 3	.09	**.65**	.09	.60	.10	**.67**	.06	.59							
32 Idea gen. 5	.11	-.03	**.84**	.78	.04	.02	**.87**	**.77**	.05	-.03	**.90**	.72			**.90**
17 Idea gen. 3	.10	-.03	**.77**	.65	.03	.05	**.76**	**.**63	.04	-.02	**.81**	.62			**.81**
10 Idea gen. 2	-.10	.20	**.69**	.65											
24 Idea gen 4	-.04	.23	**.67**	.72	-.12	.27	**.73**	**.71**	-.10	.23	**.75**	.70			**.75**
3 Idea gen 1	-.11	.18	**.62**	.62											
Eigenvalue	11.84	3.46	1.43		11.13	2.94	1.37		9.12	2.62	1.18				
Variance account for (%)	47.34	13.83	5.73		46.36	12.27	5.7		50.8	14.5	6.6				

Note: P = Pattern matrix, h^2 = Communalities, the bold types indicate on which factors the items had strongest loading, emergence = emergence of idea, Idea gen = idea generation, idea comm = idea communication, idea dev = idea development , idea imp = idea implementation, imp idea = implemented idea

Table 4. Confirmatory factor analysis of the employee-driven innovation scale in the validation subsample (n = 144)

Model	df	χ^2	RMSEA (90% CIs)	CFI	TLI	SRMR
One factor	54	464.29	.23 (.21 - .25)	.62	.54	.18
Two factor	64	192.22	.12 (.10 - .13)	.89	.87	.07
Three factor	62	116.39	.08 (.06 - .10)	.95	.94	.05

Note: CI = confidence interval; RMSEA = root mean square error of approximation (<0.08); CFI = comparative fit index (>0.9); TLI = Tucker-Lewis index (> 0.9); SRMR = standard root mean square residual (<0.1).

Table 5. Scale items and Confirmatory Factor Analysis result

Factors and items	Standardized factor loadings	Raykov's factor reliability coefficient	AVE	α
Emergence and search of ideas		**.86**	**.60**	**.85**
I recognize when there is an opportunity for improvement with a practice	.84			
I always identify when there is need for changes in the practice	.83			
I am able to search for solutions to identified problems	.71			
I can identify when there are problems with a daily routine/practice	.71			
Idea generation		**.87**	**.69**	**.87**
I come up with creative ideas that might improve the daily work	.89			
I often come up with creative solutions to problems at work	.77			
I am good to generate original solutions for problems	.83			
Idea development & Implementation		**.92**	**.64**	**.91**
When a developed idea is put into practice, it becomes part of the routine	.81			
We are good at implementing new ideas	.89			
We systematically implement innovative ideas into work practices	.83			
Implemented ideas become part of the routine	.85			
There is a process for developing ideas in the department/unit	.75			
We develop suitable plans and schedule for the implementation of new idea	.67			

Note: AVE = Average Variance Extracted, α = Cronbach's alpha

Table 6. Multigroup analysis of the validation subsamples, user contact, organizational affiliation and job category

Model	$\chi 2(df)$, p	Model compared	RMSEA	Diff $\chi 2(df)$, p	CFI	TLI	ΔCFI
User contact							
1. Equal form	240.80(147), 0.00	n.a	.09	n.a	.92	.92	
2. Equal loadings	240.80(147), 0.00	2 vs. 1	.09	0.00 (0)	.92	.92	.00
3. Equal intercepts	240.90(147), 0.00	3 vs. 2	.09	0.00	.92	.92	.00
4. Equal error variances	270.31(160), 0.00	4 vs. 3	.10	29.51(13), 0.01*	.91	.91	-.01
5. Equal factor means	270.31(160), 0.00	5 vs. 4	.10	0.00(0)	.91	.91	.00
Organization							
1. Equal form	221.01(124), 0.00	n.a.	.10	n.a	.92	.90	
2. Equal loadings	234.35(134), 0.00	2 vs. 1	.10	13.34(10), 0.21	.91	.90	-.01
3. Equal intercepts	244.01(144), 0.00	3 vs. 2	.10	9.65(10), 0.47	.91	.91	.00
4. Equal error variances	263.21(157), 0.00	4 vs. 3	.10	19.21 (13), 0.12	.91	.91	.00
5. Equal factor means	276.82 (160), 0.00	5 vs. 4	.10	13.61 (3), 0.4	.90	.90	-.01
Job category							
1. Equal form	213.77 (124), 0.00	n.a	.10	n.a	.93	.91	
2. Equal loadings	226.33 (134), 0.00	2 vs. 1	.10	12.57(10), 0.25	.92	.91	-.01
3. Equal intercepts	234.46(144), 0.00	3 vs. 2	.10	8.12(10),0.62	.92	.92	.00
4. Equal error variances	259.47 (157), 0.00	4 vs. 3	.10	25.01(13), 0.02**	.92	.92	.00
5. Equal factor means	268.91 (160), 0.00	5 vs. 4	.10	9.45(3), 0.02**	.91	.91	-.01

Note: RMSEA = root mean square error of approximation (<0.1); CFI = comparative fit index (>0.9), Tucker-Lewis Index (TLI) (>0.9)

*$p < 0.001$, **$p < .05$

Paper II

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Linking Structural Empowerment to Employee-Driven Innovation: The Mediating Role of Psychological Empowerment

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Abstract: This paper aims to link structural empowerment to employee-driven innovation (EDI) with psychological empowerment as a mediation mechanism. Recently, there has been an increase in interest in utilizing all sources of knowledge in an organization to stimulate innovation among all employees. A clear understanding of some of the mechanisms used to achieve this is needed. The paper applies a quantitative approach based on two studies. Study 1 involved a total of 228 employees in a public sector organization, while study 2 involved 60 employees from a private sector organization. We employed structural equation modeling to test the hypothesized relationships among the variables. It was determined that both structural empowerment and psychological empowerment have a direct positive association with EDI. Second, the relationship between structural empowerment and EDI was partially mediated by psychological empowerment. EDI can only happen in an organization if employers and managers empower the ordinary employees to not only generate creative ideas but also to participate in its development and implementation.

Keywords: employee-driven innovation; structural empowerment; psychological empowerment

1. Introduction

Several studies have acknowledged the importance of innovation in modern organizations (Hartley 2005; Snyder et al. 2016; Pieterse et al. 2010; Osborne and Brown 2011). The modern economy is characterized by globalization, dynamism and more knowledgeable employees, as customers and citizens are continually expecting better services. Therefore, both public and private organizations continually strive to renew themselves, and service innovation is viewed as one of the main channels for improvement (Helkkula et al. 2018; Carlborg et al. 2014; Durst et al. 2015; Witell et al. 2016). Osborne and Brown (2011) argue that the dominance and influence of innovation on public policy and innovation in public services would remain essential to meet the economic and social challenges of today.

To enhance innovative capabilities, organizations should exploit all sources of knowledge (Alasoini 2013) instead of restricting innovation to only a few within the organization (Høyrup 2012; Kesting and Ulhøi 2010). As such, new models of innovation have suggested more active and diverse roles for all employees within the organization. One of these models is expressed through the conceptual framework of employee-driven innovation (EDI), which embraces innovation activities that are initiated and driven by ordinary employees (Renkema 2018; Smith et al. 2012; Båckstrom and Lindberg 2018). To drive innovation implies that employees participate in both the generation of creative ideas and their implementation (Smith et al. 2012; Bäckström and Lindberg 2019). Kesting and Ulhøi (2010) argue that "for ordinary employees, to drive innovations largely means participating in those organizational

decision-making procedures by which innovations are triggered and determined" (p. 68). According to Aaltonen and Hytti (2014), contextual factors such as organizational structures could act as a barrier to innovation. In a more recent study, Renkema et al. (2018) suggest that organizations cannot utilize the innovation potential of ordinary employees if they fail to empower those employees. By implication, it means removing the contextual barriers that inhibit the participation of ordinary employees in innovation activities. This indicates that empowerment could play an important role in facilitating EDI. Yet, the role of empowerment in EDI has not been previously investigated in the context of EDI. In general, studies show that even though empowering initiatives are enabling, sometimes they could be a burden as well (Cheong et al. 2016).

Empowerment is a concept that describes working arrangements in which the empowered is engaged at an emotional level (Conger and Kanungo 1988). Kanter (1977) argues that empowerment results from decentralization, a flattening of the hierarchy and increased employee participation. Amundsen (2014) suggests that the involvement of employees and power-sharing with employees are at the core of empowerment. This includes giving employees more freedom and autonomy in the workplace (Amundsen 2014; Amundsen and Martinsen 2015). Empowerment enables employees to learn to use their initiative and act more creatively (Laschinger et al. 2004; Humborstad 2012). In this context, Conrad (2017) suggests that through empowerment, organizations engage and enable their employees to take responsibility. Thorlakson and Murray (1996), cited by Laschinger et al. (2004) described empowerment as a tool to encourage employees to independently reflect about their work instead of continuously engaging in the usual routine.

According to Kanter (1988), employees are unlikely to initiate processes that deviate from established organizational routines and practices if they are not empowered. In this paper, we draw on the argument that employees need to be empowered by organizational structures to participate in the organizational decision-making procedures by which innovations are triggered and determined (Kesting and Ulhøi 2010). However, structural empowerment may not be enough for EDI to occur. Studies have shown that when employees are psychologically empowered, such employees are more likely to believe they are autonomous, more impactful, creative and less likely to be constrained by technical or rule-bound aspects of work (Spreitzer 1995; Spreitzer and Doneson 2005). In a recent study, Lempiala and Yli-Kauhaluoma (2019) highlighted how teams with similar structural support and resources could differently perceive their ability to engage in EDI. Thus suggesting that empowering structures may not be enough for EDI but how employees experience and interpret these matter.

Consequently, this paper aims to develop and test a model that focuses on how the two main approaches of empowerment (structural and psychological empowerment) associate with EDI. Accordingly, this paper makes the following contributions: First, we contribute to the EDI body of knowledge by developing and empirically testing a model that links structural and psychological empowerment to EDI. We show that a work environment that is considered to be structurally empowering will positively influence EDI. Secondly, we reaffirm the positive relationship between structural empowerment and psychological empowerment. Lastly, we demonstrate that the association between structural empowerment and EDI is partially mediated by psychological empowerment.

We organize the rest of this paper as follows: Next, we discuss the theoretical perspectives and formulate the study's hypotheses, followed by the research methodology. After that, we present our analyses, conclusion and limitations of the study.

2. Theory and Hypotheses

2.1. Employee-Driven Innovation

EDI belongs to an umbrella concept, usually referred to as workplace innovation. This is because employees' contribution and EDI are based upon how their innovation activities are embedded within their work practice. The premise for EDI is that employee participation is seen as a means of increasing

productivity, achieving more influence on the decision-making process and subduing conflicts and democratization of society (Aasen et al. 2012; Bäckström and Bengtsson 2019).

EDI is a concept that describes innovation whereby a new idea, product or process is initiated and implemented by a single employee or by the joint effort of two or more employees (Kesting and Ulhøi 2010; Høyrup 2010). EDI emphasizes innovation as a process wherein ordinary employees are seen as the primary sources and drivers of innovation (Saari et al. 2015; Lempiala and Yli-Kauhaluoma 2019; Holmquist and Johansson 2019; Kurz et al. 2018). Because these employees are not required to be involved in innovation, EDI is therefore described as an extra role behavior (Renkema 2018; Buhl 2018). The argument for employee participation is based on the idea that these employees regularly face challenges through their work practices and are ideally positioned as a source of innovation (Wihlman et al. 2014; Båckstrom and Lindberg 2018). In addition, the employees' knowledge of their work practices puts them in a position to gain a context-dependent understanding that their managers might lack (Kesting and Ulhøi 2010). Despite the fact that employees are acknowledged as essential sources for innovation, their creative potential is often underutilized (Saari et al. 2015).

Following Saari et al. (2015), participatory decision making and power-sharing are some of the factors that facilitate EDI. In a recent study, Voxted (2018) identified management support as one of the key factors that facilitate EDI. These factors determine the extent that employees can develop and use their competencies as well as their creative potentials (Totterdill and Exton 2014), and are mostly dependent on the kind of workplace where employees perform their jobs. Innovation (including EDI) depends on an employee's network of relationships within the organization, "because it is these relationships that provide the requisite inspiration, information, resources, and support that help innovators develop, promote, and realize their new ideas" (Wang et al. 2015, p. 1).

2.2. Employee Empowerment

Empowerment can be traced back to studies on employee involvement and participation that were carried out over six decades ago (Maynard et al. 2012). It implies a range of management practices (e.g., sharing authority, resources, information) that directly affects work outcomes (e.g., quality, productivity, customer satisfaction). It also indirectly affects them by influencing employee cognitions (e.g., self-efficacy, motivation) (Fernandez and Moldogaziev 2013; Spreitzer 1995; Vecchio et al. 2010). Amundsen and Martinsen (2015) argue that to empower is concerned more with the transfer of influence to another than with influencing another. They further stated that work designs that flow from empowerment approaches are characterized by autonomy, self-leadership, the delegation of responsibility and decision making authority. In this regard, Wong Humborstad and Perry (2011) suggest that empowerment is a form of employee involvement initiative, which explains the degree to which employees are allowed to make decisions without recourse to their superiors.

Empowerment literature indicates that two dominant views of empowerment have gradually emerged over the years (Amundsen 2019; Maynard et al. 2012; Rhee et al. 2017). These are the social-structural and the psychological approach. Conceptually, social-structural empowerment is made of both structural and social empowerment (Amundsen 2014). The structural approach is linked to structural aspects, such as information, resources, decentralization, knowledge and authority (Maynard et al. 2012). In contrast, social empowerment is linked to relational aspects such as between leaders and their subordinates or among employees themselves (Amundsen 2014). The social perspective is also called the relational perspective in the literature. However, both the structural and social aspects are aimed at fostering psychological empowerment and are based on employees' perceptions of their work role (Amundsen and Martinsen 2015; Baird et al. 2018). This paper focuses on the structural part of the social-structural approach of empowerment.

2.3. Structural Empowerment

Structural empowerment, sometimes referred to as managerial empowerment, focuses on how individuals with power and authority in an organization (managers) share it with those that lack

it (employees) (Conger and Kanungo 1988; Fernandez and Moldogaziev 2013). It derives from organizational theories with the main emphasis on the delegation of power and authority (Knol and Van Linge 2009). At the core of structural empowerment is the transition of authority and responsibility from upper management to employees (Maynard et al. 2012). It is described as a fundamental determinant that influences behavior, whereby employees with sufficient empowerment can fulfil the tasks (Knol and Van Linge 2009). Structural empowerment implies that lower-level employees in an organization are enabled to take appropriate action through a set of structures, practices and policies within the organization that result from a flattening of the hierarchy (Seibert et al. 2011). Previous studies have found that structural empowerment leads to innovative behavior (Knol and Van Linge 2009; Hebenstreit 2012; Dan et al. 2018).

Drawing from Kanter's theory of structural empowerment, Kanter identified four work empowerment structures: information, resources, support and opportunity (Kanter 1977, 1979). Research shows that having access to information, receiving support, having access to resources necessary to do one's job and having the opportunity to learn and grow are considered as empowering structures. When employees are structurally empowered, the manifestation in the organization is reflected by access to these structures facilitated by formal job characteristics (Laschinger et al. 2001). Kesting and Ulhøi (2010) suggested that a lack of time, resources and information would considerably hamper employees' idea generation.

According to Kesting and Ulhøi (2010), in an ideal type of organizational structure that promotes EDI, employees can propose changes while management can delegate the decision authority to employees. The implication is that employees who are not required to take on the task of innovation now begin to do so through organizational designs. That is, the organization's ability to offer access to information, resources, support and opportunity in the work environment has a major impact on innovation (O'Brien 2010). In their study, Hansen et al. (2017) noted that de-emphasizing an organisational structure was among the most critical factors for successful innovation. Based on the above discussion, we put forward the following hypothesis:

H1: *There is a positive relationship between structural empowerment and EDI.*

2.4. Psychological Empowerment

Psychological empowerment has its foundation in social psychological theory based on personal development. Conger and Kanungo (1988) defined psychological empowerment as a motivational construct. Their view of empowerment shifted the perception of empowerment to the individual. Thomas and Velthouse (1990) elaborated Conger and Kanungo's work further, and linked empowerment to increased intrinsic task motivation. The focus here is on employees' perceptions or cognitive states regarding empowerment, thus regarded as individual perspective on empowerment (Maynard et al. 2012; Menon 2001).

Psychological empowerment manifests in four cognitions reflecting an individual's orientation to his or her work role: meaning, competence, self-determination and impact (Spreitzer et al. 1999; Thomas and Velthouse 1990). These four dimensions combine into the overall construct of psychological empowerment (Spreitzer 1995; Spreitzer and Doneson 2005). Meaning reflects on how one's feels that one's work is personally important (Knol and Van Linge 2009). Competence refers to the belief in one's ability to successfully perform one's job (Laschinger et al. 2001). Autonomy (self-determination) indicates the perceptions of how free one is to choose how to initiate and carry out tasks (Laschinger et al. 2004). Impact concerns the extent to which one perceives one's behaviors as making a difference in work outcomes (Spreitzer 1995).

As investigated and noted in other studies, psychological empowerment can be viewed as a mechanism that mediates the relationship between structural empowerment and different work outcomes (Knol and Van Linge 2009; Laschinger et al. 2001; O'Brien 2010; Amundsen and Martinsen 2015; Wagner et al. 2010; Seibert et al. 2011). Research has consequently indicated that the two major

approaches of empowerment are related. Psychological empowerment is a reaction to structural empowerment (Amundsen and Martinsen 2015; Corsun and Enz 1999; Camilla and Krishna 2015), as it underscores employees' reactions to structural empowerment conditions (Knol and Van Linge 2009; Laschinger et al. 2004; O'Brien 2010). According to Laschinger et al. (2004), "by increasing access to work empowerment structures, employee experience feeling of personal empowerment . . . " (p. 268).

We postulate as follows:

H2: *There is a positive relationship between structural empowerment and psychological empowerment.*

Previous studies indicate that empowerment and allowing autonomy are crucial as they stimulate idea generation in employees (Avolio et al. 1991; Russell and Stone 2002; Wagner et al. 2010), and are therefore conducive to the generation of innovations (Laschinger et al. 2001). It enables employees to respond more quickly to customer service requests, act to rectify complaints and be more engaged in service encounters (Conrad 2017; Laschinger et al. 2004). Empowered employees are likely to feel more self-efficacious (Amabile 1988; Spreitzer 1995), and have more significant opportunities for self-direction (Vecchio et al. 2010). Also, research suggests that empowerment initiatives lead to enhanced employee performance, well-being and positive attitudes (Maynard et al. 2012), which may also have a positive impact on their innovation attempts. Above all, previous studies show that empowered employees are more innovative (Fernandez and Pitts 2011; Fernandez and Moldogaziev 2013).

EDI is a complex process made up of different activities, which includes emergence and search of ideas, idea generation and development as well as the implementation of ideas (Echebiri et al. forthcoming). For example, idea generation itself is a creative process that requires employees' internal desire for creativity, learning and development (Alasoini 2013). Previous studies indicate that empowerment and allowing autonomy is indeed conducive to idea generation in employees. That is to say that employee participation stimulates idea generation and is, therefore, helpful to the generation of innovations (Kesting et al. 2015).

As previously argued, ordinary employees are not expected to take on the role of being innovators. Instead, they are expected to undertake various supportive functions and implement management decisions (Kesting and Ulhøi 2010). However, empowerment encourages employees to think for themselves and ultimately move beyond doing blindly what they are told to do (Laschinger et al. 2004). By being empowered, employees may learn to take the initiative and creatively respond to the challenges of the job. Hence the following hypotheses:

H3: *There is a positive association between psychological empowerment and EDI.*

Since previous studies have suggested that psychological empowerment is a reaction to structural empowerment, we also expect psychological empowerment to act as a mediation mechanism between structural empowerment and EDI. The mediation role of psychological empowerment between work environment structures and work outcomes has been supported by previous studies (e.g., Camilla and Krishna 2015; Rhee et al. 2017). However, owing to the nature of social reality, we expect the mediation to be partial rather than complete, which implies that structural empowerment would manifest direct associations with EDI but have an indirect effect via psychological empowerment. This leads to the following (see Figure 1):

H4: *Psychological empowerment will partially mediate the relationship between structural empowerment and EDI.*

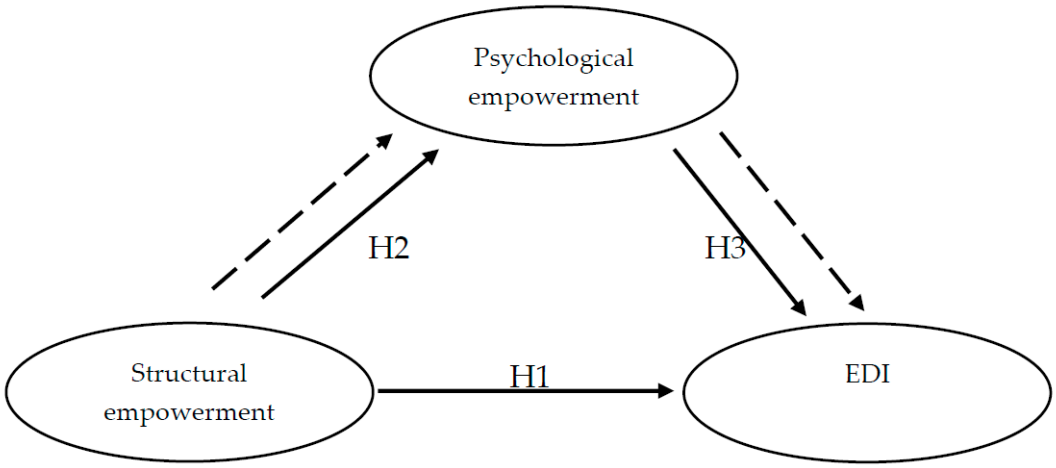

Figure 1. Hypothesized model. Notes: Direct parts are represented with straight arrows. The mediation part is represented with the dashed arrows.

3. Study 1: Methodology

3.1. Data Collection and Sample Attributes

We collected data from the Norwegian Labour and Welfare Administration (NAV). Based on an onging research collaboration between our research group and the organization, we relied on the convenience sampling method. We designed our survey instrument using Checkbox. Checkbox is a professional tool for conducting online surveys (Checkbox 2018). A link to the survey with an explanation was sent to our contact person in the organization, who then distributed it among other employees. A total of 461 employees received the survey and 228 employees completed it, representing a response rate of 49%. Of these, 68 respondents (30%) were males, while 160 (70%) were females. There were 186 respondents (82%) who reported that they were subordinates, whereas 42 (18%) had leadership responsibilities. Among the respondents, 160 (70%) had contact with users, and 68 (30%) had no contact with users.

3.2. Common Method Bias (CMB)

To deal with common method variance, which is usually associated with studies that rely on self-reported data collected at the same point in time (Podsakoff et al. 2003; Chang et al. 2010), we implemented two ex-ante remedies at the research design stage (Conway and Lance 2010). First, our survey was designed to be anonymous. It has been suggested that protecting the anonymity of the respondents minimizes the evaluation apprehension and can reduce method bias. Second, we counterbalanced the order of the measurement of our dependent and independent variables, as suggested in previous studies (Podsakoff et al. 2003). According to Chang et al. (2010), counterbalancing the order of items in relation to different scales and constructs makes CMV less likely.

3.3. Research Instruments

All items used for this study were scored using a seven-point Likert scale rated from 1 (strongly disagree) to 7 (strongly disagree).

Employee-Driven Innovation (EDI). We measured EDI with a 13 items scale developed by Echebiri, Engen, and Amundsen (in press). The scale is comprised of the following three sub-dimensions: Emergence and search for ideas (four items), idea generation (three items), and idea development and implementation (six items). The Cronbach alpha were 0.89, 0.88 and 0.92, respectively. Sample items include emergence and search for ideas (I recognize when there is an opportunity for improvement with a new practice), idea generation (I come up with creative ideas that might improve daily work), and idea development and implementation (When a developed idea is put into practice, it becomes part

of the routine). The fit indexes for three first-order factors (three dimensions) plus one second-order factor fell within an acceptable range [χ^2 (62) = 191.25, $p < 0.001$; CFI = 0.95; TLI = 0.94; RMSEA = 0.09; SRMR = 0.04]. The overall scale reliability of EDI was 0.78. All indicators exhibited significant relationships ($p < 0.001$) with their intended latent variable (range = 0.71 to 0.89).

Structural empowerment. Structural empowerment was assessed with an 11-item scale adapted from the conditions of work effectiveness questionnaire (Havaei and Dahinten 2017). The scale is originally made up of four sub-dimensions that is opportunity, information, support and resources, with each having three items. Because discriminant validity was not achieved for resources, the item that had the lowest *r*-squared value for the construct was dropped. Sample items include; opportunity (I have the chance to gain new skills and knowledge on the job), information (I am informed about the policies and procedures to do my job well), support (I get specific information about things I do well) and resources (I have the resources I need for my job). The fit indexes for four first-order factors plus one second-order factor fell within an acceptable range [χ^2 (38) = 149.54, $p < 0.001$; CFI = 0.93; TLI = 0.90; RMSEA = 0.10; SRMR = 0.65]. The overall scale reliability for structural empowerment was 0.78. All indicators exhibited significant relationships ($p < 0.001$) with their intended latent variable (range = 0.68 to 0.88).

Psychological empowerment. We assessed psychological empowerment with the Spreitzer (1995) 12-item scale. The scales comprises of four sub-dimensions: meaning, competence, impact and autonomy with each having three items (α = 0.87, 0.87, 0.90 and 0.94, respectively). Sample items included: meaning (The work I do is very important to me), competence (I am confident about my ability to do my job), autonomy (I have autonomy in determining how I do my job) and impact (My impact on what happens in my department is large). The fit indexes for the four correlated first-order factors model fell within an acceptable range [χ^2 (50) = 118.03, $p < 0.001$; CFI = 0.97; TLI = 0.96; RMSEA = 0.07; SRMR = 0.06]. The overall scale reliability for psychological empowerment was 0.78. All indicators exhibited significant relationships ($p < 0.001$) with their intended latent variable (range = 0.80 to 0.95).

Control variables. Previous studies show that control variables can influence the result (Bos-Nehles and Veenendaal 2017). We controlled for three semi-demographic characteristics including gender, education and contact with clients. Table 1 shows that education is only significant to another control variable (user contact), which means that no control variables impacted on the substantive variables. Therefore, control variables were excluded from further analysis.

Table 1. Mean, Standard deviation and scale correlations.

Mean	SD	1	2	3	4	5	6
Gender	1.70	0.46					
Education	2.94	0.68	−0.08				
User contact	1.30	0.46	−0.16	0.24 ***			
Structural empowerment	5.8	0.84	−0.10	0.33	0.02		
Psychological empowerment	6.2	0.59	−0.04	0.17	0.07	0.74 ***	
EDI	5.5	0.78	−0.18	0.14	−0.05	0.66 ***	0.64 ***

Note: ** = $p < 0.01$; *** = $p < 0.001$.

3.4. Data Analyses

To test the hypotheses, we employed structural equation modeling (SEM) using Stata version 15.1 (StataCorp. 2017) with maximum likelihood (ML) estimation. Seven observations with missing values were automatically excluded in the analysis. As recommended by Mehmet and Jakobsen (2017), we reported multiple goodness-of-fit indices for CFA, as the chi-square test is known to be sensitive to the sample size. These include: (a) test statistics, degrees of freedom and significance level for the chi-square test; (b) RMSEA (root mean square error of approximation) and 90% CIs, with values of 0.05 indicating a close fit (Acock 2013) and values <0.10 indicating an acceptable fit (Mehmet and Jakobsen 2017); (c) SRMR (standardized root mean square residual), with values ≤0.1 indicating a good

fit (Mehmet and Jakobsen 2017); and (d) CFI (comparative fit index) and TLI (Tucker–Lewis index), with values >0.90 generally indicating an acceptable fit (Acock 2013).

The analyses were done in two major parts. First, the measurement model was tested, and this was followed by examining the hypotheses with a structural model. Descriptive statistics, a bivariate correlation of the research constructs and control variables are reported in Table 1.

3.5. Test of the Measurement Model

First, confirmatory factor analyses (CFA) was used to assess the first-order measurement model. We verified the reliability, item loadings, factor reliability, convergent validity and discriminant validity of the scales used. The model included 36 items capturing 11 first-order correlated latent constructs. The measurement model shows an acceptable fit [χ^2 (539) = 1034.70, $p < 0.001$; CFI = 0.93; TLI = 0.92; RMSEA = 0.06; SRMR = 0.05]. In addition, the average variance extracted (AVE) of all latent construct confirmed the reliability and construct validity (Acock 2013). AVE for all constructs was over 0.50 (0.54–0.83), showing the convergent validity of the constructs. Also, the measurement model exhibited discriminant validity because the AVE for all constructs was larger than the squared correlation between constructs (Acock 2013; Mehmet and Jakobsen 2017). Raykov's factor reliability coefficient for all of the 11 correlated constructs was above the recommended minimum of 0.70 (0.74–0.94) (Mehmet and Jakobsen 2017). Standardized factor loadings of the measurement items, scale reliability indicators and average variance extracted (AVE) are reported in Table 2.

Since the three constructs under study (structural empowerment, psychological empowerment, and EDI) were reflective variables, we added and tested a second-order reflective measurement model in which items loaded on the first-order factors and were used as indicators for the second-order factor. The results were satisfactory and the overall goodness of fit were all above the recommended minimum [χ^2 (580) = 1437.25, $p < 0.001$; CFI = 0.90; TLI = 0.90; RMSEA = 0.07; SRMR = 0.09]. In addition, there was no problem with both discriminant and convergent validity. Having established a good measurement model at both first-order and second-order levels, we proceeded with the structural model using this measurement model.

3.6. Test of the Structural Model

Our hypotheses were tested based on bivariate variable correlation in Table 1. Hypothesis 1, which postulated that structural empowerment has a positive relationship with EDI, was supported in a statistically significant way ($\beta = 0.66$, $p < 0.001$). Hypothesis 2 postulated that there is a relationship between structural empowerment and psychological empowerment. This hypothesis was supported ($\beta = 0.74$, $p < 0.001$). Hypotheses 3, which predicted that there is a positive relationship between psychological empowerment and EDI, was also confirmed ($\beta = 0.64$, $p < 0.001$). With significant results in all the three parts tested in Hypotheses 1, 2 and 3, preliminary support for H4 was demonstrated. We tested for mediation based on our structural model. To test our structural model, we set the mat size to 5000. Mat size is a mechanism that controls the internal size of matrices that Stata uses. (StataCorp. 2017). Structural modeling results suggested that the hypothesized model fit the data well (χ2 [614] = 1455.21, $p < 0.001$; CFI = 0.90; TLI = 0.90; RMSEA = 0.07; SRMR = 0.09).

However, we ran mediation analyses based on the hypothesized model to determine if mediation was partial or full and proportion of the effect. We performed the mediation test using a program developed for Stata with Monte Carlo replications. Monte Carlo replication is considered to be a good alternative to bootstrapping, as it takes less time and still acceptable (Jose 2013; Mehmet and Jakobsen 2017). The number of Monte Carlo replications was set to 5000. The analyses showed that mediation was partial. The average indirect effect of structural empowerment on EDI was estimated to be 0.54, SE = 0.10, $p < 0.001$, 95% CI [0.34, 0.75]. The ratio of indirect effect to total effect was 0.65; this meant about 65% of the effect of structural empowerment on EDI was mediated by psychological empowerment.

Table 2. Items and Confirmatory Factor Analysis results.

Assessment of Measurement Items	Standardized Factor Loadings	Raykov's Factor Reliability Coefficient	AVE
Employee-Driven Innovation			
Emergence and search for ideas		0.87	0.64
I recognize when there is an opportunity for improvement with a practice	0.84		
I always identify when there is an opportunity for improvement with a practice	0.83		
I am able to search for solutions to identified problems	0.80		
I can identify when there are problems with a daily routine/practice	0.72		
Idea generation		0.88	0.71
I come up with creative ideas that might improve the daily work	0.90		
I often come up with creative solutions to problems at work	0.80		
I am good at generating original solutions for problems	0.84		
Idea development & Implementation		0.92	0.66
When a developed idea is put into practice, it becomes part of the routine	0.83		
We are good at implementing new ideas	0.88		
We systematically implement innovative ideas into work practices	0.79		
Implemented ideas become part of the routine	0.85		
There is a process for developing ideas in the department/unit	0.80		
We develop suitable plans and schedules for the implementation of new idea	0.71		
Structural empowerment			
Opportunity		0.87	0.71
My work provides me with challenges to grow at work	0.86		
I have the chance to gain new skills and knowledge on the job	0.78		
My job provides me with the possibility for growth	0.88		
Information		0.79	0.54
I am informed about the goals and strategy needed to do my job well	0.77		
I am informed about the policies and procedures needed to do my job well	0.85		
I have access to the necessary information to do my job well	0.66		
Support		0.85	0.63
I get specific information about things I do well	0.88		
I receive helpful hints or problem solving advice	0.87		
I get comments about things that I could improve	0.62		
Resources		0.74	0.58
I have available materials to accomplish job requirements	0.68		
I have the resources I need for my job	0.84		

Table 2. *Cont.*

Assessment of Measurement Items	Standardized Factor Loadings	Raykov's Factor Reliability Coefficient	AVE
Psychological Empowerment			
Meaning		0.87	0.70
The work I do is very important to me	0.86		
My job activities are personally meaningful to me	0.82		
The work I do is meaningful to me	0.84		
Competence		0.85	0.66
I am confident about my ability to do my job	0.81		
I am self-assured about my capabilities to perform my work activities	0.80		
I have the skills necessary for my job	0.82		
Autonomy		0.90	0.76
I have significant autonomy in determining how I do my job	0.89		
I can decide on my own how to go about doing my work	0.85		
I have considerable opportunity for independence and freedom in how I do my job	0.86		
Impact		0.94	0.83
My impact on what happens in my organization/department is large	0.93		
I have a great deal of control over what happens in my department	0.85		
I have significant influence over what happens in my department	0.95		

[χ^2 (539) = 1034.70, $p < 0.001$; CFI = 0.93; TLI = 0.92; RMSEA = 0.06; SRMR = 0.05].

4. Study 2: Methodology

The purpose of Study 2 was to replicate the study in another organization and sector with different situational factors. Since study 1 was done in a public sector organization, we carried out study 2 in a private sector organization. The main elements of the research design were the same. The data collection procedure, the steps adopted to check common method bias were same as for study 1. The measurement instruments were also the same.

4.1. Data Collection and Sample Attributes

A total of 202 employees of the Nordic Choice hotel received the survey. After two reminders, 60 completed the survey, representing a response rate of 30%. Of these, 27 respondents (45%) were males, while 33 (55%) were females. There were 23 respondents (38%) who reported that they were subordinates, whereas 37 (62%) had leadership responsibilities. Among the respondents, 39 (65%) had contact with guests, and 21 (35%) had no contact with users.

4.2. Control Variables

Similar to for study 1, we controlled for three semi-demographic characteristics including gender, education and contact with clients. However, the correlation analysis show that the control variables had no significant relationships with the substantive variables and were therefore excluded from further analysis.

4.3. Data Analyses

We decided to perform SEM using Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM is recommended by scholars (e.g., Venturini and Mehmet 2019; Wong 2019) when the sample size is small, as was the case with our data. We used a package developed by Venturini and Mehmet (2019) for Stata.

We began with the descriptive statistics and correlation analyses of the research construct. Table 3 displays the bivariate correlations between the main constructs and control variables and gives preliminary support to hypotheses 1–3.

Table 3. Mean, Standard deviation and scale correlations.

Mean	SD	1	2	3	4	5	6
Gender	1.55	0.50					
Education	2.97	0.72	−0.23				
User contact	1.35	0.48	−0.25	0.18			
Structural empowerment	5.8	0.84	0.11	−0.04	0.12		
Psychological empowerment	6.2	0.59	−0.06	−0.02	0.10	0.67 ***	
EDI	5.5	0.78	0.03	−0.81	−0.08	0.60 ***	0.59 ***

Note: *** = $p < 0.001$.

Next, we proceeded with the main analysis that was done in two steps. First, the measurement model was examined. We assessed our measurement model by looking at the loadings, Cronbach's alpha, composite reliability and AVE as suggested in PLS-SEM literature (e.g., Hair et al. 2019). As seen in Table 4 the results of the factor analysis showed satisfactory properties for all constructs. The composite reliability (CR) for all constructs were above the suggested value of 0.6 (Bagozzi and Yi 2012) and the Cronbach alpha was above the recommended level of 0.7, indicating a good internal consistency of the second-order constructs of this study (EDI, structural empowerment and psychological empowerment). Equally, the average variance extracted value (AVE) were satisfactory. All our constructs showed an AVE value that was higher than 0.50, indicating a sufficient degree of convergent validity. Table 4 shows the standardized factor loading of the reflective constructs, CR, Cronbach's alpha and AVE.

Table 4. Model—standardized factor loadings.

	Reflective	Reflective	Reflective
	Structural Empowerment	**Psychological Empowerment**	**EDI**
Opportunity	0.87		
Information	0.87		
Support	0.84		
Resources	0.77		
Meaning		0.79	
Competence		0.54	
Autonomy		0.73	
Impact		0.79	
Emergence			0.83
Ideagen			0.67
Ideaimp			0.86
Cronbach	**0.86**	**0.70**	**0.73**
CR(DG)	**0.90**	**0.82**	**0.85**
AVE	**0.70**	**0.52**	**0.62**

Notes: 1. Emergence = emergence and search for ideas, ideagen = idea generation, ideaimp = idea development and implementation; 2 CR(DG) = composite reliability or Dillion-Goldstein's rho, AVE = average variance extracted.

The next step was the evaluation of the structural model. As noted by Venturini and Mehmet (2019), "assessment of the model goodness for a PLS-SEM model is rather complicated and not yet properly defined" (p. 12). To evaluate the quality of our hypothesized model (Figure 1), we reported the path coefficient (standardized) and coefficient of determination (R^2) (Venturini and Mehmet 2019). The R^2 for psychological empowerment was 0.53 while that of EDI was 0.50, indicating a moderate sample's explanatory power.

The results from the PLS-SEM analysis showed support for H1, H2 and H3). Hypothesis 1, which postulated that structural empowerment has a positive relationship with EDI and was supported in a statistically significant way ($\beta = 0.48$, $p < 0.001$). Hypothesis 2 postulated that there is a positive association between structural empowerment and psychological empowerment. This hypothesis was supported ($\beta = 0.73$, $p < 0.001$). Hypotheses 3, which predicted that there is a positive relationship between psychological empowerment and EDI, was also confirmed ($\beta = 0.28$, $p < 0.05$). Together, structural empowerment and psychological empowerment explained 50% of the variance in EDI. (shown as Table 5).

Table 5. Model - Standardized path coefficients.

Variable	Psychological Empowerment	EDI
Structural empowerment	0.73 (0.001)	0.48 (0.001)
Psychological empowerment		0.28 (0.05)
Adjusted R^2	**0.53**	**0.50**

With significant results in all the three parts tested in Hypotheses 1, 2 and 3, preliminary support for H4 was demonstrated. We tested for mediation by first estimating the indirect effects, and secondly testing the statistical significance (Hair et al. 2019). Accordingly, we found that the mediating effect of psychological empowerment has on the relationship between structural empowerment and EDI was significant ($\beta = 0.21$, $p < 0.05$), thus partial. Thus, we found support for the H4.

5. Supplementary Analysis

To verify if there is any significant difference between study 1 and study 2, we performed a multigroup analysis based on the model depicted in Figure 1. More specifically, we now checked whether the model estimates (path coefficients and loadings) differ between study 1 and study 2 respondents. We did this by merging the two datasets and then performed a multigroup analysis. Here, we used the bootstrap option with 200 replications. We performed this three times, setting a significance level (alpha) of 0.001, 0.05 and 0.10 to check if any part will be significant. The results show the path coefficients for the whole sample (Global) as well as those for study 1 (Group 1) and study 2 (Group 2) samples were insignificant at the three significance levels. All path coefficients were not significantly different between the two organizations. This demonstrates that there is no significant difference between the two studies. See Table 6 and Figure 2 below.

Table 6. Multigroup comparison (organizations)—Bootstrap t-test.

Structural Effect|	Global	Study 1	Study 2	Abs Diff	Statistic	*p*-Value
Stremp -> Psyemp|	0.742	0.743	0.732	0.011	0.249	0.804
Stremp -> Edi|	0.386	0.375	0.483	0.107	0.858	0.391
Psyemp -> Edi|	0.373	0.374	0.282	0.092	0.665	0.507

Notes: Number of replications: 200; Group labels: group 1: NAV, group 2: Choice; Group sizes: group 1: 221, group 2: 60.

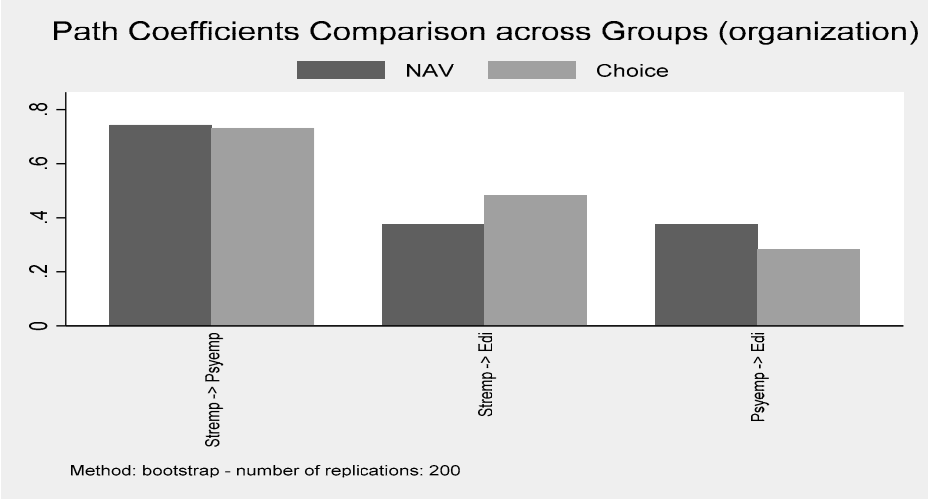

Figure 2. Path coefficients comparison across groups.

6. Discussion, Implications and Limitations

The main aim of this study was to empirically test the relationship between the two main approaches of empowerment (structural and psychological empowerment) and EDI, and to determine to what extent psychological empowerment mediates the relationship between structural empowerment and EDI. We tested our hypothesized model in samples drawn from two organizations.

Employee empowerment is a widely studied concept but not empirically linked to EDI. This is particularly important because EDI is about ordinary employees who are not hired for innovation they may need to empowered to engage in innovation activities. This study contributes to the EDI literature by illuminating how empowerment influences ordinary employee participation in innovation.

We found that both structural empowerment and psychological empowerment had a direct positive association with EDI. This finding is theoretically meaningful, since structural empowerment within an organization provides employees with significant opportunities, information, support and resources to take an active role in the innovation process. Likewise, employees feel a state of being psychologically empowered provides them with motivation and initiative to use their creativity and

effort to generate, develop and implement innovative ideas. These findings indicate that empowerment is a useful and promising concept to enable employees engage in innovation activities. In general, this is consistent with early qualitative studies in which management practices were found to be important for EDI (e.g., Sorensen and Ussing 2018; Voxted 2018; Hansen et al. 2017).

We also found that psychological empowerment partially mediated the relationship between structural empowerment and EDI. The mediation role of psychological empowerment is a well-established mechanism in the literature tasks (Seibert et al. 2011; Amundsen and Martinsen 2015). Previous studies have pointed out that psychological empowerment acts as a mediating mechanism between different independent and dependent variables (Zhang and Bartol 2010; Camilla and Krishna 2015). However, to the best of our knowledge, this is the first study that investigates the construct's mediating role between structural empowerment and EDI. A plausible explanation of our findings is that structural empowerment stimulates psychological motivation processes in employees regarding their work tasks (Amundsen and Martinsen 2015; Rhee et al. 2017), which in turn transmit effects of structural empowerment on EDI.

Furthermore, our study also shows that structural empowerment can also enable EDI directly without going through psychological empowerment as a mediating mechanism. Our finding of a strong relationship between structural empowerment and psychological empowerment was consistent with earlier findings (Laschinger et al. 2001). Additionally, our multigroup analyses indicated that there was no significant difference between the two organizations. That is to say that there were no difference as regard the path coefficient between structural empowerment and EDI and between psychological empowerment and EDI for the two organizations. This suggests that the role of empowerment in facilitating EDI is consistent and that it does not matter whether it occurs in a private or public sector organization.

6.1. Implications of the Study

Based on the findings of our study, it is possible to draw out some implications on how organizations can enhance the innovative performance of their regular employees through empowerment. First, for organizations that seek to stimulate and maximize the innovative abilities of ordinary employees, it is crucial to prioritize sources of structural empowerment in the working environment. This implies that regular employees will react positively to the presence of a work environment that provides access to information, access to resources, required support and opportunities. This is the responsibility of managers and management of organizations. Employees on their own cannot provide these empowering structures but instead merely react to their existence. Sometimes these structures are inherent in the organization, whereas during other times, immediate supervisors will have to give employees access to these structures.

Second, managers and the management of organizations need to ensure that structural empowerment initiatives are arranged in such a way that it simultaneously promote a state of feeling psychologically empowered among employees. Psychological empowerment is described as motivational cognitions that can be induced in employees by the organizational environment (Rhee et al. 2017; Conger and Kanungo 1988). It comprises of employees' perceptions of meaning, competence, self-determination and impact in one's work role (Spreitzer 1995). This paper has demonstrated that an employee's state of feeling psychologically empowered has the potential to enable EDI.

6.2. Limitations of the Study

The present study has some limitations that are worth mentioning. First, the data for the two studies were based on cross-sectional design. So, causal claims cannot be made. Again, the correlation among the variables could have been inflated by common method bias, even though we employed some ex-ante remedies. We recommend that future studies adopt a cross-lagged approach and separate independent and dependent variables in time. This will help to rule out the possibility of common method variance. Second, the sample size for study two was small compared to for study one. We recommend that

future studies should be based on larger sample sizes. Third, these studies were conducted in services sectors and in one country. Within the Norwegian context, organizational structures are flattening, and there is less distance between employees and their supervisors. The Norwegian work environment regulations guarantee an employee certain basic structures within their work environment. Without further studies, our research cannot necessarily be generalized to other contexts.

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Paper III[1]

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The relationship between leadership styles and employee-driven innovation: The mediating role of leader-member exchange

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The relationship between leadership styles and employee-driven innovation: the role of leader–member exchange

Abstract

Purpose – The purpose of this study is to explore the association of two opposite leadership styles on employee-driven innovation and how the leader–member exchange mediates these relationships.

Methodology – We used online surveys administrated in two waves to collect data from 315 employees working in the banking sector in Norway. Exogenous variables, which include empowering and directive leadership styles, were measured at time 1, while the endogenous variables of the leader–member exchange and employee-driven innovation were measured at time 2. The data were analysed using structural equation modelling.

Findings – The findings confirmed that empowering leaders are more likely to have a positive relationship with their subordinates and in turn, stimulate employee-driven innovation. Conversely, the directive leadership style was found to have a negative relationship on the quality of the relationship between leaders and subordinates. It was also found that the association of directive leadership on employee-driven innovation was negative and indirect through the leader–member exchange.

Research limitations – The data for the study were collected from a single organisation, which limits the generalisability of the study. Several other leadership styles were not covered in this study.

Originality – This paper provides empirical evidence to support the association between leadership styles and employee-driven innovation. Analyses of these relationship types are unavailable in the employee-driven innovation literature.

Article classification – Research paper.

1. Introduction

Innovation calls for the utilisation of ideas throughout an organisation (Kesting and Ulhøi, 2010). However, ideas and innovation do not flourish on their own. Studies show that extra-role behaviours, such as employee-driven innovation (EDI), in which ideas are initiated and implemented by employees, must be fostered and facilitated. Managers and leaders have been recognised to play an essential role in the innovation process (Engen and Magnusson, 2015, Saari *et al.*, 2015, Smith *et al.*, 2012). However, the impact of different leadership styles on EDI remains underexplored.

Leadership is one of the most essential phenomena in management research and practice, which has led to a tremendous accumulation of both theoretical and empirical work from divergent perspectives (Hughes *et al.*, 2018, Uhl-Bien *et al.*, 2014). Leaders in most organisations constitute a minority of the members of the organisation. Nonetheless, their influence on the direction and success of their organisations cannot be overemphasised. Leaders get credit for both the failure and success of their organisation. Leadership refers to the ability to influence others (Sims *et al.*, 2009). Leadership has also been described as one of the most consequential contextual influencers of employee performance (Ilies *et al*., 2007; Martin *et al*., 2013). Islam *et al.* (2018) noted that leadership plays several roles, including simulating employees' innovation capabilities.

Theoretically, leadership has long been recognised as a critical antecedent of EDI (Smith *et al.*, 2012). According to Amundsen *et al.* (2014), "leader support" is emphasised by the authors as the single most important condition for successful EDI (p. 26). Likewise, Kesting and Ulhøi (2010) identify management support as one of the main drivers of EDI for two reasons. First, management support is a requirement for any employee's participation in decision-making as part of the strategic innovation routine. Second, it could also mean the mentoring of employee initiatives at the idea-generation and decision-making stages. Smith *et al.* (2012) identified leader support as a key antecedent of EDI, arguing that the relationship between management behaviour and the level of creativity deserves more attention. Previous studies have highlighted that EDI needs management (Voxted, 2018) because regular employees cannot implement innovation on their own (Saari *et al.*, 2015).

However, despite this theoretical awareness and likely impact of leadership on EDI, we still lack a clear understanding of how specific leadership styles could support or hinder EDI. The proposition by Smith *et al.* (2012) of a positive impact of leader support on EDI has not yet been empirically tested, as various leadership styles have different advantages and disadvantages (Somech, 2006). The question is how different leadership styles will foster or hamper EDI. More specifically, this paper investigates how two contrasting leadership styles, i.e. empowering leadership (EL) and directive leadership (DL) influence EDI, and to what degree this relationship is mediated by the quality of the dyadic relationship between leaders and subordinates. An EL style entails a delegation of responsibility and authority to subordinates (Amundsen & Martinsen, 2014; Vecchio *et al*., 2010) whereas a DL style is based more on instructing, commanding and governing of subordinates whereby leaders provide their subordinates with concrete guidelines (Yun *et al.*, 2006). We chose to study these contrasting leadership styles based on their conflicting attributes, as mentioned above. We want to test whether an ordinary employee would react more willingly regarding EDI to a leader's actions characterised by cooperation rather than coercion. We argue that EDI being an extra roll behaviour may not likely be imposed on employees. Instead, they can be encouraged through supportive leadership behaviours as exhibited by an empowering leader.

Therefore, the primary objective of this paper is to investigate how leadership styles influence EDI. A clearer understanding will help leaders and organisations enhance the participation of employees in the innovation process by adopting the appropriate leadership style. Accordingly, this paper makes the following contributions: First, we empirically show

that different leadership styles have a divergent association with EDI. Second, we demonstrate that there is a positive relationship between EL and EDI. Third, we show that EL has a positive association with leader–member exchange (LMX), while LMX acts as a mediator between EL and EDI. Fourth, we demonstrate that DL has a negative association with LMX and an indirect relationship with EDI through LMX.

The rest of this paper is arranged as follows: next, we discuss the theoretical perspective and develop the hypotheses for the study, followed by the research methodology. After that, we present our analyses, discussion, implications, limitations and recommendations for further studies.

2. Theory and hypotheses

2.1. Empowering leadership

EL is defined as "behaviours that share power with subordinates" (Vecchio *et al.*, 2010, p.531). EL has become a specific form of leadership that differs from other leadership styles (Amundsen & Martinsen, 2014; Vecchio *et al.*, 2010. Empowering leaders give their subordinates the freedom and ability to make independent decisions (Slåtten *et al.*, 2011), with the intention to their encourage followers to take the initiative to manage and control their own behaviour (Yun *et al.*, 2006). EL is regarded as a form of socio-structural empowerment (Lee *et al.*, 2017) and suggested as an approach to employee empowerment (Cheong *et al.*, 2019). The central and foundational aspect of the EL style is to increase individual motivation at work through the delegation of responsibility and authority to the lowest organisational level where a competent decision can be made (Cheong *et al.*, 2019, Lorinkova *et al.*, 2013).

An empowering leader promotes initiative, self-responsibility, positive thinking and problem-solving (Sims *et al.*, 2009). Several benefits have been attributed to EL, including targeting employees to develop self-control and to act on their own (Vecchio *et al.*, 2010), the development of the follower's self-leadership skills and encouraging opportunistic thinking (Pearce *et al.*, 2003). In their recent meta-analysis, Lee *et al.* (2017) compared leaders rated as empowering and those rated as less empowering. They suggested that employees led by an empowering leader are more likely to come up with new ideas and think of new ways of getting things done. They concluded that EL is more effective for work outcomes that require employee creativity and proactive behaviours.

2.2. Directive leadership

Drawing from the Path-goal theory, DL is defined as "a leader's behaviour that provides followers specific guidance regarding goals, the means of achieving goals and performance standards" (Martin *et al.,* 2013, p. 1374). This leadership behaviour relies on a power position that is sometimes referred to as coercive power, which is typically associated with descriptions such as direction, command intimidation and reprimand as primary mechanisms to influence subordinates (Pearce *et al.*, 2003). Likewise, Sims *et al.* (2009) noted that DL is associated with words like instruction and command. Yun *et al.* (2006) argued that the DL style is not only contrary to the notion of employee empowerment but would also diminish followers' self-leadership and negatively affect employees with a high need for autonomy. However, Martin *et al.* (2013) found that even though both DL and EL increased work task proficiency, only EL increased proactive behaviours. Leaders specify goals and directions for subordinates in advance and often use rewards and punishment (Martin *et al.*, 2013), which may have a limiting effect on autonomy and creativity.

2.3. Employee-driven innovation

EDI is characterised as a broad concept to indicate and emphasise that the sources and drivers of innovation, as well as innovation processes, revolve around ordinary employees (Høyrup, 2010, Saari *et al.*, 2015). Høyrup (2012, p. 8) refers to EDI as:

the generation and implementation of new ideas, products, and processes – including the everyday remaking of jobs and organisational practices – originating from the interaction of employees who are not assigned to this task. The processes are unfolded in an organisation and may be integrated into co-operative and managerial efforts of the organisation. Employees are active and may initiate, support, or even drive/lead the processes.

EDI is based on the notion that innovation can originate from employees outside of the R&D department or strategic level (Deslee and Dahan, 2018, Echebiri, 2020). It is characterised as an extra-role behaviour (Renkema, 2018), and the co-operation between the leader and their subordinates in the process is important (Saari *et al.*, 2015). EDI has been conceptualised to include the emergence and search for ideas, idea generation, and idea development and implementation. (Echebiri *et al.*, in press).

According to Somech (2006), a "leadership style might serve as a catalyst or as a neutraliser, which might lead to different, sometimes productive and sometimes counterproductive, outputs" (p. 152). Research shows that the type of leadership in an organisation determines the extent of employees' involvement and commitment, which in turn influences the climate for innovation management (Kesting *et al.*, 2015). When leadership is considered to be effective, it can act as a catalyst to stimulate employees' creative outcomes (Atitumpong and Badir, 2018). Studies show that management support is required for employees to engage in innovation (Engen and Magnusson, 2015, Saari *et al.*, 2015), whereas supervisor support was found to have a positive impact on innovation (Voxted, 2018). The leadership role will also vary depending on the stage of innovation. For example, support and protection stand out at the initial stages, while resource allocation will become the focus in later stages (Amundsen *et al*., 2014). Smith *et al.* (2012) identified autonomy, which implies the delegation of decision-making as a vital attribute of EL and as a crucial enabler of innovation.

Therefore, the kind of leadership style a manager or an organisation adopts will stimulate or discourage EDI. EDI is mainly about ceding some decision-making rights to employees. When this is taken into account, a directive leader relies on positional power and becomes the main focus in the decision making authority. In contrast, an empowering leader involves the followers in decision making (Boulu-Reshef *et al.*, 2019). Thus, a leadership style that promotes autonomy, initiative, support and encourages followers to learn and build confidence such as EL, is expected to encourage innovative efforts among employees. Conversely, a leadership style that is controlling and instructing, such as DL, will reduce employees' room for action and thereby hinder their opportunities to innovate. Therefore, we propose the following hypotheses:

H1: There is a positive relationship between EL and EDI.

H2: There is a negative relationship between DL and EDI.

2.4. Leader-member exchange

LMX is based on the social exchange theory (Blau, 1964). According to this theory, a social exchange involves a series of interactions that generate obligations with the potential to create high-quality relationships. As these relationships evolve, it leads to a desire for reciprocation or repayment (Cropanzano and Mitchell, 2005). Amundsen (2014) argues that it is challenging to classify LMX in any behavioural approach to leadership because it differs from other theories by its specific focus on the quality of the dyadic leader–follower relationship. LMX is a relational approach that focuses explicitly on the unique quality of the dyadic relationship that leaders develop with each subordinate (De Jong and Den Hartog, 2007, Kuvaas *et al.*, 2012, Lee *et al.*, 2019). LMX theory posits that the relationship that develops between a leader and a follower falls along a continuum from low quality, which is strictly based on the transactional aspect of employment, to high quality based on mutual liking and trust (Dulebohn *et al.*, 2011).

A high-quality relationship results in a feeling of obligation on the part of the follower to reciprocate through a higher level of effort and positive outcome.

Leaders exercise their influence over their employees through their deliberate actions (De Jong and Den Hartog, 2007). The leader's behaviour will affect the quality of the relationship between the leader and the subordinate. Therefore, a leadership style such as EL has the potential to lead to a high-quality relationship because an empowering leader will share power with their subordinates through behaviours such as delegation of responsibility and autonomy. On the contrary, a leadership style such as DL that uses command and control has the potential to result in a low-quality relationship because the actions of employees are controlled through rewards and punishments. Empirical studies show that EL has a positive association with LMX (Hassan *et al.*, 2013), while DL was found to diminish employees with a need for autonomy (Yun *et al.*, 2006). We put forth the following hypotheses:

H3: There is a positive relationship between EL and LMX.

H4: There is a negative relationship between DL and LMX.

As suggested by Amundsen (2014), the quality of the relationship between leader and subordinate has a substantial influence on whether leader behaviours lead to favourable subordinate outcomes or not. This relationship ranges from those that are purely based on employment contracts (i.e. a low-quality LMX), to those that go beyond the employment contract, which are characterised by a mutual trust, respect and reciprocal influence (i.e. a high-quality LMX) (Graen and Uhl-Bien, 1995, Wang *et al.*, 2015). Where a high LMX exists, subordinates will get more of an opportunity to discuss new ideas, get regular feedback, and gain from their supervisors' expertise (Atitumpong and Badir, 2018). A high-quality relationship results in subordinates feeling obliged to reciprocate through their higher level of effort for favourable outcomes (Lee *et al.*, 2019). As suggested by Volmer *et al.* (2012), employees in high-quality relationships are much likely to become creative because of their focused approach to challenging tasks, higher risk-taking and interpersonal support.

Furthermore, previous findings have linked a high LMX with increased innovative behaviour (Javed *et al.*, 2018), positive relationship citizenship behaviours (Ilies *et al.*, 2007) and task performance (Martin *et al.*, 2016). Therefore, we propose the following hypothesis:

H5: There is a positive relationship between LMX and EDI.

In a work environment where the employees perceive their supervisor as empowering, this will result in a high-quality relationship. Typically, high-quality LMX offers the followers rewards such as resources, challenging tasks, and mentoring, and as a way of reciprocation, followers display discretionary behaviours aimed at promoting organisational outcomes (Amundsen, 2014, Ilies *et al.*, 2007). In line with social exchange theory, employees in high quality-relationship are more likely to reciprocate through EDI. As previously argued, a directive leader will more likely discourage opportunistic thinking because employees are strictly guided as to what they should do or not do. This results in a low-quality relationship between the leader and the follower and in turn, lower the chance of EDI.

In this paper, we have chosen to study LMX as a mediator between empowering and directive leadership behaviours and EDI. We view LMX in the context of our study as the rating of the relationship between the leader and follower (Hughes *et al.*, 2018) and how the quality of this relationship influences EDI. Previous studies show that LMX is increasingly considered as a mediator between leadership and workplace outcomes (e.g. Hassan *et al.*, 2013, Wang *et al.*, 2015). In their meta-analysis, Dulebohn *et al.* (2011) noted that LMX was used as a mediator between a range of antecedents and consequences experienced by followers such as job performance, organisational citizenship behaviour etc. This was also supported in other meta-

studies where LMX was identified as a mediator mechanism (e.g. Gottfredson & Aguinis, 2016; Lee *et al*., 2018).

Based on the previous arguments and hypotheses, we expect that LMX will mediate the relationships between EL and EDI, and between DL and EDI. We propose the following hypotheses:

H6: LMX will mediate the relationship between EL and EDI.

H7: LMX will mediate the relationship between DL and EDI.

[Figure 1: Hypothesised model about here]

3. Research method

3.1. Participants and procedure

The data were collected from employees working in the Norwegian banking sector. We designed the surveys on an online platform. To help minimise the effect of common method variance, which arises from self-report surveys (Chang *et al.*, 2010), we separated our variables by collecting data in two waves with a time lag of 10days, which is a procedure described as an ex-ante remedy for common method bias (Podsakoff *et al.*, 2003). The exogenous variables, which include EL and DL, were measured at time 1 (T1), whereas the endogenous variables LMX and EDI were measured at time 2 (T2). The surveys included a cover letter in which respondents were assured of their anonymity and confidentiality. The literature suggests that protecting the anonymity of the respondents can help to minimise both evaluation apprehension and response bias (Podsakoff *et al.*, 2003).

A total of 715 employees received the survey. At T1, 443 completed the survey, while 377 participated at T2. After linking respondents who finished both T1 and T2, we had a usable sample of 315 respondents. Based on demographical characteristics, 49.5% were men and 50.5% were women. A total of 79.4% of the participants had direct contact with their customers. The average working experience in the organisation was 3 years. When it comes to education, 11.4% had a secondary education, 21.6% completed a 1-year post-secondary program, and 41% had a bachelor's degree, while 26% had a master's degree or higher.

3.1. Measures

The study used questionnaires in which we asked the participants to rate the questions on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree.

3.1.1. Empowering leadership

We measured EL with seven items adapted from a short version of the Amundsen (2019) Empowering Leadership Scale. Sample items include: "My leader conveys that I shall take responsibility" (α = .75).

3.1.2. Directive leadership

We measured DL based on a six-item scale. Four items were adopted from leaders' behaviour (Hemphill and Coons, 1957), while two items were adopted from Yun *et al.* (2006) (who adopted their items from a short version of the Leadership Strategies Questionnaire II). Sample items include: "When it comes to my work, my leader gives me instructions on how to carry it out to do my job" (α = .76).

3.1.3. LMX

To measure the LMX, we adopted four items from Kuvaas *et al.* (2012). Sample items include: "My relationship with my leader is about mutual sacrifice, sometimes I give more than I receive, and sometimes I receive more than I give" (α = .79).

3.1.4. Employee-driven innovation

We measured EDI based on a 13-item scale developed by Echebiri *et al.* (In press). The scale consists of the following three subdimensions: Emergence and search for ideas (four items), idea generation (three items) and idea development and implementation (six items). The Cronbach's alphas were .76, .70 and .84, respectively. Sample items include emergence and search for ideas ("I recognise when there is an opportunity for improvement with a practice"), idea generation ("I come up with creative ideas that might improve the daily work"), and idea development and implementation ("When a developed idea is put into practice, it becomes part of the routine"). The fit indexes for three first-order factors (three subdimensions) plus one second-order factor fell below the acceptable range [$\chi^2(62) = 242.60$, $p < .001$; CFI = .88; TLI = .85; RMSEA = .10; SRMR = .06]. We employed modification indices, which suggested that we allowed two pairs of error terms to correlate. The correlation was theoretically supported because each pair of error terms belong to the same construct. With this, the model fit improved. The fit indexes for three first-order factors (three subdimensions) plus one second-order factor fell within an acceptable range [$\chi^2(60) = 163.08$, $p < .001$; CFI = .93; TLI = .91; RMSEA = .07; SRMR = .06], thereby indicating that the dimensions reflected the overall construct. The overall scale reliability of EDI was .70.

3.1.5. Control variables

To rule out some alternative explanations, we decided to control for gender and education. Gender was measured as a dichotomous variable coded such that 1 was male and 2 female. Education was measured by four categories ranging from secondary education coded 1 to master degree or higher coded 4.

3.2. Analysis

We tested our hypotheses within the framework of structural equation modelling (SEM), which belongs to what is called the second-generation statistical method. We considered SEM appropriate because our study involved latent variables and SEM makes it possible to estimate the hypothesised relationships between endogenous and exogenous variables at the same time (Hair *et al.*, 2017, Mehmet and Jakobsen, 2017). Furthermore, SEM allows measurement error in indicators of latent variables to be modelled and estimated.

First, we validated our measurement model using confirmatory factor analysis (CFA) before proceeding with the structural model, as recommended in previous studies (Acock, 2013, Mehmet and Jakobsen, 2017). Testing of the bivariate hypotheses *H1–H5* were based on latent variable correlations in the measurement model, while testing of the mediation hypotheses *H6–H7* were based on the structural model. We used SPSS Amos version 25.0 with maximum likelihood estimation in our analyses.

4. Results

The means, standard deviations and latent bivariate correlations for all the variables included in the present study are reported in Table 1.

[Table 1 about here]

4.1. Measurement model

We conducted CFAs to investigate the appropriateness of our measurement model. We verified the reliability, item loadings, factor reliability, convergent validity and discriminant validity of the scales used. The model was comprised of 30 items capturing six first-order latent constructs. The model gave a combination of an acceptable and unacceptable fit [$\chi^2(390) = 793.49$, $p < .001$; CFI = .88; TLI = .86; RMSEA = .06; SRMR = .06]. The average variance extracted (AVE), which was used to assess discriminant and convergent validity, was problematic in EL, DL, LMX, and the emergence and search for ideas. We checked the variance explained for all the items and dropped items that were low. Accordingly, we dropped one item from the

emergence and search for ideas, one item from idea development and implementation, two items from EL and one item from DL. Also, we used modification indices that suggested allowing two pairs of error terms to correlate. This was theoretically acceptable because the respective pairs belonged to the same construct as suggested in other studies (Byrne, 1994, Byrne, 1998, MacCallum *et al.*, 1992). We performed a CFA again, and the model fit significantly improved. The fit indexes demonstrated that the model fit the data well [$\chi^2(258) = 386.50$, $p < .001$; CFI = .95; TLI = .95; RMSEA = .04; SRMR = .05].

Because EDI is a second-order reflective construct, we added the second-order factors of EDI and repeated the CFA. The results were satisfactory, and the overall goodness of fit were all above the recommended minimum [$\chi^2(264) = 408.59$, $p < .001$; CFI = .95; TLI = .94; RMSEA = .04; SRMR = .06], with all indicators exhibiting significant ($p < .001$) relationships with their intended latent variable, range = .42 to .86 (average .68). The Raykov's factor reliability coefficients were equal to or greater than the recommended minimum of .70 (Mehmet and Jakobsen, 2017). The AVEs of all but one construct was equal or greater than the recommended minimum of .50. We then proceeded to test the structural model based on this model. Standardised factor loadings of the measurement items, t-values, and Raykov's factor reliability are reported in Table 2.

[Table 2 about here]

4.2. Testing of hypotheses

First, we tested our bivariate hypotheses *H1–H5* based on the latent variable correlations obtained in Table 1. *H1*, which says that EL has a positive relationship with EDI, was supported ($r = .54$, $p <. 001$). *H2*, which states that DL has a negative relationship with EDI, was not supported by our results ($r = -.08$, ns). However, the picture is more nuanced because DL showed a significant relationship with two out of the three underlying subdimensions of EDI. As shown in Table 1, DL has a negative relationship with emergence and search for ideas ($r = -.16$, $p <. 05$), and a negative relationship with idea generation ($r = -.14$, $p <. 05$). This means that *H2* was partially supported. *H3*, which says that EL has a positive relationship with LMX, was supported ($r = .63$, $p <. 001$). *H4*, which says that DL has a negative relationship with LMX, was supported ($r = -.19$, $p <. 01$). *H5*, which says that LMX has a positive relationship with EDI, was also supported ($r = .64$, $p <.001$).

We then tested our mediation hypotheses *H6–H7* using SEM and the hypothesised model with all substantive and control variables included fitted the data well [$\chi^2(312) = 482.81$, $p < .001$; CFI = .94; TLI = .93; RMSEA = .04; SRMR = .06]. Table 3 presents the results for all paths in the structural model.

[Table 3 about here]

H6 states that LMX will mediate the relationship between EL and EDI. This hypothesis was supported in that all three paths in the mediation model were significant when estimated simultaneously; i.e. a significant relationship between EL and LMX ($\beta = .62$, $p <. 001$), a significant relationship between LMX and EDI ($\beta = .49$, $p <. 001$), and a significant relationship between EL and EDI ($\beta = .23$, $p <. 05$). However, the mediation was partial because the path between EL and EDI remained significant when the mediator LMX was included in the model. We subsequently performed a test of the indirect mediation effect using a bias-corrected bootstrap procedure in AMOS. The number of bootstrap samples was set to 2,000. The average indirect effect of EL on EDI was estimated to .31, SE = .07, $p < .001$, 95% CI [.18, .48]. Furthermore, the average total effect was estimated to .54, SE = .08, $p < .001$, 95% CI [.38, .70], indicating that 57% of the relationship between EL and EDI was mediated through LMX.

The mediation hypothesis *H7*, which says that LMX will mediate the relationship between DL and EDI, was not supported because DL, as shown in Table 1, had no significant bivariate relationship with EDI (Baron *et al.,* 1986). Nevertheless, as recommended in previous studies,

because the relationships between DL and LMX, as well as between LMX and EDI were significant (Table 3), this indicated that the conditions for an indirect effect were satisfied (Mathieu and Taylor, 2006). This assumption was supported because calculation with the bias-corrected procedure in AMOS gave an average indirect effect of DL on EDI of −.07, SE = .04, $p < .01$, 95% CI [−.16, −.02].

5. Discussion, implications and limitations

Although leadership has been linked to EDI in several studies (e.g. Smith *et al.*, 2012; Amundsen *et al.*, 2014), this proposition has yet to be tested. Therefore, the primary purpose of this paper was to develop our understanding of how different leadership styles may foster or hinder EDI and how the quality of the relationship between leaders and their subordinates mediates this association. We investigated our hypotheses in two stages. First, we tested what bivariate relationship EL and DL had with EDI and LMX, and the bivariate relationship between LMX and EDI. Additionally, we tested a mediation model that studied what mediation effect LMX had between the two leadership styles and EDI.

Our findings suggest that contrasting leadership styles had a varying association with EDI. As hypothesised, we found that EL behaviour had a positive association with EDI. This provides empirical support to the proposition of Smith *et al.* (2012), which suggested that leaders' support can enable EDI. We also found a positive relationship between EL and LMX and between LMX and EDI such that the relationship between EL and EDI is mediated by LMX. The link between EL and LMX is an established mechanism in the literature, but our finding has thus provided further empirical support to this link (e.g Hassan *et al.*, 2013, Javed *et al.*, 2018). On the contrary, DL had no significant relationship with the main constructs of EDI. Instead, it had a statistical significant negative association with emergence and search for ideas and idea generation, which represent the more creative and initial stages of EDI. Similarly, DL had a negative relationship on LMX and an indirect negative effect on EDI. In effect, the finding in this study can influence the attitudes of leaders who want to encourage innovative employees across their organisation, no matter their category.

5.1. Theoretical Implications

Several implications emerge from this study. From a theoretical perspective, this study contributes to the existing body of knowledge, reinforces our general understanding of how different leadership styles impact outcome variables and extend it to EDI for the first time. Although leadership has been linked to innovation (Kesting *et al.*, 2015), and EDI (Smith *et al.*, 2012), empirical evidence to support this in the EDI literature has remained missing until now. Therefore, this study answers the question of how leadership behaviour influences EDI and which specific behaviours are more likely to associate with EDI positively. Second, it also contributes to our understanding of EDI by demonstrating that EDI can be triggered through certain actions of the leaders and discouraged through others. Third, linking empowering leadership to EDI suggests that empowering based approaches might help to activate EDI. This agrees with a recent study by Lee *et al.* (2017), who indicated that EL behaviour is most effective for extra roll behaviours. Fourth, the mediation mechanism LMX contributes by showing that the relationship that exists between the leader and the subordinate cannot be ignored in EDI.

5.2. Practical Implications

From a practical point of view, the most significant is that leaders, human resource management (HRM) managers and supervisors should be aware that they must create room for their employees to become innovative through the kind of leadership style they adopt. EDI cannot

merely happen (Saari *et al.*, 2015) because it requires conscious leadership effort to inspire and motivate employees (Amundsen *et al.*, 2014).

This study has implications for the way organisations recruit and train their leaders. While HRM is responsible for job designs, leaders and managers have a direct responsibility to manage their employees and teams. For organisations, that want to broaden sources of creative ideas that include ordinary employees, our findings suggest that the way leaders are trained to lead should be in such a way as to entrench EL behaviours as against directive leaders. These findings tell us that leaders and managers have a role in leading employees towards a more innovative direction through the kind of leadership style they adopt and exhibit. EL is associated with proactive behaviour among subordinates (Martin *et al.*, 2013) while EDI is considered as an extra role behaviour. The proactive behaviour can encourage this extra role behaviour (EDI). On the contrary, employees cannot be coerced into these extra role behaviours, with such leadership style as DL. It is crucial for HR managers, leaders and supervisors to make conscious effort to display EL traits, such as encouraging the subordinates to take the initiative through practices like delegation of responsibility and authority to the lowest organisational level where EDI mostly occurs. Getting employees to be able to recognise a problem or an opportunity can only be encouraged if the subordinates understand that they have the autonomy and discretion to do so. This also applies to generating a new idea and in developing and implementing new ideas as empirically demonstrated in this study. Conversely, leader's behaviours such as command and control, will be counterproductive because EDI relies on employees acting on their own volition. Such leadership styles have a greater tendency to limit the emergence and search for new ideas and idea generation because autonomy and use of discretion could be restricted.

Again, our findings also show that the type of relationship that exists between a leader and his/her subordinate will have a significant role in enabling EDI. The cooperation that is built between the leader and the subordinate is important for EDI (Saari *et al*., 2015). Our finding supports this earlier study indicating that high quality LMX causes a positive outcome on EDI and vice versa. Therefore, leaders should endeavour to create a high-quality relationship (i.e. LMX) with their followers because this is likely to be reciprocated through a favourable outcome such as EDI. The positive correlation between EL and the three dimensions of EDI perhaps suggests that EL behaviours should be carried throughout the process. In a DL-dominated organisation, idea emergence will be hampered while employees may not have the discretion to generate new ideas. This is partly because behaviours such as command and control associated with DL leaders will not give lower-level employees the needed space to use their discretion, unlike an empowering leader.

5.3. Limitations and further research

Several leadership styles have different advantages and disadvantages. We admit that the two styles covered in this paper are not enough to cover the entire spectrum of leadership styles. Therefore, it is essential to expand this study and investigate other leadership styles, such as transformational or servant leadership styles, among others. The reason for this is because the supposed advantage of one leadership style could be a disadvantage in another setting or circumstance (Somech, 2006). Even when a particular leadership style does not support EDI in one setting, it does not in any way rule out its possibility in another sector, industry or organisational culture.

Our study could not affirm the hypothesised relationship between DL and the main construct of EDI, which should be an area of further research. Another limitation of this study is that the data were collected from one organisation; thus, the findings may not be generalisable based on this single organisation. There is also a possibility that the culture and climate in the organisation may have had an impact on the findings. Hence, we call on future researchers to expand the scope and depth of what was covered in this paper. Again, this study was conducted

in a banking setting; we are unsure how this might play out in other sectors or organisations with standard products against service delivery settings, as in this paper.

Additionally, we suggest future studies that will investigate the association between leadership styles and different stages of EDI. We are unable to hypothesis these relationships in the present study. However, our bivariate analyses of the correlation among the constructs point to this direction as an exciting area for future studies. Again, one of the dimensions of EDI had an AVE below the recommended level of 0.5.

Cross-sectional studies are known to have an obvious limitation, and we want to admit that as well. In this context, positive correlations and linkages among our variables should not be seen as causal relationships. Finally, we suggest that future studies include other control variables that were not included in the present study to rule out other alternative explanations.

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Figure 1
Hypothesized model

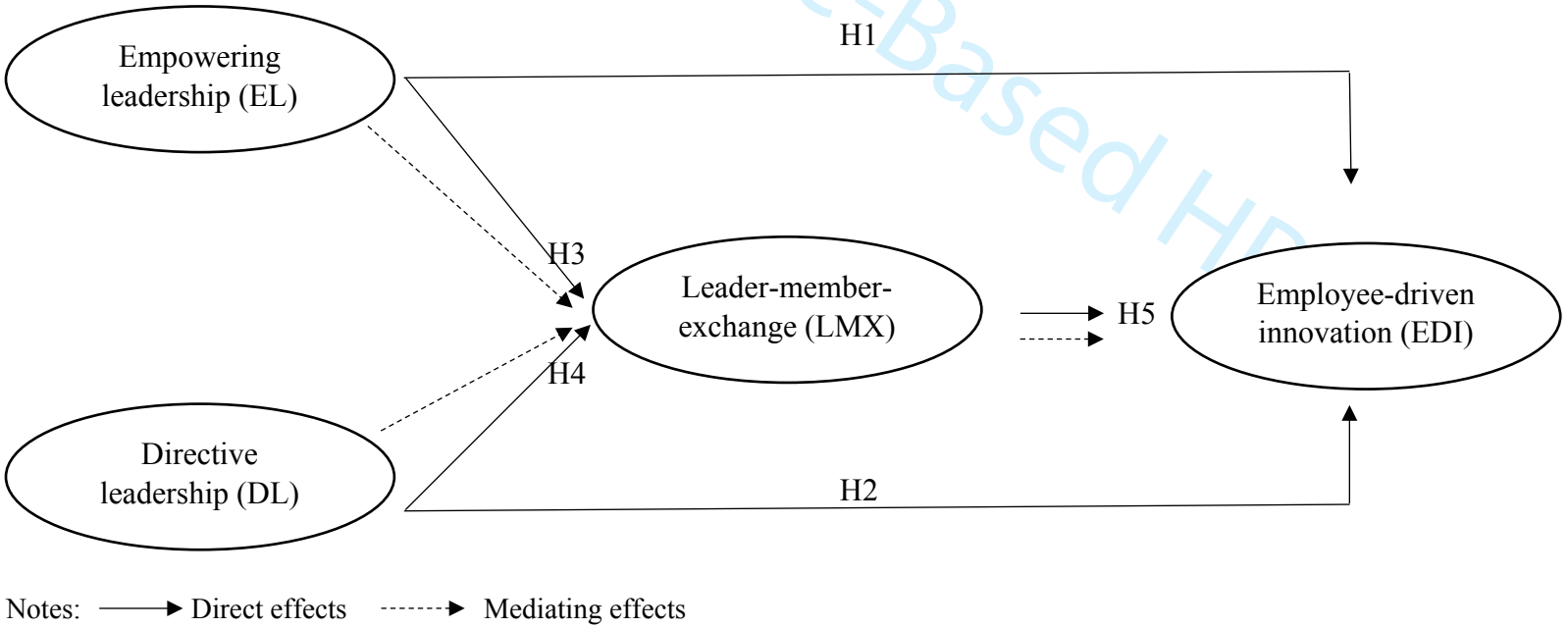

Table 1
Descriptive statistics and latent variable correlations

	Mean	(Std)	1	2	3	4	5	6	7	8	9
1. EL	4.30	(.52)									
2. DL	3.14	(.70)	-.10								
3. LMX	4.05	(.70)	.63***	-.19**							
4. ES	4.44	(.48)	.23***	-.16*	.30***						
5. IG	3.78	(.74)	.25***	-.14*	.30***	.48***					
6. ID	3.74	(.64)	.49***	-.02	.56***	.43***	.41***				
7. EDI	3.10	(.47)	.54***	-.08	.64***	NA	NA	NA			
8. Gen.	1.5	(.50)	.02	.14**	-.05	.04	-.04	.04	.00		
9. Edu.	4.4	(1.1)	.00	-.17**	-.00	.05	.11	-.07	.05	-.17	

Note:

EL = Empowering leadership; DL = Directive leadership; LMX = Leader-Member Exchange; ES = Emergence & search for idea; IG = Idea generation; ID = Idea development and implementation; EDI = Employee-driven innovation; NA = Not applicable; Gen = Gender; Edu = Ed

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 2
Confirmatory factor analysis of constructs

Constructs	Items	Standardized factor loadings (t-value)	Raykov's factor reliability
Empowering leadership	My leader encourages me to take initiative	.70 (9.62)	.81
	My leader listens to me	.74 (10.01)	
	My leader is concerned that I reach my goals	.70 (9.66)	
	My leader manager discusses shared affairs with me	.65 (9.19)	
	My leader conveys a bright view of the future	.63 (9.20)	
Directive leadership	My supervisor establishes my goals for me	.42 (6.09)	.80
	My supervisor commands in regard to my job	.72 (8.68)	
	My supervisor gives me instructions about how to do my job	.82 (9.14)	
	My supervisor establishes the goals for my work	.73 (8.76)	
	My supervisor establishes my performance goals	.55 (8.76)	
Leader-Member Exchange	If I am working hard today, I am pretty sure my leader will be there for me if I need it	.77 (9.79)	.80
	My relationship with my leader is about mutual sacrifice, sometimes I give more than I receive and sometimes I receive more than I give	.60 (9.79)	
	Even though I may not always receive the recognition from my leader I deserve, I know that he or she will take good care of me in the future	.69 (11.26)	

	I try to look out for the best interest of my leader because I can rely on my leader to take care of me	.76 (12.27)	
Employee-driven innovation	***Emergence and search for ideas***		.70
	I always identify when there is an opportunity for improvement with a practice	.58 (6.34)	
	I am able to search for solutions to identified problems	.55 (6.32)	
	I can identify when there are problems with a daily routine/practice	.68 (6.68)	
	Idea generation		.84
	I can identify when there are problems with a daily routine/practice	.80 (14.32)	
	I come up with creative ideas that might improve the daily work	.85 (14.32)	
	I often come up with creative solutions to problems at work am good to generate original solutions for problems	.75 (13.21)	
	Idea development and implementation		.81
	When a developed idea is put into practice, it becomes part of the routine	.64 (9.10)	
	We are good at implementing new ideas	.75 (9.10)	
	We systematically implement innovative ideas into work practice	.82 (9.70)	
	Implemented ideas become part of the routine	.68 (13.26)	
	We develop suitable plans and schedule for the implementation of new idea	.49 (7.37)	

Note:

Model fit indices: [$\chi^2(258) = 386.50$, $p < .001$; CFI = .95; TLI = .95; RMSEA = .04; SRMR = .05]

Table 3
Estimates of structural paths of the mediation model

Path	Standardized beta-value	t-value	Result
EL → EDI	.23	2.35*	Supported
DL→ EDI	.03	0.55	Not supported
EL→ LMX	.62	12.51***	Supported
DL→LMX	-.14	-2.30*	Supported
LMX→EDI	.49	4.84***	Supported

Note:
EL = Empowering leadership; DL = Directive leadership; LMX = Leader-Member Exchange; EDI = Employee-driven innovation.
Model fit indices: [$\chi^2(265) = 410.83$, $p < .001$; CFI = .95; TLI = .94; RMSEA = .04; SRMR = .06].
* = $p < .05$; ** = $p < .01$; *** = $p < .001$

Paper IV

Echebiri, C.K. (2020). An empirical study into the individual-level antecedents to employee-driven innovation. *Technology Innovation Management Review*. Vol. 10, No. 6, 41–51. doi: http://doi.org/10.22215/timreview/1367

An Empirical Study into the Individual-Level Antecedents to Employee-Driven Innovation

Chukwuemeka K. Echebiri

> *"Employees at all levels of the organization are perceived as innovation capital or innovation assets."*
>
> Kesting and Ulhøi (2010)

The purpose of this paper is to link individual-level factors (such as need for autonomy, self-leadership, and perceived job autonomy) to employee-driven innovation with self-leadership as an indirect link. The study is based on survey data of 315 employees in the banking sector, collected in two waves where the variables were separated in time. The hypothesized model was analysed using a structural equation model on Stata. First, it was found that the need for autonomy had an indirect association with employee-driven innovation through self-leadership. Second, the findings show that self-leadership had a positive relationship with employee-driven innovation. Finally, there was no support found for the moderating role of perceived job autonomy between self-leadership and employee-driven innovation. The findings in this paper are important because they identify individual-level antecedents of employee-driven innovation.

Introduction

Innovation refers to the series of steps organizations take to transform ideas into improved products, services, or processes, as a way of competing to differentiate themselves in the marketplace (Baregheh et al., 2009). Up to this point, innovation studies have been primarily concerned with innovations that mainly emanate from research and development (R&D) departments. Recently, the roles of ordinary employees in innovation processes have become a focal point in innovation literature (Aasen et al., 2012; Deslee & Dahan, 2018; Voxted, 2018). It has become imperative to regard all employees, irrespective of their role or capacity, as the "innovation capital" or asset of every organization (Kesting & Ulhøi, 2010). As a result, organizations today expect more creativity, innovation, and involvement from employees in the rapidly changing business environment. This has led to a focus on the potential of ordinary employees as contributors to innovation (Price et al., 2012; Wihlman et al., 2014; Engen & Magnusson, 2015).

R&D-focused innovation in most companies has relied on the assumption that innovation requires special skills and should be restricted to a small group in the organization that possess these skills (Harmaakorpi & Melkas, 2012). Today, this assumption is no longer tenable as previous studies have shown that all employees have the potential to contribute to innovation (Engen, 2016; Båckstrom & Lindberg, 2018; Renkema, 2018). Employee-Driven Innovation (EDI) is a construct that describes an innovation emanating from employees who are not overtly required to do so (Høyrup, 2010; Kesting & Ulhøi, 2010). Specifically, it refers to new ideas that are initiated and driven by ordinary employees well beyond their regular duties (Wihlman et al., 2014; Xin, 2016; Holmquist & Johansson, 2019). On this basis, EDI is described as an extra role behaviour (Buhl, 2018; Renkema, 2018) that begins at the job task and worker level (Høyrup, 2012). What this suggests is that employees who get involved in EDI are merely acting on their own free will. They are innovators, so they innovate at their place of work. It is on this basis that Alasoini (2013) argued that the starting point for EDI is an employee's internal desire for creativity, learning, and development based on what De Spiegelaere and Gyes (2012) described as direct participation in the innovation process.

As stated above, EDI revolves around individuals who decide to accept and take on roles outside of their officially allotted duties. We thus require a better understanding of the factors that motivate individuals to participate in this kind of extra role behaviour. Specifically, this paper focuses on self-leadership, the

need for autonomy, and perceived job autonomy in relation to EDI. Perceived job autonomy may not be considered among individual factors such as the need for autonomy and self-leadership. However, the perception of job autonomy by individual employees will depend on their own personal interpretation. This implies that different employees will recognise the same job and its level of job autonomy differently. Research shows that individual-level factors are essential in predicting organizational performance (Kim, 2005). In this paper, it is argued that the presence, perception, and interpretation by employees of these three mentioned factors serves as a form of motivation, whereby employees are encouraged to engage in EDI. Nevertheless, up to the present time individual-level antecedents to EDI have not been previously investigated. Therefore, this paper aims to examine the association between individual-level factors and EDI.

Self-leadership refers to the process through which an individual acquires and develops self-influence to achieve self-direction and self-motivation skills that are necessary to perform effectively in the workplace (Manz, 1992; Stewart et al., 2011; Amundsen & Martinsen, 2015). The need for autonomy and perceived job autonomy looks at autonomy from various perspectives. Perceived job autonomy is related to the job characteristic model and comes across more as an external type of autonomy driven by workplace conditions (Hackman & Oldham, 1975; Parker et al., 2017). Alternatively, the need for autonomy is considered as a basic need according to self-determination theory, suggesting more of an internal type of autonomy tied to the characteristics of individual employees (Ryan & Deci, 2000; Deci & Ryan, 2008b).

Accordingly, this paper makes the following contributions. First, this study empirically links individual-level factors to employee-driven innovation, thereby deepening and extending our understanding of the central role of individual factors when it comes to EDI. Second, through the positive association between a need for employee autonomy and self-leadership, this paper provides further empirical evidence of this relationship and extends it to EDI. In this regard, it further demonstrates a positive relationship between self-leadership and EDI. Additionally, self-leadership acted as an indirect link between the need for autonomy and EDI.

The rest of this article is structured as follows. The next section focuses on key constructs in this study, and builds the argument for setting up the research model and hypotheses. The research methodology section follows this. Next, the results are presented, and finally, the discussion and conclusions.

Theory and Hypotheses

Need for autonomy and self-leadership

Self-determination theory (SDT) is conceived as a macro-level theory of human motivation that addresses issues such as personality development, self-regulation, and universal psychological needs (Deci & Ryan, 2008b). SDT centres around differentiation between autonomous motivation and controlled motivation, and suggests that these two types of motivations are different with respect to both their underlying regulatory processes and their accompanying experiences (Deci & Ryan, 2008a). Furthermore, SDT suggests that behaviours are characterized depending on whether they are shaped by autonomous versus controlled motivation (Gagné & Deci, 2005). Individuals who are autonomously motivated, experience volition in action, whereas those who are control motivated instead experience pressure to think and behave in a specific way (Deci & Ryan, 2008b). In line with this, Yun, Neck, Cox, and Sims (2006) defined the need for autonomy as "a trait, predisposition, or an individual difference variable that refers to a personal need or eagerness to express one's initiative in doing one's job", while Norris (2008) defined it as "a person's desire to engage in activities of his or her choosing".

Self-leadership is about the influence one exerts over oneself to achieve self-motivation and self-direction, contingent on behaving in desirable ways (Manz, 1992; Neck & Manz, 1996; Carmeli et al., 2006; Yun et al., 2006). It is rooted in several inter-related theories of self-influence, including self-regulation, self-control, intrinsic motivation, and self-management (Houghton & Neck, 2002; Carmeli et al., 2006; Neck & Houghton, 2006; Yun et al., 2006). This combination of theories is in contrast to conventional top-down leadership approaches, in which a single leader or a group of leaders aims to influence and control their work subordinates through certain behaviours and actions (Carmeli et al., 2006; Houghton et al., 2014). Instead, through self-leadership, individuals develop the requisite skills to enable their intrinsic motivational abilities to shine forth, instead of merely relying on their leaders for this (Williams, 1997). Self-leadership at work is thus an acknowledgement that even when employee behaviours are shaped by external forces such as

hierarchical leadership in a company, they are ultimately controlled by forces internal to individual employees (Stewart et al., 2011).

Literature shows over time that three distinct but complementary cognitive and behavioural strategies of self-leadership have emerged. They are, namely: behaviour-focused strategies, natural reward strategies, and constructive thought pattern strategies (Carmeli et al., 2006; Houghton et al., 2012). Together these make up the construct of self-leadership (Houghton et al., 2012; Houghton & Neck, 2002). Behaviour-focused strategies imply strategies that are aimed at increasing self-awareness, leading to greater management of behaviours (Manz, 1992), such as self-observation, goal setting, self-rewarding, self-correcting feedback and practice. (Carmeli et al., 2006; Houghton & Neck, 2002). The natural reward strategies in contrast focus on positive experiences associated with a task and the process through which it is achieved. Finally, constructive thought pattern strategies involve visualizing successful performances, engaging in positive self-talk, and raising consciousness about beliefs and assumptions needed to change dysfunctional thinking (Houghton & Neck, 2002).

Even though self-leadership and the need for autonomy are closely related, the need for autonomy at work is a latent trait, while self-leadership is a manifestation of a person's overall level of self-control (Yun et al., 2006). Self-leadership is influenced by the need for personal autonomy and helps motivate autonomous action (Norris, 2008). As Deci and Ryan (2008b) suggested, the need for autonomy is seen as an essential element of individualism, where taking personal responsibility is also crucial for self-leadership. Norris (2008) argued that employees who possess a personal need for autonomy appear to be more likely to take responsibility, participate in decision making, and practice self-leadership strategies.

Empirical studies have complemented theory to suggest a link between the need for autonomy and self-leadership. For example, Yun et al. (2006) found that an individual's perceived need for personal autonomy can subsequently determine the extent to which that individual engages in self-leadership. This is attributable to the fact that such employees are better able to make their own choices, act independently, and take action on certain decisions (Norris, 2008).

Based on the above arguments, the following hypothesis is proposed:

H1: *There is a positive relationship between the need for autonomy and self-leadership.*

EDI and self-leadership

EDI refers to the generation and implementation of new ideas by ordinary employees who are not formally assigned the task of innovation (Høyrup, 2012). Empirical evidence no longer upholds the view that only specific individuals or groups dominate creative thinking (Høyrup, 2012; Haapasaari et al., 2017; Bäckström & Bengtsson, 2019). However, the notion of EDI focuses on the participation of ordinary employees in the company's innovation process. First, EDI indicates that innovative ideas can come from those outside of a selected group of employees with non-innovation specific roles. Instead, innovation could emerge from the insights of employees within the organization, such as customer-facing employees, shop-floor workers, and middle managers, among others (Kesting & Ulhøi, 2010; Xin, 2016). Second, employees who engage in EDI perform extra-role behaviours because they engage in duties not formally assigned to them. Third, it shows that employees who always have been primarily involved in the execution of ideas can also generate, and/or select the most suitable ideas as well (Xin, 2016).

Innovations are typically described as complex procedures, consisting of a variety of different activities (Kesting et al., 2015). Previous studies have suggested that various stages of innovation belong to different domains of an organization. The ideation phases mostly occurs at the individual level, whereas the implementation phase occurs at the organizational level (Axtell et al., 2000). Accordingly, Echebiri, Engen, and Amundsen (Forthcoming, 2020) stated that EDI consists of three encompassing dimensions, namely: the emergence of and search for ideas, idea generation, and idea development and implementation. The emergence of and search for ideas along with idea generation, occur at the individual level. In contrast, idea development and implementation occur at the team or organizational level. The team's importance shows, as argued by Smith, Ulhøi, and Kesting (2012), that to successfully drive forward an idea implies that employees are involved throughout the process. Therefore, ordinary employees are enabled to be actively involved throughout the three phases of EDI.

Several studies have shown the positive effects of self-leadership on work outcomes (e.g. Neck, DiLiello, & Houghton, 2006; Stewart et al., 2011), and emphasized its importance for the innovation process (e.g. Gomes,

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Curral, & Caetano, 2015; Neck et al., 2006). Carmeli et al. (2006) found that self-leadership was positively associated with both self and supervisor ratings of innovative behaviours. Carmeli et al. (2006) suggested that people who possess good self-leadership qualities at the same time know how to achieve high levels of self-direction and self-motivation. The outcome is that these individuals can learn to lead themselves and others. In their study, Neck et al. (2006) suggested that individuals with strong self-leadership are more likely to consider themselves as more creative and innovative, unlike those with weak self-leadership. According to Neck and Manz (1996), applying self-leadership strategies may result in several predictable outcomes such as creating a tendency towards creativity and innovation. Prussia, Anderson, and Manz (1998) described self-leadership as a vital foundation for an organization. Neck et al. (2006) argued that employees who possess high levels of self-leadership are more likely to achieve higher innovation and creative potential than employees who are low in self-leadership. Since behaviour-focused strategies increase self-awareness through such things as self-observation and natural reward strategies, potential exists for promoting a positive experience concerning one's task. Consequently, self-leadership is crucial for employees in order to help initiate and drive company innovation. This likely means promoting extra-role behaviour by individuals at work, as well as positively encouraging EDI.

Based on the above, this study states the following hypothesis:

H2: *There is a positive relationship between self-leadership and EDI.*

Need for autonomy and EDI

Building on the previous argument regarding the need for personal autonomy along with EDI, this paper argues that employees with a higher need for autonomy are more inclined to engage in EDI. Thus, the following hypothesis is stated:

H3: *There is a positive relationship between the need for autonomy and EDI.*

The mediating role of self-leadership

The mediating role of self-leadership is not a new mechanism in the literature (Amundsen & Martinsen, 2015). However, this paper proposes that the relationship between the need for autonomy and EDI are mediated by self-leadership. As previously stated, self-leadership is an actual manifestation of self-control (Yun et al., 2006). Considering what actually happens in social reality regarding innovation, the mediation of self-leadership should be expected only to be partial.

H4: *Self-leadership partially mediates the relationship between need for autonomy and EDI.*

The moderating role of perceived job autonomy

Job autonomy is defined as "the degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used in carrying it out" (Hackman & Oldham, 1975). Based on the job characteristics model (JCM), job autonomy emerges as one of the five job characteristics that make a job more satisfying (Humphrey et al., 2007; Parker et al., 2017). Also, it is one of the four sub-dimensions of psychological empowerment (Spreitzer, 1995). Unlike the need for autonomy earlier discussed, perceived job autonomy is a more global concept, one that touches upon almost all aspects of a job (Kuvaas et al., 2016). At the core of job autonomy is the notion of perceived control concerning one's job (Ng & Feldman, 2014). That is to the extent to which employees have the freedom to make decisions and carry out their tasks with less supervision (Morrison et al., 2005; Smith et al., 2012).

When a workplace environment offers higher autonomy, it implies that employees have significant freedom and discretion on how to plan and execute their job tasks (Morgeson & Humphrey, 2006). Having a higher level of job autonomy means that employees assume greater responsibility for their own decisions and initiative, thus depending less on their supervisors (Hackman & Oldham, 1975; Yun et al., 2006). As argued by Spector (1986), the extent that employees believe they can have a considerable impact on their work environment will influence how they react to it. On the contrary, lack of job control has been suggested to result in a sense of lower personal accomplishment (Kim & Stoner, 2008). Axtell and Parker (2003) argued that giving employees more autonomy in their job encourages employees to go beyond their assigned roles and responsibilities.

In their meta-analysis of 415 empirical samples, Ng and Feldman (2014) observed that job autonomy was positively and significantly related to a wide variety of positive work outcomes that cut across sectional and longitudinal designs. Dhar's (2016) study shows that job autonomy, as a moderator, strengthened the relationship between leadership and innovative behaviour. In a recent study, Kurz, Husig, and Dowling (2018) found that job autonomy had a positive

relationship with innovative behaviour. Previous studies show that perceived job autonomy is most crucial at the individual level, especially for the ideation stages. Employees who worked in a high task-autonomy work environment were found to have generated more creative ideas (Zhou, 1998). Smith et al. (2012) proposed that autonomous work structures are positively related to employee-driven idea generation. Consequently, when a job or "position" is designed in a manner that provides employees with high levels of autonomy, it will likely result in increased opportunities for EDI.

Based on this, the following hypothesis is proposed:

H5: *Perceived job autonomy will moderate the relationship between self-leadership and EDI, such that this relationship will be stronger with higher perceived job autonomy, and weaker with lower perceived job autonomy.*

Method

Data for this study was collected from employees working in the Norwegian banking sector, which is dominated by a few very large commercial banks, some regionally based and several small savings banks spread across the country (Cook, 2018). The bank was chosen because of its focus on innovation-driven by its employees. The survey was designed on an online platform called Nettskjema. Following research cooperation between the research team and the organization, the link to the survey was sent to an HR person in the organization, who then distributed the survey to the employees within the scope of the study.

To help minimize the effect of common method variance, which arises from self-report surveys (Chang et al., 2010), two ex-ante remedies were applied as recommended (Chang et al., 2010; Podsakoff et al., 2003). The variables were separated in time by collecting data in two waves. Self-leadership and need for autonomy were measured at time 1 (T1) whereas EDI and perceived job autonomy were measured at time 2 (T2). There was a time lag of 10 days between T1 and T2. Second, the items were counterbalanced in their order.

A total of 715 employees received the survey. At T1, 443 completed the survey, while 377 participated at T2. After linking respondents who completed both T1 and T2, there was a usable sample of 315 respondents representing a response rate of 44 percent. Table 1 shows the description of the respondents.

Survey instruments
The study used a survey-based approach and respondents were asked to rate the questions on a five-point Likert scale ranging from "1 - strongly disagree to 5 - strongly agree."

EDI
EDI was measured based on a 13-item scale developed by (Echebiri, Engen, & Amundsen, in press). The scale consists of the following three sub-dimensions: Emergence and search for ideas (four items), idea generation (three items), and idea development and implementation (six items). Sample items include emergence and search for ideas ("I recognize when there is an opportunity for improvement with a practice"), idea generation ("I come up with creative ideas that might improve the daily work"), and idea development and implementation ("When a developed idea is put into practice, it becomes part of the routine"). The reliability for EDI was .70.

Perceived job autonomy
Three items were adopted from the work design questionnaire (Morgeson & Humphrey, 2006). The items were: "The job gives me good opportunities to take personal initiatives or consider how to do the work", "The job allows me to make my own decisions", and "I have great freedom of decision in my work". Cronbach's alpha was .77

Self-leadership
The items were adopted from the abbreviated self-leadership questionnaire (Houghton et al., 2012). The scale comprises of three dimensions with each dimension measured with three items. The dimensions were: Behaviour Awareness & Volition (I establish specific goals for my own performance), Task Motivation (I visualize myself successfully performing a task before I do it), and Constructive cognition (Sometimes I talk to myself, out loud or in my head, to work through a difficult situation). The factor reliability coefficient of self-leadership was .73.

Need for autonomy
Three items were adopted from Yun (2006). The items include: "I would find solutions to my problems at work without consulting my supervisor", "I would make decisions on my own initiative without involving my supervisor", and "I would collaborate with other employees at my level to accomplish tasks without involving my supervisor". Cronbach's alpha was .80.

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Table 1. Respondents profile (N = 315)

	Frequency	Percentage
Gender		
Female	159	50.5
Male	156	49.5
Contact with customers/users		
Yes	250	79.4
No	65	20.6
Education		
Secondary	36	11.4
One year post-secondary	68	21.6
Bachelors degree	129	41.0
Master degree or higher	82	26.0

Data analysis

Structural equation modelling (SEM) was performed with Stata version 15.1 using a maximum likelihood estimation. The analyses were carried out in four major steps. First, the measurement model was validated using a confirmatory factor analysis (CFA). Next, the analysis proceeded with the structural model, as recommended in previous studies (Acock, 2013; Mehmet & Jakobsen, 2017). SEM was performed based on the measurement model to estimate the fit of the hypothesized model to the data. Next, the analysis of the indirect effect was performed on Stata. Finally, the moderation analysis was performed using SPSS version 25.

Results

The means, standard deviations and latent bivariate correlations for all the variables included in the present study are reported in Table 2.

Measurement model

The measurement model consisted of one first-order construct (the need for autonomy), and two-second order constructs that had multiple indicators (self-leadership and EDI). Perceived job autonomy was not included because the moderation was performed separately, as previously stated. The model indicated a good fit [$\chi^2(243) = 395.29$; CFI = .93; TLI = .92; RMSEA= .05; SRMR = .06]. The average variance extracted that was used to gauge construct validity did not reveal any problems. With a satisfactory measurement model, the next step was to test the structural model.

Hypotheses testing

Since H1, H2, and H3 were based on the bivariate relationships, the hypotheses were tested based on latent variable correlations obtained in Table 1. H1 suggested a positive association between the need for autonomy and self-leadership. This hypothesis was

Table 2. Descriptive statistics and latent variables correlations

	Mean(SD)	1	2	3	4	5	6
ES	4.7(.47)						
IG	3.8(.74)	.48***					
IDM	3.7(.64)	.43***	.45***				
EDI	4.1(.46)	.NA	NA	NA			
NFA	3.7(.85)	.07	.16**	-.04	.12		
PJA	4.1(.77)	41.***	.44***	.52***	70.***	-.03	
SL	3.9(.50)	.60***	.38***	.48***	.71***	.16*	19

Note: ES = Emergence and search for ideas, IG = idea generation, IDM = idea development and implementation, EDI = employee-driven innovation, NFA = need for autonomy, PJA = perceived job autonomy and SL = Self-leadership, NA = Not applicable
*$p < .05$, ** $p < .01$, ***$p < .001$

Table 3. Moderation effects of perceived job autonomy

Model		Std. coefficients Beta	Std. Error	t	Sig
1	Constant		.02	183.88	.000
	SL	.26	.04	5.58	.000
	PJA	.47	.03	9.84	.000
	SL x PJA	-.02	.06	-.48	.632

Note: SL = Self-leadership, PJA = Perceived job autonomy. Dependent variable = EDI.

supported (r = .16, p < .05). H2 postulated a positive relationship between self-leadership and EDI. This hypothesis was also supported by the data (r = .71, p < .001). H3 suggested a positive relationship between the need for autonomy and EDI, but was not supported (r = .12, p < .ns). H4 proposed that the relationship between the need for autonomy and EDI is mediated by self-leadership. This mediation hypothesis was not supported because of the non-significant relationship between need for autonomy and EDI. However, with significant relationships between need for autonomy and self-leadership (H1), as well as between self-leadership and EDI (H2), this satisfied the conditions for an indirect relationship in the data between need for autonomy and EDI (Mathieu et al., 2008).

Test of the indirect effect

A test of the indirect effect was conducted based on a structural model, which fit the data well. The test was performed using Monte Carlo replications in Stata. The number of Monte Carlo replications was set to 5,000. The average indirect effect of the need for autonomy in EDI through self-leadership was estimated to .10, SE = .05, p < .05.

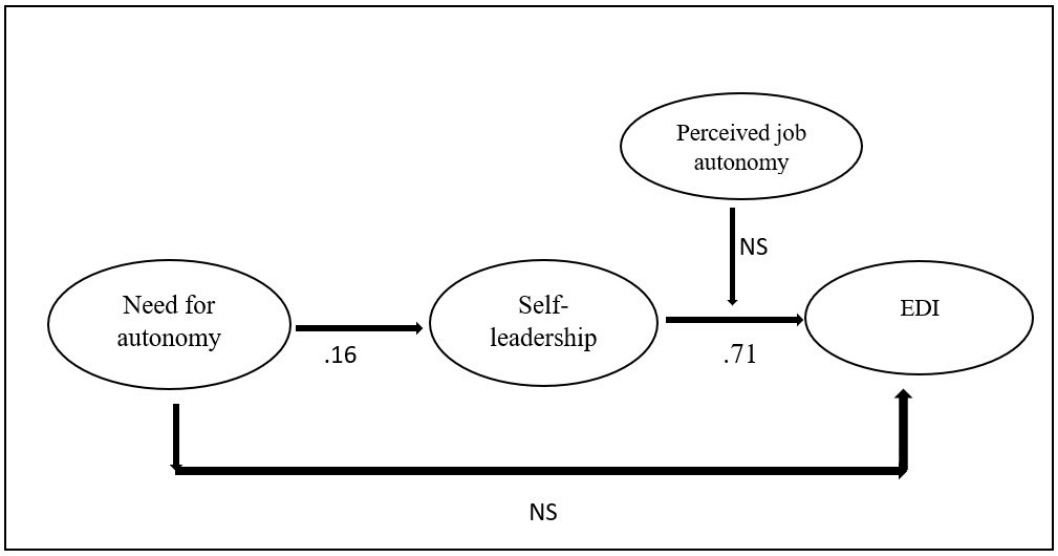
Moderation analyses

H5 suggested that perceived job autonomy would moderate the relationship between self-leadership and EDI, such that this relationship would be stronger when there is higher perceived job autonomy, and weaker with lower perceived job autonomy. To reduce the potential for multicollinearity between lower-order and higher-order terms, the variables were mean-centred. As shown in Table 3, the data did not support the hypothesis.

The results of hypotheses testing are summarized in Figure 1.

Supplementary analysis

A supplementary analysis was performed regarding the relationship between self-leadership and the various sub-dimensions (stages) of EDI. To remind, these are:



NS = Not supported

Figure 1. Complete hypothesized model included results of the hypotheses testing

the emergence and search for ideas, idea generation, and idea development and implementation. This structural model gave a mixture of acceptable and nonacceptable fit indices. The modification indices were used to check for areas of improvement, and indicated allowing two pairs of error terms to correlate that belonged to the same construct. The model improved and indicated that the supplementary model was satisfactory [$\chi^2(181) = 314.01$, $p < .001$; CFI = .94; TLI = .92; RMSEA = .05; SRMR = .07]. It was found that self-leadership had a positive relationship with emergence and search for ideas ($\beta = .71$, $p <. 001$), idea generation ($\beta = .54$, $p <. 001$), and idea development and implementation ($\beta = .59$, $p <. 001$).

Discussion

The main aim of this paper was to investigate how individual-level variables (need for autonomy, perceived job autonomy, and self-leadership) associate with EDI. First, it was found that the need for autonomy had a positive relationship with self-leadership, and an indirect association with EDI through self-leadership. Second, it was established that self-leadership has a positive association with EDI. Contrary to the hypotheses presented, there was no support for a direct positive association between the need for autonomy and EDI, and for the moderating role of perceived job autonomy between self-leadership and EDI. Additionally, the supplementary model indicated that self-leadership has a positive relationship on all stages of EDI.

The findings in this paper give additional support to some earlier findings on relationships in management research. The result of a positive correlation between the need for autonomy and self-leadership agrees with previous results (Yun et al., 2006). This implies that employees who have more need for autonomy are likely to be more motivated to lead themselves because such people can express themselves at work, display positive behaviours (Yun et al., 2006; Ng & Feldman, 2014), and thereby increase the likelihood of becoming more innovative and vice versa.

The positive relationship between self-leadership and EDI is also in line with previous studies where self-leadership was found to predict innovation (Neck et al., 2006). However, this is the first empirical paper to demonstrate a positive relationship between self-leadership and EDI, as well as an indirect association between the need for autonomy and EDI. Similarly, the positive association between self-leadership and the three phases of EDI (emergence and search for ideas, idea generation, and idea development and implementation) is also a crucial finding, as it links self-leadership to both the individual and organizational stages of EDI. Innovation literature suggests that different stages of innovation belong to their respective domains in the organization. For example, individual behaviour such as idea generation belongs to the individual level. In contrast, implementation phases belong to the organizational, group, or team level (Axtell et al., 2000).

These results, clearly underscore the central role of individuals in initiating and driving the innovation process. EDI is about ordinary employees participating in the entire innovation process (De Spiegelaere & Gyes, 2012; Smith et al., 2012). This is because their involvement is beyond mere ideation (Båckstrom & Lindberg, 2018). Furthermore, it also brings to light a new understanding that the development and implementation of an innovative idea within the context of EDI belongs to both the individual and organizational domains. This is theoretically understandable because employees on their own cannot implement innovation, though they are involved in the process.

Therefore, it is safe to say that the supplementary findings in this paper not only re-affirm our understanding of innovation, but also extend this understanding. As earlier stated in this section, the moderating role of perceived job autonomy was not supported by the data. Instead, self-leadership had the same impact on EDI regardless of whether perceived job autonomy is low or high. Nevertheless, despite the design of this paper, it still suffers from the weaknesses associated with a cross-sectional survey that has no real causality.

Theoretical and practical implications

Based on these findings, the following implications can be deduced. From a theoretical point of view, the various implementation phases of an innovation process ideally belong to the organizational domain (Axtell et al., 2000). This paper brings a new perspective to that long-held view. From the perspective of self-leadership studies, this finding is not entirely surprising, as self-leadership has been extended to the group level analysis (Stewart et al., 2011). The finding suggests that EDI, as both a process and an outcome, belongs to individual and organizational domains. Idea development and implementation require a level of self-leadership on the part of employees that runs beyond resources and other factors associated with the organizational domain. This

is the most important theoretical contribution of the paper.

From a practical perspective, external factors such as leadership are crucial for innovation (Hughes, Lee, Tian, Newman, & Legood, 2018). This includes EDI, while self-leadership skills are also important. The management and leadership of an organization should be aware that individual-level factors can engender EDI. There is no guarantee that management or good leadership alone can adequately motivate employees to become innovative if they cannot lead themselves. The implication here is that organizations should strive to complement external influences with internal incentives such as rewarding employees for valuable examples of self-leadership. Employees who can lead themselves are in a better position to identify a problem or perceive an opportunity at work, in a way that allows them to contribute more actively to the development and implementation of their ideas.

In conclusion, the findings in this paper suggest that the management, line managers, supervisors, and human resources department should be aware that employees with a high need for autonomy are in a better position to self-lead themselves. This is in line with Houghton et al. (2014) argument that internal forces ultimately shape behaviours. Organizations should therefore strive to create an opportunity for employees with a high need for autonomy to develop their skills to influence themselves and others, because through self-leadership, they can lead themselves to become more innovative in the company.

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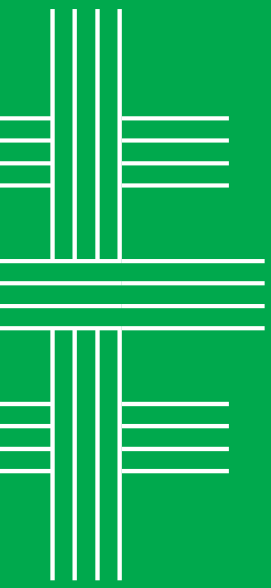

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The assumption that innovation requires specific skills and should be restricted to a certain category of employees is no longer tenable in today's modern organizations. Rather, organizations should recognize that all their employees irrespective of their category have the potential to contribute to innovation. Employee-driven innovation entails the active participation of employees in the organization's innovation processes. However, considering employees as actors in the innovation is about facilitating their participation in the processes by enabling and empowering them to engage in innovation processes. This dissertation aims to gain more understanding about fostering employee-driven innovation using empowerment as a lens.

This study is a quantitative investigation of employees' participation in innovation based on three empirical studies in service organizations. The results of this study contribute to the understanding of employee-driven innovation as a multidimensional construct consisting of emergence and search for ideas, idea generation, and idea development and implementation. In addition, employee empowerment is framed as an approach to employee-driven innovation. This implies that organizations can stimulate employees' participation in innovation processes through empowering practices from both the organizational and individual levels.