Maria Pajuoja

From mechanistic measuring to up-to-date understanding

Problematising the study of innovative work behaviour

ACTA WASAENSIA 489

Vaasan yliopisto
UNIVERSITY OF VAASA

ISBN 978-952-395-028-3 (print)
978-952-395-029-0 (online)

ISSN 0355-2667 (Acta Wasaensia 489, print)
2323-9123 (Acta Wasaensia 489, online)

URN http://urn.fi/URN:ISBN:978-952-395-029-0

Hansaprint Oy, Turenki, 2022.

ACADEMIC DISSERTATION

To be presented, with the permission of the Board of the School of Management of the University of Vaasa, for public examination in 2nd of September, 2022, at noon.

Article based dissertation, School of Management, Human Resource Management.

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Tiivistelmä

Innovaatiot ovat elintärkeitä yritysten selviytymiselle. Yksittäiset työntekijät, jotka luovat ja implementoivat uusia ideoita, ovat organisaatiotason innovaatioiden ja innovatiivisuuden perusta. Yksilötason innovaatioprosesseja tutkitaan usein termillä innovatiivinen työkäyttäytyminen, joka on käsillä olevan tutkimuksen lähtökohtana. Hermeneuttisessa tutkimuksessa etsitään nyt vastauksia siihen, voiko valmentava esihenkilötyö lisätä yksilön innovatiivista työkäyttäytymistä, miten tämä työkäyttäytyminen on ymmärretty ja miten sitä mitataan, ja onko yksilötason innovaatioprosessi samanlainen kuin aikaisempi tutkimus on sen käsittänyt. Väitöskirjan tavoitteena on lisätä ymmärrystä yksilön innovatiivisuudesta ja siitä, miten sitä tulisi lähestyä tutkimuksessa ja työelämässä.

Ilmiötä lähestytään monimenetelmällisesti yhdistäen määrällisiä ja laadullisia menetelmiä ja erilaisia aineistoja. Kvantitatiivinen aineisto koostuu 4418 pk-sektorin työntekijöiden vastauksesta. Kirjallisuuskatsauksessa analysoidaan 255 artikkelin aineistoa. Tapaustutkimus pohjautuu 34 puolistrukturoituun teemahaastatteluun.

Tutkimus osoittaa, että yksilön innovaatioprosessien tutkiminen termillä innovatiivinen työkäyttäytyminen on ongelmallista ja selittää syitä tähän. Yksilön innovaatioprosessia on viimeksi tutkittu 1980-luvulla, ja näihin tutkimuksiin perustuvat vielä nykyäänkin käytössä olevat mittaristot. Väitöskirjassa esitetään, että yksilön innovaatioprosessi on nykyään erilainen kuin 1980-luvulla, mm. siihen kuuluvien aktiviteettien ja yksilön roolin osalta. Innovatiivisen työkäyttäytymisen tutkimuksessa on keskitytty mekanistiseen käyttäytymiseen vaikuttavien tekijöiden mittaamiseen vanhentuneilla mittaristoilla sen sijaan, että olisi yritetty ymmärtää sitä, miten yksilöt nykyään innovoivat. Väitöskirja rakentaa uudenlaista kuvaa yksilötason innovaatioprosessista lisäten ymmärrystä siitä sekä tarjoaa kiintopisteitä yksilön innovatiivisuuden tukemiseen organisaatioissa.

Asiasanat: Innovatiivinen työkäyttäytyminen, yksilötason innovaatioprosessi, valmentava esihenkilötyö, hermeneuttinen kehä, monimenetelmällisyys

Abstract

Innovation is vital for the survival of organisations. Individual employees are the microfoundations of organisational innovation since it is the individuals who generate new ideas and implement solutions. Individual innovation processes are often studied using the term innovative work behaviour (IWB). The topic is explored in a hermeneutic circle in which answers are sought to whether managerial coaching can enhance IWB; how IWB has been understood and measured; and whether the individual innovation process is similar to how previous literature has conceived it. The overall aim of the thesis is to increase understanding of the individual innovation process and how it should be approached in research and in modern working life.

Three data sets are utilised in the quest for answers. 4418 responses from employees in Finnish SMEs comprise the quantitative data set. An article cache of 255 articles is analysed in the integrative literature review. 34 semi-structured interviews at a Finnish MNC make up a single case study. The mixed-methods approach allows for a multifaceted understanding of the phenomenon studied.

The thesis makes several important contributions. It highlights that the practice of studying individual innovation processes under the term innovative work behaviour is problematic, and explains reasons for this. It finds that the individual innovation process was last studied in the 1980s and that the measuring instruments used even today are based on these studies. The thesis suggests that the individual innovation process is different today than it was in the 1980s, both in consisting of different activities than before, and in the role of the individual being more active and engaged. In all, the study of IWB has focused on the mechanistic measuring of the effects of various determinants to behaviours using outdated measuring instruments instead of attempting to understand the microfoundations of innovation. The thesis builds new understanding of the individual innovation process and offers focal points for supporting an individual's innovation efforts in organisations.

Keywords: Innovative work behaviour, individual innovation process, managerial coaching, hermeneutic circle, mixed methods

ACKNOWLEDGEMENT

This is it – I have achieved my childhood dream of becoming a published author. I now feel like I should have been more specific as a child since it appears that getting published does not automatically mean international book tours and getting to decide whether Anne Hathaway or Natalie Portman should play me in the movie. That may be just as well since, in the end, watching a movie about a 40-something-year-old woman spending most of her day with her head resting on the desk, sighing in desperation, would not make for very good entertaining, no matter who she is portrayed by.

Another thing that I did not realise is that, much like with raising kids, it takes a village. Fortunately, I had a very supportive village around me. My supervisor, boss, mentor, and friend, professor Riitta Viitala was an invaluable companion, alternately pushing me to produce better-quality results and reminding me to cut myself some slack. I could fill up a couple of pages just listing her many merits but I will just say this: the fact that she never saw me as anything other than an equal ended up being perhaps the characteristic that meant the most to me. My second supervisor, assistant professor Susanna Kultalahti, could always be counted on for top-notch advice on my work, funding applications, career, and how to throw a good party. I also want to mention assistant professor Anni Rajala for answering literally hundreds of (mostly stupid) questions about quantitative research. Professor Adam Smale, in the role of our school's dean, hired me early on in the process, thus providing me with time and motivation to focus on my research.

The pre-examination process was very helpful in giving me a glimpse of how experts in my field read my work. I am grateful to professor Joakim Wincent and associate professor Timothy Bednall for their insightful comments and suggestions which gave me a chance to improve the manuscript. I want to thank Dr Timothy Bednall for accepting the invitation to act as the opponent in the examination; I look forward to a fruitful and interesting discussion.

My colleagues have been invaluable throughout this process. In particular, I want to call out my co-authors Maarit Laiho and Kaisa Henttonen for teaching me so much about the research process and how it leads to a written article; Marko Kohtamäki, Rumy Narayan, and Rodrigo Rabetino for discussions on the philosophy of science and the nature of knowledge; and Kati Söderlund, Suvi Einola, Niina Koivunen, Jukka Vesalainen, Tiina Jokinen, and Maria Järlström for well-placed pieces of advice and kind words of encouragement. For peer support, pick-me-ups, and information sharing, I am grateful to my fellow PhD candidates

Tania Biswas, Rodrigo Mello, Inés Escobar Borruel, Laura Urrila, and Elizabeth Edgal, with special thanks to Tiina Leino for encouraging me to go for a PhD in the first place. Thank you, Heini Pensar, for the walks, talks, lunches, and thought-provoking questions, and Jenni Kantola for challenging my thinking and for being a great companion in Barcelona. Beyond my home university, I am happy to have found a supportive and fun research community at ISPIM; the presentations and comments at conferences have been extremely useful, and interactions with like-minded people have resulted in some of the most amazing moments on this journey (I'm thinking learning line dancing on a Thai riverboat).

The generous funding that I have been able to obtain has made living in this village highly enjoyable, and I wish to acknowledge the Foundation for Economic Education (Liikesivistysrahasto), and the Evald and Hilda Nissi Foundation for the support they have given me. The OpenInnoTrain project, funded by European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant, enabled me to go on research visits to Melbourne and Barcelona and led me to get to know such inspiring academics as professor Anne-Laure Mention and warm-hearted, open-minded, and hilarious people as Bruno Woeran and Georg Macher.

Finally, the support on the home front has been my lifeline. I have been blessed with two amazing friends and fellow writers: Eva-Maria Oberauer comforted me during those times when I wanted to pluck out my eyebrows one by one, and Johanna Virtanen had such amazing faith in me that it was impossible not to have faith in myself. My parents and siblings with their multitude of kids make up an Italian-style, loud and chaotic family life that offers a refreshing change from the (occasional) solemnity of the academic life. Anna-Lena Walleczek made everything easier by competently and with exceptional judgment managing our household during the last months leading to the completion of this thesis. My helpful, wise, and innovative husband Sami has played all the roles you can think of: housekeeper, chef, massage therapist, IT support, cheerleader, and discussant, to name but a few. He is the best companion a girl could have asked for in this – or, indeed, any – endeavour. Noa and Amos have been responsible for ensuring that I take my mind off work by demanding that I make them pancakes, race toy cars, and read them stories about bears who fart. Guess what, boys: mummy is finally done with her big book.

Barcelona, June 2022

Maria Pajuoja

Contents

Figures

Tables

Abbreviations

HRM	Human resource management
IWB	Innovative work behaviour
LMX	Leader-member exchange theory
MC	Managerial coaching
R&D	Research and development
SME	Small- and medium-sized enterprises
WE	Work engagement

Publications

[1] Pajuoja, M., R. Viitala & K. Henttonen (in progress). Examining the effect of managerial coaching on four dimensions of innovative work behaviour. An earlier version of the paper was presented at the ISPIM conference in Bangkok, Thailand in March 2020.

[2] Laiho, M., R. Viitala, M. Pajuoja & K. Henttonen (in progress). Managerial coaching and employees' innovative work behaviour – The mediating effect of work engagement.

[3] Pajuoja, M. (in progress). Are we measuring the innovative work behaviour of the 1980s? A critical review of the measuring instruments. Paper presented at the virtual EURAM conference in June 2021.

[4] Pajuoja M. & M. Laiho (in progress). Insights into the individual innovation process: Updating prevalent understanding. Paper accepted for presentation at the Academy of Management conference in Seattle in August 2022.

1 PROLOGUE

"Get mad about what's missing in your conversation to get over the timidity newcomers often feel."

Anne Sigismund Huff, former President of the Academy of Management

I am eager for us to get started on a topic that I find to be of the utmost importance: what individuals do when they innovate. Although innovation is usually a team effort, individuals still act in certain ways as part of the team, and understanding how their processes unfold is, for me, extremely interesting. Indeed, as a former manager at one of the most innovative companies in the world, I witnessed daily how my colleagues innovated and how the results of their processes allowed us to do our jobs faster, more effectively, and have more fun while doing it. Naturally, understanding an individual's role in the innovation process was always going to be my research topic. But before delving into that, I want to spend a couple of minutes explaining two transitions that occurred during my thesis journey. They help explain why I chose this topic, and why the thesis took the direction that it did.

From linear progression to hermeneutic circle

I started with the question that seemed highly practical to me: what can managers do to help their employees be more innovative? I explored this topic in the first two papers, expecting to find answers straightforward enough to follow in a neat, linear fashion. I am usually not happy to just accept answers that are given to me, however. So, in a way, it came as no surprise that when I started to conduct research into how managers can influence the innovative work behaviour of their employees, my natural instinct was first to question whether the way innovative work behaviour was measured is correct; then, whether the whole concept in itself is accurate and up-to-date; and ultimately whether the question of how managers can "influence" their employees is the most pertinent one.

Eventually, I came to understand that I was engaged in a hermeneutic process of interpreting and understanding the concepts and data before me. I particularly relate to Gadamer's definition of the hermeneutic circle which emphasises the

development of a new understanding of a concept after exploring its details in an iterative process that goes back and forth between the whole and its parts (Gadamer, 2004). Hermeneutic understanding arises in a dialogue between the interpreter and what is to be understood with the interpreter's prior experiences, knowledge, and prejudices as essential elements in the quest to build new understanding (Gadamer, 2004). The use of the word *circle* has been criticised as incorrect; for who or what exactly is at the centre of the circle (Shklar, 2004)? I experienced the circle more as a spiral but will use the word circle as it is the established term.

From positivist to more interpretative ponderings

I was all set to be a positivist. Having finally mastered enough matrix algebra to do quantitative data analysis I took to it like fish to water and revelled at how beautifully the numbers aligned and painted such compelling pictures. When I realised that I would not be able to find out what I wanted to find out for Paper 4 utilising quantitative research methods I grudgingly enrolled on a post-graduate course on qualitative methods. "I live my life thinking of everything I see as latent variables and analysing which way the arrows might go from one variable to another. Trying now to conceptualise what a case study might look like and what I can accomplish with that is like trying to breathe under water," I wrote in my learning diary for the course. My most significant qualms related to my own role in making science and I have frequently been reluctant to take what I considered a more prominent role than I was ready to accept. How do I safeguard science from my mistakes and deficiencies in understanding? How do I make sure that the lens through which I observe as a researcher is reliable? And ultimately, I suppose; why should anyone be interested in any of the thoughts and ideas that are the result of my subjective processing?

Obviously, I am at the beginning of my quest to answer some of these questions and the struggle is, I think, evident in these pages. But, to go back to the quote that started this prologue, I did get mad about what I felt was missing in the conversation about how individuals innovate. And that did help me get over some of my feelings of being a newcomer to research.

2 INTRODUCTION

This chapter starts with an exploration of the importance of innovation and what, and how, has been studied about innovation. I have here considered the general, vast discussion on innovation to give the reader a chance to place my research on the field. I will then narrow down the focus to my interest area, how individuals innovate. This allows for a more detailed discussion of what that study looks like, what some of the issues with it are, and what the objective of this thesis is.

2.1 The importance of innovation

The World Economic Forum (*Strategic Intelligence*, n.d). lists a vast number of global issues to be resolved. Although the issues are complex, and as such, resist any attempts at categorising them, broad distinctions can be made between technological (such as Artificial Intelligence and the Internet of Things), ecological (e.g. climate change and biodiversity), economical (e.g. digital economy, circular economy), societal (e.g. ageing and systemic racism) and governance issues (e.g. internet governance, global governance). That we are facing unprecedented changes is clear, and the speed of technological disruption makes the situation even more complex. The OECD has called for a re-setting of policies to ensure that innovation efforts are directed towards resolving the issues that we are faced with . A good example of innovating to fight a global issue is the currently ongoing global pandemic COVID-19. Innovation has played an essential role both in understanding what the virus is like and how it is transmitted and also in developing vaccines in a short period of time (*OECD Science, Technology and Innovation Outlook - OECD*, n.d).

At the national level, the ability to innovate and to bring those innovations to market has long been understood to be a crucial factor in how nations remain globally competitive and many countries have produced national strategies for their innovation efforts (*The OECD Innovation Strategy: Getting a Head Start on Tomorrow*, 2010). Finland is no exception and a 2019 report on Finland's innovation policy clearly nominates innovation (and specifically internationally successful innovation) as the solution to the sustainable growth of the economy and rising employment rates. (Koski, Husso, Kutinlahti, Huuskonen, & Nissinen, 2019).

That innovation is important for the success and survival of organisations is so much a given today that many articles bypass the entire claim with a short single sentence at the beginning (e.g., Anderson, Potočnik, & Zhou, 2014; Hughes, Lee, Tian, Newman, & Legood, 2018), or, indeed, make no mention of it at all (e.g.,

Lukes & Stephan, 2017). Digging deeper into the literature reveals that there are two main areas that respond to innovation that can help organisations be more competitive: the products and services the organisation offers (product innovation) and how those offerings are delivered (process innovation) (Francis & Bessant, 2005). Product innovation refers to the ability to introduce new products or services to benefit customers, or to exploit technologies commercially (Gopalakrishnan & Damanpour, 1997; Lukas & Ferrell, 2000). Focusing on improving processes can help the organisation become more effective, improve their quality, and save costs (Damanpour, 1991; Johne, 1999). Both types of innovation can be either incremental or radical, and in their radical form can transform industries and destroy competition (Gopalakrishnan & Damanpour, 1997). Additionally, and relevant to this thesis, how innovation is managed is also seen as a way of ensuring competitive success (Adams, Bessant, & Phelps, 2006). Suggestions include developing managers' ambidextrous capabilities to allow them to manage both radical and incremental innovation (Tushman & O'Reilly, 1996), and learning how to harness the knowledge and capabilities of employees at all levels (Dess & Picken, 2000).

Regardless of whether the advantage comes from new products, improved processes, or better management of innovation, that innovation is more critical now than ever is clear from a report by McKinsey in 2020. In the survey of over 200 organisations representing various industries, 90% of the executives believed that COVID-19 would fundamentally change their business in the next five years. Over 75% thought that the crisis would create significant new growth opportunities. However, only 21% said that they had the skills and resources to pursue these opportunities. (Bar Am, Furstenthal, Jorge, & Roth, 2020). Clearly, the need to innovate and generate knowledge on innovation is as important as ever.

Individuals also benefit from innovation efforts. Although research on this topic is sparse (Janssen, van de Vliert, & West, 2004), it has been shown that engaging in innovative behaviours leads to enhanced employee engagement and well-being (Huhtala & Parzefall, 2007) and can even shield employees from burnout following their company downsizing (Hammond, Cross, Farrell, & Eubanks, 2019). Engaged employees tend to innovate more (van Zyl, van Oort, Rispens, & Olckers, 2019; Wu & Wu, 2019) which makes innovation an activity that results from feeling positive, vigorous, and fulfilled at work (Schaufeli, Salanova, González-Romá, & Bakker, 2002). Therefore, the circumstances necessary to encourage an individual to innovate call for both capabilities to innovate and a highly engaged state of mind. The individual innovation process is as much a mental process as a technical one,

and the manager's role in facilitating the process has been reported to be instrumental (e.g., Hughes et al., 2018).

2.2 Academic discussions on innovation

Innovation can be studied at the individual, work team, organisational, or at multiple levels (Anderson et al., 2014). Three streams of innovation research can be distinguished: one that focuses on the determinants of innovation, one that looks at innovation as a process, and one that is interested in innovation outcomes (Crossan & Apaydin, 2010). The streams are related to each other: determinants affect the innovation process, and the innovation process must precede innovation outcomes (Crossan & Apaydin, 2010). Putting these two categorisations together gives us Figure 1, which presents how the levels and streams merge. The details of Figure 1 are discussed in Chapter 3.

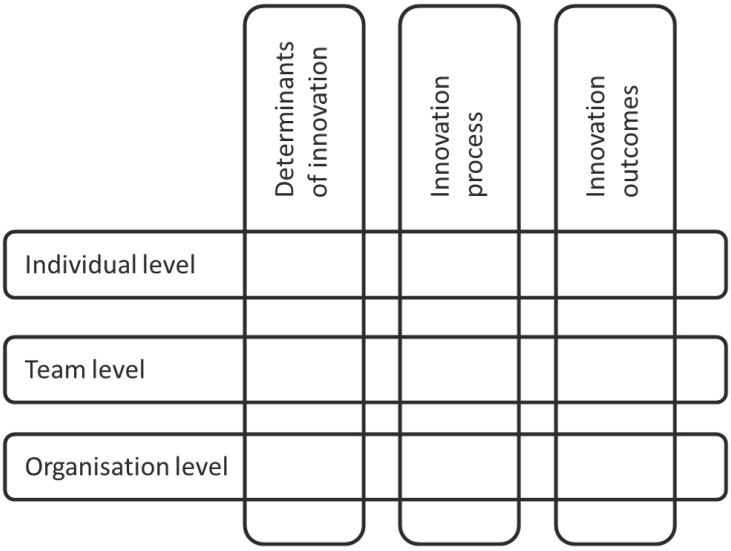

Figure 1 Levels and streams of innovation research

From the start, I was interested in how organisational-level determinants (in particular managerial actions) affect individual-level innovation processes. When talking about these individual processes, the term *innovative work behaviour* (IWB) is often used (Anderson et al., 2014). The study of IWB has been concerned with how individuals' innovative actions can be measured, and which determinants impact it and in what way.

The field of innovation research is vast and today comprises discussions such as open innovation, circular innovation, business model innovation, digital transformation, innovation policies, and sustainable innovation, to mention but a few of the newer streams. The need to define the scope of this thesis was evident. I chose innovative work behaviour for two reasons. First, I was interested in the relationship between certain determinants and how individuals innovate, and this type of research is often conducted under the umbrella of innovative work behaviour. Second, the measuring instruments for how individuals innovate have been developed utilising the term *innovative work behaviour* (e.g., de Jong & den Hartog, 2010; Janssen, 2000; Scott & Bruce, 1994), and as a former operations manager, I believe that what gets measured, gets done. Therefore, to study what aspects of individuals' innovation processes have been measured and how seemed a task worth undertaking.

To look at where these discussions take place, it can be noted that research on innovative work behaviour is published in journals of many different descriptions and also in industry-specific journals such as *Tourism Management* and the *American Journal of Nursing*. Five main interested parties can be distinguished: human resource management, management, psychology, organisational behaviour, and innovation management. Again, while many articles are general enough to have been published in any journal, some nuances are apparent. HR journals, such as *Human Resource Management*, have published more extensively on the role of HR practices, such as performance-based rewards, in enhancing innovative work behaviour (Sanders, Jorgensen, Shipton, Van Rossenberg, Cunha, Li, Rodrigues, Wong, & Dysvik, 2018). Management journals, such as the *Academy of Management Journal*, have naturally focused more on the role of the manager in the process, including whether managerial expectations of performance have an impact (Yuan & Woodman, 2010). Journals with an emphasis on psychology, such as *Current Psychology*, have been interested, for example, in the role of personality in innovating (Li, Liu, Liu, & Wang, 2017) whereas organisational behaviourists in journals such as *Journal of Organizational Behavior* have examined diverse perspectives on organisational life, such as whether innovative behaviours are typically ascribed more often to men than to women and whether the bias affects the performance evaluations of women who innovate (Luksyte, Unsworth, & Avery, 2018). Finally, journals on innovation management, such as *Creativity and Innovation Management*, have explored questions related to measuring innovative work behaviour (de Jong & den Hartog, 2010), among other interesting topics.

2.3 Defining innovative work behaviour

Creativity has typically been seen to consist of the generation of entirely novel ideas (Amabile, 1988), whereas innovation has been defined as encompassing the introduction of ideas and their application (West & Farr, 1990). The current understanding is that creativity is the domain particularly concerned with generating novel ideas that need not respond to a need or a problem, and that need not be implemented; the result of creativity is an idea. Innovation, however, always starts with an identified problem to which a solution may be an entirely new (i.e., creative) idea, or an idea applied from another context. It is also meant to be implemented. (Hughes et al., 2018). Innovation, then, has a strong practical element to it.

As already stated, innovation can be studied at the individual, work team, organisational, or at multiple levels (Anderson et al., 2014). When the innovation process is studied at the individual level, it is often called innovative (work) behaviour (IWB) (Anderson et al., 2014). It refers to the different individual behaviours that are exhibited during the innovation process (Scott & Bruce, 1994). Over the years, academics have been interested in the question of whether these innovative behaviours consist of dimensions other than the idea introduction and application envisioned by West and Farr (1990), exactly how many dimensions there are, and which are the dimensions. Dividing innovation into two dimensions has been popular (e.g., Axtell, Holman, Unsworth, Wall, Waterson, & Harrington, 2000; Krause, 2004). Scott and Bruce (1994) introduced a third dimension, idea promotion, that includes behaviours related to the fact that often a new idea meets with resistance and needs to be championed to get acceptance and the resources needed to go through with the idea. De Jong and den Hartog (2010) noticed that the first dimension, idea introduction, is quite broad, and divided it into idea exploration and idea generation. Since then, even five or six dimensions have been proposed (e.g., Kleysen & Street, 2001; Lukes & Stephan, 2017). Recently, Hughes et al. (2018) analysed 159 definitions of innovation used by scholars in the past ten years and suggested that innovation is the identification of a problem, the introduction and the modification of ideas as a solution to the problem, and the promotion and implementation of those solutions.

Researchers have often tried to distinguish between these dimensions of behaviour to develop ways to measure innovative work behaviour. Consequently, several different measuring instruments have been constructed, either purposefully or as a bi-product of a study (for examples of measuring instruments, see, e.g., de Jong & den Hartog, 2010; Janssen, 2000; Messmann & Mulder, 2020; Scott & Bruce, 1994). These instruments have been used to study which determinants influence

the individual's innovation process. The most popular line of research has been on the role of the manager and what can they do to ensure their employees are more innovative (for a review, see Rosing, Frese, & Bausch, 2011). Much of this research has been conducted on different leadership styles, for example, transformational leadership (e.g., Bednall, Rafferty, Shipton, Sanders, & Jackson, 2018).

The study of innovative work behaviour is really the study of these three questions: What is innovative work behaviour? How can it be measured? Which factors impact innovative behaviour at work? The questions are nested, and the answer to the previous question has to be known before attempting to answer the next one. One cannot study which factors impact the innovative behaviour of employees unless one knows how to measure IWB. And one cannot measure IWB unless one knows what innovative behaviour looks like in the workplace. Figure 2 presents this visually.

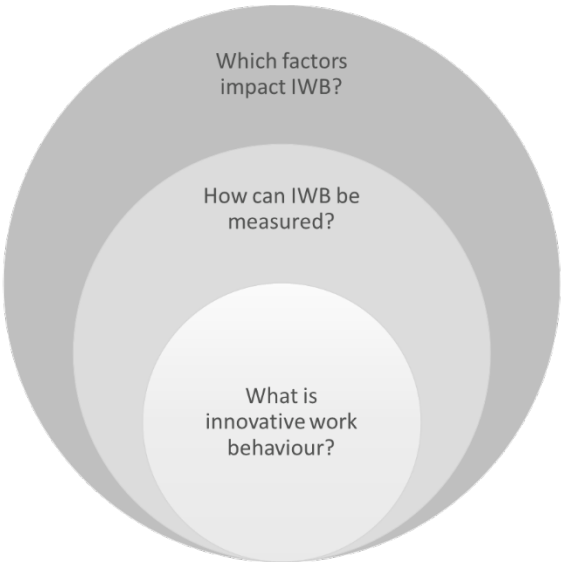

Figure 2. Nested nature of questions about IWB

The study of innovation has generated much criticism, most of which is also applicable to the study of innovative work behaviour. The sharpest critique was presented by Anderson, De Dreu, and Nijstad as early as 2004. That research argued that the study of innovation had already become routinised, and as previous studies had identified the determinants of innovation, much of what scholars had done merely replicated and slightly extended those studies (Anderson, De Dreu, & Nijstad, 2004). Together with Potočnik and Zhou,

Anderson again criticised the study of innovation for its lack of theoretical grounding and disparate approaches (Anderson et al., 2014). Hughes et al. also conducted a review into the study of leadership and innovation and called it "fragmented and primarily populated by small, 'exploratory' studies" (2018, p. 549).

The question of how innovation is measured has been severely criticised over the past years. Under question has been, firstly, whether the nature of the measures is appropriate for the topic and why psychometric questionnaires still dominate over more experimental designs (Hughes et al., 2018). In addition, many studies utilising self-ratings has been criticised (Ng & Feldman, 2012). In their analysis of six popular measuring instruments for creativity and innovation, Hughes et al. (2018) went even deeper: they noticed that all instruments, regardless of whether they purported to measure creativity or innovation, actually measured both. In addition, the instruments also included items that measured neither concept. In other words, no instrument exists that measures exactly what it said it would measure. Furthermore, the instruments mixed items related to the innovator (e.g. traits), the innovation process, and the outcome. They conclude that we are clearly in need of "new scales that offer clear facet-level measurement and scales that distinguish between person, process, and product" since "none [of the current instruments] is particularly appropriate for future research" (Hughes et al., 2018, p. 563).

Another aspect of measuring that raises concern is the dimensionality of the concept of innovative work behaviour. While most researchers theoretically distinguish multiple dimensions and agree that each involves distinct behaviours, innovative work behaviour is usually measured one-dimensionally (e.g., Newman, Tse, Schwarz, & Nielsen, 2018; Odoardi, Montani, Boudrias, & Battistelli, 2015). There have been attempts to develop a multidimensional measuring instrument (e.g., de Jong & den Hartog, 2010; Lukes & Stephan, 2017) but those have either shown insufficient construct validity, or have not been thoroughly tested (e.g., they report only Cronbach's alphas). The reason why IWB should be measured multidimensionally is that one-dimensional measurement has produced inconsistent findings (Anderson et al., 2014). When IWB has been measured two-dimensionally, different determinants have had different effects on the dimensions (Axtell et al., 2000; Krause, 2004). It has even been suggested that some determinants might be beneficial for one dimension but detrimental to another (Perry-Smith & Mannucci, 2017). Such findings are impossible to discover using a one-dimensional measuring instrument.

With regard to studying the influence of managers on innovative work behaviour among employees, research has been criticised for employing grandiose leadership styles (such as transformational or servant leadership) that do a poor job in explaining organisational reality (Alvesson & Einola, 2019; Alvesson & Kärreman, 2016). Due to the multidimensional nature of innovative work behaviour, it has been suggested that one management style may not be effective in managing the whole range of behaviours involved (Rosing et al., 2011). There have also been concerns that the effect of managerial style on innovative work behaviour has been addressed in too straightforward a manner and that, in fact, it is likely to be mediated through a mechanism (Hughes et al., 2018).

Finally, as already noted, innovation can be studied at different levels. The most popular of these has been the organisational level (Crossan & Apaydin, 2010). However, in order to unpack the collective concept of *organisational innovation,* we have to understand how individual-level actions lead to organisation-level innovation (Felin, Foss, & Ployhart, 2015; Felin & Foss, 2005). There have been several calls for more research on how individuals generate and apply new ideas (e.g., Anderson et al., 2014; Crossan & Apaydin, 2010; Hughes et al., 2018).

2.4 Problematising the study of innovative work behaviour

In this thesis, problematisation refers to exploring the problems and weaknesses of a theory relative to the phenomenon it tries to explain, allowing that which does not work in current theory to spark an interest (Alvesson & Kärreman, 2007). Although problematisation has been developed into a methodology (Alvesson & Sandberg, 2011), it is recognised that it is a creative act and as such, researchers are encouraged to find the steps that work for their problematisation process rather than follow a given script (Alvesson & Sandberg, 2011; Deacon, 2000).

Problematising the study of innovative work behaviour led me to understand that there are deeper concerns with the study than those discovered before and that I detailed in the previous section. Specifically, there are three bigger issues: that the current understanding (and measurement) of innovative work behaviour hails from the 1980s and has not been updated since; that the study of behaviours is not the same as the study of the innovation process; and that there is confusion about at which level innovative work behaviour is and should be studied. Below, I will go into each issue in more detail.

2.4.1 Current understanding of innovative work behaviour hails from the 1980s

A study of innovative work behaviour needs to address these three questions: What is innovative work behaviour? How can it be measured? Which factors impact innovative behaviour at work? Rummaging around the literature on innovative work behaviour has led me to question whether we really know what the answer to the first question is, at least in a modern context. There is the study of which dimensions IWB consists and how it can be measured, and which determinants influence it – that is, answers to the last two questions. But searching for answers to these questions is not the same as knowing what innovative work behaviour is. Indeed, answering them is pointless if we do not know the answer to the first question, which is the foundation for the other two. The discussion around which dimensions make up IWB and how it can be measured comes close – as obviously such discussion needs to address which behaviours turn into the items in the questionnaires that ultimately measure IWB – if the discussion were based on recent empirical studies on how employees innovate at work. But I am concerned that it is not. Currently, the discussion seems to be about whether this dimension or that dimension is part of IWB based on the literature review conducted. The last studies of how employees innovate in a corporate setting might be those by Rosabeth Kanter in the 1980s (e.g., Kanter, 1988; Kanter, 1984).

The informed reader may at first be sceptical: surely this is not the case! Articles about innovative work behaviour are published monthly and they extend our understanding of what innovative work behaviour is like today.

My answer to this is they increase our understanding of *factors that impact* the type of innovative work behaviour that the measuring instruments measure. But do they add to what we know about how employees innovate in organisations today?

Two separate questions need to be explored more in-depth here. One, have none of the recent studies on IWB examined how employees innovate (instead of what affects how employees innovate)? Two, are the measuring instruments all outdated?

Let us take question number one first. In my literature review consisting of 255 articles utilising the keywords “innovative work behaviour” and “employee innovative behaviour” from the year 2000 until September 2020, 245 articles (or 96%) are so-called antecedent studies. Of the remaining 10 articles, only one study had done empirical research into how and why innovations are developed (Messmann & Mulder, 2011). However, the study looked at the innovative

behaviour of vocational teachers, and we know that care must be taken when comparing how employees innovate in public and private organisations (Bysted & Hansen, 2015). The goals and responsibilities for vocational teachers can be very different to those of employees in private companies. Therefore, it is likely that some dimensions of innovative behaviour can carry a lot of weight for vocational teachers but are not of equal importance for employees in private companies. Likewise, dimensions that are important for employees in private companies may be missing from the scales that originate from a study of vocational teachers. As such, questions can be raised about how suitable it is to use a measuring instrument that is based on the innovative behaviours of vocational teachers in the private sector. Therefore, the answer to the first question is: no, none of the recent studies on IWB has examined how employees innovate in a corporate setting.

The answer to the second question about whether measuring instruments are outdated is also found in the literature review that I conducted. That study identified 13 different measuring instruments for IWB. Most reported that they had based their instrument on previous instruments and/or literature reviews. Some articles (e.g., de Jong & den Hartog, 2010; Scott & Bruce, 1994) that had developed a measuring instrument reported having also conducted some interviews (in addition to a literature review), but the interviews in question were done at the company where the survey was later carried out, and they were more oriented to ensuring that the questionnaire was appropriate than understanding how employees innovate. Moreover, the results of these interviews were not reported, so we do not know what the researchers found. Therefore, the answer to the second question is: yes, all measuring instruments for IWB used today to measure which antecedents affect IWB are ultimately based on studies on how employees innovated in the 1980s.

What are the implications of all this? Anyone who was in working life in the 1980s will, I am sure, immediately agree that things look very different in the 2020s. In the 1980s, the major question was how to get employees to bring their ideas to work after years of merely doing what they had been told to do (Kanter, 1988; Van de Ven, 1986). Dess and Picken (2000) observed that eight out of ten new jobs were for knowledge workers and that organisations and managers must therefore shift their emphasis from managing mass markets and tangible assets effectively to managing knowledge and innovation. The study recommended that leaders learn to harness the innovation capabilities of all employees in order to compete in the ‘knowledge age’. Moreover, the skills workers need have changed tremendously. The Hudson Institute predicted that in the 1990s, there would be few new jobs created for workers unable to read and understand directions, to think and speak clearly, and to do basic maths such as adding and subtracting

workers (Johnston & Packer, 1987). Today, with some predicting that 50% of all work activities are automatable, workers are needed for tasks that require more advanced cognitive skills, such as creativity and complex problem solving (Manyika et al., 2017). Given that such a major chasm has appeared in working life, is it likely that the way employees behave when they innovate at work has changed since the 1980s? Yes, of course it is; yet, we use the measuring instruments that have been developed using Kanter's observations of the IWB in the 1980s to measure the IWB of today.

Of even greater concern than measuring innovative work behaviour with an outdated instrument is the fact that IWB has been measured to provide recommendations to managers on how to manage for innovation. In the best case, this advice has been sound and reliable. In the worst case, it has prompted managers to encourage behaviour that is not only inefficient in producing innovations for the organisation, but that is potentially detrimental to it. In any case, we have to know whether the innovative behaviour that Kanter observed, and that is the basis for all measuring instruments, is the behaviour that leads to innovation also in modern organisations.

Directing attention to the fact that the kinds of innovative behaviours that employees should demonstrate at work today has not been studied, and presenting some tentative results of how an individual innovates at work, is one of the three issues about how IWB has been studied.

2.4.2 Behaviour is not the same as process

A question related to the previous point is that of *behaviour* and *process*. The term *innovative (work) behaviour* is often adopted when discussing the individual innovation process (Anderson et al., 2014).

But why? Why is the term *individual innovation process* not adopted when discussing the individual innovation process?

The highly influential study (7360 citations and counting, according to Google Scholar) of Scott and Bruce (1994) was the first to use the term innovative behaviour and perhaps the phrase just stuck without anyone giving it further thought. Maybe it was thought that behaviours are easier to measure and a good enough proxy for what takes place in the individual innovation process. In any case, there are countless studies where the concepts of innovative behaviour and innovation process have been applied synonymously. In other words, innovative work behaviour has been equated with the (organisational?) innovation process

when clearly, the two are not the same. As a result, while there are studies of team innovation processes (e.g., Grass, Backmann, & Hoegl, 2020) and organisational innovation processes (e.g., Damanpour & Schneider, 2009), there is no real study of individual innovation processes – only the behaviours that are necessary to the process. That the study of individual innovation processes should be concerned with the entire process and not only a part of it (i.e., behaviours), is the second issue that the study of IWB is faced with.

2.4.3 The study of innovative work behaviour is confused about the correct level of analysis

Finally, I will look at the level at which innovative work behaviour has been studied, and which level it should be studied at. I will start by first discussing the types of levels that exist.

The term *level* can refer to three things in this context: the level of theory, of measurement, and of analysis. The level of theory means the entity that generalisations are made on (e.g., organisations or individuals). The level of measurement means from which entity data are drawn. The level of analysis means the entity to which data are assigned for analysis (Mathieu & Chen, 2011).

Theories can be single- or multilevel (Kozlowski & Klein, 2000). An organisational-level (O-level) single-level theory aims to theorise about organisational structures and processes or collective phenomena such as organisational culture (Devinney, 2013). An O-level single-level theory considers the behaviour of individuals to be regular (Kozlowski & Klein, 2000); that is, that the same stimulus always produces the same response. Individual-level (I-level) single-level theories focus on how the individual acts, with little regard to how the context might affect those actions (Devinney, 2013).

Aggregation-level (A-level) theories incorporate multiple levels of analysis to explain how one level impacts another (Devinney, 2013). It is noteworthy that the levels are seen as impacting each other (Kozlowski & Klein, 2000). A theory that incorporates multiple levels, but considers only the higher level as able to influence the lower level, is a single-level theory.

If we now consider the research conducted on innovative work behaviour, I propose that much of it is single-level and specifically O-level. Although the level of measurement is clearly individual – given that data are collected about employees' innovative behaviours – the individual is expected to react in a predictable and regular manner, typical of methodological collectivism (Agassi,

1960). Therefore, previous research has represented more single-level than multilevel theorising. This may have something to do with the fact that creativity was originally thought to occur at the individual and team level, and innovation at the organisational level (Amabile, 1988). Additionally, when the foundations for the study of innovative work behaviour were laid (e.g. de Jong & den Hartog, 2010; Janssen, 2000; Scott & Bruce, 1994), organisation theory was strongly focused on macro explanations (Felin et al., 2015; Felin & Hesterly, 2007). That one could and should explain macro concepts at the micro level was not a popular argument and led, perhaps, to some scholars attempting to "raise" their level of analysis to the macro level.

The need for a multilevel approach is clear (Anderson et al., 2014; Mathieu & Chen, 2011). Such an approach would include multiple levels of analysis and consider those levels as capable of influencing each other; that is, that the lower level (that of the individual) can influence the organisational level and not only the other way around (Kozlowski & Klein, 2000). Current studies of innovative work behaviour examine innovative work behaviour as the dependent variable, as if the buck stopped there when, of course, it does not. Innovative work behaviour is not the end stop, it is a means to an end. Often, that end is innovative outcomes but it could also be other things such as improved team commitment or organisational culture. This ultimate end result is often implied in current research and references are made to previous studies that have verified that innovative work behaviour leads to innovations, but although some exceptions exist (e.g., Gambi, Lizarelli, Junior, & Boer, 2021), insufficient attention has been paid to the study of what the outcomes of innovative efforts are (Janssen et al., 2004).

The third issue that I found with the study of IWB is unclarity around which level of theorising has so far been employed. My recommendation is that as scholars of individual innovation, we honestly conduct research at the individual level to help explain organisational level phenomena. The microfoundations movement provides solid reasons for doing so, given that its aim is "to unpack collective concepts to understand how individual-level factors impact organizations, how the interaction of individuals leads to emergent, collective, and organization-level outcomes and performance, and how relations between macro variables are mediated by micro actions and interactions" (Felin et al., 2015, p. 576). In the past decade or so, the microfoundations movement has had substantial success (Felin et al., 2015) and has made explaining collective concepts with the help of individual-level factors acceptable. In fact, some have gone as far as stating that "truly explaining …the organization (e.g. existence, decline, capability, or performance), or any collective for that matter, *requires* starting with the individual as the central actor" (Felin & Foss, 2005, p. 441, emphasis added).

To be clear, I am not claiming that innovation is mostly a solitary activity. On the contrary, I acknowledge that important research has been conducted on team innovation (Alexander & Van Knippenberg, 2014; Mitchell & Boyle, 2015; Tang, Chen, van Knippenberg, & Yu, 2020) and my own research also pointed to innovation being a team effort. What I am saying, though, is that it also important to study the actions of individuals in a team without necessarily aggregating to team level in order to preserve some of the heterogenous voices of the individuals (Barney & Felin, 2013).

2.5 Objective and research questions

Initially, my aim was to improve the understanding of how organisations can remain innovative, having seen first-hand the benefits to both the organisation and to its employees. Having been in a managerial position myself and having a strong desire to contribute to the training and development of better managers, I was keen to understand the role of managers in fostering individual innovation. As I explored the topic I entered into a hermeneutic circle where the more I understood about the topic, the more questions I had, and the deeper I had to dig. Table 1 describes how the results of the previous paper shaped the research questions for the next paper.

In addition to the individual research questions that each of the papers answered, as presented in Table 1, the hermeneutic circle also produced an overarching research problem that I explored in the entire dissertation:

How should the study of innovative work behaviour be developed to respond to the needs of modern working life?

Although seemingly simple, the problem is multifaceted. First, to know how the study should be developed one must know what the current state is, and that there is room, and a need, for development. It is also necessary to understand whether the way that the study is currently conducted meets the needs of modern working life; that is, to what extent does the study portray the phenomenon as it exists in the world today. Finally, there is the question of which the most suitable ways are to develop the IWB study. Due to these many aspects, the research problem invites theoretical, methodological, and practical perspectives. I will return to these in Chapter 6.

Table 1. Description of the hermeneutic research process

	Research questions	**Main results**	**Questions that arose**
Paper 1	• Does managerial coaching (MC) have a positive relationship with IWB? • Does MC have the same effect on all four dimensions of IWB?	• MC is an appropriate tool for fostering IWB • When IWB is measured four-dimensionally, the effect of MC was observed to grow throughout the process	• Does MC affect IWB through a mediating mechanism? • What issues are there in measuring IWB multidimensionally?
Paper 2	• Does MC affect IWB through work engagement (WE)? • Is the effect the same in all four dimensions of IWB?	• The effect of MC on IWB is stronger through WE than directly • The effect grows throughout the process	• Is the current picture of IWB up-to-date? • Are we really measuring the IWB of today?
Paper 3	• What is studied about innovative work behaviour today? • How have the current measuring instruments been developed?	• 97% of studies since 2000 are replication-extension studies • The instruments used for measuring IWB are based on the work by Kanter in the 1980s	• How has the individual innovation process changed from how previous literature has conceived it?
Paper 4	• How has the individual innovation process changed from how previous literature has conceived it?	• The innovation process consists of different activities than described in previous literature in our case study • The role of the individual in the innovation process is more active and engaged than previously thought of	• What does the individual innovation process look like in other contexts? • Do managers and team members experience the innovation process the same way? • Are behaviours the right construct to measure? • To what extent is it possible to theorise on the individual innovation process so that it applies to all or most contexts?

2.6 Thesis structure

The thesis comprises six chapters that together form a background for the four individual papers that make up the second part of the dissertation. The introductory chapter has provided brief background information on the topic, and outlined the need for this study and its objectives. The next chapter delves deeper into the concept of innovative work behaviour: what it is, and what is currently known about it. The fourth chapter is dedicated to the methodological choices and assumptions made in this dissertation. The fifth chapter presents a summary of the four appended papers and their contributions. The results shed light on what tangible levers managers have available to encourage their employees to be more innovative, and on the nature of the phenomenon itself: what innovative work behaviour looks like today, and how it has been measured. The sixth and final chapter discusses the contributions of this entire thesis theoretically, methodologically, and practically, before reflecting on the limitations and directions for further research.

3 THEORETICAL BACKGROUND

This chapter presents the theoretical background of the thesis. First, I adopt a broader perspective on the study of innovation: what has been studied and at what level, and how is innovation different from creativity. As the backbone, I have utilised three highly regarded systematic literature reviews: those by Anderson et al. (2014), Crossan & Apaydin (2010), and Hughes et al. (2018), and added to them. The scope is then narrowed to the level of the individual, and I look at what kind of study is currently being conducted on how individuals innovate. Here, I summarise the results of the systematic literature review that I conducted for Paper 3. I also discuss dimensions of innovative work behaviour, measuring instruments, and managing individual innovation. A look at the current state of science of research on individual innovation completes the chapter.

3.1 The study of innovation

The purpose of this section is to position this thesis in the wider innovation literature. To help do this, I compiled Figure 3 which combines two categorisations of innovation study: at what level the study is conducted, and what stage of innovation the study is concerned with.

The study of innovation can take place at the individual, work team, organisational, or multiple levels (Anderson et al., 2014), as presented in the horizontal bars in Figure 3. The vertical bars show an alternative categorisation that distinguishes three streams of innovation research: one that focuses on the determinants of innovation, one that looks at innovation as a process, and one that is interested in innovation outcomes (Crossan & Apaydin, 2010). The streams are related: determinants affect the innovation process, and the innovation process precedes innovation outcomes (Crossan & Apaydin, 2010). The two dots in Figure 3 represent the focus areas of this thesis and the line indicates that I was, at least to start with, interested in exploring how organisational-level determinants affect the individual innovation process.

As far as I am aware, I am the first to combine the two categorisations. The benefit of doing so and presenting the result visually is that it makes it easier to grasp what is being talked of. It gives a framework for structuring literature on innovation and allows for observations about which areas have received the most attention, and which are so far under-researched. Innovation studies can be mapped into this framework and with the help of dots and lines, it can be made clear whether a study explores one of the streams (and at which level) or whether the focus is on the effects of one stream on another (and at which level). To make such an intent clear

in the beginning of a study would be beneficial both to the readers and to the scholars themselves to avoid ambiguity. The framework immediately shows that at least theoretically, it is possible to study determinants of innovation, the innovation process and its outcomes at all the three different levels but also that innovation scholars may want to challenge the framework and research questions outside of it. In Section 6.2, I will discuss some opportunities for further study that this presents. In what follows, I will go through each of the streams and what has been studied so far at the different levels.

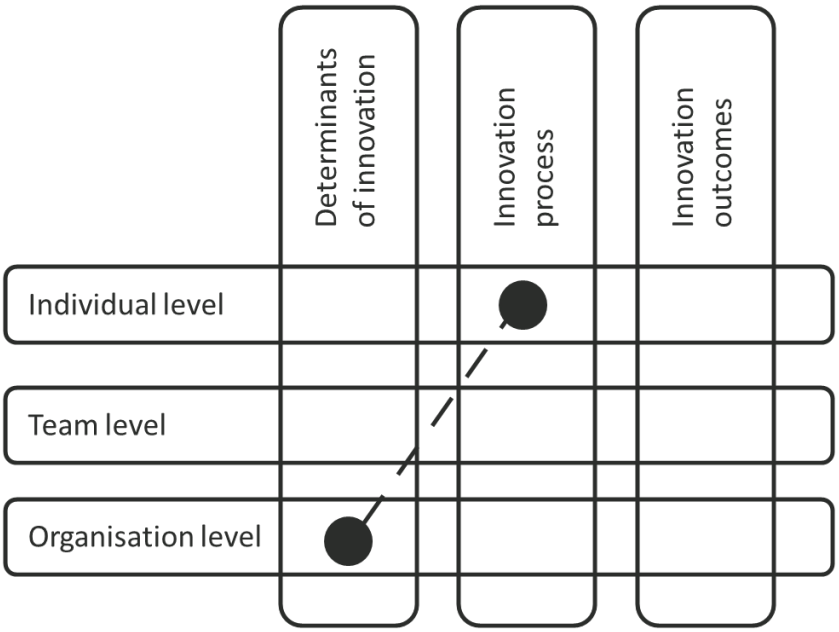

Figure 3. Initial research interest

3.1.1 Innovation outcomes

Starting with innovation outcomes, the majority of research has taken place at the organisational level (Crossan & Apaydin, 2010). The outcome is generally either radical or incremental innovation (Gopalakrishnan & Damanpour, 1997) related to products or services, processes, or business models, and new either to the firm, its market, or the entire industry (Crossan & Apaydin, 2010). Recent interest areas in this body of research have included, for example, how business model innovation takes place in strategic alliances (Spieth, Laudien, & Meissner, 2021).

At the other levels (team and individual), relatively little research exists on what could be considered specifically team or individual outcomes of innovation; the outcome of team or individual efforts is usually expected to be organisational-level innovation. Additionally, most studies at the team and individual level have focused on determinants of innovation and have therefore examined innovation as a dependent variable, and studies utilising the innovation process as an independent variable are scarce (Janssen et al., 2004). Some such studies do exist and have shown that the outcome may be positive, such as enhanced employee engagement and well-being (Huhtala & Parzefall, 2007); however, outcomes can also be negative – for example, risk of conflict and resistance to change from other people when pushing through innovative ideas (Janssen, 2003). A recent study finds a positive outcome: engaging in innovative behaviours shields employees from burnout after company downsizing (Hammond et al., 2019).

3.1.2 Innovation processes

Innovation processes refer to the activities and interactions required for an innovation to be generated and implemented. As mentioned before, when studied at the individual level, the term innovative (work) behaviour is often used (Anderson et al., 2014). This is one of the two focus areas in this thesis and will be discussed in more detail in Section 3.2. At the team level of analysis, Anderson et al. (2014) in their comprehensive review were surprised by how few studies examine within-team processes. Since then, more and more research has taken the team-level view on innovation. For example, a model of team innovation process was recently developed that focuses on empowerment as the key human factor within agile teams (Grass et al., 2020). Alexander and van Knippenberg (2014) examined the success factors behind teams pursuing radical innovation and found that switching team goal orientations may increase success in radical innovation.

At the organisational level, the discussion has tended to start with the distinction between creativity and innovation. In some of the most influential work in this arena, Amabile (1988) conceptualised creativity as novel and useful ideas produced by an individual or a small group, whereas innovation was presented as an organisational concept ensuring that the creative ideas are successfully implemented; the two concepts are related but clearly differ from each other. According to West and Farr (1990), the innovation process consists of both idea generation (i.e., creativity) and the application of ideas, where creativity is the initial step in the innovation process. West and Farr provoked a lively debate on the exact nature of creativity and innovation that features arguments for creativity being the first step in the innovation process (Černe, Hernaus, Dysvik, & Škerlavaj,

2017) and also stand-alone concept (Anderson et al., 2014). In practice, the two concepts are often confused and even top-tier journals have published articles referring to innovation but citing sources from the creativity literature (Hughes et al., 2018).

While the innovation process has always been seen as consisting of different phases, different strands of literature have conceptualised the phases differently. For example, Damanpour and Schneider (2006) distinguish between initiation, the adoption decision, and the implementation phases. Amabile and Pratt (2016) suggest five phases: agenda setting, stage setting, producing ideas, testing and implementing ideas, and outcome assessment. One stream of research starts with Kanter who distinguished four innovation 'tasks' that were described as "correspond[ing] roughly (but nowhere near exactly) to the logic of the innovation process as it unfolds over time" (Kanter, 1988, p. 96). These tasks are idea generation, coalition building, idea realisation, and the diffusion of knowledge in commercialisation of the product (Kanter, 1988). It is this stream that is followed in this thesis. Similar conceptualisations have since been formulated by scholars including Scott and Bruce (1994), Janssen (2000), and de Jong and den Hartog (2010), and Section 3.2 will elaborate further on this.

Hughes et al. (2018) have argued the importance of clearly defining, and making a distinction between, the concepts of creativity and innovation. In their review of 195 articles concerned with the effects of leadership on creativity and innovation, they coded all definitions of creativity and innovation found in their article cache. They then formulated their own definition based on the codings. They disregarded any codings mentioning organisational benefits or useful ideas, arguing that a phenomenon exists outside of its effects; that is, an idea can be innovative even if it is not yet known whether it has any benefits. What remained was that the overwhelming majority (96%) of creativity definitions agree that creativity is the generation of entirely new or original ideas. They distinguished five conceptual markers in the definitions of innovation: problem recognition, introducing and modifying (relatively) new ideas, promoting the ideas, and finally implementing them. (Hughes et al., 2018). Based on this, they suggest that the two key differences between creativity and innovation are, 1) only creativity refers to the generation of brand new ideas; innovation refers to ideas that are new to the context but not necessarily to the world; and 2) innovation is born out of a need or as a solution to a problem and is always implemented, whereas creative ideas can occur with no specific need in mind, nor do they need to be implemented.

3.1.3 Determinants of innovation

Finally, when talking about determinants (the terms antecedents and predictors are also used) at the individual level, these are factors that an individual possesses or that are at least to some degree within an individual's control. Such factors include individual differences (such as personality and traits), motivation, knowledge and abilities, and psychological states (Anderson et al., 2014; Hammond, Neff, Farr, Schwall, & Zhao, 2011). At the team level, a meta-analysis of team-level predictors found that support for innovation, vision, task orientation, and external communication all had strong relationships with innovation, whereas team structure and composition did not (Hülsheger, Anderson, & Salgado, 2009). Researchers at Google studied 699 people working on group tasks and discovered that what distinguished the well-performing teams was that everyone spoke approximately the same amount, and the team members were good at picking up social cues from one another (Bergmann & Schaeppi, 2016; Duhigg, 2016).

Organisational-level determinants influence not only the organisational innovation process but also team and individual processes. These determinants can be divided into five groups (drawing inspiration from Anderson et al., 2014; Crossan & Apaydin, 2010): the characteristics of the innovation itself, factors related to the external environment, organisation-wide factors, factors concerned with top management, and factors within an individual manager's control. *Innovation characteristics* such as its cost, how complex it is, and how advantageous it will be for the organisation influence innovation adoption (Damanpour & Schneider, 2009). Different aspects of the *external environment* include factors such as urbanization and the unemployment rate (Damanpour & Schneider, 2006). *Organisation-wide factors* may include the characteristics of the organisation such as its size and complexity (Damanpour & Schneider, 2006) or its practices such as organisational climate (Shanker, Bhanugopan, van der Heijden, & Farrell, 2017), HR practices (Bos-Nehles, Renkema, & Janssen, 2017) such as performance-based rewards (Sanders et al., 2018), strategy (Adams et al., 2006), and knowledge management (Battistelli, Odoardi, Vandenberghe, Di Napoli, & Piccione, 2019). With regard to factors related to *top management*, previous research has looked at CEO demographics such as tenure (Wu, Levitas, & Priem, 2005) and diversity in occupational background at the board level (Goodstein, Gautam, & Boeker, 1994). The different leadership styles of CEOs have also been studied; for example, a recent study found that entrepreneurial leadership encourages the innovative behaviours of employees with creative self-efficacy and passion for inventing as mediators (Bagheri, Newman, & Eva, 2020).

The fifth and last category of determinants are factors *within an individual manager's control*, which is one of the focus areas of the thesis. Accordingly, that category is examined in some detail in Section 3.4.

3.2 The individual innovation process

Studying organisational innovation has been by far the most popular course of action for innovation researchers: in their systematic review of 525 articles, Crossan and Apaydin (2010) found that 52% of the articles explored innovation at the organisational level and only 5% did so at the individual level. Nevertheless, there appear to remain significant opportunities to improve the understanding of macro level outcomes through investigating their microfoundations since individuals make up organisations and organisations do not exist without individuals (Felin et al., 2015; Felin & Foss, 2005). Furthermore, while the organisational innovation process has been presented as consisting of phases such as idea generation and idea promotion, it is individuals who do the generating and promoting (Scott & Bruce, 1994; Van de Ven, 1986). Therefore, in this thesis, the actions of individual actors in organisations receive primary attention.

When the innovation process is studied at the individual level, it is often called innovative (work) behaviour (IWB) (Anderson et al., 2014). The fact that research on the individual innovation *process* is, in fact, research on individual *behaviours* in the (organisational?) innovation process, is significant, and not without its complications. It means that the individual innovation processes are actually not being studied at all; behaviours within the process are. Some researchers have stated explicitly that process and behaviour are not the same. Kanter (1988) talked about four innovation tasks, which she roughly equated to the innovation process. Scott and Bruce (1994, p. 582) viewed innovation "as a multistage process, with different activities and different individual behaviors necessary at each stage". In later research, the words *process* and *behaviour* are sometimes used interchangeably or behaviours are talked of as having stages (e.g., Stoffers, Van der Heijden, & Jacobs, 2020), indicating that the concepts have become muddled. In this thesis, I use the term *innovative work behaviour* in Papers 1–3, and the term *individual innovation process* in Paper 4, which looks at the whole process instead of only behaviours.

Janssen (2000) noted that since generating, promoting, and implementing ideas for the improvement of the organisation are not in a regular employee's job description, innovative behaviour can be classified as extra-role behaviour. Indeed, in an era where a mental shift had to be made from obeying to bringing

idea power to work (Kanter, 1984), this was probably the case. Now, innovative behaviour is often seen as a specific form of performance (Montani, Vandenberghe, Khedhaouria, & Courcy, 2020), and part of an employee's regular duties. Innovative behaviour is thus separate from employee-driven innovation; the latter specifically relating to innovation beyond the normal job description of an employee (Bäckström & Bengtsson, 2019; Kesting & Ulhøi, 2010).

One of the first mentions of the concept of innovative behaviour is by Scott and Bruce (1994), who developed and tested a model of innovative behaviour on the individual level. They drew on the work of Kanter (1988) to conceptualise innovative behaviour as consisting of recognising problems, generating ideas and solutions, seeking sponsorship for the idea and building a coalition to support it, and producing a prototype of the innovation. Innovative behaviour, then, has always been thought to be a multidimensional concept and the question of how many dimensions there are and what they are interests scholars to this day. Some of the suggestions are two (Krause, 2004), three (Janssen, 2000; Scott & Bruce, 1994), four (de Jong & den Hartog, 2010), five (Hughes et al., 2018; Kleysen & Street, 2001), or even six (Lukes & Stephan, 2017) dimensions. Table 2 summarises the different dimensions suggested in some of the previous literature.

We can see that when two dimensions are distinguished, they are related to generating ideas and implementing them (Krause, 2004). When a third dimension is added, as Scott and Bruce (1994) and Janssen (2000) did, idea promotion becomes a dimension on its own. De Jong and den Hartog (2010) separated idea generation into two dimensions with idea exploration preceding the generation of ideas; a conceptualisation that is fairly close to the one proposed by Kanter (1988). Kleysen and Street (2001) divided the early stages even further and recognised that after the problem or opportunity has been explored and ideas for it generated, the ideas usually go through some type of refinement or development. Lukes and Stephan (2017) are the only ones who divided the idea implementation stage further. In their model, ideas are first searched for and generated, after which they are communicated. Implementation starting activities follow (making plans, essentially), after which others need to be involved in the implementation and coalitions built. Throughout the implementation process, Lukes and Stephan saw that obstacles would emerge that must be overcome (Lukes & Stephan, 2017).

Hughes et al. (2018) coded all the definitions of innovation they identified in their article cache of 195 articles, spanning roughly the previous ten years. The work reviews previous literature and suggests that five dimensions (problem recognition, idea introduction, idea modification, promotion, and implementation) have often been used by innovation researchers. Some

dimensions have been included in definitions more often (e.g., the implementation dimension had been mentioned in 75% of the definitions), and others less often (e.g., problem recognition was present in 4.4% of the definitions) (Hughes et al., 2018). The review provides a handy snapshot of which dimensions are generally thought to make up innovative behaviour, and is highlighted in Table 2 in italics to indicate that their dimensions are the result of a review of other researchers' definitions.

Table 2. Previously suggested dimensions of IWB

<table>
<tr><th>Krause, 2004</th><th>Scott & Bruce, 1994; Janssen 2000</th><th>de Jong & den Hartog, 2010</th><th>Kleysen & Street, 2001</th><th>Hughes et al., 2018</th><th>Lukes & Stephan, 2017</th></tr>
<tr><td rowspan="3">Gene-ration & testing of ideas</td><td rowspan="2">Idea gene-ration</td><td>Idea exploration</td><td>Opportunity exploration</td><td>Problem recognition</td><td>Idea search</td></tr>
<tr><td rowspan="2">Idea generation</td><td>Generativity</td><td>Idea introduction</td><td rowspan="2">Idea generation</td></tr>
<tr><td>Idea promotion</td><td>Idea championing</td><td>Formative investigation</td><td>Idea modification</td></tr>
<tr><td rowspan="3">Imple-mentation of ideas</td><td rowspan="3">Idea realisation</td><td rowspan="3">Idea imple-mentation</td><td rowspan="3">Application</td><td rowspan="3">Idea implementation</td><td>Championing</td><td>Idea promotion</td><td>Idea communication</td></tr>
<tr><td>Implementation starting activities</td></tr>
<tr><td>Involving others</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Overcoming obstacles</td></tr>
</table>

Another question about how managers can enhance the innovative work behaviour of their employees that remains open is whether all dimensions of innovative behaviour require the same antecedents. Innovative behaviours vary and change depending on the phase of the innovation process. When an employee looks for opportunities, their behaviour is of a certain kind; for example, they might ask questions about a specific product to determine whether its performance could be improved. When an employee wants to sell their performance improvement idea to their manager (to obtain money and other resources), the behaviours are different and might include calculating the return on investment for the innovation. Do the same factors help the innovator in these two phases? Some research suggests that different factors, and different managerial support, are needed (e.g., de Jong & den Hartog, 2007; Fang, Chen, Wang, & Chen, 2019; Perry-Smith & Mannucci, 2017).

3.3 Measuring innovative work behaviour

For as long as the concept of innovative work behaviour has existed, it has been measured. It has been measured mainly to acquire information about which antecedents – the factors within the manager's or the organisation's control – have an impact on it and can thus be used to enhance the innovative behaviours of employees. I will delve deeper into this topic in the next section but for now, I will focus on what types of measuring instruments exist and identifying some of the known issues with them.

To the best of my knowledge, the first measuring instrument that attempted to measure innovative behaviour was developed by Hurt, Joseph and Cook (1977). Work on developing a measuring instrument for innovative work behaviour really got underway with the instrument developed by Scott and Bruce (1994). Since then, several measuring instruments have been developed and the work continues to this day; two proposals for new instruments emerged only recently (Lambriex-Schmitz, Van Der Klink, Beausaert, Bijker, & Segers, 2020; Messmann & Mulder, 2020).

Instrument development work has closely mirrored the work on dimensions of innovative behaviour (described in Section 3.2). This is because work on how innovative behaviour can be measured has necessarily always included figuring out what it is that should be measured. In the systematic literature review that I conducted, I found that articles examining different aspects of innovative work behaviour since the year 2000 reported using more than 30 different measuring instruments for IWB. A closer inspection of the instruments revealed colourful practices in what is considered a measuring instrument; it was quite customary, for example, to report using a measuring instrument that was developed in a certain article but when reading said article the author(s), in turn, reported using a measuring instrument developed by someone else. Having followed these trails to the end led to 13 unique measuring instruments that can, with some confidence, be considered a relatively accurate number of measuring instruments for IWB that researchers have used in the past 20 years.

These instruments can be divided into three categories based on whether they measure innovative work behaviour one- or multidimensionally. In the first category, the developers theoretically distinguish more than one dimension but they do not even attempt to measure innovative work behaviour multidimensionally. Such cases are for example Scott and Bruce (1994) and Radaelli, Lettieri, Mura and Spiller (2014) who see the innovation process as consisting of idea generation, promotion, and implementation but whose

instruments measured the concept one-dimensionally in the article where the instrument was introduced.

In the second category, the instrument was designed to be multidimensional but when tested, it did not show sufficient validity (i.e., the dimensions were shown to all belong under the umbrella concept of innovative work behaviour but they were not distinct enough from one another; the boundaries between idea exploration and idea generation, for example, were blurred) and therefore the developers reverted to measuring innovative behaviour one-dimensionally. Examples of these types of measuring instruments are the ones by Kleysen and Street (2001) and de Jong and den Hartog (2010).

The third category is for measuring instruments that sought to measure innovative work behaviour, did so, and reported that they succeeded. A closer examination of these instruments reveals that none is particularly good for wider use. Some of the instruments reported Cronbach's alphas and item loadings for the factors. However, they did not report conducting tests for scale validity and consequently we do not know whether the dimensions were distinct enough from one another (Axtell et al., 2000; Krause, 2004). Some instruments conducted more thorough testing but consisted of 35 items (Messmann & Mulder, 2012) and 44 items (Lambriex-Schmitz et al., 2020) which does not make them very user-friendly; additionally, these two instruments were developed specifically for measuring the innovative work behaviour of teachers.

Issues with measuring instruments

Measuring innovative work behaviour multidimensionally has evidently proved difficult. Successfully measuring IWB multidimensionally is, however, important for two reasons. First, when IWB is measured one-dimensionally the results tend to be inconsistent. There is disagreement on for example the role of such managerial practices as rewards or leadership styles (Anderson et al, 2014) and whether it is better to work on innovations alone or as a team (Perry-Smith & Mannucci, 2017). A likely explanation is that some parts of the innovation process are best worked on alone and others with other people but a one-dimensional measuring instrument cannot capture the difference. Second, when innovative work behaviour has been measured two-dimensionally (Axtell et al., 2000; Krause, 2004; Veenendaal & Bondarouk, 2015), the antecedents studied have had a different effect on the dimensions. For example, when de Jong and den Hartog (2007) examined the effects of 13 different leadership behaviours on two dimensions of innovative work behaviour, they found that some behaviours

impacted idea generation more, whereas others had a bigger effect on idea implementation. It has even been suggested that an antecedent that is beneficial for one dimension can be detrimental to another (Perry-Smith & Mannucci, 2017).

With regard to the measuring instruments themselves, it is clear that most instruments measure innovative work behaviour using a survey instead of, for example, a divergent thinking test (Hughes et al., 2018), and in many studies, self-ratings are used which often result in larger effect sizes (Ng & Feldman, 2012). Hughes et al. (2018) conducted a thorough review of six of the most commonly used measuring instruments for creativity and innovation and found significant issues. First, the scales mix items related to the personality of the innovator (e.g., traits), the innovation process, and innovative outputs. Second, scales that purport to measure innovative work behaviour often also include items that measure creativity or something else entirely that is neither innovation nor creativity. Third, most of the instruments failed to demonstrate scale accuracy through appropriate psychometric analyses. In addition, concerning the use of measuring instruments (by researchers other than those who had developed the scale), Hughes et al. (2018) reported that it was common to take a subset of items from a scale, or combine items from several scales without conducting thorough analyses to ensure the reliability and validity of the newly formulated scale.

In Paper 3, I add my own observations relating to the issues with current measuring instruments and find that we may have cause to question whether any of the scales measure the innovative work behaviour of *today*. When carefully examining the development methods of 13 measuring instruments, I discovered that with the exception of one measuring instrument (Messmann & Mulder, 2012), all were developed based on previous literature alone; no one has examined what the individual innovation process looks like since the work done by Kanter in the 1980s. The case study, the results of which are reported in Paper 4, provides proof that an individual's innovation process looks different from how current measuring instruments depict it. These results are explained in more detail in Section 5.4.

3.4 Managing innovative work behaviour

In Section 3.1.3, several different types of determinants at different levels of analysis were identified. Many different types of factors have been shown to have an effect on employees' innovative behaviour and choosing any one of them would have been justified in this thesis. However, the focus here is on the ways and means available to a line manager or equivalent (a separate group from top management)

to influence the innovative behaviour of employees, for two reasons. First, leaders have been characterised as key drivers of innovative behaviours (Krause, 2004; Schuh, Zhang, Morgeson, Tian, & van Dick, 2018) and their role to the innovation process has been the topic of a growing number of studies (Hughes et al., 2018). Second, leadership effect has mostly been studied using traditional management models, and employing managerial coaching as the leadership influence in Papers 1 and 2 allowed me to choose a more modern approach whose effect on IWB is not yet well-studied.

The way leaders impact on individual-level innovation can be divided into two categories: leadership styles and supervisory practices. We will take a look at both here since managerial coaching can include elements of both.

3.4.1 Leadership styles

Leadership style is a key predictor of innovation, and the effects on individual innovation of several styles have been studied. One of the most studied styles is the transformational leadership style (Hughes et al., 2018). In general, transformational leadership has been found to relate significantly to innovative work behaviour (Choi, Kim, Ullah, & Kang, 2016; Reuvers, Van Engen, Vinkenburg, & Wilson-Evered, 2008). It has been suggested that the relationship between transformational leadership and innovative work behaviour is non-linear; that the positive effect of transformational leadership is stronger at high and low levels and weaker in the middle (Bednall et al., 2018). The effects of both transformational and transactional leadership have also been studied; when the followers exhibited high levels of psychological empowerment, transformational leadership positively influenced innovative work behaviour while transactional leadership had a negative effect (Pieterse, van Knippenberg, Schippers, & Stam, 2009). Others have found that one component of transactional leadership, verbal rewards, has a positive influence on innovative behaviour (Hansen & Pihl-Thingvad, 2019).

Leader-member exchange theory (LMX) has also been a popular leadership style to study as an influencer of innovative work behaviour and has been found to lead to psychological empowerment, which in turn prompts more innovative behaviour (Schermuly, Meyer, & Dämmer, 2013). Another study found that LMX has a positive and significant effect on innovative behaviour when there are fewer within-group strong ties, and also to fully mediate the effect that out-group weak ties have on innovative behaviour (Wang, Fang, Qureshi, & Janssen, 2015). Employees with high-quality LMX relationships also consistently get favourable

performance ratings when they exhibit innovative work behaviour (Schuh et al., 2018).

Other leadership styles studied in connection with innovative work behaviour include the empowering, authentic, and servant leadership styles. All have, in general, been found to be positively related to IWB (Hughes et al., 2018). As is true of the other leadership styles, research has lately focused on how the leadership styles moderate or mediate the relationship between some other determinant and innovative work behaviour; for example, that servant leadership mediated between ethical climate perception and IWB (Topcu, Gursoy, & Gurson, 2015). Another, more popular trend is to examine which factors might mediate or moderate the relationship between a certain leadership style and IWB; an example is the finding that psychological empowerment moderates the relationship between authentic leadership and IWB (Grošelj, Černe, Penger, & Grah, 2020).

While it has been far more common to examine the effects of positive leadership styles on IWB, a few studies have also looked at more negative styles. As expected, a destructive leadership style negatively influences millennial employees' IWB (Hou, 2017), as does abusive supervision (Wang, Li, Zhou, Maguire, Zong, & Hu, 2019).

3.4.2 Supervisory practices

In this section, we only look at practices under an individual supervisor's control, and therefore solely organisation-wide HR practices are excluded. More research has been conducted on leadership styles than on supervisory practices. The studies focusing more on practices have often explored the role of feedback and found that feedback from supervisors moderates the positive relationships between time pressure and skill variety and innovative work behaviour (Noefer, Stegmaier, Molter, & Sonntag, 2009). Feedback is also directly and positively related to innovative work behaviour, and that relationship is mediated by work engagement and perceptions of breaches of a psychological contract (Eva, Meacham, Newman, Schwarz, & Tham, 2019). If the managers let their employees know that innovative behaviours are expected of them, employees engage in them more frequently (Yuan & Woodman, 2010).

Some participative practices have also been studied. Supervisors who permit their employees autonomy and encourage skill development can encourage innovative behaviours among those employees (Bysted & Jespersen, 2014). Supervisors who help employees develop their proactive goal-setting skills are likewise likely to provide a driver of innovative behaviour at work (Montani, Odoardi, & Battistelli,

2014). Facilitating knowledge sharing is also a practice worth fostering (Kim & Park, 2017).

Managers can, at least to some extent, constrain innovation. A review found that a moderate level of input constraints (such as time, money, and equipment) motivates experimentation by framing the task as a challenge. However, both too high and too low levels of constraint are detrimental to innovation (Acar, Tarakci, & van Knippenberg, 2019).

3.4.3 Issues with managerial determinants

The use of these determinants has not escaped criticism. First, leadership styles such as transformational leadership and LMX have been seen as too grand and heroic to truly study organisational reality (Alvesson & Einola, 2019; Alvesson & Kärreman, 2016). Second, the nature of the innovation process, which encompasses both creative (exploratory) elements and implementational (exploitative) elements spurs concerns over whether any one leadership style is likely to be enough (Rosing et al., 2011). Third, some scholars strongly recommend abandoning current approaches to measuring charismatic-transformational leadership styles due to fundamental issues with its conceptualisation and measurement validity (van Knippenberg & Sitkin, 2013).

Additionally, Anderson et al. warned in 2004 that innovation research had become routinised and that too many replication-extension studies had been published already then (Anderson et al., 2004). The systematic literature review that I conducted found that the situation since then has only exacerbated and that 96% of the 255 articles published on innovative work behaviour since the year 2000 are quantitative studies exploring the effect of one determinant or another on innovative work behaviour. The research settings have also become more complex over time, probably because the direct effects of the most obvious determinants (such as different leadership styles, as already discussed) have already been studied. Moderated mediation analyses have become popular, an example of which is one investigating the relationship between top-down knowledge hiding and IWB with self-efficacy first as a mediator and further moderated by the nationality of supervisor and employee (Arain, Bhatti, Hameed, & Fang, 2019). Another example of a fairly complex research setting is a multilevel study utilising two sources. That study found two- and three-way interactions with decision autonomy, task interdependence, and a mastery climate moderating the relationship between knowledge hiding and innovative work behaviour (Černe et al., 2017).

A further issue is the continued practice of measuring innovative work behaviour one-dimensionally, despite the method tending to produce inconsistent findings. Only a few studies exist that examine the effects of different types of managerial determinants on two dimensions of innovative work behaviour. Noefer et al. (2009) discovered that supervisors who give feedback to their employees can enhance their idea implementation but not idea generation. Krause (2004) found that leaders' support for innovation enhances the generating and testing of ideas, whereas expert knowledge and openness in the decision-making process more strongly predict idea implementation. Fang et al. (2019) showed that leaders who encourage and recognise the achievements of their employees have a significant influence on both the idea generation and implementation of new generation employees, whereas their respectful and fair treatment of employees has a more significant influence on idea implementation. Finally, de Jong and den Hartog (2007) showed that of the 13 leadership behaviours they found impacted the innovative work behaviour of employees, intellectual stimulation, facilitating knowledge diffusion, and task assignment exclusively boosted idea generation, and organising feedback, rewards, and providing resources had the same exclusive effect on idea application.

3.4.4 Managerial coaching as a determinant of innovative work behaviour

Managerial coaching means coaching practised by line managers (in contrast to coaching professionals) to help their team members exceed their performance level (Hagen & Gavrilova Aguilar, 2012). It is a reciprocal process between a leader and their team member where the manager engages in specific behaviours, such as facilitating creative thinking, giving constructive feedback, clarifying goals, and supporting the cooperation of teams (Ellinger, Watkins, & Bostrom, 1999; McCarthy & Milner, 2020).

Managerial coaching is an appropriate leadership approach in complex and demanding situations where leaders must motivate their employees, improve their abilities, and offer opportunities to make use of their skills and knowledge (Anderson, 2013), and where there is considerable pressure for continuous renewal and performance improvements (Berg & Karlsen, 2013). The goal of managerial coaching is to support employees in achieving their targets and to enhance organisational efficiency (Bond & Seneque, 2013; Popper & Lipshitz, 1992) but it has also been shown to stimulate autonomy and feelings of competence (Moen & Federici, 2012). Further positive outcomes of managerial coaching have been found in the areas of learning (Matsuo, 2018), job satisfaction

(Kim, Egan, Kim, & Kim, 2013), and performance (Tanskanen, Mäkelä, & Viitala, 2019).

I chose managerial coaching as the determinant for four reasons. First, employing it allows for the examination of the effects of tangible managerial actions on employee innovative behaviour. Second, while research has identified which the domain-relevant and creativity-relevant skills are that are needed for creative ideas to emerge (Amabile, 1996), so far the ways in which managers can enhance these skills have largely been ignored (Hughes et al., 2018). Given that one of the aims of managerial coaching is to develop skills and give feedback on performance (Anderson, 2013), it can with good reason be utilised in filling the above-mentioned research gap. Third, a positive motivational state is required for innovation (Amabile, 1996) and managerial coaching has been shown to contribute to higher workplace well-being (Zhao & Liu, 2020) and to increased work engagement (Tanskanen et al., 2019). Fourth, managers can employ several different styles of coaching (Ibarra & Scoular, 2019) and thus can help employees improve their performance in all the four dimensions of IWB that Paper 1 and Paper 2 measure.

The relationship between managerial coaching and innovative work behaviour has only been the subject of a few earlier studies. In general, managerial coaching has been found to positively impact IWB (Ali, Raza, Ali, & Imtaiz, 2020; Wang, 2013). In these studies, innovative work behaviour was measured one-dimensionally, constituting a research gap that Papers 1 and 2 set out to fill.

3.5 The state-of-science of the concept of innovative work behaviour

I have now scrutinised innovative work behaviour to establish what it is, how it has been measured, and how it can be enhanced. Before moving on, let us summarise the state-of-science of the study of innovative work behaviour before the addition of my research reported in this thesis.

First, while innovative work behaviour is generally thought to consist of multiple dimensions, there is no consensus in the research field on exactly what the dimensions are. This lack of consensus hinders the ability to measure the concept and in fact, innovative work behaviour is often measured one-dimensionally despite known issues with the practice (Anderson et al., 2014).

Second, even the one-dimensional measuring instruments are not particularly suited to their job, mixing items measuring creativity and innovation and items

related to the innovator, the innovation process and its outcomes (Hughes et al., 2018). Additionally, some of the instruments currently still in use are fairly old; for example, the one developed by Scott and Bruce dating from 1994 and the one by Janssen from 2000 are already more than 20 years old.

Third, while leadership is the most commonly used determinant of innovative work behaviour (Hughes et al., 2018), advocating grandiose leadership styles has been criticised (Alvesson & Einola, 2019). Some of the research settings seem excessively complex (e.g., Černe et al., 2017). Concerns were raised as early as 2004 that the study of innovation is populated by small replication-extension studies (Anderson et al., 2004).

This is the starting point for my research, the results of which are presented in Chapter 5 (for the individual papers) and Chapter 6 (for the overall results). First, however, I will examine the methods that I employed in my search for results.

4 RESEARCH METHODOLOGY

The aim of this dissertation is to explore the concept of innovative work behaviour: what it really is, how it has been measured, and what are some of the ways that it can be enhanced. During the process, the hermeneutic circle that I entered into influenced my methodological choices and also shaped my research philosophy. In this chapter, I explain which methodological choices I made and why, and which assumptions underlie my approach.

4.1 Methodological choices

Assumptions about ontology, epistemology, and human nature are at the core of all debates about research methods (Burrell & Morgan, 1979; Morgan & Smircich, 1980). Figure 4 presents a useful tool for discussing the assumptions made in this thesis.

	Subjective ◄				► **Objective**
Ontological assumptions	Reality is a projection of imagination	Reality is a social construct	Reality is a pattern of symbolic relationships	Reality is a contextual field of information	Reality is a concrete process	Reality is a concrete structure
Epistemological aim	Gain phenomenological insights	Understand how reality is created	Understand patterns of discourse	Map contexts	Study systems and processes	Observe and measure predictable phenomena
Assumptions about human nature	Humans as spirits or consciousness	Humans create their own realities	Humans are actors contributing to the enactment of reality	Humans are in a process of exchange with their context	Humans adapt to their environment	Humans are products of their environment
Commonly used reserch methods	Phenomenology	Ethnomethodology	Symbolic analysis	Contextual analysis	Historical analysis	Lab experiments, surveys

Figure 4. Continuum of basic assumptions in social science research (adapted from Morgan & Smircich, 1980)

The thesis utilises mixed methods as a result of my coming to view the phenomenon of innovative work behaviour in a different light over the course of the research process. Initially, I assumed that reality, and the phenomenon that I studied, are concrete structures existing independently of individuals (Burrell & Morgan, 1979). In a way, I viewed innovative work behaviour as a concept that looks the same everywhere, remains consistent, and presents itself in predictable events that can be measured. Although I was immediately convinced that the individual level of analysis is the one that I wanted to adopt, I saw the individual's role in the innovation process as fairly deterministic, responding to stimuli from the environment (Morgan & Smircich, 1980). Overall, my position could be described as occupying the more objective end of the subjective-objective continuum. Consequently, I utilised surveys as a research method to study the connection between managerial coaching and innovative work behaviour.

The more I read and thought about innovative work behaviour, the more I came to see it as a social construct that I needed, and was allowed, to inspect critically. I understood that because quantitative studies are good for finding patterns and averages, some of the richness of the research context may be lost. When that happens, it becomes difficult to detect changes in any of the circumstances that "will reverberate throughout the whole, initiating patterns of adjustment and readjustment capable of changing the whole in fundamental ways" (Morgan & Smircich, 1980, p. 495). In short, innovative work behaviour began to appear as a much more fluid concept to me, and therefore more difficult to define and capture.

Even more so than my view of the concept itself, I went through a shift in my perception of human nature. Or rather, I allowed my researcher personality to view the individual the same way that I view the individual as a person and as a former manager; as an actor "with the capacity to interpret, modify, and sometimes create the scripts that they play upon life's stage", as Morgan and Smircich (1980, p. 494) eloquently put it. It was not enough for me to put the individual centre stage in my research; I also began to see individuals as agents with at least as much to say about how they innovate as the environment does. Consequently, I began to take an interest in methodological individualism, which identifies the individual's interests and characteristics as the starting point for any theory (Coleman, 1990).

The above shift in my assumptions about the world and human nature from the objective end towards the middle of the continuum, prompted me to employ qualitative research methods to investigate the nature of the innovation process at work and what role the individual has in it.

4.2 Research methods

As a result of the process where I continuously learned new things about my topic and asked new questions about it, it was natural for me to employ mixed methods in this dissertation. Mixed methods can be defined as research where qualitative and quantitative methods are used in collecting and analysing data, integrating findings, and drawing conclusions (Tashakkori & Creswell, 2007). The benefits of mixed-methods research are that it fosters a multifaceted understanding of the phenomenon studied (Creswell, 2011), and that the triangulation of methods mitigates the flaws of the individual methods (Turner, Cardinal, & Burton, 2015). My methods can with good reason be described as mixed: I pose two types of research questions, collect data in two ways that result in both numerical and textual data that I then analyse in two ways, arriving at two types of conclusions (Tashakkori & Creswell, 2007). I have taken care to properly integrate my findings so that the result is more than just the sum of the quantitative and the qualitative parts (Bryman, 2007) by taking into account everything that I have learned. The result, I hope, is a coherent picture of the concept of innovative work behaviour.

The hermeneutic circle refers to the development of a new understanding of a concept after exploring its details in a circular and iterative process that goes back and forth between the whole and its parts (Burrell & Morgan, 1979). To follow that process, methods must be tailored to the question at hand (Van Manen, 1997). Because I had different types of questions, a mixed-methods approach was the obvious choice for me. The most vocal critics of mixed-method studies claim that it is not even possible to mix quantitative and qualitative research methods because the underlying paradigms are too different (Burrell & Morgan, 1979; Tashakkori & Teddlie, 1998). Those who say that it is possible to mix the two methods are concerned that the results are often not integrated properly but represent merely the sum of the quantitative and the qualitative parts (Bryman, 2007).

My take on the first criticism has been to start with the research problem and have that serve as the guiding light. As I entered into the hermeneutic circle, my research questions became increasingly exploratory, and as such, I found it impossible to answer them utilising quantitative research methods. Neither method is the better one; they just answer different types of questions. I took the approach that the research problem should be the starting point and both paradigms can be used effectively when in pursuit of deeper understanding (Creswell, 2003; Tashakkori & Teddlie, 1998)

Integrating the results has come about quite naturally because my research questions were always built on the results of the previous study. I also chose to present the results of the studies separately in Chapter 5, and then try to integrate everything that I learned during the process in the higher-level discussion of overall contributions in Chapter 6.

I have used a quantitative research strategy to measure the relationships between different variables (in this case, between innovative work behaviour, managerial coaching, and work engagement) (Denzin & Lincoln, 2005). In Paper 1, the variables are innovative work behaviour and managerial coaching and the paper aims to understand the dynamic through which managerial coaching affects four dimensions of employees' innovative work behaviour. Paper 2 adds work engagement as a mediator to this relationship to discover in what way managerial coaching affects innovative work behaviour through a mediating factor (in this case, stronger work engagement).

The qualitative research strategy is executed through two approaches in this thesis: an integrative review and a case study. In Paper 3, I first conduct a systematic literature review on the concept of innovative work behaviour; this is best characterised as a descriptive review aiming to review studies conducted on IWB from the year 2000, and to identify the measuring instruments used. I then conduct a review on the 13 measuring instruments integrating evidence found in the instruments to produce new insights in a narrative, qualitative way to clarify what has been measured. In addition, the process highlights some mismatches between what is theoretically thought about innovative work behaviour and how the construct has been operationalised (Dwertmann & van Knippenberg, 2021).

Paper 4 applies a case study approach. I deemed the approach suitable because I was interested in *what* affects an individual's innovation process and *how* the process evolves, questions that case studies typically answer (Yin, 2014). The case study aimed to describe the individual innovation process at work but even more so to build theory (Eisenhardt, 1989). Although such theory exists about how employees innovate at work, I have repeatedly argued that it is out of date and that both scholars and practitioners would benefit from it being looked at from a completely fresh perspective. Merely refining or elaborating on the existing concept will not do, as that will limit original thinking about the concept (Corley & Gioia, 2011). Because I had reason to question the previous theory, my approach in Paper 4 was to build nascent theory. Open-ended data (often interviews and observations) are typical of nascent theory, and must be interpreted to produce meaning and advance towards the goal of identifying patterns (Edmondson & McManus, 2007). The case study was an appropriate research method as for

theory-building purposes, it is necessary to begin with as clean a slate as possible (Eisenhardt, 1989).

4.3 Data sets and analyses

The dissertation comprises different datasets and different types of research questions requiring different types of data analysis. Table 3 presents a summary of the data sets and analyses.

Table 3. Data sets

Paper	Purpose	Data collection method	Sample size	Method of analysis
1	Examine the effect of MC on IWB	Survey	4418 respondents	Structural equation model
2	Examine the effect of MC on IWB through WE as a mediator	Survey	4418 respondents	Hierarchical regression analysis
3	Review how IWB is studied and measured	Systematic literature review; integrative review	255 articles; 13 measuring instruments	Qualitative review
4	Understand individual innovation processes	Interviews, observations	34 interviews; 24 h of observation	Gioia method

Quantitative studies

Initially, the aim was to investigate the relationship between managerial coaching and four dimensions of innovative work behaviour, namely idea exploration, generation, championing, and implementation, either directly or mediated by work engagement. To do so, I used a data set collected 2015–2016 to measure the impact of HR activities in small- and medium-sized businesses (SMEs). A total of 88 Finnish companies took part in the survey that was made available in either electronic form or a paper format. The company size varied between 20 and 250 employees, with several industries represented from manufacturing to service and retail. The questionnaires were distributed to 10434 employees, and the respondents numbered 4418, constituting a response rate of 43%. The sample is a fairly good representation of the SME field in Finland, with 68.8% of the respondents being male and 84.6% holding a non-managerial role. The manufacturing sector was however slightly over-represented. SMEs provide an

important data collection ground, given that they are responsible for roughly 60% of the total turnover of Finnish companies and because new jobs have mainly been created in SMEs in the twenty-first century.

In Paper 1, the data were analysed using structural equation modelling in Stata 16. This was deemed a suitable method of analysis for its ability to explain relationships between multiple variables and to show causal relationships (together with theoretical grounds for testing such relationships) (Hair, Black, Babin, & Anderson, 2014). The measurement model first tested the relationship between the latent variables and their measures, and then the structural model was run to examine the relationships between the latent variables. Both managerial coaching and innovative work behaviour were measured using validated scales. The scale for managerial coaching was developed by Tanskanen et al. (2019), and the scale by de Jong and den Hartog (2010) was utilised to measure innovative work behaviour. Both scales were self-assessed by the respondents and were first tested using confirmatory factor analysis. For innovative work behaviour, the validation process also included constructing alternative models to the proposed four-factor model, but the proposed model was the only one that achieved a good fit.

In Paper 2, the same dataset was analysed using SPSS Statistics 26.0 and Amos 26.0 statistical software. The same scales were utilised for managerial coaching and innovative work behaviour as in Paper 2. For work engagement, the validated Finnish Utrecht Work Engagement Scale was used (Seppälä et al., 2009) (originally developed by Schaufeli et al., 2002). Before testing the hypotheses, confirmatory factor analysis was again carried out to assess the discriminant validity of the scales. Hierarchical regression analysis was used to investigate the hypothesised associations between managerial coaching and innovative work behaviour, and the mediating effect of work engagement was tested using Hayes (2013) PROCESS macro version 3.5 (model 4). 5.000 bootstrap samples were extracted to obtain the 95% bias-corrected confidence intervals (CI) and to examine the statistical significance of the hypotheses.

Qualitative studies: literature review

While conducting the quantitative studies, I started to question how innovative work behaviour has been studied and measured. Specifically, I noticed that most studies referred to Scott and Bruce (1994) and/or Kanter (1988) when defining innovative work behaviour, and I thought it odd that newer studies on IWB were not referenced; I reasoned that surely working life is different today than in the

1980s and thus innovative behaviour must be too. Such questions about the kind of studies conducted on innovative work behaviour in the past 20 years obviously merited a systematic literature review, and so it became necessary to collect a dataset that would facilitate such a review. I searched two databases (ISI Web of Knowledge, Scopus) using the keywords *innovative work behavio** and *employee innovative behavio**. from the year 2000 to mid-September 2020. The search resulted in 726 articles. After reviewing them against inclusion criteria and removing duplicates, 255 articles remained. I then read the abstracts and recorded and analysed the details to determine the number and type of studies conducted.

Because I was also interested in how innovative work behaviour has been measured, I had to identify the measurement scales used. To this end, I recorded the measurement scale the method sections of the 245 quantitative articles stated they used and identified 38 measurement scales. A further seven measurement scales were added after reading three articles that have reviewed measurement scales previously (de Jong & den Hartog, 2010; Lambriex-Schmitz et al., 2020; Lukes & Stephan, 2017). The final total was thus 45 measurement scales. I then read these articles and made a judgement call on whether the authors of the study had developed a measurement scale for innovative work behaviour, based on the fact that they stated that this is what they had done, the scale had been used by at least one other researcher in the past 20 years, and the scale measured behaviours (as opposed to traits, for example). After this review, 13 measurement scales remained and formed the dataset for an integrative review.

Integrative reviews identify similarities and differences between studies, or in this case, between measuring instruments. They do not merely produce descriptions or summaries of the state of the science but instead advance it by identifying conceptual insights through the integration of evidence. (Dwertmann & van Knippenberg, 2021). Accordingly, I identified insights about scale usage and development and also about the scales themselves, answering questions such as what, exactly, has been measured when measuring innovative work behaviour. In the last step, I worked with another expert to code all 159 behaviours found in the 13 measuring instruments. Subsequently, we analysed them to identify six dimensions of IWB.

Qualitative studies: case study

The result of the review was that innovative work behaviour – what it is, not what affects it – was last thoroughly studied in the 1980s. I saw this as constituting a large gap that should be filled. Having identified a case study as a suitable research

method, I set about conducting interviews and observations at the case company – a multinational corporation in the technology industry that manufactures physical products. One of the agile R&D units was chosen for the study and 34 interviews were conducted in two rounds. The first round comprised 19 interviews in February and March 2020 and the second 15 interviews in March 2021. I interviewed 16 informants and the remainder were conducted by masters-level HRM students who were thoroughly briefed. The interviews lasted between 25 and 120 minutes, averaging approximately 50 minutes. Different points of view were sought from different functional areas and positions. The interviews were semi-structured and covered three themes. First, we wanted to know how the informants defined innovation. Second, we asked about their innovation process (e.g., where do ideas normally come from; what needs to happen to get an idea implemented?). Third, we asked about the factors that help or hinder the innovation process (e.g., what are the challenges involved in innovating; what helps you innovate?). My co-author and I also logged 24 hours of observing meetings and workshops.

All 34 interviews were transcribed verbatim and coded in NVivo. Guided by Gioia, Corley, and Hamilton (2013), we grouped the codings into dozens of first-order concepts, continuously becoming lost in the wealth of data. In the second-order analysis, we attempted to see higher-level themes, paying attention to some of the nascent concepts that seemed to emerge (Gioia et al., 2013). The aggregate dimensions followed quite naturally once the second-order themes were labelled, and we were able to produce the data structure for the study.

5 SUMMARY OF STUDIES

Four papers make up the second part of this thesis. This chapter presents the summary of these papers, their contributions, and assessments of quality. Chapter 6 is focused on the more overall contributions that the dissertation produced.

The process of asking questions and answering them unfolded hermeneutically, as Table 1 in Section 2.5 outlined. The papers took their cues from the previous one and set out to answer the questions that the previous paper had raised. Each paper contributes with a claim, summarised below, and explained in more detail in the sections that follow. The contributions are also summarised in a table format in Table 4 in Section 5.6.

Managerial coaching affects different dimensions of IWB differently

Managers influence their employees' IWB through work engagement

Current measuring instruments may not reflect the IWB of today

The individual innovation process looks different than previously thought

Figure 5 visualises the points of view of each of the papers.

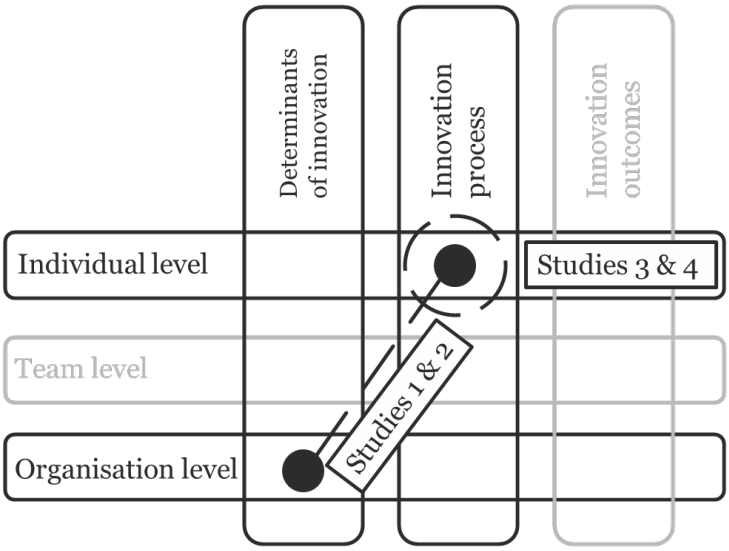

Figure 5. Points of view of the research papers

5.1 Managerial coaching affects different dimensions of IWB differently

Prior literature has found that managerial support plays a major role in fostering the innovative work behaviour of employees. Previous research has attracted criticism on two fronts. First, the use of leadership styles such as LMX and transformational leadership employed as popular managerial antecedents in the IWB research, have been criticised for being too grandiose to accurately capture organisational reality (Alvesson & Einola, 2019; Alvesson & Kärreman, 2016). Another criticism is that such research focuses excessively on general leadership styles instead of tangible behaviours (Hughes et al., 2018). Second, previous studies have often utilised a one-dimensional measuring instrument for innovative work behaviour despite the method often producing contradictory results (Anderson et al., 2014). Furthermore, when IWB is measured two-dimensionally, different antecedents affect the various dimensions of IWB in different ways (e.g., Krause, 2004; Veenendaal & Bondarouk, 2015).

Paper 1 responds to the above criticism and utilises managerial coaching (MC) as the antecedent. Managerial coaching is a more modern leadership style in which the manager coaches team members to improve their performance levels through specific behaviours such as giving feedback and clarifying objectives (Hagen, 2012; Matsuo, 2018). The data set consists of 4418 responses to a survey conducted among Finnish SMEs in 2015-2016; altogether 88 companies took part. A four-dimensional measuring instrument originally developed by de Jong and den Hartog (2010) was utilised to measure IWB and a one-dimensional instrument developed by Tanskanen et al. (2019) measured MC. The instruments can be found in the appendices. The analysis was conducted using structural equation modelling.

The paper's results show that managerial coaching is an appropriate tool for fostering employees' innovative work behaviour but that its effect is not uniform on all dimensions of behaviour. It is at its weakest when employees explore ideas and strongest when employees implement ideas. The shift in efficacy makes sense because the dimensions of promoting and implementing ideas often necessitate securing resources and involving other people; activities where managerial support is more advantageous than when an individual or a small group explores or generates ideas. The first dimensions have also been argued to represent more intraindividual, cognitive processes, and the latter dimensions involve social, interindividual processes (Anderson et al., 2014). The results were the same regardless of industry (e.g., manufacturing, service, retail).

Prior research shows that different antecedents can have different effects on two dimensions of IWB (e.g., Axtell et al., 2000; Veenendaal & Bondarouk, 2015), indicating that innovative work behaviour might best be measured multidimensionally. Applying the four-dimensional measuring instrument for the first time (as far the authors are aware of) and on a large sample size (4418 respondents) permitted a close examination of the instrument. The four-factor model performed better than the competing models, proving that distinguishing four dimensions of IWB was justified. However, the four dimensions were not clearly distinct from one another, indicating that more work is required on a multidimensional measuring instrument before it can be seen to capture the phenomenon of innovative work behaviour accurately.

The unique finding is that managerial coaching, while positively related to the four dimensions of innovative behaviour, does not have the same effect size in all dimensions. Previously, it has been thought that different antecedents affect different dimensions of IWB. The idea that the effect can be gradual within a single antecedent is novel and could only be distinguished because of the use of a four-dimensional measuring instrument. Knowing that the influence of managerial coaching increases through the dimensions offers important information for managers about when the employees most need their support.

The paper contributes to the IWB literature by showing that when innovative work behaviour is measured as a multidimensional concept, the results indicate that different types of support may be required of managers in the different dimensions. We also contribute to the discussion on how innovative work behaviour can and should be measured, and our study shows that interesting findings ensue when IWB is measured four-dimensionally. Therefore, we recommend that efforts continue to distinguish and measure different dimensions as it is the only way to reliably understand whether different determinants can have an effect on the different dimensions, or how a single determinant affects an individual's innovative behaviour. However, we also conclude that the current instruments do not lend themselves well to this and the study confirms the difficulty of multidimensional measuring efforts (Batey, 2012).

5.2 Managers influence their employees' IWB through work engagement

Paper 2 is titled *Managerial coaching and employees' innovative work behaviour – The mediating effect of work engagement*. It utilises the same research setting as Paper 1, in that it also explores the effect of managerial coaching on a four-

dimensional conceptualisation of innovative work behaviour. However, it places more focus on the individual by testing whether work engagement mediates the relationship between managerial coaching and IWB, as previous research has shown that there are solid theoretical reasons to expect that the leadership influence on innovation is mediated (Hughes et al., 2018). We propose that job resources (such as managerial coaching) initiate a motivational process leading to work engagement (Bakker, 2011; Bakker & Demerouti, 2007; Kwon & Kim, 2020). Work engagement, in turn, has been shown to lead to innovative work behaviour (De Spiegelaere, Van Gyes, De Witte, & Van Hootegem, 2015; Huhtala & Parzefall, 2007), and previous studies demonstrate that it fully mediates the relationship between leader behaviour and innovative work behaviour in (Alfes, Truss, Soane, Rees, & Gatenby, 2013).

The study utilises the same data set as Paper 1, consisting of 4418 respondents in 88 Finnish SMEs. Hierarchical regression analysis was used to test the hypotheses. The analysis confirms the results in Paper 1 and demonstrates that managerial coaching has a positive influence on innovative work behaviour. Moreover, the influence is stronger in the latter dimensions of IWB. The analysis in Paper 2 also shows that work engagement mediates the relationship between managerial coaching and IWB. The positive influence is in fact stronger through the mediator than on its own. This finding strengthens previous theorising that innovation requires motivation and effort from employees (Shin, Yuan, & Zhou, 2017; Yuan & Woodman, 2010) and that engaged employees expend such efforts (De Spiegelaere et al., 2015). Paper 2 takes a first step towards understanding that the best route that managers can take to encourage innovative behaviours among their employees involves strengthening employee engagement at work, which will lead to better performance such as innovative work behaviour.

The contribution of Paper 2 to the literature on managerial coaching lies in highlighting how managerial coaching strengthens employee work engagement which in turn leads to better performance. Its contribution to the literature on work engagement is to confirm that work engagement acts as a mediator in the motivational process where a job resource (in this case, managerial coaching) leads to improved work performance (in this case, innovative work behaviour) (Bakker & Demerouti, 2007). While previous research demonstrates a link between both managerial coaching and work engagement (e.g., Ladyshewsky & Taplin, 2018; Tanskanen et al., 2019), and work engagement and innovative work behaviour (e.g., van Zyl et al., 2019; Wu & Wu, 2019), this study is the first to explore the links between all three concepts. As such, it advances knowledge about the "black box"; the mechanism through which managerial work can have an impact on improved performance at work. Hughes et al. (2018) found solid theoretical reasons to

believe that leader influence on innovation is mediated, and Paper 2 answered several calls to study the mediating effect, most notably by exploring how leaders *develop* employees' abilities (in contrast to *leveraging* them), and by examining the mediating effect on different dimensions of innovative work behaviour. For managers, it is important to understand that if they want to encourage their employees to be more innovative, a good method may be to focus on strengthening employee work engagement which, in turn, will lead to innovative behaviour.

5.3 Current measuring instruments may not reflect the IWB of today

Paper 3, titled *Are we measuring the innovative work behaviour of the 1980s? A critical review of the measuring instruments*, focuses on the concept of IWB. Following the findings of Paper 1 and 2, which cast doubt over the accuracy of how innovative work behaviour is measured, an integrative review was conducted on 255 articles published on the topics of employee innovation and innovative work behaviour from the year 2000 to September 2020. An integrative review is a qualitative approach describing the state of the science but that also seeks to advance it by integrating evidence found in the data to present new insights (Dwertmann & van Knippenberg, 2021). Although a systematic literature review on IWB already exists (AlEssa & Durugbo, 2021), it aims to categorise the determinants to IWB whereas the focus of Paper 3 is to examine in detail the measuring instruments in use.

The review offers three major insights. First, it found that the research field is a topical one, with 65% of research conducted in or after 2016, and with on average five new studies published every month in 2019. The overwhelming majority (96%) of these studies are quantitative explorations of the role of different antecedents to innovative work behaviour. Anderson et al. (2004) called such studies *replication-extension studies* and warned that the research field has stagnated with only 13% of studies that could be classified as theory-driven. The review in Paper 3 confirms that the warnings have not been heeded, and that the situation has only deteriorated.

Second, 13 measuring instruments were scrutinised to reveal the kind of instruments they are and how and where they were developed. Here, the biggest concern is that the majority of the instruments are based on previous instruments and/or literature reviews rather than on empirical evidence of how employees innovate at work. All of the studies could be traced back to work on the individual innovation process by Kanter in the 1980s. Given that major advancements have

occurred in working life since the 1980s (think e-mail and the internet as obvious examples), the question should be asked whether the innovative work behaviour that is *measured* today is the innovative behaviour that employees *exhibit* today. The only measuring instruments that are based on empirical findings are the two developed by Messmann and Mulder (2012, 2020) but those were based on observations of the innovative work behaviour of vocational teachers (Messmann & Mulder, 2011). However, innovation in the public and private sectors is influenced by different things (Bysted & Jespersen, 2014), and utilising a measuring instrument developed for vocational teachers to measure IWB in private companies is therefore not without its issues.

Third, the review contributed to the discussion on how many dimensions innovative work behaviour consists of. Analysing 159 behavioural items that the 13 measuring instruments use to gauge how innovative employees are led to distinguishing six dimensions: idea exploration, idea generation, idea promotion, planning the implementation, implementing the idea, and building a capacity for innovation. Most instruments measure the frequency of innovative behaviours as opposed to innovation being a skill or a capability, and the review concluded that more discussion is merited on whether this is an accurate conceptualisation.

The overall theoretical contribution of Paper 3 is to highlight the serious concerns related to the study of innovative work behaviour. The overwhelming focus has been to study which antecedents impact innovative work behaviour, and which mediators and/or moderators should be employed. The actual study of IWB (i.e., what it is) is virtually non-existent. Consequently, in the past 20 years or so, the field has not moved forward in terms of producing new knowledge about how employees innovate at work because all research is based on what was studied in the 1980s. Nevertheless, working practices have changed tremendously since the 1980s, and it is logical to think that changes have also taken place in what it takes for innovations to occur. That current research on IWB has not kept up with these changes is extremely worrying, to say the least. Additionally, as a result of innovative behaviour itself not being studied since the 1980s, measuring the concept necessarily reflects the innovative behaviour as it was in the 1980s. That behaviour may or may not be the one that generates innovations at work today. In the worst case, practitioners have been given incorrect advice on encouraging innovative behaviours among their staff.

The review also contributes to the discussion on the dimensions contributing to IWB by analysing all behavioural items included in the 13 measuring instruments. The six dimensions unearthed offer new information about how innovative work behaviour has been conceptualised, both in terms of uncovering new dimensions

rarely used in measuring instruments, and in raising questions about whether innovative work behaviour is a habit, best measured by how frequently one engages in such behaviours (as has been customary) or whether it is a skill or capability, best measured by how good someone is at it.

While keeping the practitioners in mind at all times – it is for them that all work is done, after all – the review's contribution will overwhelmingly be of interest to fellow academics. The review serves to alert them to the fact that before any more work is conducted on the effects of this or that antecedent on IWB, the concept itself should be very closely scrutinised.

5.4 The individual innovation process looks different than previously thought

Paper 4 is titled *Insights into the individual innovation process in the 2020s: Updating prevalent understanding*. It answers the call presented in Paper 3 and explores what the individual innovation process looks like. The research context is an agile environment reflecting claims that agile methods are one of the most important advances in innovation in 30 years (Cooper & Sommer, 2016). Therefore, it is reasonable to believe that the individual innovation process unfolds in a modern way in such a context, and observing the process will provide state-of-the-art information about how employees innovate.

The study is a case study informed by 34 semi-structured interviews conducted at an R&D unit of a multinational corporation. The interview guide can be found in the appendices. To get a diverse perspective, different functional areas and positions (such as agile team members, product owners, management, and HR) were represented in the interviews (Eisenhardt, 1989). The analysis used the Gioia methodology with the two authors working together on all aspects of the analysis. The findings indicate that the individual innovation process looks different from how it has been depicted in literature so far. It has been common to distinguish between five phases in the innovation process: problem recognition, introducing and modifying new ideas, promoting them, and implementing them (Hughes et al., 2018). Our study finds that individuals at the team member level describe six steps: identifying needs, managing constraints, producing solutions, testing, evaluating, and implementing.

Two major differences to the traditional model were discovered. First, managing constraints did not play a big role in the process before but now constitutes an extremely important phase. Constraints in this context refer to conditions limiting the possible solutions to address the identified need. The respondents described

being involved in identifying the constraints, negotiating them, clarifying and communicating their own constraints, and utilising existing constraints to their advantage. Second, the promotion phase was absent from the respondents' accounts of their interview process. Although previous literature has not been in complete agreement about the dimensions of innovative work behaviour, as discussed in Chapter 2, almost all researchers have included a promotion dimension. This phase was missing virtually entirely in the team-member level interviews. Looking at the organisational context in the 1980s and today helps explain this. The thinking that workers at the employee-level could be involved in innovation efforts began to spread in the 1980s, and employees were encouraged to start thinking creatively (Kanter, 1984; Van de Ven, 1986). Stage-gate or waterfall processes were being implemented where the innovator could bring their idea, together with the promotional pitch, for the 'go' or 'kill' decision. Kanter's 1988 article depicts innovative ideas as big and transcending organisational boundaries, and describes how the best ideas "send out ripples and reverberations to other organization units" (Kanter, 1988, p. 95). Of course, promotion was always a prerequisite for such ideas.

The fact that team members did not talk about a need to promote their ideas may be down to two potential reasons. The interviewees in my study talk about a different type of innovation to Kanter's: the more incremental kind that does not send out those ripples to other parts of the organisation. Additionally, they have been given the task to innovate, that is, to come up with new solutions to the problems identified. As such, there is more leeway, both in terms of costs and personal freedom. As a result of the innovative efforts being on a smaller scale, and the individual having been given the mandate to look for a new solution, there is hardly a need for promoting and championing ideas.

The last contribution relates to the role of the individual in the innovation process. We note that previous literature usually depicts the individual as a fairly passive and reactive participant in the process; because much of recent research on the topic has been based on surveys, they necessarily lean on a more positivist research philosophy which depicts individuals reacting to the environment in a stable and predictable manner. Our results, in contrast, show that the individual has a great deal of active agency and ownership. We identified four ways that individuals show agency in the process. First, they pursue inspiring social interaction to have networks which they can utilise in all activities in the innovation process. Second, they nurture their own thinking and expose themselves to new ideas and skills which provide stimuli for producing innovative solutions. Third, they demonstrate being self-aware of what makes them innovative; for example, whether they prefer to talk the initial idea over with someone or write a short paragraph about it to

themselves. Fourth, they have a great deal of innovation self-efficacy – belief in their own abilities to innovate.

This finding, although initially surprising to us, is understandable when put into context. The last time employees were asked about their innovation process, the tide was turning from doing what they were told to do to bringing their creative energy to work (Kanter, 1984). Employees have now been doing that for years, so it really should be no surprise that they have got very good at it. But because no one in the meantime has checked what employees themselves think about their innovation process, the research efforts have lagged behind and missed this important development in the management of employees' innovative pursuits. Our study invites the question of how effective, in the modern context, is the customary setup of how managers and organisations can influence their employees to be more innovative and instead urges to think about ways that individuals' own efforts to innovate can be facilitated and supported.

Paper 4 takes its cue from the results of Paper 3 and takes the first steps towards examining how employees innovate today. Whereas Paper 3 found theoretical grounds to suspect that the currently used construct of innovative work behaviour is not up-to-date, Paper 4 contributes with a case study that finds a black swan (Flyvbjerg, 2006; Popper, 2005) to show that at least in one environment, the innovation process at the team member level does not look the same today as it did in the 1980s. Additionally, although the study of innovative work behaviour has been thought to be in the mature theory research phase (which typically focuses on testing hypotheses relating to existing constructs), we suggest the study should be approached as being in the nascent theory phase (Edmondson & McManus, 2007). The reason for this is that if the existing construct does not represent the phenomenon as it exists today (as we have given reason to suspect), then the link between the phenomenon and the construct should at least be re-examined.

5.5 Summary of research results

Previous sections have detailed the results and contributions of each of the studies. Figure 5 presents graphically the two focus areas in the thesis (individual-level innovation process and how it can be managed), and the points of view that the four papers take. The contributions are summarised for the convenience of the reader in Table 4.

Table 4. Summary of the contributions

Paper	What was already known	What I have added
1 & 2	• Leadership is the most commonly used determinant and a key driver of innovation (Hughes et al., 2018) • If IWB is measured multi-dimensionally, different antecedents may have different effects on the dimensions	• Managerial coaching is an appropriate method of enhancing IWB through heightened work engagement • The effect of MC is not uniform on all dimensions of IWB
3	• None of the current instruments are good for further use (Hughes et al., 2018) • Dominated by replication-extension studies; very little theory produced (Anderson et al., 2004)	• Measuring instruments in use today are based on the work on the individual innovation process conducted by Kanter in the 1980s
4	• Researchers have often distinguished five dimensions: problem recognition, idea generation and modification, promotion, and implementation (Hughes et al., 2018)	• The innovation process in an agile environment has six steps (need identification, managing constraints, ideating solutions, testing, evaluating, and implementing) • The individual innovator is an active and engaged owner of his or her innovation process, capable of enhancing their own process

5.6 Quality assessment of the studies

5.6.1 Evaluating the quantitative studies

Lastly, I will assess the quality of the studies, starting with the two quantitative studies that are included in this thesis. The two concepts used to assess quality in quantitative studies are reliability and validity. Reliability is concerned with how consistently a construct is measured and commonly relies on tests for Cronbach's alpha and/or composite reliability (CR). In the quantitative studies appended to this thesis, both tests were used. The Cronbach's alphas for all scales varied between 0.73 and 0.95, exceeding the generally accepted level of 0.7 (Nunnally, 1978). The composite reliability of the constructs ranged from 0.76 to 0.95 and thus also exceeded the required threshold of 0.70 (Hair, Black, Babin, & Anderson, 2014), attesting to the constructs having strong internal consistency.

Validity is concerned with how accurate the construct is, in other words, with whether the measuring instrument measures what was intended (Nunnally, 1978). Here, the two tests that were performed related to convergent validity and discriminant validity. Convergent validity refers to whether the hypothesised parts all belong to the same construct; in this case, whether idea exploration, generation, championing, and implementation are all part of the concept of innovative work behaviour. That convergence was assessed by calculating the average variance extracted, which was above the cut-off value of 0.50 for each construct (Fornell & Larcker, 1981).

Discriminant validity refers to whether parts of the construct are distinct from each other; in this case, whether idea exploration, for example, is a distinct dimension from idea generation, championing, and implementation. The assessment involves comparing the square roots of the AVE values with the inter-construct correlations. There is adequate discriminant validity if the correlations between constructs are smaller than the square roots of the AVE values (Fornell & Larcker, 1981). In Paper 2, this was the case but in Paper 1, the inter-construct correlation was higher in all but one comparison, indicating that the four dimensions are not clearly distinct. A possible reason for this discrepancy is that the data were analysed using two different methods (structural equation modelling and hierarchical regression analysis). The lack of discriminant validity is discussed extensively in Paper 1 and possible explanations are explored. Those include the measure used being intended to be brief and user-friendly but possibly not including items about all the types of behaviour constituting innovative work behaviour.

5.6.2 Evaluating the qualitative studies

In qualitative studies, trustworthiness is the hallmark of good quality. Trustworthiness can be inferred if the study meets the criteria of credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985).

If the research is conducted in such a way that the probability of finding the results credible is high, then the study meets the criteria for credibility (Lincoln & Guba, 1985). The research should provide as true a picture of the phenomenon being investigated as possible (Shenton, 2004). In both the review and the case study, credibility was enhanced by the thorough reporting of the steps taken throughout the process. The case study employed several interviewers to minimise the chances of a single interviewer influencing the data. Moreover, two experts conducted observations, afterwards comparing notes and discussing any discrepancies in them. The two authors of the case study also conducted all analyses together, and

in the review, two experts conducted the critical analyses most in need of objectivity.

Transferability is evaluated by other researchers based on whether they believe that the results can be generalised to other contexts (Lincoln & Guba, 1985). Case studies, particularly single case studies, are commonly held to have limited transferability and recommended to most safely be applied only to similar cases. The point of Paper 4, however, is not to claim that the individual innovation process looks the same in all organisations and contexts as we observed it. Rather, it is a critical case (Flyvbjerg, 2006); a black swan, if you will, that shows that at least in this one context the innovation process looks very different to how it has been depicted. The case subjects the theory of innovative work behaviour to falsification by presenting one observation which does not fit the theory and therefore, the theory has to be revised or rejected (Popper, 2005). For such a purpose, a well-chosen single case study is ideal (Flyvbjerg, 2006). Because the context for the case study in Paper 4 was agile – a modern method for innovating – that is inherently different to the context that prevailed in the 1980s (as alluded to in Section 5.5), the case can be considered a well-chosen one.

Dependability refers to reliability which cannot exist without validity (Lincoln & Guba, 1985). Demonstrating validity, as I have done with detailed accounts of how the credibility and transferability of the studies has been enhanced, should be sufficient to establish the dependability of this research.

The characteristics of the data should be confirmable (Lincoln & Guba, 1985). In the review, confirmability was enhanced through a detailed description of, for example, keywords used, number of articles obtained, and inclusion criteria. In the case study, we used the respondents' terms wherever possible in the first-order concepts to ensure that we stayed true to their experiences instead of substituting with our own interpretations (Gioia et al., 2013). Moreover, the full data structure with all first-order concepts, second-order themes and aggregate dimensions is given in Paper 4, with ample quotes from the respondents.

6 DISCUSSION AND OVERALL CONTRIBUTIONS

Having reviewed the contributions of the individual studies in the previous chapter, the purpose of the present chapter is to discuss the overall contributions and conclusions of the study, starting with theoretical contributions. Suggestions for future research are presented next, followed by practical and methodological implications. Finally, limitations and reflections complete the chapter.

6.1 Theoretical contributions

The individual papers each make their own, important contributions. As a result of the hermeneutic research process I came to understand the concept of innovative work behaviour in a more holistic way than separate answers to the research questions. I formulated the overarching research problem thus:

How should the study of innovative work behaviour be developed to respond to the needs of modern working life?

I approached the question in a problematisation process where I examined the problems and weaknesses of the theory relative to the phenomenon it attempts to depict (Alvesson & Kärreman, 2007). I explored the problem in three steps to arrive at four insights (which will be discussed in detail below). In the first step, I familiarised myself with the research field by conducting the same type of replication-extension studies that have been ubiquitous in the past. This allowed me to explore what the current state of the study of innovative behaviour is, and whether there is room, and indeed a need, for development. This led me to insight 1: *the study of the individual innovation process has been narrow in scope and mostly focused on measuring innovative behaviours*.

In the second step, I examined weaknesses and problems in the current theory of innovative work behaviour. This led me to question to what extent the study of innovative work behaviour portrays the phenomenon as it exists in the world today. I developed insight 2: *current studies measure an outdated theoretical construct*.

In the last step, I looked for new directions for the study of how individuals innovate at work. Insight 3: *the study of the individual innovation process is in need of new measuring instruments* was developed following the quest to understand what the most suitable ways to develop the IWB study are from the point of view of measuring instruments. Insight 4: *the study of innovative work behaviour is in crisis* (examined in Section 6.2) was the result of attempts to

understand how the construct could better represent the phenomenon in the present day. Next, I will go through each insight in more detail.

Insight 1: The study of the individual innovation process has been narrow in scope and mostly focused on measuring innovative behaviours

As noted several times, innovative work behaviour has become the established term when discussing individual-level innovation processes. Investigating the roots of the study of IWB, I noticed that the term came into use more by accident than by design and it appears that little thought was put into whether behaviours are really the most appropriate or interesting construct to study and /or measure.

The study of innovation processes in other levels (i.e., team and organisational level) has focused on the processes themselves, not specifically or solely on behaviours. For example, a recent study of team innovation processes in agile environments asked respondents to focus on one team that they had worked in and describe both good and bad teamwork incidents in that team, using Critical Incident Technique (Grass et al., 2020). Similar studies have not been conducted at the individual level. Yet the study of what takes place when an individual innovates could bring forth a number of interesting observations related to, for example, the role of the individual innovator in the process, hitherto unthought-of determinants, or, indeed, prompt an entirely revolutionary take on the innovation process (and paper 4 scratches the surface of such study). Therefore, the study of the individual innovation process has been narrow in having mostly focused on behaviours instead of the entire process.

The second way that the study has had a narrow scope is in the predominance of research that measures innovative behaviours. Although mostly focusing on behaviours instead of the whole process is already concerning, scholars have not even studied how employees behave when they innovate in the 2000s but have instead put their research efforts into measuring the effects of different determinants on innovative work behaviour. Such efforts can produce information about whether an employee exhibits more or less IWB depending on changes in the determinant, but they cannot be used to study whether this behaviour or that behaviour is part of IWB.

Another way of saying that is that in the figure that I presented in Section 3.1 where the levels and streams of innovation study merge, such studies focus on producing information about the arrows, not the dots. This is, of course, a legitimate research programme, and can uncover useful insights. However, if the dot (in this case, the

concept of innovative work behaviour) happens to be faulty in some way, studying the arrows will not reveal the flaw. Consequently, if the main focus is on measuring the effects of the arrow between two dots, then the understanding of the dots better be correct.

Insight 2: Current studies measure an outdated theoretical construct

As it turns out, I discovered that what has been measured about innovative work behaviour is not correct. Criticising measuring instruments is not new and the instruments for innovative work behaviour have been under severe criticism lately. The conclusion is that none of those currently in use are sufficiently reliable and valid (Hughes et al., 2018). I look at the measuring instruments from another point of view: not whether there are issues with reliability and validity, but whether they measure the innovative work behaviour as it is exhibited by employees in modern organisations.

Two questions are relevant to this point: has the individual innovation process been researched in the 2000s, and what are current measuring instruments based on. To answer the first question, only one study has explored empirically how employees innovate but those employees are teachers in vocational education (Messmann & Mulder, 2011) and their experiences cannot directly be translated into corporations as there are differences in how employees innovate in private and public sector (Bysted & Hansen, 2015) . The overwhelming majority of studies conducted on innovative work behaviour explore the effects of certain determinants to IWB. The answer to the second question is that current measuring instruments are based on previous literature or instruments instead of an empirical study of how employees innovate. All instruments are ultimately based on the research results of the 1980s. Therefore, the measuring instruments that are being used today measure the innovative behaviours that employees exhibited 40 years ago that may or may not be the behaviours that employees exhibit today.

This is a concern that has not been raised previously and it raises the discussion on how to measure IWB to an entirely new level – one that directs its focus to the fact that measuring innovative work behaviour reliably and validly is pointless unless the behaviour that is measured is the one that the employees engage in and that *produces innovations for the organisation*. That, of course, is the ultimate purpose of measuring employee innovation. It seems as if perhaps this has been forgotten in the heated pursuit of developing a multidimensional instrument that is reliable and valid.

As the first step, I detail the results of a critical case that finds that at least in an agile environment, the individual's innovation process does indeed look different to what is being measured. Therefore, if empirical studies have not been conducted on the individual innovation process in the 2000s, measuring instruments are based on research conducted in the 1980s, and the first piece of evidence has been presented about the innovation process looking different now than how it has been measured, this dissertation gives a strong indication that current understanding of the individual innovation process is not up-to-date.

Insight 3: The study of the individual innovation process is in need of new measuring instruments

Current measuring instruments, then, are not particularly suited for their job but that does not mean that as a research community, we are not in need of measuring instruments. Here, I offer two contributions at different levels.

The first, more incremental-level contribution relates to improvements to current instruments; which changes could be made to the instruments to bring them more up-to-date and make them more usable in the current context? I show that when looking at all items that have been employed in the measuring instruments, two dimensions have been somewhat neglected: planning the implementation, and building a capacity for innovation. Adding items related to these dimensions might help make the measuring instrument more representative of all activities that innovating entails. Additionally, by dividing each of the six dimensions that the review identified into sub-categories the dimensions became richer; for example, *implementing ideas* is a more finely tuned activity than the standard item "I implement ideas" that most instruments use, comprising of communication on progress, identification of bottlenecks and finding solutions to them, evaluation and monitoring of progress, and turning ideas into practice. While economy is of importance in measuring instruments and they obviously cannot contain too many items, it might be worthwhile seeing if there is a way of bringing some of this richness into the instrument.

I show that the modern innovation process may be more context-dependent than previous measuring efforts would lead to believe. In an agile environment the promotion phase was not necessary but constraint management was. However, in another environment different phases may emerge. For anyone wanting to measure individual-level innovation in a similar context to our case, they could include items about identifying and negotiating constraints, clarifying others' constraints and communicating one's own, and utilising constraints to one's own

advantage. Additionally, my research shows that adding items about individual agency (for example, whether the respondents know how they can ensure they are innovative, and whether they believe in their ability to innovate) might be in order.

The second, more revolutionary-level contribution is that perhaps trying to plug the holes in the current measuring instruments is not the best approach. The individual innovation process might be substantially different to what has been measured so far. If that is indeed the case (and more studies on this are definitely needed), it may make sense to start from the beginning and do the groundwork on what the innovation process actually looks like, and what the useful measurable constructs are in it, and then build a measuring instrument that lays solidly on this foundation. In other words, the study of innovative work behaviour might best be studied as being in the nascent theory research phase.

6.2 The future of innovative work behaviour

Above, I have detailed three insights that contribute to research on individual-level innovation. The overall picture of the study conducted using the term 'innovative work behaviour' is that it has focused on mechanistic measuring of the effects of different determinants to behaviours using outdated measuring instruments. This raises several concerns. For one, it means that not a lot is known about the individual innovation process as it takes place in organisations today; for example, whether behaviours are the most interesting measurable construct in it, and whether the same behaviours that are measured in current measuring instruments are still exhibited. It is also unclear whether the behaviours that have been measured produce innovations for organisations. In the worst case, the advice given to practitioners over the years on how innovative employees should and could be managed may not be accurate – or, indeed, this may not be the most useful question anymore.

Based on what I came to understand in this dissertation, my fourth insight is that *the study of innovative work behaviour is in crisis*. By that, I do not mean that innovation should not be studied at the individual level; on the contrary, I think it is the most helpful level in the quest to understand how organisational innovation takes place. But I think that we should lay the concept of *innovative work behaviour* to rest and adopt the term *individual innovation process* in any further quest to understand the microfoundations of organisational innovation. This would mean conducting research honestly at the individual level and exploring the whole process instead of a specific part of it (behaviours). Doing so might open up possibilities of finding other interesting constructs that can be measured; other

determinants that have so far not been discovered; or even entirely new questions that should be posed about the concept of individual innovation process.

This section is focused on recommendations for the future study of individual innovation processes. It is also a contribution to what I see could be studied in the future to keep the study of individual-level innovation relevant and useful to both researchers and practitioners. What, then, would be a good course of research for individual-level innovation?

The first step must be seeking a deeper understanding of how employees innovate at work. I have already conducted one study showing that the innovation process may differ from how it was previously described. Two larger findings emerged from this study as particularly worthy of further examination. The first is the idea of constraint management as an important activity in the innovation process. As such an activity has not been recognised before as being an integral part of the individual's innovation process, not much is known about it. Previous research has found that there can be constraints to the innovation process (for a review, see Acar et al., 2019) but how an individual manages these constraints is an unexplored topic. Stakeholder management in innovation is a trending research field (Leonidou, Christofi, Vrontis, & Thrassou, 2020) and as it is stakeholders who bring various constraints to the process, the study is relevant to constraint management. However, it is usually conducted at firm level (Urbinati, Landoni, Cococcioni, & De Giudici, 2020) and focuses on identifying who the stakeholders are (Vos & Achterkamp, 2006) and what their impact is on innovation (Haefner, Palmié, & Leppänen, 2021). Constraint management might be how stakeholder management shows itself at the individual level; in any case, this is a fascinating research topic that deserves more attention in the future.

The second larger finding is the active agency of the individual. Valuable information about determinants to innovative work behaviour has been obtained in survey studies in recent years. Such research settings are fairly mechanistic: A affects B, while B is a passive respondent that reacts in predictable ways. My finding is that individuals take great ownership of their innovation process and are active and participating agents in the process. When asked about what affects their innovation process, their answers related to taking the time to think about new ideas, having colleagues around to discuss things with, and negotiating constraints so that there is enough space for new ideas. Only a couple of respondents mentioned that having a supportive manager matters to their innovation process. Yet in literature, effective managers have been described as key drivers of IWB (e.g., Hughes et al., 2018; Krause, 2004; Schuh et al., 2018).

Many questions spring to mind that future studies can tackle. What ways do individuals have to ensure that they are and remain innovative? From where do they get the belief that they are innovative – their innovation self-efficacy – and how can that be impacted? I have suggested that there are at least four ways that individuals show agency: being active in networks; self-awareness; cognitive skills; and innovation efficacy. What other ways might there be? What ways are there to enhance any of these? If not the key drivers of IWB, what is the role of managers in individuals' innovation processes? There is ripe ground for research in this area.

Of course, ours was one case study in one context. Now, more studies in different contexts in terms of industry, country and environment are required to provide an overview of how individuals innovate. The process may be different depending on, for example, what type of innovation is involved (e.g., process or product innovation), or where the innovator works (e.g., in management or as a team member; in R&D or a service department). Current IWB studies have aimed to generalise across situations and contexts but what happens in the innovation process may well differ dramatically depending on the situation. In fact, it may not be possible to find a model of the individual innovation process that would be applicable to all contexts.

The first job, then, is to understand what individual innovation looks like. Conducting these studies will update our knowledge about how individuals innovate at work. This knowledge will allow for work to commence on new measuring instruments (which may measure a construct different than behaviours). Basing the instruments on what we know about individual innovation in organisations today, designing the instrument to be multidimensional, as well as making sure that the instruments are reliable and valid – on which Hughes et al. (2018) offer good advice – will ensure that any subsequent recommendations given to practitioners will accurately reflect how innovation is pursued in their organisations. Such instruments will then permit the measurement of the effects of individual, team, and organisational-level determinants of the individual innovation process (see Figure 6 for an illustration).

Having accurate measuring instruments will also facilitate another line of study that has not received enough attention. While in the past, the focus was on measuring the role of various determinants in innovative work behaviour, meaning that the IWB construct has been the dependent variable, I propose that energies should be directed, at least initially, to examining whether individual innovation efforts lead to innovative outcomes, what kinds of outcomes, and under what circumstances. These outcomes may be individual, team, or organisational-level, as illustrated in Figure 6.

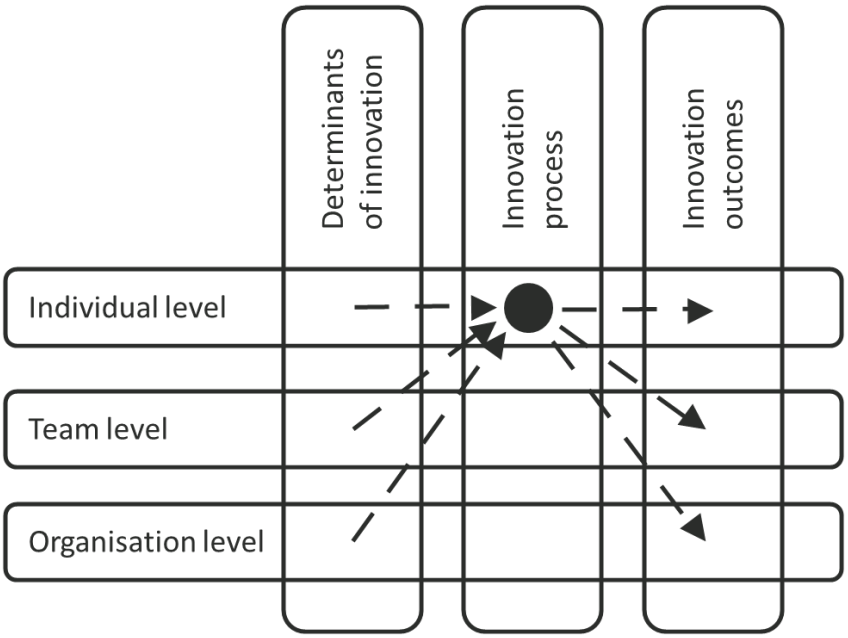

Figure 6. Potential directions for further studies

Apart from the question of how individual innovation could be studied in future, there is the more ground-breaking question of whether how to get employees to bring their ideas to work is the more predominant concern anymore. After years of employees doing what they had been told (Kanter, 1988; Van de Ven, 1986), it is understandable that researchers focused their efforts on figuring out how managers could stimulate innovative behaviour among their employees. In the 2020s, at least in Western countries, some organisations may be facing another question: one about how to control innovation. "We can't have employees innovating willy-nilly with no regard as to whether it is useful for the organisation or not", is how one case study interviewee, a manager of the organisational innovation process, put it. Whether at the organisational level the aim is to stimulate or to control innovation has implications for individual-level study, too, as the role of the manager, for example, is likely to be entirely different depending on their task.

To sum up my recommendations for further studies, these should at first be focused on the individual innovation process itself: what happens when an employee innovates, and what can or should be measured. Once enough is known about that, new measuring instruments can be designed to examine the effects of various determinants on the individual innovation process, as well as which

outcomes the individual innovation process generates at the various levels. Of these, the outcomes should be the first priority, as it is important to establish that the individual innovation process does indeed produce benefits at all levels and precisely what those benefits are. Additionally, the question of to what extent organisations want to stimulate or control innovation should also be explored.

6.3 Methodological contributions

The dissertation makes four main methodological contributions. The first one relates to the ontological discussion about the extent to which the concept of innovative work behaviour is understood in a way that is relevant to the present day. Such a discussion has not been brought forward previously. I have highlighted that the theoretical construct of innovative work behaviour (on which the measurement of the concept is based on) is, in fact, a snapshot of the phenomenon as it appeared in the 1980s, and that there is reason to believe that the phenomenon today looks different. Therefore, I built nascent theory about how the individual innovation process looks like in a modern context.

The second contribution is applying a case study to research on the individual innovation process. The systematic literature review found two case studies on the topic of innovative work behaviour since the year 2000. One explored the role of knowledge in IWB in the hotel service sector (Edghiem & Mouzughi, 2018). The other examined the role of supervisors in supporting the IWB of firefighters (Bos-Nehles, Bondarouk, & Nijenhuis, 2017). Neither had as its object of study the individual innovation process itself. Yet the case study is ideally suited for when a phenomenon should be studied with an open mind, not assuming the end result (Eisenhardt, 1989). This was the case with the study of the individual innovation process; although by no means unchartered territory, it was nevertheless one that needed to be approached from a fresh point of view.

The third contribution has to do with the mixed-methods approach that I applied in this dissertation. In the literature review, I discovered that quantitative research methods prevail in the study of innovative work behaviour, making up 96% of articles published since 2000. Only one article had utilised mixed methods in their study of the effects of leadership styles on innovative work behaviour (Grošelj et al., 2020). Again, they did not study the individual innovation process itself, making my research the first one in 20 years to do so. Although criticism has been raised about the compatibility of quantitative and qualitative research methods (Burrell & Morgan, 1979), in this research, the results are richer for the approach

and genuinely contribute to a much more multifaceted picture of the phenomenon than would have been possible utilising only one type of research methods.

The fourth contribution is the realisation of the hermeneutic circle in a dissertation. Although I did not strive for the circle but realised later that it had happened organically during the process (as hermeneutic circles perhaps have a tendency to do), and as such it may not be something that future dissertation writers can plan for, my hope is that in detailing my process and being honest about my struggles and doubts, this dissertation may serve as inspiration to anyone finding themselves in the throes of the hermeneutic circle.

6.4 Practical implications

Although I ended up producing a fairly theoretically-oriented thesis, my thoughts have always been with the practitioner. Having been one myself, I easily embrace the idea of Corley and Gioia (2011) that scholars have a responsibility to generate knowledge that is useful to practice. The goal must be to tackle real-world problems (Tushman & O'Reilly, 2007) unless we want to "condemn ourselves to increasing irrelevance and diminishing influence in describing, explaining, understanding, and improving organizations and their management" (Corley & Gioia, 2011, p. 29).

Innovation is the main driver of growth but it is also crucial in solving the many social challenges that we face, such as health, access to food, and climate change. Therefore, understanding how the innovation process unfolds is important not just for leaders and professionals in business environments but in a wide variety of sectors. Knowing what happens in the process, and what is required for innovation to take place, is key to managing and supporting the process. Individuals, managers, and HR have their different roles in the successful execution of the process, as portrayed in Figure 7.

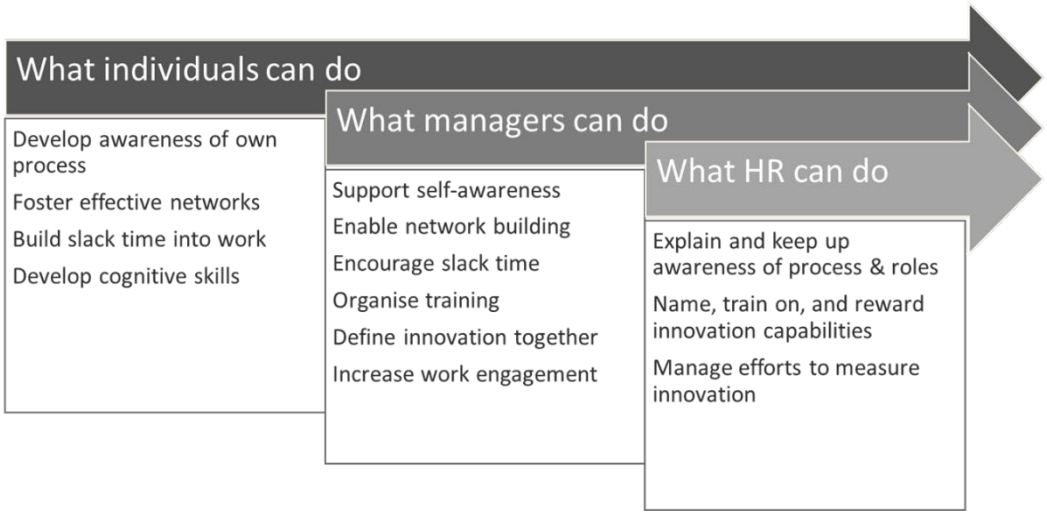

Figure 7. Different roles in the innovation process

I have argued throughout this thesis that the individual innovator is an active owner of his or her own innovation process. Therefore, it is befitting that the examination of the different roles starts with the individuals. Developing an awareness of how they innovate and what helps them innovate is key to being an effective innovator. This thesis shows that some of these factors may be fostering diverse networks in- and outside of the organisation, building slack time into their work schedule to allow for both the generation of new ideas, and the modification of these ideas, and developing their cognitive skills from keeping up-to-date about their substance area to improving their analytical capabilities.

Although the individual is the owner of their innovation process, that is not to say that managers do not play an important role in both motivating their employees to innovate, and in fostering their abilities to do so. Managers should understand that innovative employees are aware of how they innovate best and they take active ownership of their own innovation process. To support employees in this, managers would do well to discuss with each employee what they need to help them innovate, and try to facilitate those conditions. One of the practical tasks here might be supporting employee's self-awareness of their innovation process. In this, managerial coaching is actually a very good practice in that it focuses on the development of skills through asking questions and listening. Some of the other tasks include enabling network building, for example through facilitating coffee breaks or events that bring people together also from outside the organisation, accepting and encouraging slack time, and organising training for cognitive skills.

It also pays to define innovation together with all levels of the organisation. The case study reported in this thesis establishes that management and employees define innovation differently with many employees believing that if they are only doing their jobs, they are not innovating. Defining what kinds of ideas and actions are valued, and celebrating these together, could have a big motivational impact on employees.

As the last point on the list for managers, they should know that helping employees improve their performance (for example to innovate more) is a complex phenomenon with no one-size-fits-all solutions. Employees who experience high work well-being and work engagement are likely to perform well at work, and focusing on ensuring that everyone has the opportunity to experience these may be key to enhancing innovation at work. Again, managerial coaching, being highly employee-centred, is an appropriate leadership style for increasing work engagement.

HR professionals should know how the innovation process commonly unfolds in their organisation, make this knowledge visible to employees and managers, and explain the different tasks and capabilities that employees and managers typically have in executing the process. HR can play a big role in helping to understand that the individual innovation process requires capabilities from both individual employees and managers. Making these capabilities visible, providing training where appropriate, and rewarding employees demonstrating these capabilities help build an innovative organisation. For example, the ability to build and foster strong networks may not be an obvious indicator of an individual's ability to innovate. Making this visible sends the signal to the employees that the organisation wants them to meet people both in- and outside of the organisation and keep in touch with them. It also makes it clear to managers that various networking events such as workshops with collaboration partners, team events, or indeed the famous watercooler conversations should be encouraged as eventually highly beneficial for innovation; even though it might at times look like less productive work.

6.5 Limitations

The more detailed limitations as pertaining to the individual studies are discussed in the papers, and this section provides an overview of the more general limitations that arose from the study. Two main limitations are discussed here.

First, the scope of the dissertation is deep and narrow. In Chapter 2, I presented Figure 1 with its three streams of innovation research that can each be studied at

three levels, making it nine potential focus areas (not to mention the possibility to study the effects of different determinants on each area). I chose to focus on the individual innovation process and the effects of one particular organisational determinant (managerial coaching). While there would have been other interesting research arenas – the one focusing on outcomes of innovation, especially at team or individual level, might have been particularly fruitful, given that not a lot of research exists on this (Janssen et al., 2004) – this choice was a conscious one. Once I realised that something was amiss with the study of individual-level innovation, I could not rest until I had found some answers to my questions.

Context plays a big role in interpreting the results of the dissertation. All of the empirical studies have been conducted in Finland. The quantitative studies use a data set that was collected in small and medium-sized companies. The case study company is an MNC in the technology industry. All of these choices have implications for the generalisability of the results. Additionally, although I recognise that innovation is important also for solving social challenges and not only for the growth and survival of private companies, all of the studies take place in the private sector. This is partly due to my own background but also to my desire not to spread the study too thin, given that public and private sector innovation are likely influenced by different factors (Bysted & Jespersen, 2014).

6.6 Reflections

How could I possibly join them on to the little bit (two inches wide) of ivory on which I work with so fine a brush, as produces little effect after much labour?

Jane Austen

I have referred to this entire thesis as being a product of a hermeneutic circle. While the hermeneutic circle is a strength in that it allowed me to go deep into the roots of the concept of innovative work behaviour and discover problems and inconsistencies not previously illuminated, I also often struggled with it, in two ways. First, I ventured *deep* into the study of innovative work behaviour. I certainly had plans to study the concept from a broader perspective, but the more I read and understood, the more I wanted to get to the bottom of what innovative work behaviour is, where our understanding of it comes from, and what we actually know about it. As a result, I ended up producing fairly detailed knowledge about one single concept. This caused me to question (more times than once) whether producing such knowledge is worth the effort that goes into it. In such times, I was comforted by Jane Austen's brush (quoted above).

Second, I had to try to reconcile with the fact that it is *my* hermeneutic circle; someone else might have come up with entirely different questions. It is characteristic of hermeneutic research that the researcher's prior experiences, knowledge, and prejudices are essential elements in the quest to build new understanding (Gadamer, 2004). For a researcher like me who wants to remain as objective as humanly possible, this was not good news. Although I am not yet fully confident in my interpretative abilities, I list some perspectives I adopted when compiling this thesis to reconcile my discomfort.

- I understood that no research is ever completely objective. Even the most hardcore quantitative study is subject to interpretation, choices, and decisions by the researcher.

- I chose to highlight my role instead of hiding behind any pretence of objectivity. Throughout, I have discussed my assumptions, the decisions I made, and the doubts I had. While some may say that the thesis has a far too personal ring to it, for me, this was the only way to write it. In so doing, I ultimately followed Gadamer's advice to "bring before me something that otherwise 'happens behind my back'" (Gadamer, 2004, p. xxix).

- When I started this thesis, I thought that someday it would be "complete". I have had to accept that because I constantly change and learn new things – a process that in turn forms the basis of a new creation of meaning – the process is infinite and can never be complete. I now view this thesis as a snapshot of what I currently know, accepting that in the months and years to come, I will know more, and differently, to what I do know.

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Appendices

Appendix 1. Measurement scales

Items in the innovative work behaviour measurement scale

*denotes items added to the original scale by de Jong & den Hartog (2010)

How often do you…

1. pay attention to issues that are not part of your daily work?

2. wonder how things can be improved?

3. search out new working methods, techniques, or instruments?

4. generate original solutions to problems?

5. find new approaches to execute tasks?

6. make important organisational members enthusiastic for innovative ideas?

7. attempt to convince people to support an innovative idea?

8. systematically introduce innovative ideas into work practices?

9. contribute to the implementation of new ideas?

10. contribute to the implementation of new ideas together with other people?*

11. put effort into the development of new things?

12. apply new ideas to practice?*

Items in the managerial coaching measurement scale

*denotes items added to the original scale by Tanskanen, Mäkelä and Viitala (2019)

1. My manager discusses our performance with us sufficiently.

2. My manager facilitates mutual cooperation in a group.

3. My manager ensures that everyone is capable of doing their tasks.

4. My manager supports the work community in dealing with problems and mistakes constructively.

5. My manager seeks to develop the operation of our unit.

6. My manager understands the problems and needs of my work.

7. My manager gives me supportive feedback on my work.

8. My manager promotes and supports innovative ideas, experiments and creative processes.*

9. I know what my manager thinks about my performance.*

Items in the work engagement measurement scale

Measured using the Finnish version of UWES-9 (Seppälä et al., 2009)

1. At my work, I feel bursting with energy

2. At my job, I feel strong and vigorous

3. I am enthusiastic about my job

4. My job inspires me

5. When I get up in the morning, I feel like going to work

6. I feel happy when I am working intensely

7. I am proud on the work that I do

8. I am immersed in my work

9. I get carried away when I'm working

Appendix 2. Interview guide

Note: The guidance of Gioia et al. (2013) was adhered to where interview questions change during the progression of the study. However, all of these question areas were covered in the interviews.

Background questions

What is your current role?

How long have you worked for the company?

Definition of innovation

How would you define innovation?

How do you know that something is an innovation?

Innovation process

Can you tell me about a time when you innovated?

Could you describe what happened in the process?

What was your role in the innovation?

Where do you get ideas from?

What needs to happen to get an idea implemented?

Factors influencing the innovation process

Which factors do you find beneficial for your innovation process?

What is challenging about the innovation process?

Publications

Examining the effect of managerial coaching on four dimensions of innovative work behavior

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ABSTRACT

Managerial support is a key factor in fostering employees' innovative work behaviour across organisations. Studies on the topic have thus far leaned mainly on a one-dimensional construct of innovative work behaviour and a few big leadership theories. This article broadens the view by investigating the influence of managerial coaching – the coaching of employees conducted by their managers to improve the employees' performance – on four dimensions of innovative work behaviour, namely idea exploration, generation, championing, and implementation. The data (N=4418) were collected through a survey administered to employees in 88 companies. The findings show that managerial coaching positively impacts innovative work behaviour in organisations, but the influence grows in a continuum, being the least important when employees are exploring ideas and the most important when they implement ideas. In light of this, we recommend managerial coaching as an appropriate tool in fostering employees' innovative work behaviour, but it is important that managers understand that their support is more necessary in certain dimensions. The study also shows that the use of a four-dimensional measurement scale has many merits, but the scale itself has some weaknesses that call for development. Some ideas are suggested for potential improvement.

Keywords: (dimensions of) innovative work behaviour (IWB); employee innovation; managerial coaching; measurement scale

INTRODUCTION

Innovation is a pivotal competitive factor of companies (Anderson, Potočnik, & Zhou, 2014), and employees' innovative work behaviour (IWB) is an important fuel for innovation (for reviews see Anderson, De Dreu, & Nijstad, 2004; Crossan & Apaydin, 2010). It is therefore important to understand how IWB can be encouraged at all levels of the organisation. The key actors from the perspective of encouragement are managers in the work units of the organisation because they know the employees, the goals of the unit, and its actual situation.

Previous studies have explored the role of managers in encouraging innovative work behaviour by employing certain leadership styles as an antecedent (Hughes, Lee, Tian, Newman, & Legood, 2018). There are two issues with that approach: First, the findings on how leadership affects innovative work behaviour have been somewhat inconsistent (Anderson et al., 2014). We suggest that may be because innovative work behaviour is usually measured one-dimensionally. A few studies have divided innovative work behaviour into two dimensions, and they have been able to show that the dimensions are affected differently by managerial actions (Fang, Chen, Wang, & Chen, 2019; Krause, 2004; Noefer, Stegmaier, Molter, & Sonntag, 2009). To the best of our knowledge, there is no study measuring the effects of managerial actions that has divided innovative work behaviour into more than two dimensions. Second, the scope has been theoretically narrow since only a few traditional leadership theories have been used in research (see Hughes et al., 2018). Such theories include transformational, empowering, or servant leadership (for comprehensive reviews see Anderson et al., 2014; Hughes et al., 2018) which have sometimes been described as too "grandiose" to aid in investigating the daily life in workplaces (Alvesson & Einola, 2019; Alvesson & Kärreman, 2016). We propose that it would be more beneficial to employ a more "down-to-earth" approach to studying the effect of leadership and suggest managerial coaching, which emphasises the day-to-day actions of managers, for this purpose (see Hagen, 2012, for a review). Managerial coaching is a leadership approach through which line-managers coach their employees to meet their targets, to develop and use their capabilities, to strengthen their autonomy, and to improve their performance (for a review see Anderson, 2013). Managerial coaching has received considerable attention in leadership research in the twenty-first century, but its relationship with innovative work behaviour has not been studied so far.

This study examines how managerial coaching affects innovative work behaviour measured as a construct consisting of four dimensions. We show that the innovative work behaviour of employees can be influenced by leaders who apply the managerial coaching approach, and that influence is more important in some

dimensions of IWB than in others. We add to the question of how innovative work behaviour can be measured by extending the work of de Jong and den Hartog (2010). We analyse a data sample of almost 4500 respondents to test the performance of a four-dimensional measurement scale for innovative work behaviour, and the connections of each dimension to the managerial coaching behaviour. The managerial value of the study comes from creating new knowledge for managers who aim to promote innovation in their workgroups.

THEORETICAL BACKGROUND AND HYPOTHESES

Innovative work behaviour

Innovative work behaviour refers to individual behaviour that aims to initiate and intentionally introduce new and beneficial ideas, procedures, processes or products (Farr & Ford, 1990). Creativity, or the generation of novel and useful ideas (Amabile, 1988), is the initial, important phase of the entire innovation process (Do, Budhwar, & Patel, 2018), but it requires more than that for creative ideas to manifest in visible improvements in processes, products, or procedures in an organisation. Research offers several proposals of how many dimensions are included in innovative work behaviour: two (Krause, 2004), three (Janssen, 2000; Scott & Bruce, 1994), four (J. de Jong & den Hartog, 2010), five (Kleysen & Street, 2001), or even six (Lukes & Stephan, 2017) dimensions have been mooted. A common element is that the innovation process is hard and requires a lot of the innovator and that there are ways and means for the organisation and managers to alleviate some of the hardships.

Although innovative work behaviour is theoretically treated as a multidimensional construct, much of the research to date has ultimately measured it one-dimensionally. Such studies have often produced inconsistent findings on the influences of leadership on innovative work behaviour, prompting a call for more research on the effects of leadership and supervision (Anderson et al., 2014). A few studies have examined the effects of different types of managerial support on two dimensions of innovative work behaviour. Noefer, Stegmaier, Molter and Sonntag (2009) found that supervisory feedback plays a role in idea implementation but not in idea generation. A study by Krause (2004) indicated that different kinds of leadership behaviours boost the generating and testing of ideas compared to the implementation of ideas. Fang, Chen, Wang, and Chen (2019) also showed that different leadership activities influenced innovative thinking and innovation outcomes positively.

It is apparent that when innovative work behaviour is measured two-dimensionally, the dimensions are impacted differently. Perry-Smith and Mannucci (2017) have even suggested that an antecedent that is beneficial for one dimension may be detrimental to another. Therefore, the question is no longer whether we should divide innovative behaviour into multiple dimensions, but rather into how many.

In this study, we follow Hughes et al. (2018), who in their recent analysis of 68 innovation studies coded the different definitions researchers have used for innovation and identified four common conceptual markers. The first of these markers is a problem recognition dimension where an individual looks for ways to improve the current situation or tries to think about it in a new way (Farr & Ford, 1990; Kanter, 1988). The second dimension relates to the introduction, adoption, or modification of ideas. De Jong and den Hartog (2010) note that key behaviour here is combining and reorganising information to solve the problem or to utilise the opportunity that has previously been identified. The third dimension addresses the issue that ideas must be promoted or championed: there are often costs involved in developing ideas, and someone must convince the budget holders that the benefits outweigh the costs (Kanter, 1988). Championing also involves getting other people involved and building coalitions, and being persistent (Howell, Shea, & Higgins, 2005). Finally, idea implementation entails aspects such as preparing plans, securing funds and resources, and ensuring the innovation becomes part of business as usual (Kleysen & Street, 2001; Lukes & Stephan, 2017; Scott & Bruce, 1994). These different behaviours can be seen more as dimensions than phases, since they may overlap and follow a non-fixed order in a complex organisational situation (Messmann & Mulder, 2012).

Managerial coaching

The next question is which leadership approach should be adopted when investigating the dynamics of managerial support on innovative work behaviour. Previous studies revealing a connection between positive leadership style and innovative behaviour in employees have most often utilised such leadership styles as transformational, empowering, or servant leadership (for in-depth reviews see Anderson et al., 2014; Hughes et al., 2018). The transformational leadership theory, dominating the discussions to date, leans on measures developed in the organisational environments of the 1980s and is rooted in traditional trait- and style-centred theories (Humphreys & Einstein, 2003). Moreover, the leader-member-exchange (LMX) theory has often been used in innovation studies, but then measurements have focused on the nature of the relationship between the manager and the follower, and not on the managers' concrete supportive

behaviours. It is therefore understandable that researchers have been incited to move away from studying leadership styles to studying leadership behaviours and to adopt newer leadership approaches in the research of innovative work behaviour (Hughes et al., 2018).

In this study, we lean on the managerial coaching approach (see Hagen, 2012, for a review), which offers a more grounded perspective on managerial work units that considers the manager's supportive behaviour in the relationship with subordinates. The approach has attracted growing attention in the leadership research in the twenty-first century but has not yet been utilised in IWB research. We suggest that managerial coaching is especially suitable for stimulating IWB among employees. It is a leadership approach that has been developed during the last two decades as a future-oriented means for meeting the increasing pressure for the continuous renewal and performance improvement of organisations (Berg & Karlsen, 2007). It has been described as suitable in organisational contexts where managers want to encourage employees to use their potential to solve new problems, to learn new knowledge and skills, and to develop and improve their performance (Anderson, 2013; Ellinger & Kim, 2014; Matsuo, 2018). Moreover, managers have been encouraged to adopt coaching behaviour to improve collaborative capabilities in teams and workgroups (Geroy, Bray, & Venneberg, 2005; Stoker, 2008). All these aspects have been listed as important facilitators of innovative behaviours (Anderson et al., 2004).

Even if the ultimate target of managerial coaching is to support employees to achieve their goals and to enhance organisational efficiency (Bond & Seneque, 2013; Popper & Lipshitz, 1992), Moen and Frederici (2012) point out that at its best managerial coaching stimulates feelings of autonomy, competence and relatedness. Those basic needs of human beings are a source of intrinsic motivation (Ryan & Deci, 2000) which is an important antecedent for innovative work behaviour (Saether, 2019).

The connection between innovative work behaviour and managerial coaching

The distinctive behaviours in the managerial coaching approach can be connected naturally to different dimensions of innovative work behaviour. Hunt and Weintraub (2002), for example, stress that a manager adopting this approach promotes reflection and learning, and encourages employees to take ownership, to develop and to engage with the organisation, which are important attributes throughout the innovative process in organisations. Managers who adopt a coaching style consciously strive to encourage employees to use their skills and

creative capabilities in exploring and developing new ideas and facing new challenges (Heslin, Vandewalle, & Latham, 2006) which is essential in idea exploration and idea generation (Kleysen & Street, 2001). Managerial coaching manifests in questioning and active listening during the reflective conversation between a manager and subordinates which builds awareness and responsibility to stimulate self-directedness (McCarthy & Milner, 2013; Moen & Federici, 2012). These attributes are important, especially in idea generation (de Jong & den Hartog, 2010). Informing staff of organisational goals and strategies (and setting clear goals in line with those together with employees), as well as providing guidance on work processes, and supporting employees trying to achieve the targeted standards (Berg & Karlsen, 2007; Bond & Seneque, 2013; McCarthy & Milner, 2013) are important tasks in managerial coaching, and requirements of different dimensions of innovation (Shalley, 1995; Yuan & Zhou, 2008). Moreover, managers leaning on the coaching approach support the efforts of workgroups and teams to reach their goals, for example, by engaging team members with collective goals and developing their ability to work collaboratively (Wageman, 2001). These attributes are important in idea generation, championing, and implementation in organisations (Hülsheger, Anderson, & Salgado, 2009). And finally, managerial coaching creates a learning climate in an organisation that supports innovative work behaviour (Cangialosi, Odoardi, & Battistelli, 2020).

Despite the clear theoretical grounds for examining the effect of managerial coaching on innovative work behaviour as outlined above, to the best of our knowledge, there are only three earlier studies on this relationship, and one of those is a dissertation (Hahn, 2016). One research article shows that managerial coaching had a positive impact on innovative work behaviour amongst 207 employees in software houses in Pakistan (Ali, Raza, Ali, & Imtaiz, 2020). The study used only five items of the 12-item scale devised by de Jong and den Hartog (2010). Wang (2013) also confirmed a positive connection between managerial coaching and individual innovative behaviour amongst 127 R&D employees in Taiwanese companies. Wang measured innovative behaviour with Scott and Bruce's (1994) six-item innovative behaviour measure, which asks supervisors to rate their subordinates' innovative behaviours in the workplace, and which is designed especially for employees who work in technology-related areas, such as R&D personnel. Finally, Hahn (2016) used five of the six items developed by Scott and Bruce (1994) when studying the connection between managerial coaching and innovative behaviour amongst 273 employees in South Korean companies representing manufacturing, construction, distribution/sales, information technology, finance, and service/consulting. That study empirically establishes the same connection. All of these studies measured innovative work behaviour one-dimensionally, and thus could not specify at which innovation stage managerial

coaching is most impactful. To summarise, the previous results show a positive connection between managerial coaching and innovative behaviour. However, prior research does not reveal the possible variety among different dimensions of innovative work behaviour. Thus, we hypothesise:

Hypothesis 1a. Managerial coaching is positively associated with idea exploration.

Hypothesis 1b. Managerial coaching is positively associated with idea generation.

Hypothesis 1c. Managerial coaching is positively associated with idea championing.

Hypothesis 1d. Managerial coaching is positively associated with idea implementation.

METHOD

Sample

The cross-sectional data were collected in 2015–2016 for a project designed to measure the impact of HR activities in small- and medium-sized businesses (SMEs). A total of 88 companies from all parts of Finland took part in the survey in either electronic form or a paper format. The size of the companies varied between 20 and 250 employees, and several industries were represented: the manufacturing industry (metal; wood/furniture making); the service sector (hotel/restaurant/catering businesses; cleaning, consulting); retail (hardware, sales of cars, hardware, pharmaceutical products); and other industries (construction, education, and IT).

The respondents numbered 4418, of whom 31.2% were women and 68.8% were men, and 15.4% held a managerial position. The response rate was 43%.

Measures

Innovative work behaviour

Innovative work behaviour was measured using 12 items (a sample item is: *How often do you come up with new ideas for doing things?*), which the respondent rated on a 7-point Likert scale anchored with *never* (1) and *very often* (7). The measure was taken from de Jong and den Hartog (2010) and translated. We sought

expert feedback on the measure and decided to add two items: one to measure the application behaviour of ideas (this was an item that de Jong and den Hartog had initially included but then dropped in their final version of the scale), and another to measure the cooperative nature of innovation (Tjosvold, Tang, & West, 2004). The items were self-rated which has often been considered problematic (e.g. Anderson et al., 2014; Hughes et al., 2018) but given that we were interested in the individual's perception of engaging in innovative work behaviour rather than an objective measurement of employee performance, self-ratings were appropriate for our study. Additionally, our questionnaire included items about paying attention to processes that could be performed more efficiently and pondering how things could be improved; behaviours that would be very difficult for someone else to notice. Following the original study by de Jong and den Hartog, we also divided innovative work behaviour into four dimensions: idea exploration (α = .73), generation (α =.91), championing (α = .92) and implementation (α = .93). De Jong and den Hartog found that the four phases each contribute to IWB, but did not find sufficient evidence that they were distinct dimensions. Nevertheless, this measure has been reported to have the greatest potential among the currently existing measures (Hughes et al., 2018). The measurement scale with all the items is available in the appendices.

Managerial coaching

Managerial coaching was measured using a validated scale of seven items developed by Tanskanen, Mäkelä, and Viitala (2019). Two items were added to adapt the scale to work well with measuring innovative work behaviour. The statement *My manager promotes and supports innovative ideas, experiments and creative processes* was added because previous research has found that when enhancing innovative behaviour it is not enough to constitute being evaluated as a good manager; managers should actively and purposefully promote innovative behaviour (Amabile, 1988; Prieto & Pérez-Santana, 2014). To be able to do that the manager and the subordinate should be able to honestly discuss performance at work (Agarwal, Datta, Blake-Beard, & Bhargava, 2012). Therefore, the statement *I know what my manager thinks about my performance* was added. The measurement scale with all items is available in the appendices.

The respondents were asked to evaluate their leader's activity against nine different types of coaching behaviour on a 7-point Likert scale anchored with *strongly disagree* (1) and *strongly agree* (7) (α =.95). Some of the items focused on the leader's coaching behaviours at a group level (e.g. *My manager facilitates cooperation in a group*), and some addressed the leader's behaviour at an individual level (e.g. *My manager gives me supportive feedback on my work*). To

confirm that the nine items measured a one-dimensional construct, as was the case in the original measurement scale, we performed an exploratory factor analysis. The items loaded on one factor that had an eigenvalue of over 1 (6.583) and explained 73.14% of the total variance. The next factor had an eigenvalue of .654. All factor loadings were acceptable, ranging between .74 and .89.

Control variables

The control variables used were gender and managerial position (male or female / yes or no). Gender has previously been found to correlate with innovative work behaviour (de Jong & den Hartog, 2010). Similarly, managers have been found to suggest more ideas and have more ideas implemented than non-managers (Lukes & Stephan, 2017). In addition, industry was controlled for by including it as a multi-group variable in the structural equation model.

RESULTS

Descriptive statistics

Table 1 includes the descriptive statistics and correlations of the variables. Cronbach's alphas (between .73 and .95) confirm that all variables showed good internal consistency.

Managerial coaching also correlated positively with the four dimensions of innovative work behaviour with the lowest magnitude of correlation being with the first dimension and the highest with the last dimension. The four dimensions of IWB correlated significantly and highly with each other (between .49 and .76). This was to be expected given results from previous research (de Jong & den Hartog, 2010). We will return to this issue more in-depth in the Discussion section of this article.

Table 1 Descriptive statistics and correlations

Variables	*N*	*M*	*SD*	*Min*	*Max*	*1*	*2*	*3*	*4a*	*4b*	*4c*	*4d*
Control variables												
1. Gender (0 = male)	4330	.31	.46	0	1							
2. Managerial position	4285	.15	.36	0	1	-.08***						
Predictor variable												
3. Managerial coaching	4328	4.96	1.41	1	7	.05**	.08***	(.95)				
Dependent variables												
4a. Idea exploration	4374	5.25	1.13	1	7	-.00	.18***	.06***	(.73)			
4b. Idea generation	4370	4.96	1.21	1	7	-.12***	.18***	.16***	.62***	(.91)		
4c. Idea championing	4376	4.32	1.46	1	7	.10***	.29***	.20***	.51***	.67***	(.92)	
4d. Idea implementation	4346	4.59	1.31	1	7	-.03	.27***	.28***	.49***	.70***	.76***	(.93)

***p<.001, **p<.01. The numbers in parentheses indicate Cronbach's alphas.

Of the control variables, gender displayed only a very slight correlation (< -.12) with the dimensions of IWB with men being slightly more likely to generate and champion ideas. Holding a managerial position displayed statistically significant and positive correlations with the four dependent variables, with idea championing and implementation displaying correlations of a slightly higher magnitude (.29 and .27) than the first two dimensions (.18 and .18).

Confirmatory factor analyses

The first step of the analysis stage involved performing confirmatory factor analysis on the nine items measuring managerial coaching. The model yielded a good fit to the data: $\chi^2 = 320.06$, df = 21, $p < .000$, root mean square error of approximation (RMSEA) = .06, comparative fit index (CFI) = .99, and standardised root mean square residual (SRMR) = .02. All items loaded significantly on the construct predicted with standardised factor loadings ranging from .69 to .89. These are in between the reliability thresholds of .50 and .95 suggested by Bagozzi and Yi (1988). To test the convergent reliability of the construct, we calculated the average value extracted and composite reliability

scores. The average variance extracted was .69, well above the recommended .50 cut-off. The composite reliability score was .95, also above the cut-off of .70. Cronbach's alpha was .95.

The next stage was to perform confirmatory factor analysis on the 12 items measuring innovative work behaviour. The first model consisted of idea exploration, generation, championing, and implementation as the four dimensions of IWB. We also constructed three alternative models to determine which model offered the best fit. The three-factor model followed the example provided by Janssen (2000) and combined idea exploration and generation into one factor while retaining championing and implementation as separate factors. The two-factor model was based on the work of Krause (2004) and combined championing and implementation into one factor, in effect retaining a factor related to idea generation and another related to implementing. Finally, all items were loaded onto one factor for the last model.

Table 2 Fit indices for the four CFA models

Model	χ^2	*df*	χ^2/df	*RMSEA*	*CFI*	*SRMR*
1. Four-factor model	651.23*	38	17.14	.06	.99	.02
2. Three-factor model	2892.44*	51	56.71	.11	.94	.05
3. Two-factor model	5055.80*	53	95.39	.15	.89	.05
4. One-factor model	9771.66*	54	180.96	.21	.79	.08

*p<.001

Cutoff values for the fit indices as recommended by Hair et al. (2014): χ^2/df <5.0; RMSEA <.08; CFI >.90; SRMR <.05

Table 2 shows the fit indices for these models. Using the thresholds indicated in the table that were proposed by Hair et al. (2014), it is evident that the four-factor model is the only model that achieves a good fit. In this model, all items loaded significantly on the four constructs predicted with standardised factor loadings ranging from .65 to .94. The average variance extracted was between .63 and .85, well above the recommended .50 cut-off. Composite reliability scores ranged from .76 to .92, also above the cut-off of .70. We have given all factor loadings, AVE and CR scores, and Cronbach's alphas for both constructs (MC and IWB) in Table 3.

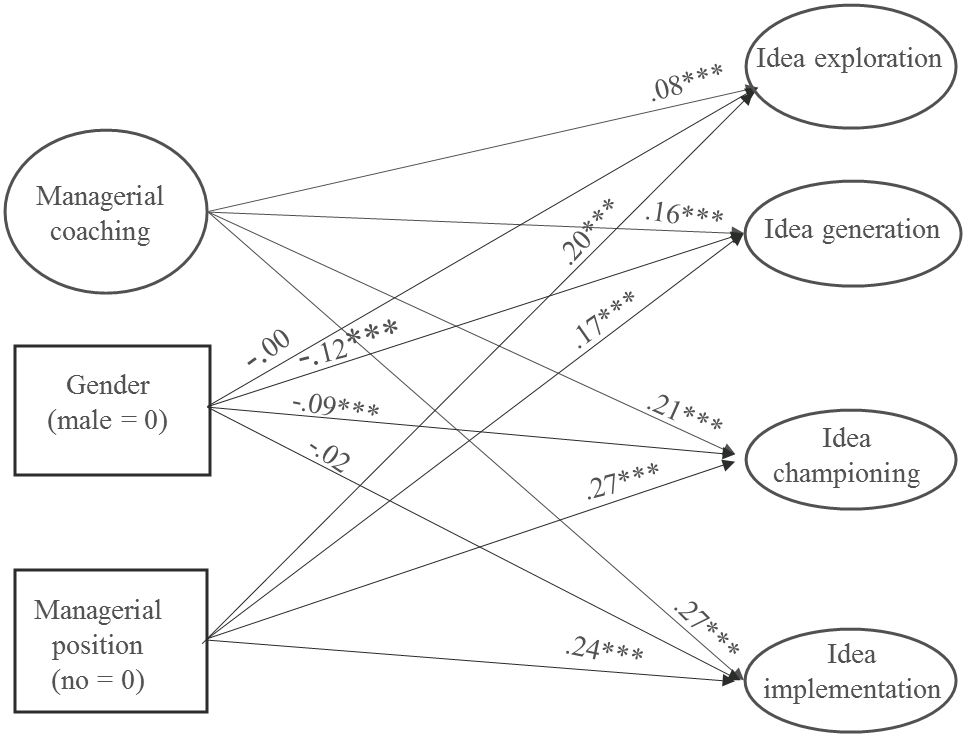
Table 3 Confirmatory factor analyses and model fit indices

Measurement model		*Factor loading*		*Composite reliability*	*AVE*	*Cronbach's α*
Managerial coaching		MC1	.88	.95	.69	.95
		MC2	.89			
		MC3	.84			
		MC4	.85			
		MC5	.83			
		MC6	.83			
		MC7	.84			
		MC8	.84			
		MC9	.69			
Innovative work behaviour	Idea exploration	IWB1	.65	.76	.63	.73
		IWB2	.90			
	Idea generation	IWB3	.87	.90	.76	.91
		IWB4	.89			
		IWB5	.86			
	Idea championing	IW56	.90	.92	.85	.92
		IWB7	.94			
	Idea implementation	IWB8	.87	.92	.69	.93
		IWB9	.84			
		IWB10	.79			
		IWB11	.81			
		IWB12	.87			

Structural equation model

We ran the measurement model which was based on our hypotheses in Stata. The model was a good-to-acceptable fit to the data: $\chi^2 = 3353.37$, df = 169, RMSEA .07, CFI .96 and SRMR .04. We then ran the structural equation model using latent variables for managerial coaching and the four dimensions of innovative work behaviour. The standardised path coefficients of the model are presented in Figure 1.

Figure 1 Standardised path coefficients of the final model.



***p<.001

We hypothesised that managerial coaching positively impacts each dimension of IWB. We can see in Figure 1 that the standardised path coefficient from managerial coaching to idea exploration is .08 (p<.001). From managerial coaching, the standardised path coefficient to idea generation is .16 (p<.001) and to idea championing .21 (p<.001). Finally, the standardised path coefficient from managerial coaching to idea implementation is .27 (p<.001). Managerial coaching, then, has a positive effect on all dimensions of IWB. Hypotheses 1a-1d are thus confirmed. The effect is at its lowest magnitude for idea exploration and increases gradually until it reaches its highest magnitude for idea implementation.

We were aware that the industry that the respondent works in may have an effect on the results (de Jong & den Hartog, 2010), and we were keen to observe this effect. To do so, we used a multi-group analysis and divided the data into four groups by industry: 34 companies were in the manufacturing industry group, 23 companies represented service businesses, ten companies operated in the retail sector, and 21 companies were placed in a category labelled *other*. All categories included companies of similar sizes; for example, in each category were companies that employed around 20 employees, as well as companies that employed over 200 people. Because neither large nor small companies dominated in any of the groups,

we can say that company size did not interfere with interpreting the results of the multi-group analysis.

The results of the standardised path coefficients between managerial coaching and the four dimensions of innovative work behaviour for each industry are presented in Table 4. We can see that the coefficients for the path between managerial coaching and idea exploration were not significant for service, retail, or other but were significant for manufacturing (.12, p<.001). The coefficients for the path between managerial coaching and idea generation were all significant and ranged from .08 (p<.05) for the other category to .17 (p<.001) for manufacturing. For the path between managerial coaching and idea championing, all coefficients were likewise significant, and the range was .13 (p<.001) for other to .20 (p<001) for service. Lastly, for the part between managerial coaching and idea implementation, all coefficients were again significant. The lowest coefficients were for other (.22, p<.001) and the highest were for service and retail (.28, p<.001). The pattern previously observed with managerial coaching increasing in importance from idea exploration to idea implementation can clearly be seen in these results as well. Therefore, we can conclude that industry does not affect the results of the study. Whether employees work in manufacturing, retail, service, or in another industry, they are likely to benefit from managerial coaching more when they are championing or implementing their ideas than when they are exploring or generating them.

Table 4 Standardised path coefficients by industry

Industry	*N*	*MC>Idea exploration*	*MC>Idea generation*	*MC>Idea championing*	*MC>Idea implementation*
Manufacturing	1725	.12***	.17***	.19***	.26***
Service	927	-.03	.15***	.20***	.28***
Retail	493	-.01	.13**	.17***	.28***
Other	873	-.01	.08*	.13***	.22***

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

DISCUSSION

Theoretical contribution

In this study, we examined how managerial coaching affects innovative work behaviour measured as a construct consisting of four dimensions. The present study suggests several theoretical implications for the academic literature on innovative work behaviour. To start with, our study confirms the findings of the few previous studies (Ali et al., 2020; Wang, 2013; Hahn, 2016) on the positive connection between managerial coaching and IWB. Subordinates who are coached by their managers are more likely to report receiving emotional and instrumental support and this may give them the confidence to take on the challenges – and possibly stressful and difficult situations – that innovation processes tend to bring. Hence, managerial coaching, by providing encouragement and emotional support, is a useful lever in enhancing subordinates' innovative behaviours. By examining the effects of managerial coaching on innovative work behaviour, we broadened the theoretical framework typically used in research on the topic which has focused on the more traditional and dominant theoretical frameworks (most often transformational leadership and LMX theory) (see Hughes et al., 2018).

Furthermore, as far as we are aware, there has been no research investigating the effect of managerial coaching on four different dimensions of IWB (including idea exploration, idea generation, idea championing and idea implementation). Accordingly, the findings reported here complement the results of earlier research which has found that two dimensions of innovative work behaviour are impacted differently (Axtell, Holman, Unsworth, Wall, Waterson, & Harrington, 2000; de Jong & Den Hartog, 2007; Krause, 2004; Magadley & Birdi, 2012). The results of our study provide entirely new insights by confirming that managerial support is not so important in idea exploration and idea generation as in idea championing and idea implementation. By separating the construct of innovative work behaviour into four dimensions instead of two, as has been more common, we were able to show that in fact, the effect of managerial coaching on IWB forms a continuum where the positive impact of managerial coaching, as felt by employees, gradually grows in importance from idea exploration, where it is felt the least, through idea generation and championing, to idea implementation where it is felt the most. We see, then, that the influence of managerial coaching strengthens as employees move towards situations where a generated idea has to be pitched to those who have the power to permit it to advance and to allocate the resources required to prepare it for implementation. That coaching from managers should be needed at that stage makes sense as managers often have the mandate to support the idea, and they also have power and networks where they can influence

the progression of the idea. Therefore, the need for managerial support is stronger at the stage when changes in organisational processes and procedures are required.

This study contributes to the cross-cultural generalizability of the innovative work behaviour literature by examining the effectiveness of managerial coaching in Western countries. Managerial coaching has to date been studied with Asian samples from countries characterised by high power distance between managers and subordinates (Hofstede, 2001). As the findings of the current study demonstrate, a positive relationship exists between managerial coaching and innovative work behaviour utilising data from Finland; hence, we suggest that managerial coaching can be effective in both Eastern and Western cultures. We also contribute to cross-industry generalisability of the innovative work behaviour literature by examining the effectiveness of managerial coaching across industries. The results of the study suggest that coaching practices can be effective in various industries regardless of whether the work is labour- or knowledge-intensive.

Lastly, this study adds to our understanding of how innovative work behaviour can be measured. As far as we are aware, a four-factor model has not been tested before, although theoretically, dividing IWB into four dimensions is justified. We performed various tests on the measurement scale in order to check its reliability and validity. We found that the four-factor model performed better than any of the competing models when looking at the fit indices. The convergent validity of our constructs was good, and idea exploration, generation, championing, and implementation are all part of the concept of innovative work behaviour. However, all the correlations between the four dimensions of IWB were high and significant, as was also the case in the original study by de Jong and den Hartog. We performed some additional testing and checked the discriminant validity of the constructs by comparing the square root of the average variance extracted to the inter-construct correlations. In all but one comparison, the inter-construct correlation was higher, indicating that the four dimensions are not clearly distinct (Fornell & Larcker, 1981). That finding is not entirely surprising; firstly because previous studies have indicated that "the innovation process as it unfolds over time is messy, reiterative, and often involves two steps forward for one step backwards plus several side steps" (Anderson et al., 2014, p. 1299), and has proven notoriously difficult to measure (Batey, 2012), and secondly because there are issues with measurement construction. We can find fault with the measures used in our study, too, which might at least partially explain for the issues with discriminant validity. Our measure leans on typical items used in innovation studies, which do not reflect everything that we know about innovation in organisations. As an example, Howell et al. (2005) validated a scale measuring product champion behaviour that was

composed of three dimensions: expressing confidence in the innovation being a success, persisting despite adversity, and involving the right people. Typically, however, when measuring innovation championing as part of IWB, the scales only include items about involving the right people. We note, therefore, that the measurement scales in use today do not accurately capture the phenomenon of innovative work behaviour, and until they do, measuring it will remain difficult. Hughes et al. (2018) provide excellent advice on how the scales can be improved, and we have contributed to this discussion here with notes on what scale items might be included in future research.

Managerial implications

For top management in organisations, we highlight the fact that innovative work behaviour can be impacted by managerial actions. This study shows that managerial coaching is an appropriate leadership approach when encouraging innovative work behaviour in work units. Therefore, developing it as a leadership ideology should be a strategic choice in companies seeking to be more innovative. In practice, this choice challenges top management as well as HR professionals to recruit, train, evaluate and appraise managers in a way that facilitates strengthening the managerial coaching approach in leadership across the organisation.

For the managers themselves, an important message of the study is that their employees' innovative work behaviour consists of different dimensions and the need for managerial support varies in each dimension. Managerial coaching consists of behaviours such as empowering and enabling the employee to act while giving helpful feedback and guidance. These types of behaviours are needed less when the employees are recognising problems and coming up with solutions to them. Given that the first two dimensions seem to involve internal processes and behaviours such as looking for ways to improve what is currently being done (Farr & Ford, 1990), and combining and reorganising information (de Jong & den Hartog, 2010), it is understandable that it is more important to give the employees space and avoid the temptation to influence too directly or intensely. However, when the idea needs to be presented and resources secured, and even more so when the idea is implemented, these managerial coaching behaviours are valued and sought after by employees. These two dimensions require involving more people: building coalitions (Howell et al., 2005) and securing funds and resources (Kleysen & Street, 2001), for example. It makes sense that employees would need more managerial support when they make an idea public, assume responsibility for the result being successful, and in the process handle organisational resources.

Limitations

The use of self-reported measures may be a limitation of the study due to potential common method bias that has been associated with such measures. The design of the questionnaire used incorporates several safeguards against common method bias including eliminating ambiguity in the scale items and introducing a proximal separation between the measures of predictor and criterion variables (Podsakoff, Mackenzie, & Podsakoff, 2012). In terms of statistical remedies, we conducted Harman's single-factor test by forcing all our items to load on to a single factor. This factor had an eigenvalue of 8.85 and explained 42.1% of the variance. It is commonly held that if one factor accounts for less than 50% of the variance then common method bias does not pose a serious threat to the interpretation of the results (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Another limitation is that the relationship between managerial coaching and innovative work behaviour may be bi-directional. Employees who receive managerial coaching may be more innovative, but it is also possible that innovative employees receive more managerial coaching. The measurement scales in use today are not well equipped to deal with endogeneity biases which prevent the proper estimation of causal effects (Hughes et al., 2018). Future research might tackle this issue by employing appropriate study designs.

Conclusion and future research

Our overall conclusion is that the connection between managerial coaching and innovative work behaviour does exist. Establishing that connection offers valuable information both for practitioners in turbulent business environments as well as researchers in academia. In addition to the immediate challenges in utilising innovation for competitive advantage in markets, business organisations face increasing environmental challenges that will have to be addressed through innovation. Innovative work behaviour is badly needed, and managerial coaching is one lever that can be employed to promote it.

Our study indicates that some interesting findings result when innovative work behaviour is handled as a multidimensional concept. The current research findings contribute particularly to the understanding that innovative work behaviour is a multidimensional concept and the different dimensions may require different forms of managerial attention. However, the measurement scales in use today are still fairly inaccurate and we agree with Hughes et al. (2018) that while we do need to start measuring innovative work behaviour multidimensionally, the current scales do not lend themselves very well to this practice. Therefore, we also strongly

urge that effort be applied to producing an improved multidimensional measurement scale for innovative work behaviour.

Producing a new scale is obviously very time-consuming and even Hughes et al. (2018) concur that to entirely cease studying innovation until we have new measures would be somewhat overzealous. In the meantime, it could be interesting to add moderators or mediators to our model. Some potential set-ups include looking at whether managerial coaching moderates the relationship between organisational culture and IWB, and whether work engagement mediates the relationship between managerial coaching and IWB.

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Managerial coaching and employees' innovative work behaviour – The mediating effect of work engagement

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ABSTRACT

SMEs rely on each employee to be innovative and understanding how employees can be supported in their innovative behavior is crucial. This study draws on the literature of managerial coaching (MC) to examine whether employees' innovative work behavior (IWB) can positively be impacted by actual, concrete leadership behaviors. We expected work engagement to mediate that relationship in an attempt to disclose the mechanism through which MC can impact the IWB of employees. We operationalized IWB as a four-dimensional construct to shed light on whether MC and work engagement affect all dimensions of innovative work behavior equally. We collected survey data (N=4418) from 88 Finnish SMEs and found that MC was positively related to each dimension of IWB, and work engagement mediated the linkages. Interestingly, the importance of MC (both directly and when mediated by work engagement) grows as the employee moves from idea exploration to implementation.

Keywords: managerial coaching, innovative work behavior, work engagement

INTRODUCTION

Innovation is a critical factor for business performance and survival of all small and medium-sized companies (SMEs) (Bodlaj & Cater, 2019; Exposito & Sanchis-Llopis, 2018; Lowe & Roper, 2015) and it is proposed that leadership is one of the key factors in innovation (Hughes et al., 2018; McCann & Sparks, 2019; Oboardi et al., 2015). Since SMEs often have scarce staff, each employee should contribute to the innovation of the organization, and their managerial practices play a crucial role. Thus, the need for research on influences of managerial practices on innovativeness in companies has been identified in previous studies (Brunswicker & Vanhaverbeke, 2015). As a response to this call, our study examines how managerial coaching (MC) as a leadership style facilitates employees' innovative work behavior in small- and medium-sized enterprises (SMEs).

MC is an employee-centered leadership approach where line managers and supervisors actively implement coaching practices to help subordinates exceed their previous performance level (see Hagen, 2012; McCathy & Milner, 2013; Anderson, 2013, for reviews). According to several definitions, a manager who applies managerial coaching practices supports individuals and teams to better performance by motivating, developing their competencies, supporting co-operation in a team, empowering employees and facilitating their creative thinking as part of everyday activities at work– that is, where innovations emerge (see e.g. Agarwal et al., 2009).

In previous studies on the connection between managerial impact and innovative work behavior, transformational and transactional leadership styles (Bednall et al., 2018; Groselj et al., 2020; McCann & Sparks, 2019) have received ample attention and are empirically established (see Hughes et al., 2018, for a review). However, we believe that especially in the SME context, we should rather adopt a managerial approach which combines elements of both styles: performance management for achieving the immediate objectives, and encouragement of followers to continually develop and renew for the future. Moreover, in addition to the individual level, MC captures also managers' support to group level co-operation, which has been noted as crucial for innovations in SMEs (Tehseen et al., 2021). Hence, by looking specifically at MC, we bring a more diverse perspective to managerial practices instead of strongly dichotomous (transformational vs. transactional) leadership approach (Collinson, 2014).

So far, there are only two earlier studies on the relationship between managerial coaching and innovative work behaviors, and they have been conducted in large, technology-oriented firms in an Asian context which is characterized by high power distance (Ali et al., 2020; Wang, 2013). So far, studies in an SME context

are missing. Additionally, these studies have addressed innovative work behaviors without attention to the multidimensional nature of innovation. Hence, there is a need to broaden earlier research findings to Western (low power distance) SME context and to consider the processual nature of innovation. In our study we operationalize innovation as innovative work behavior (IWB), which consists of the initiation, deliberate introduction, promotion, and implementation of novel and useful ideas, processes, products, or procedures (de Jong & den Hartog, 2010).

Thirdly, we will point out boundary conditions to the relationship between managerial coaching and innovative behavior by examining work engagement as a moderator in the relationship. Innovation manifests itself when individuals feel engaged with their work and work engagement represents this positive affective motivational state. Here we draw on the motivational process explained in the job demands-resource (JD-R) theory where a job resource, such as managerial support, leads to work engagement that in turn leads to improved work performance (Bakker & Demerouti, 2007) and to IWB in particular (Kwon & Kim, 2020). In this study, work engagement is "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (Schaufeli et al., 2002: 74).

Our study extends previous research on leadership for innovation by examining an additional potential mediator that has not been empirically investigated and that is theoretically relevant to fostering individual innovation (Kwon & Kim, 2020). In doing so, our study's contribution is not only to increase the understanding of the relationship between managerial coaching and innovative work behavior, but also to provide managers with guidance on enhancing individual innovation in their organization. Thus, in our study we address the question of how managerial coaching influences innovative work behavior in SMEs. Specifically, we bridge the gap between managerial coaching and innovative work behavior by examining the mediating role of work engagement. To achieve our research aims, we collected survey data (N=4418) in 88 SMEs in Finland. Finland provides a particularly apt context for this research because Finnish SMEs have been found very innovative and consequently Finland is among the top five countries leading innovation in the EU (Hollanders et al., 2020).

This article offers two key contributions to advance the development of a theoretical model towards leadership for innovation. First, we show that while MC has a positive effect on all dimensions of IWB (both directly and when mediated by work engagement), the effect is not uniform. Instead, it seems to grow in strength the further the innovation process advances. With these findings our research advances previous literature as it offers an empirical starting point for a

discussion that a single leadership style might not promote complex innovation activities effectively (Rosing et al., 2011). Our research results imply that a variety of leadership behaviors may need to be applied to the different phases of the innovation process (Ancona et al., 2001) and that the appropriate leadership behavior is contingent on the phases of the innovation process. Second, by analyzing the mediating role of work engagement, this study represents, to our knowledge, one of the first attempts to disclose the black box of the mechanism through which leadership, here managerial coaching, can impact the IWB of employees. Hence, we contribute by providing insight to the mechanisms through which managerial coaching is manifested in innovative work behavior.

Next, we examine the literature on the relationship between MC and IWB. We then proceed to the relationship between work engagement and IWB and, finally, we examine the mediating role of work engagement between MC and IWB. Thereafter, we address the methodological questions. Finally, we provide the discussion and conclusion sections incorporating managerial implications, the limitations of this study, and suggestions for future research.

HYPOTHESES DEVELOPMENT

The Relationship between Managerial Coaching and Innovative Work Behavior

There are only a few earlier studies on the relationship between MC behaviors and IWB. A recent study by Ali et al. (2020) found that MC had a positive impact on IWB among 207 employees in software houses in Pakistan. Similarly, the results of a study by Wang (2013) also confirm a positive connection between MC and IWB among 127 R&D employees in Taiwanese companies. In both studies, IWB was measured one-dimensionally and we do not know whether MC is equally impactful in all dimensions of IWB. To summarize, only a few studies exist on the relationship between MC and IWB, and they show a positive connection between the constructs. However, a more fine-grained understanding of the impact of MC on the different dimensions of IWB (including idea exploration, idea generation, idea championing, and idea implementation) is lacking. Thus, we hypothesize:

H1a: Managerial coaching is positively associated with idea exploration.

H1b: Managerial coaching is positively associated with idea generation.

H1c: Managerial coaching is positively associated with idea championing.

H1d: Managerial coaching is positively associated with idea implementation.

The Relationship between Managerial Coaching and Work Engagement

Previous studies have shown that positive leadership styles are connected to work engagement among employees (see Decuypere & Schaufeli, 2020), but research leaning on the MC approach in relation to work engagement is sparse. One of the few examples is a study by Tanskanen et al., (2019) which indicated that there is a positive connection between MC and work engagement. That study presents data on 879 respondents collected from several private or public sector organizations in Finland. However, the positive connection was lost when the effect of LMX was taken into an account. Ladyshewsky and Taplin (2018) in contrast, found a positive indirect relationship from MC to work engagement in a study involving 195 MBA students in Australia. The link was mediated by a positive organizational learning culture. Recently, Zhao and Liu (2020) found a positive relationship between MC and employees' workplace well-being. The sample in that case was 276 participants in a large state-owned company in China. This is relevant since conceptually workplace well-being comes close to work engagement. To summarize, previous studies have found only tentative indications of a link between MC and work engagement. In the spirit of the JD-R model's motivational path, we extend the literature by analyzing a largely underexplored leadership perspective and a potential job resource, namely MC, in relation to work engagement. Thus, we hypothesize:

H2: Managerial coaching is positively associated with work engagement.

The Relationship between Work Engagement and IWB

Some previous studies have investigated the association between employees' work engagement and IWB. Wu and Wu (2019), found a positive relation between work engagement and IWB in their study of 131 supervisors and 263 employees in the marketing department at China Mobile. Van Zyl et al., (2019) showed that work engagement has a positive and significant relationship to IWB measured with three dimensions (idea generation, idea promotion, and idea realization). The study presented data from a group of employees in a global IT company in the Netherlands (N= 3350). Agarwal (2014) similarly confirms the relationship with a data of 323 managers working in manufacturing and pharmaceutical organizations in India. To summarize, the results of previous studies show that work engagement is positively related to IWB, indicating that the more engaged employees are, the more innovative behavior they demonstrate. Thus, we hypothesize:

H3a: Work engagement is positively associated with idea exploration.

H3b: Work engagement is positively associated with idea generation.

H3c: Work engagement is positively associated with idea championing.

H3d: Work engagement is positively associated with idea implementation.

The Mediating Role of Work Engagement

Previous studies support the line of thought that work engagement acts as a mediator between leadership and IWB. Aryee et al., (2012), found that work engagement mediates the relationship between transformational leadership and IWB. They studied 200 employees of a large telecommunication company located in the north-eastern province in the People's Republic of China. Agarwal et al., (2012) surveyed 979 employees in six service sector organizations in India and found that work engagement mediates the relationship between LMX and IWB. Chen and Huang (2016) focused on the charismatic leadership style and found that it impacts a related concept, personal engagement, which further impacts IWB. Their sample included 1,700 different employees from 155 different R&D teams from in Greater China information technology (IT) business. Rahmadani et al. (2020) conducted a study in an Indonesian state-owned agriculture company and gathered 700 responses from the employees. The findings revealed that work engagement mediates the relationship between engaging leadership and IWB. To summarize, previous research has found that work engagement mediates the relationship between different leadership styles (namely, transformational, LMX, charismatic, and engaging leadership) and IWB. Hence, our study also extends our knowledge of the underlying mechanisms for work engagement and IWB. To the best of our knowledge, no study has examined the work engagement as the mechanism through which MC affects IWB, but there is some evidence to support expected connection. We therefore hypothesize:

H4a: Work engagement mediates the positive association between managerial coaching and idea exploration.

H4b: Work engagement mediates the positive association between managerial coaching and idea generation.

H4c: Work engagement mediates the positive association between managerial coaching and idea championing.

H4d: Work engagement mediates the positive association between managerial coaching and idea implementation.

METHODOLOGY

Sample and Procedure

To test the proposed hypotheses, a questionnaire survey method using structured questions was adopted. The questionnaires were distributed to 10434 employees in 88 SMEs representing different industries such as IT, manufacturing (for example metal, wood, and food manufacturing), service businesses (for example cleaning, consulting, health care, and hotel and restaurant businesses), retail (for example sales of cars, hardware, and pharmaceutical products), construction, education, and banking. The size of the companies varies between 20 and 250 employees and they are located in different parts of Finland. Compared to the overall picture of the Finnish SME field, manufacturing companies are somewhat overrepresented in the sample.

According to Statistics Finland, there are 2995 SMEs (employing 11–249 people) in Finland representing 6.8 percent of all companies. They generate approximately 60 percent of the total turnover of companies in Finland. In the twenty-first century, the majority of new jobs have been created in SMEs. According to the European Innovation Scoreboard 2020, Finland is ranked among the top countries when it comes to innovations in products and business processes in SMEs and thus, the context of our study is fruitful from the perspective of innovations.

A sample of 4418 valid cases constituted a response rate of 43 percent. The majority of the respondents (68.8 percent) were male which is an accurate representation of the gender distribution in the private sector in Finland. In terms of position, 84.6 percent of participants were subordinates and the remaining 15.4 percent were in a management role. A total of 64.6 percent of the respondents were blue-collar workers and the rest were white-collars (lower level, upper level and top management). 42.1 percent of participants worked for manufacturing, 16.8 percent for services, 11.0 percent for trade and 30.1 percent for other industries.

The questionnaire was piloted in two phases before the actual data gathering. In the first phase, 9 academics and 11 practitioners from various companies took the survey. In the second phase, the respondents were employees from one company. The study was conducted in accordance with the research ethics guidelines. The anonymity of the participants was guaranteed and they were informed that their responses will be used for research purposes.

MEASUREMENT

Innovative Work Behavior

A ten-item scale from de Jong and den Hartog (2010) was used to measure the dimensions of IWB. All items were reworded from manager ratings to employee self-assessments; that is, participants rated their performance on a 7-point scale anchored with *never* (1) and *very often* (7). The idea exploration dimension was measured with two items, an example item being, *"At your workplace, how often do you pay attention to issues that are not part of your daily work?"* The Cronbach's alpha was .733. Idea generation was measured with three items; an example item being, *"At your workplace, how often do you generate original solutions to problems?"* The Cronbach's alpha was .915. Championing was measured with two items; an example item being, *"At your workplace, how often do you attempt to convince people to support an innovative idea?"* The Cronbach's alpha was .917. Implementation was measured with three items; an example item being, *"At your workplace, how often do you put effort into the development of new things?"* The Cronbach's alpha was .876.

Managerial Coaching

A validated 7-item scale developed by Tanskanen et al. (2019) was used as a measure of MC. The respondents were asked to evaluate their supervisor's leadership activity on a 7-point scale anchored with *strongly disagree* (1) and *strongly agree* (7). Examples of items are *"My manager ensures that everyone is capable of doing their tasks"* and *"My manager facilitates mutual cooperation in the group."* The Cronbach's alpha was .948.

Work Engagement

Work engagement was measured using the Utrecht Work Engagement Scale (UWES) originally developed by Schaufeli, Salanova, González-Romá, and Bakker (2002). For this study, the validated Finnish version of UWES-9 (Seppälä et al., 2009; see also Schaufeli et al., 2006) with a 7-point response scale anchored with *never* (0) and *every day* (6) was selected; an example item being, "*I am enthusiastic about my job."* The Cronbach's alpha was .945.

Control Variables

We used gender, position (manager vs. subordinate), and job status (blue-collar vs. white-collar) as control variables because they have been tested as controls in

relevant studies (for example Chen & Huang, 2016; De Spiegelaere et al., 2015; Lukes & Stephan, 2017; Sarwar et al., 2020). In addition, we controlled industry. For hypothesis testing, the control variables were modified to dummy variables.

Analysis Strategy

The analysis of the data was conducted using SPSS Statistics 26.0 and Amos 26.0 statistical software. Before testing our hypotheses, confirmatory factor analysis (CFA) was carried out to assess the possibility of common method variance and to ensure the discriminant validity of the scales used. Harman's single-factor test and average variance extracted analysis (AVE) were used to further establish the validity and reliability of the scales. Hierarchical regression analysis was used to investigate the hypothesized associations (hypotheses 1a-1d, 2, and 3a-3d). Hayes (2013) PROCESS macro version 3.5 (model 4) was utilized to test the mediating effect of work engagement on the relationship between MC and innovative work performance in terms of exploration, generation, championing, and implementation (Hypothesis 4a-4d). We extracted 5.000 bootstrap samples to obtain the 95 percent bias-corrected confidence intervals (CI) and to examine the statistical significance of the hypotheses.

RESULTS

Analysis of Factor Structure and Common Method Variance

Table 1 illustrates the comparison between the four different CFA structures. First, we analyzed a one-factor baseline model, wherein MC, UWES, and IWB were set to load on a single factor. This model did not fit the data adequately ($\chi 2$ = 55967.91; *df* = 299; *p* <.000; *RMSEA* = 0.205; *CFI* = 0.448; *TLI* = 0.352) as it did not reach the commonly used cutoff values for model fit (Marsh et al., 2004). Second, the three-factor model was specified by setting the loadings onto the respective three factors. Compared to the previous model, the three-factor model ($\chi 2$ = 12034.61; *df* = 296; p <.000; *RMSEA* = 0.095; *CFI* = 0.884; *TLI* = 0.862) showed an improved, albeit still inadequate, fit to the data. Third, the hypothesized six-factor model was specified by setting the loadings of IWB onto the four respective factors. This model was contrasted with the one-factor and three-factor models. The results indicate that the hypothesized model ($\chi 2$ = 6728.63; *df* = 289; p <.000; *RMSEA* = 0.072; *CFI* = 0.936; *TLI* = 0.921) clearly outperformed the previous models.

Table 1. Results of confirmatory factor analyses.

Model	χ^2	df	RMSEA	CFI	TLI
Six-factor model: MC, UWES, IWB-E, IWB-G, IWB-C, IWB-I	6728.63	289	.072	.936	.921
Three-factor model: MC, UWES, IWB	12034.61	296	.095	.884	.862
One-factor model: MC+UWES+IWB	55967.91	299	.205	.448	.352

CFI: comparative fit index; IWB: innovative work behavior; IWB-E: exploration; IWB-G: generation; IWB-C: championing; IWB-I: implementation; MC: managerial coaching; RMSEA: root mean square error of approximation; TLI: Tucker-Lewis index; UWES: work engagement.
"+" denotes two factors merged into one.

Owing to the use of cross-sectional self-report data and collection of all data from the same source, our data is susceptible to common method variance (Podsakoff et al., 2003). Harman's single-factor test was conducted to address the threat of common method variance (see for example Curado, 2018). Table 1 shows the results of the CFA and indicates that the six-factor model showed a better fit than any of the competing models, thus suggesting that common method variance does not pose a problem in our results.

Assessing Validity and Reliability

Our measurement constructs showed high reliability, as the Cronbach's alphas for each scale exceeded the generally accepted level of 0.7. The composite reliability of the constructs (CR) ranged from.759 to.948 (see Table 2), thus exceeding the required threshold of .70 (Hair et al., 2014) and attesting to the strong internal consistency of the constructs.

To assess the convergent validity of the constructs, the AVE was computed for each construct (see Table 2). All the AVE values were above the cutoff value of .50 recommended by Fornell and Larcker (1981). Each factor loading was above the generally accepted level of .50. The discriminant validity of the constructs was assessed by comparing the square roots of the AVE values with the construct correlations. For adequate discriminant validity, the correlations between constructs should be smaller than the square roots of the AVE values. The results shown in Table 2 indicate good discriminant validity and construct independence for each scale.

Table 2. Measurement model summary.

Latent constructs	CR	AVE	Discriminant validity					
			1	2	3	4	5	6
1. MC	.948	.725	**.851**					
2. UWES	.945	.660	.494	**.812**				
3. IWB-E	.759	.618	.081	.278	**.786**			
4. IWB-G	.916	.784	.159	.339	.788	**.885**		
5. IWB-C	.918	.848	.210	.382	.617	.730	**.921**	
6. IWB-I	.879	.707	.269	.470	.641	.819	.860	**.841**

AVE: average variance extracted; CR: composite reliability; IWB-E: exploration; IWB-G: generation; IWB-C: championing; IWB-I: implementation; MC: managerial coaching; UWES: work engagement.
On diagonal: square root of AVE in bold; off-diagonal: correlations between constructs.

Descriptive Statistics

Table 3 shows the means, standard deviations, and correlations between the study variables. All the correlations showed expected direction and were significant at the $p<0.01$ level. The relationship between MC and work engagement was positive (r =.464). Managerial coaching was also positively related to all dimensions of IWB (r. =.060 -.245). In addition, the relationships between work engagement and IWB dimensions were positive (r =.246 -.433).

Table 3. Mean, standard deviation, and correlation for the scale variables.

Variable	*M*	*SD*	Gender	Position	Status	Manufacturing	Services	Trade	MC	UWES	IWB-E	IWB-G	IWB-C
1. Gender [a]	.69	.46	–										
2. Position [b]	.15	.36	.078**	–									
3. Status [c]	.35	.48	-.127**	.485**	–								
4. Manufacturing[d]	.42	.49	.255**	-.023	-.077**	–							
5. Services[e]	.17	.37	-.251**	-.054**	-.068**	-.383**	–						
6. Trade[f]	.11	.31	.048**	.051**	-.030*	-.300**	-.158**	–					
7. MC	4.95	1.42	-.045**	.074**	.067**	-.087**	.142**	-.045**	–				
8. UWES	5.52	1.26	-.120**	.191**	.186**	-.110**	.079**	.015	.464**	–			
9. IWB-E	5.25	1.13	-.003	.185**	.130**	-.044**	-.002	.056**	.060**	.246**	–		
10. IWB-G	4.96	1.21	.113**	.179**	.119**	-.014	-.020	-.013	.147**	.320**	.649**	–	
11. IWB-C	4.32	1.46	.098**	.287**	.217**	-.027	-.019	.019	.194**	.362**	.522**	.672**	–
12. IWB-I	4.63	1.30	.049**	.248**	.194**	-.070**	.022	-.003	.245**	.433**	.529**	.737**	.773**

IWB-E: exploration; IWB-G: generation; IWB-C: championing; IWB-I: implementation; MC: managerial coaching; UWES: work engagement. *$p < .05$; **$p < .01$. [a] (0=female, 1=male), [b] (0=subordinate, 1=manager), [c] (0=blue-collar, 1=white-collar), [d] (0=other industries, 1=manufacturing), [e] (0=other industries, 1=services), [f] (0=other industries, 1=trade).

Table 4. Results of hierarchical regression analyses predicting innovative work behavior.

Variable/	Exploration			Generation			Championing			Implementing		
parameter	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Gender [a]	.000	-.001	.023	.130***	.129***	.160***	.112***	.111***	.141***	.076**	.075***	.111***
Position [b]	.158***	.155***	.125***	.141***	.133***	.093***	-.217***	-.207***	-.168***	-.191***	-.178***	-.131***
Status [c]	.051**	.049**	.029	.063***	.058**	.032	.127***	.120***	.095***	.105***	.096***	.066***
Manufact.[d]	-.017	-.014	-.008	-.047*	-.040*	-.031	-.035*	-.027	-.018	-.077***	-.066***	-.055**
Services[e]	.012	.007	.008	-.002	-.018	-.018	.007	-.012	-.012	.019	-.006	-.006
Trade[f]	.047**	.048**	.042*	-.041*	-.036*	-.044**	-.004	.002	-.006	-.037*	-.029	-.039*
MC		.040*	-.068***		.135***	-.006		.165***	.027		.218***	.052**
UWES			.246***			.321***			.315***			.378***
R^2	.039	.040	.086	.050	.067	.144	.102	.129	.203	.077	.123	.230
ΔR^2	.039	.002	.045	.050	.018	.077	.102	.026	.074	.077	.046	.107
F	27.682***	24.722***	48.066***	35.707***	42.268***	86.438***	77.872***	86.575***	130.589***	57.257***	82.480***	153.434***
ΔF	27.682***	6.726**	202.962***	35.707***	77.637***	369.103***	77.872***	124.712***	382.376***	57.257***	215.842***	570.055***

MC: managerial coaching; UWES: work engagement.
*$p < .05$; **$p < .01$; ***$p < .001$. [a] (0=female, 1=male), [b] (0=manager, 1=subordinate), [c] (0=blue-collar, 1=white-collar), [d] (0=other industries, 1=manufacturing), [e] (0=other industries, 1=services), [f] (0=other industries, 1=trade)

Hypothesis Testing

Table 4 shows the results of the hierarchical regression analysis predicting the dimensions of IWB. The results indicate that MC has a direct positive relationship with each dimension of IWB—exploration (Model 2: β =.040, $p < 0.05$), generation (Model 2: β =.135, $p <$ 0,001), championing (Model 2: β =.165, $p < 0.001$) and implementation (Model 2: β =.218, $p < 0.001$) —after gender, position (manager/subordinate), job status (white/blue-collar) and industry (manufacturing/services/trade/others) were controlled for. This result provides support for Hypotheses 1a–1d.

The results in Table 5 show that MC has a positive relationship with work engagement (Model 2: β =.440, $p < 0.001$) after controlling for gender, position, job status and industry; thus, Hypothesis 2 is supported. Table 4 further illustrates the positive relationship between work engagement and the dimensions of IWB—exploration (Model 3: β =.246, $p < 0.001$), generation (Model 3: β =.321, $p <$ 0.001), championing (Model 3: β =.315, $p < 0.001$) and implementation (Model 3: β =.378, $p < 0.001$)—after gender, position, job status and industry were controlled for. This result provides support for Hypotheses 3a–3d.

The Hayes PROCESS macro was used to test the mediation hypotheses (Hypothesis 4a–4d). The results depicted in Table 6 show that work engagement mediates the relationship between MC and exploration (effect = 0.0866, boot SE = 0,0078, 95 percent bootstrap CI = [0.0714, 0.1024]), thus, Hypothesis 4a receives support. With regard to generation, the findings show that work engagement mediates the relation between MC and generation (effect = 0.1204, boot SE = 0,0086, 95 percent bootstrap CI = [0.1041, 0.1372]) providing support for Hypothesis 4b. For championing, the results show the mediation effect (effect = 0.1426, boot SE = 0,0092, 95 percent bootstrap CI = [0.1245, 0.1607]), and provide support for Hypothesis 4c. Finally, the results show the mediating role of work engagement between MC and implementation (effect = 0.1532, boot SE = 0,0088, 95 percent bootstrap CI = [0.1366, 0.1709]), thus, Hypothesis 4d receives support. Table 6 demonstrates that the mediating effect of work engagement strengthens as the innovation process goes further.

Table 5. Results of hierarchical regression analyses predicting work engagement.

	Work engagement	
Variable/ parameter	**Model 1**	**Model 2**
Gender [a]	-.092***	-.094***
Position [b]	.150***	.123***
Status [c]	.097***	.080***
Manufacturing[d]	-.050**	-.028
Services[e]	.050**	-.001
Trade[f]	.007	.025
MC		.440***
R^2	.066	.254
ΔR^2	.066	.188
F	48.401***	200.213***
ΔF	48.401***	1037.985***

IWB-E: exploration; IWB-G: generation; IWB-C: championing; IWB-I: implementation; MC: managerial coaching, UWES: work engagement. *p < .05; **p < .01; ***p < .001. [a] (0=female, 1=male), [b] (0=manager, 1=subordinate), [c] (0=blue-collar, 1=white-collar), [d] (0=other industries, 1=manufacturing), [e] (0=other industries, 1=services), [f] (0=other industries, 1=trade).

Table 6. Results of the bootstrap for the indirect effects of managerial coaching on innovative work behavior via work engagement.

Indirect effect	**Effect**	**Boot SE**	**Boot LL 95 percent CI**	**Boot UL 95 percent CI**
MC => IWB-E	0.0866	0.0078	0.0714	0.1024
MC => IWB-G	0.1204	0.0086	0.1041	0.1372
MC => IWB-C	0.1426	0.0092	0.1245	0.1607
MC => IWB-I	0.1532	0.0088	0.1366	0.1709

CI: confidence interval; IWB-E: exploration; IWB-G: generation; IWB-C: championing; IWB-I: implementation; LL: lower limit; UL: upper limit; MC: managerial coaching. Gender, position, status and industry were controlled for.

DISCUSSION

The aim of this study was to improve the understanding of the connection between leadership and innovativeness in SMEs where the challenge is to activate all employees to participate in the continual renewal and innovation of the business. Especially, we investigated the connection between MC and employees' IWB, taking four different dimensions into consideration, and particularly examined the mediating effect of work engagement in those connections. As far as we can ascertain, our study is the first to test this model. It surveyed 4418 employees from 88 SMEs in Finland which is considered to be one of the most innovative countries in Europe (Hollanders et al., 2020). To our knowledge, this is the first empirical research on the topic in an SME context.

Our results reveal that MC is positively associated with IWB which reinforces previous observations of MC as a factor in improved employee performance (Huang & Hsieh, 2015; Kim, 2014; Kim & Kuo, 2015) by showing that there is a clear connection between MC and IWB, an increasingly important dimension of job performance (Harari et al., 2016) in SMEs. Our findings add to the few previous studies on the topic conducted utilizing small samples in Asian countries (Ali et al., 2020; Wang, 2013) which offer evidence that the more MC employees experience, the more they exhibit IWB. Although our focus in this paper was not on comparing cultural contexts, it manifests that MC seems to boost IWB also in different cultural environments.

We found that while MC has a positive effect on all dimensions of IWB (both directly and when mediated by work engagement), the effect is not uniform. Instead, it seems to grow in strength the further the innovation process advances. In both cases, the connection is the weakest in the first dimension (idea exploration) and the strongest in the last dimension (idea implementation). We suggest that the increase in impact is due to the nature of the MC approach where the ultimate goal of the manager is always to support employees in exceeding their previous performance level (Hagen, 2012). Concerning the innovation process, the championing and implementation stages manifest innovative performance in a more concrete way than the other two dimensions. They may also be experienced as "harder" work than exploring and generating ideas and therefore managerial support is more necessary in these stages. Typically, the championing stage involves selling the idea to acquire resources or to support it and building a coalition to help move the idea toward realization. The implementation stage usually requires a working team that builds a prototype (whether tangible or intangible) and manages the execution (de Jong & den Hartog, 2010.) These stages necessitate involving more people and managing a plan; something that a lot of

employees could use their manager's help with. Further, idea championing and implementation are closer to team innovation than individual innovation. This interpretation makes sense in light of the activities that a coaching manager engages in, many of which have to do with facilitating collaboration in the workgroup (Hackman & Wageman, 2005; Hagen & Gavrilova Aguilar, 2012).

Further, our results demonstrate that work engagement mediates the connections between MC and IWB. An interesting question is why the positive effect of MC on IWB seems to be stronger through the mediating effect of work engagement than on its own. Innovations rarely happen by accident but demand both motivation and effort from employees (Yuan & Woodman, 2010). Engaged employees tend to use their creative potential compared to those who are not engaged (De Spiegelaere et al., 2015) because they feel stimulated and motivated to devote time and effort at work, they see their tasks as significant and meaningful, and they are fully concentrated (Schaufeli et al., 2002). In so doing, they often have to go beyond their traditional roles and routines which according to the study by Gu, Wu, Li and Evan (2019) is essential for innovation performance in SMEs. These findings broaden our understanding of the motivational process through which managerial coaching leads to the innovative behavior of subordinates.

This study has responded, firstly, to a call by Hughes et al. (2018), who stated that more research on the relationship between leadership and IWB is still needed but that future research should examine actual leadership behaviors rather than styles. In this sense, MC is an especially relevant leadership approach as it particularly illustrates supervisors' tangible activities and behaviors (for example Ellinger et al., 1999; Hackman & Wageman, 2005). Secondly, our study materialized the indications presented by Mesu et al. (2015), according to which a combination of different leadership behaviors, formerly connected either to transformational or transactional leadership, may be the most efficient in SMEs. Based on the previous literature and our empirical results we argue that managerial coaching as a leadership construct combines the important managerial activities needed in modern SMEs seeking efficiency and continuous development and innovation.

Theoretical Implications

Our research offers two key contributions to advance the development of a theoretical model towards *leadership for innovation*. First, prior leadership research has demonstrated the overall effect of leadership actions on employee IWB (Hughes et al., 2018). Further, innovative work behavior has been conceptualized as consisting of several phases (de Jong & den Hartog, 2010; Janssen, 2000; Kleysen & Street, 2001; Krause, 2004; Lukes & Stephan, 2017).

Although it has been suggested that some leadership styles are more conducive to idea generation whereas others enhance idea implementation more (de Jong & den Hartog, 2007), the field still lacks theoretical understanding of the role of leadership in promoting the different stages of innovative behavior (Hughes et al., 2018). Although some earlier studies have suggested that different antecedents could have different effects on the various dimensions of IWB (Hughes et al., 2018; Perry-Smith & Mannucci, 2017), previous research has mostly examined innovative behavior as a one-dimensional concept (Newman et al., 2018; Odoardi et al., 2015; Yi et al, 2019). We add to previous work by showing that while MC has a positive effect on each dimension of IWB, the effect is not uniform. Instead, it grows in strength the further the innovation process advances. By showing this, we extent previous literature as our study offers an empirical starting point for a discussion that a single leadership style might not promote complex innovation activities effectively. Our research results imply that a variety of leadership behaviors may need to be applied in the different phases of the innovation process in SMEs (Ancona et al., 2001). Thus, we extend the leadership literature by suggesting that the appropriate leadership behavior is contingent on the phases of the innovation process.

Second, by analyzing the role of work engagement as a mediator, this study provides theoretical insight about the mechanism that allows leadership to influence the IWB of employees. Although the motivational process depicted in the JD-R theory (Bakker & Demerouti, 2007) has been extensively studied within the leadership research (for example Lee et al., 2019; Schaufeli 2015), the observed effects of leadership on in-role performance outcomes, such as task performance (Breevaart et al., 2015; Christian et al., 2011) or on extra-role outcomes, such as organizational citizenship behaviors (Christian et al., 2011; Salanova et al., 2011) may not be directly applicable to IWB, which according to the latest knowledge cannot be directly classified as in-role or extra-role activities (Kwon & Kim, 2020). Instead, IWB has been said to represent a distinctive form of organizational behavior that is fostered by work engagement. Being a distinctive type of behavior, also the factors influencing it are likely to be different from what has been previously discovered (Kwon & Kim, 2020). Therefore, it is surprising that the role of work engagement as a mediating construct between leadership and IWB has not previously been tested empirically. Therefore, we contribute by providing understanding of the mechanisms through which managerial coaching of supervisors manifests itself in the innovative work behavior of subordinates.

The scholarly discussion on MC in the theoretical framework of the JD-R theory has been relatively sparse so far. The current study particularly illuminates the motivational process explained by JD-R theory, where a job resource (managerial

support among others) leads to work engagement that in turn leads to improved work performance (Bakker & Demerouti, 2007). Among the different physical, psychological, social, and organizational features of the job that can influence achieving work goals, managerial support has proved to be a significant job resource (Bakker & Demerouti, 2007), and previous studies have shown that employees' work engagement boosts IWB (Agarwal, 2014; De Spiegelaere et al., 2015; Kwon & Kim, 2020; van Zyl et al., 2019; Wu & Wu, 2019). We took this line of thought one step further and found that managerial actions and behaviors initiate a motivational process that leads to work engagement and that in turn leads to the IWB of employees. In other words, our study brings us closer to understanding the mechanism through which managers can, through concrete actions, enhance the IWB of their employees.

Practical Implications

The study has important implications for both researchers and practitioners. We believe that one of the most important tasks for organizational researchers is to seek answers to the fundamental question of how the innovative potential of employees can flourish and be utilized in a way that it at the same time benefits both the work engagement of employees and the innovative performance of organizations and SMEs in particular. The more routine tasks are digitalized or automatized, the more human resources will be available to focus on problem solving and innovation. Therefore, understanding how employees can be encouraged to display innovative behaviors is of great importance in SMEs.

The current study should particularly help to build understanding of the dynamics in this construct by showing that managers can impact the IWB of their employees both directly and also through work engagement, and that the impact may be greater on championing and implementing innovations than on the stages of exploring and generating them. This observation suggests that companies must develop MC capabilities to boost work engagement and innovativeness. The findings challenge the HRM function in particular, and not just its leadership development activity. Managers' task descriptions (job design), target setting, rewards, and recruitment are essential HR practices through which MC can be supported in companies. Building leadership that supports IWB must be a strategic choice in an increasing number of SMEs.

Limitations and Future Research

Despite the important contributions of this study, there are of course some limitations that warrant attention. The first relates to the data which albeit based

on a large sample and being well representative from the perspective of Finnish SMEs, is single-source data. Self-report questionnaires create a potential risk of common method variance. Future studies could obtain the measure of MC from subordinates and a measure of subordinates' IWB from the leader. Second, our cross-sectional data does not allow us to draw conclusions on the causal relationships between the constructs. We can only, based on theory, speculate on the form of the connection between MC, work engagement, and IWB. Accordingly, more research, especially of a longitudinal nature, is needed in the future to explore whether there may be contextual factors that impact all three of the constructs simultaneously. Third, our data were collected in SMEs in Finland and evidently do not reflect the situation in other European countries. Considerably more research in different countries would be required to show if the findings from the current study recur in other countries and business contexts.

CONCLUSION

In this study, we examine the role of leadership in enhancing innovation in an SME context. Our study shows that MC is not only an important job resource in SMEs, its importance grows as we move from idea exploration through generation and championing to the implementation of ideas. We also demonstrate the role of employees' work engagement as a mechanism through which managers may enhance the innovative behavior of their employees. Our findings provide significant implications that achieving innovation in SMEs requires the development of managerial coaching. The HR function and company executives must take this into account when making future business plans.

ACKNOWLEDGEMENTS

We warmly thank all researchers who participated in the data gathering: Riitta Forsten-Astikainen, Katja Ekman, Pia Heillman, Jenni Kantola, Susanna Kultalahti, Helena Kosola, Mikko Luoma, Sanna Skyttälä and Timo-Pekka Uotila. We would also like to thank Jussi Tanskanen for his help with the statistical analysis.

This work was supported by Business Finland, the Finnish Work Environment Fund, and the Foundation for Economic Education.

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Are we measuring the innovative work behaviour of the 1980s? A critical review of the measuring instruments

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ABSTRACT

Individual employees' innovative actions are the key to innovations in organisations, and knowing how to support those actions has been of interest to researchers and practitioners alike since the 1980s. In order to answer these types of questions, it is essential that we are able to measure innovative work behaviour accurately. In this study, we question not whether the current measuring instruments are statistically reliable and valid, but whether they measure the innovative work behaviour of the 2020s. We review articles (N=255) published on the topic of innovative work behaviour since the year 2000 to understand what type of research has been conducted in the past 20 years. Our review shows that research on the topic is growing exponentially and that most of it is quantitative research on which antecedents affect innovative work behaviour and how. We then identify which measuring instruments these studies have utilised to measure innovative work behaviour and perform a number of analyses on these instruments (N=13) to see how they have been developed and what, exactly, they measure. The results show that most instruments are based on literature reviews or past instruments and that these ultimately date to research conducted in the 1980s. Given that working life and the role of innovation has changed dramatically since then, we recommend that efforts to develop new measuring instruments based on the previous ones, as well as efforts to give advice on how to enhance the innovative behaviour of employees, be paused until we have ascertained that the innovative behaviours that we try to enhance are the behaviours that are required in working life today. To give future research a starting point, we review the behaviours and dimensions of innovative work behaviour that have been measured so far, also conducting our own analysis of the dimensions.

Keywords: Innovative work behaviour (IWB); individual innovation; measurement

INTRODUCTION

The study of the innovation process and individual innovation has come a long way. In 1984, Rosabeth Moss Kanter attempted to wake up the research field and practitioners to the challenges that were to lie ahead by writing, "[after] years of telling corporate citizens to "trust the system", today many companies must relearn instead to trust their people and encourage them to use neglected creative capacities in order to tap the most potent economic stimulus of all – idea power" (Kanter, 1984, p. 51).

We have heard this call, and today innovation is widely held to be the road not just to superior competitive advantage, but to company survival (Anderson, Potočnik, & Zhou, 2014). Since innovation cannot occur without individual employees engaging in it, researchers have been hard at work figuring out how managers and organisations can enhance the innovative behaviour of their employees (for reviews see e.g. Anderson et al., 2014; Bos-Nehles, Renkema, & Janssen, 2017). Questions such as what type of managerial style (e.g. Bednall, Rafferty, Shipton, Sanders, & Jackson, 2018; Hansen & Pihl-Thingvad, 2019) or HR practices (e.g. Prieto & Pérez-Santana, 2014; Sanders et al., 2018) best support employees in their efforts to be innovative, or what the role of constraints is (e.g. Acar, Tarakci, & van Knippenberg, 2019; Baer & Oldham, 2006), have occupied researchers for years now.

In order to answer these types of questions, it is imperative that we have a way of measuring innovative work behaviour accurately. Hughes, Lee, Tian, Newman & Legood (2018) provided a thorough review of the current measuring instruments, and valuable recommendations for improving them, from the point of view of scale validity and reliability. The question we ask here is, is the innovative work behaviour that we have been measuring, and learning to enhance, the innovative work behaviour of the 2020s? In other words, since learning to tap the idea power of employees, as urged by Kanter, have we in the age of AI, IoT, and numerous other technological advancements, paused to check that the behaviours that we have for years tried to enhance, are current and relevant – the kind that employees should still engage in and that will produce innovations for organisations even today?

In order to answer this question, we undertook the task of reviewing high-impact articles that studied innovative work behaviour between the years 2000 and 2020. We wanted to understand how many studies have looked at innovative work behaviour in the past 20 years, and what kind of studies these have been. We then reviewed all the measuring instruments that were used in these articles and analysed how and where they were developed, and what they measure. Our

purpose here is three-fold. First, we produce a picture of the field of measuring innovative work behaviour: how much and what kind of research is conducted, and which measuring instruments are used throughout the years. Second, we examine the development of the measuring instruments to understand what they are based on, and whether, and how, the scales have evolved over the years. Third, we look at what has been measured: what types of behaviours are included in the measurement scales, and what dimensions have been thought to make up innovative behaviour. We also conduct our own analysis of the dimensions.

We contribute to the discussion on individual innovation and specifically what has been measured and how. Our study raises questions about the extent that the measuring instruments currently in use meet the needs of today's organisations, and will serve as a basis for the further development of a measuring instrument fit for its purpose and the innovation landscape of the 2020s.

BACKGROUND TO THE STUDY

Much debate has taken place lately about the exact definition of creativity and innovation (Anderson et al., 2014; Hughes et al., 2018). In this study we are concerned with innovative work behaviour which is the study of the types of behaviours that employees engage in at work when they innovate. It always includes elements of both creativity and innovation as is evident in the definitions of the concept used by researchers of innovative work behaviour. These definitions commonly encompass at least the generation, introduction, and application of new ideas, products or processes at work (see e.g. de Jong & den Hartog, 2010; Scott & Bruce, 1994; West & Farr, 1990). Innovative behaviours are closely linked to the innovation process in that each stage of the process requires different individual behaviours. Since the innovation process consists of discontinuous activities, individuals generally do not exhibit innovative behaviours in a neat, chronological order but can rather be involved in a combination of behaviours at any given time. (Scott & Bruce, 1994.)

Research on innovative work behaviour can be seen to consist of four streams. The first of these is the (qualitative) study of what innovative behaviours look like. It draws on the work of Kanter (1988) who identified four innovation tasks: idea generation, coalition building, idea realisation, and transfer. We will take a closer look at this body of research in Section 5. The second stream is concerned with measuring innovative work behaviour. Although older measuring instruments exist (e.g. Ettlie & O'Keefe, 1982), the one developed by Scott & Bruce (1994) is the first one to be used more widely to measure innovative work behaviour. We will have more to say about this in Sections 3 and 4. The third stream includes research

conducted on the antecedents to innovative work behaviour and aims to answer questions about what affects innovative work behaviour and through which means it can be enhanced (for comprehensive reviews see e.g. Anderson et al., 2014; Hughes et al., 2018). We are not concerned with what affects innovative work behaviour in this study except indirectly in that the measurement of innovative work behaviour makes this possible. The fourth stream is concerned with the research methodologies employed to study innovation and innovative work behaviour; Hughes et al. (2018) is a prime example of this stream.

Search strategy

We wanted to find two article caches. The first cache was to include all articles that have been published on the topic of innovative work behaviour in the past 20 years. The second cache was to include articles in which the authors have developed currently used measuring instruments for innovative work behaviour.

In order to find the first cache, we conducted searches in two databases (ISI Web of Knowledge, Scopus) for the keywords ”innovative work behavio*” and ”employee innovative behavio*” for peer-reviewed articles from 2000 to mid-September 2020. The search yielded 726 results. These were reviewed against inclusion criteria (published in English in a journal with an impact factor; concerned with individual innovative behaviour and not team/organisational innovative behaviour, innovative outputs or entrepreneurial behaviour), and duplicates were removed. 255 articles remained. Of these, 245 used quantitative research methods, and 10 used non-quantitative research methods.

To produce the second cache, we had to find out how many and which measuring instruments have been used in the past 20 years when measuring innovative work behaviour. We focused on those articles in the first cache that employed quantitative research methods. We read the method sections of these 245 articles and recorded the measurement scale used. 38 different measurement scales were reported as having been used. In order to be sure that our list of measuring instruments was comprehensive, we also read three articles that have previously reviewed measurement scales (de Jong & den Hartog 2010, Lukes & Stephan 2017, Lambriex-Schmidt et al. 2020). Doing this added further seven measurement scales. Altogether 45 measurement scales were found.

The 45 articles cited as having developed a measurement scale were then read. Our aim was to examine scales that have either been purposefully developed for measuring innovative work behaviour or have been popular in the measurement of the concept. Therefore, we defined that the authors of a study had developed a

measurement scale for innovative work behaviour if a) they stated that this was the purpose of their study, or b) the scale had been used in our first article cache by at least one other researcher. Furthermore, we considered only scales that were for the entire construct of innovative work behaviour (or employee innovative behaviour); that is, scales that measured only creativity or idea championing, for example, were not included. Additionally, we did not include build-on scales. For example, a number of articles reviewed reported using a measuring instrument developed by Janssen in 2001, 2003 or 2004. We considered these as building on his measurement scale that appeared in his article in the year 2000 since the later versions of the scale only brought minor alterations to the original scale. After this review, 14 measurement scales remained.

Next, since we wanted to focus specifically on innovative work behaviour (and not, for example, outcome) we looked at the 196 items in the 14 measurement scales and classified them as being a behaviour, trait, product, or environment, following the example set by Hughes et al. (2018). They defined products as "creative ideas generated or innovative outputs implemented"; an example of this is "To which extent have your suggestions been implemented with regards to new information or recording systems" (Axtell et al., 2000). Environment was defined as the features of the organisation where innovation happens; an example is "You are able to apply your own ideas in your work" (Dediu et al. 2018). Behaviour was considered to be *doing* while trait was considered to be *being*, and the items were classified accordingly. An example of a behaviour is "Investigates and secures funds needed to implement new ideas" (Scott & Bruce, 1994) and an example of a trait is "I do not give up even when others say it cannot be done" (Lukes & Stephan 2017). After this classification we disregarded trait, product and environment related items and retained 159 behaviours. One measurement scale (Dediu et al. 2018) was dropped at this stage since it included only items that were classified as relating to the environment. 13 scales remained for analysis.

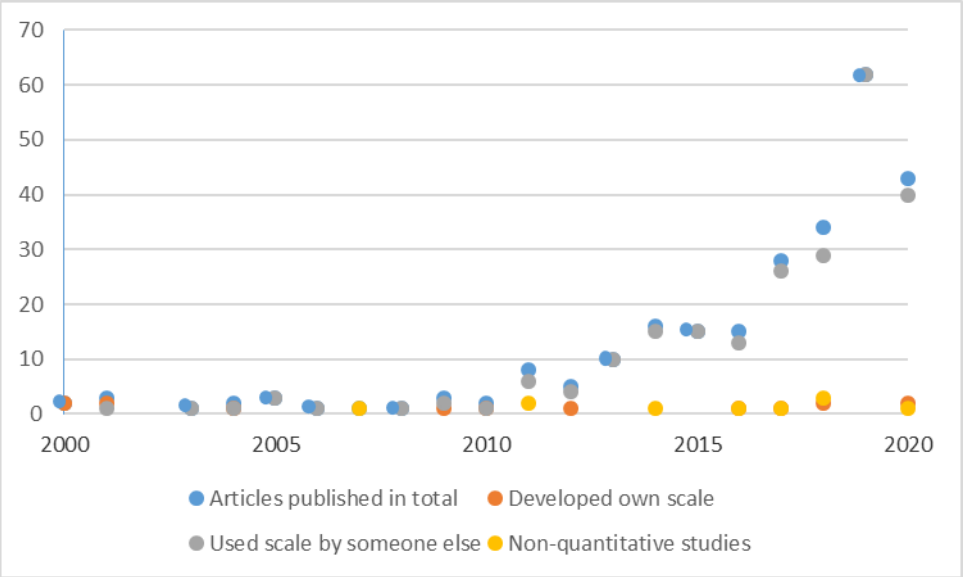
ANALYSIS OF PUBLICATIONS AND SCALE USAGE

In this section we look at two things. First, we analyse the research field in terms of the number of publications and what type they are. Then, we use this data to explore how the 13 scales have been used.

We started our analysis by looking at research conducted in the last 20 years on the topic of innovative work behaviour. As already reported, altogether 255 articles that met the inclusion criteria were published. Of these, 245 used quantitative research methods and ten used other research methods than quantitative; these include five qualitative studies, two conceptual papers, a mixed methods study, a

summary, and a literature review. Of the 245 articles that used quantitative research methods, 14 developed their own measuring instrument and 231 used an instrument that has been developed by someone else. Chart 1 shows the different article types on a timeline.

Chart 1. Types of studies conducted on innovative work behaviour in 2000-2020.



= 245.

Two observations can be made about the chart. First, looking at scale development work, most of it was done in the first ten years of our observation period (2000-2010) when 7 out of 19 studies (37%) on innovative work behaviour was conducted to develop a measuring instrument. In the last ten years (2011-2020) seven instruments were again developed, but this was out of 236 publications (3%). This makes sense as the research field was still relatively young in 2000 and lacked measuring instruments. Interestingly though, most non-quantitative research has been conducted in the latter part of the observation period: nine out of ten non-quantitative studies have been published between the years 2011 and 2020.

Second, the number of articles published on the topic of innovative work behaviour annually remained below ten until the year 2013. We see a clear spike in the chart in 2017 when the number of articles published almost doubles from 2016 (15) to 2017 (28). Indeed, 65% of all research on the topic since the year 2000 has been conducted in or after the year 2017. Looking at these past four years in more detail, the majority of the studies conducted have been quantitative in nature (162 out of

167 studies) and used a measuring instrument developed by someone else (97% of quantitative studies).

The research field is hot. In 2019, 62 articles exploring innovative work behaviour were published; that is five new studies published every month. The field is dominated by antecedent studies (studies of which antecedents impact innovative work behaviour and how) which utilise measurement scales developed by other researchers.

The second analysis centres around this scale usage. 231 articles used a measurement scale developed somewhere else than in the article in question. Table 1 details the usage of the 13 measurement scales in these 231 articles.

Table 1. Scale usage in articles studying innovative work behaviour from 2000 to 2020.

Author	Year	# of times used after development*	First time used	Last time used
Hurt et al.	1977	2	2015	2018
Scott & Bruce	1994	76	2001	2020
Welbourne et al.	1998	1	2019	2019
Janssen	2000	93	2003	2020
Axtell et al.	2000	1	2018	2018
Zhou & George	2001	6	2009	2019
Kleysen & Street	2001	10	2013	2019
Hu et al.	2009	3	2020	2020
de Jong & den Hartog	2010	43	2013	2020
Messmann & Mulder	2012	3	2014	2019
Lukes & Stephan	2017	0	N/A	N/A
Lambriex-Schmitz et al.	2020	0	N/A	N/A
Messmann & Mulder	2020	0	N/A	N/A

*Some articles reported using two scales, hence the total equals more than 231 articles.

Let us first look at the number of times that the scale has been used after its development. We see that the most popular measurement scale is by Janssen from the year 2000. The three most popular scales (de Jong & den Hartog, 2010; Janssen, 2000; Scott & Bruce, 1994) account for 89% of all scale usage. They have retained their popularity throughout the years and were all still used in 2020. The last three scales to be developed have not been used by other researchers yet; and with the scale developed by Messmann & Mulder in 2012 it should be mentioned

that all three uses are by Messmann or Mulder themselves. Therefore, we can say that no scale developed after the year 2010 has gained any popularity.

Most scales have been fairly slow to be picked up by other researchers to use to measure innovative work behaviour. On average, it has taken 9,5 years from the development of a measurement scale until it has first been used. The fastest adoption is with the scale by de Jong & den Hartog (2010) with three years (again excluding the scale by Messmann & Mulder in 2012 which has only been used by the developers themselves). The slowest adoption is with the scale by Hurt et al. (1977) with its 38 years. This scale was again used in 2018; a scale developed 41 years prior to it being utilised to measure the innovative work behaviour of the 2010s. The scale developed by Scott & Bruce (1994) is 27 years old and still used enthusiastically. Even the youngest scale to be used by other researchers, the one by de Jong & den Hartog (2010), is already 11 years old.

All in all, the table paints a picture to be concerned about. The choice of measuring instruments seems haphazard with no regard paid to how old it is. None of the newer measuring instruments have gained any popularity and the adoption rate of a measuring instrument is slow: it takes on average almost ten years for an instrument to be used to measure innovative work behaviour.

ANALYSIS OF SCALE DEVELOPMENT

We asked three questions about the measurement scales: How have they been developed? Where have they been developed? What kinds of scales have been developed?

Development methods

In order to answer the first question of how the measuring instruments have been developed we looked at whether the instrument was developed purposefully or whether it emerged as a bi-product, and what the developers based the instrument on. To first look at the question of purposefulness we identified whether the development of the instrument was the whole or the main purpose of the study, or whether it was a bi-product of some other purpose. To answer this question, we read the articles to see what the authors had stated as the purpose. Of the 13 scales, we classified eight as having been developed purposefully. Of these, five were developed in the past ten years (de Jong & den Hartog, 2010; Lambriex-Schmitz, Van Der Klink, Beausaert, Bijker, & Segers, 2020; Lukes & Stephan, 2017; Messmann & Mulder, 2012, 2020), indicating that there is a drive towards a more purposeful measurement scale development. When it comes to the three most

popular scales (de Jong & den Hartog, 2010; Janssen, 2000; Scott & Bruce, 1994), only de Jong & den Hartog developed theirs specifically to serve as a measuring instrument.

Next, we looked at what the measuring instrument was based on. We read the Methodology section of each article and recorded what the authors stated about the origins of the measuring instrument. The developers of seven measuring instruments based their instruments on literature reviews or previous instruments. Six studies reported having done at least some research prior to developing their measurement scale. In four cases (de Jong & den Hartog, 2010; Hu, Horng, & Sun, 2009; Scott & Bruce, 1994; Welbourne, Johnson, & Erez, 1998) this work was done to ensure that the scale was appropriate for the context and consisted of interviews or meetings with managers or personnel of the company where the questionnaire was later to be administered. None of these studies did general research among a more widespread audience. An exception to this are the two scales by Messmann & Mulder. These are based on their explorative study (Messmann & Mulder, 2011) of the innovative behaviour of vocational teachers.

What emerges from this exploration into the origins of measuring instruments is an upside-down pyramid where measuring instruments developed in the 2010s have been "inspired" by the instruments developed by de Jong & den Hartog (2010) or Janssen (2000) which in turn lean on the work of Scott & Bruce (1994). Scott & Bruce based their measuring instrument on the work of Kanter (1988), and conducted some interviews at the company where the survey was administered to ensure its suitability. Therefore, 11 of the 13 scales under analysis in this study are ultimately based on the work by Kanter on what the innovation process looked like in the 1980s.

The only exception to this are the two measuring instruments developed by Messmann & Mulder. Their scales, however, are based on their observations of the innovative work behaviour of vocational teachers. Even though their measurement scales might show reliability and validity when measuring the innovative behaviours of other industries, the origin of the scales is still good to keep in mind. Vocational teachers inhabit a very different environment from employees in private companies, not least in terms of their goals and responsibilities. Previous research has found that when comparing the public sector to the private sector, different things can be seen to influence innovative behaviours (Bysted & Hansen, 2015). It is possible, for example, that some dimensions of innovative behaviour that are important for employees in private companies are missing from the scales that originate from the study of vocational teachers, or that a dimension carries a lot of weight for vocational teachers but is not of equal importance for employees

in private companies. At the very least, this raises questions about the suitability of a measuring instrument based on the innovative behaviours of vocational teachers to be used in the private sector.

Context of development

The next question was where the scales have been developed. Here we looked not only at the country, but also at the sample: which context, what are the sample sizes, and what is the proportion of men to women. The results are reported in Table 2.

Table 2. Details on scale development.

Author	Year	Context	Sample size*	% male	Country
Hurt et al.	1977	Students and teachers	662	N/A	US
Scott & Bruce	**1994**	**R&D**	**172**	**92**	**US**
Welbourne et al.	1998	Various	653	N/A	US
Janssen	**2000**	**Food**	**170**	**85**	**Netherlands**
Axtell et al.	2000	Manufacturing	149	24	UK
Zhou & George	2001	Manufacturing	149	74	US
Kleysen & Street	2001	Various	225	N/A	US
Hu et al.	2009	Hotel	621	36	Taiwan
de Jong & den Hartog	**2010**	**Knowledge-intensive service firms**	**693**	**66**	**Netherlands**
Messmann & Mulder	2012	Automotive & vocational teachers	628	72	Germany
Lukes & Stephan	2017	Various	2812	N/A	Switzerland, Germany, Czech Republic, Italy
Lambriex-Schmitz et al.	2020	Vocational teachers	440	41	Netherlands
Messmann & Mulder	2020	Various	369	69	Germany

*Sample size of main study not including the pilot.

What we were looking for in this table is overreliance on any one country, context, gender, or inadequate sample sizes; any of these may skew the development of the measurement scale. When looking at the picture overall, these seem fairly well in balance. The only thing to comment on is that Europe and the US dominate when it comes to the country, and that only one study included a cross-cultural sample (Lukes & Stephan, 2017). However, when looking at the three most popular scales (highlighted in the table) we see some reason for concern. Firstly, these studies have been conducted in the US or in the Netherlands. Secondly, the scales by Scott

& Bruce and Janssen have some of the lowest sample sizes. Thirdly, the samples in all studies are heavily skewed towards the male population; in all cases, 66% or more of the sample were men, and in the case of Scott & Bruce, this figure goes to 92%.

Types of scales developed

The last question in this section concerns the kind of scales that have been developed. Here we looked at the Likert scales used and how the items were formulated.

Table 3 presents the findings on the types of scales that have been employed by the measurement scales. In order to find out what the researchers were thinking that they measured, we categorised the Likert scales according to what they measured. The overwhelming majority – 12 out of 13 scales – measured the extent or frequency with which the respondent engaged in the activity in question. Within these, there were different nuances of frequency; for example, one scale asked whether an activity was characteristic of the respondent (Zhou & George, 2001). Some scales asked whether the respondent was in agreement with a statement, from strongly disagree to strongly agree (e.g. Hu et al., 2009). Despite the nuances, the overall question still referred to how often the respondent engaged in said activity. Here, the logic seems to be that an employee can be considered innovative if they display innovative behaviours frequently.

Only one scale used a different approach and measured how skilled the respondent is in the behaviour in question. Contrary to the scales highlighting frequency, here it is considered that an employee is innovative if they are "excellent" at coming up with new ideas (for example), regardless of how often they produce new ideas. At least one other measuring instrument (but one that did not meet the criteria for inclusion in this study) has also conceptualised innovative work behaviour as a set of skills or competencies (Birdi, Leach, & Magadley, 2016). This raises the question of what is important in innovative work behaviour: frequency of behaviours, or with what quality the innovative activities are conducted? And if we start thinking about innovative behaviours as skills or competencies, could employees be trained to be more innovative and if so, how? In any case, this is a question that needs to be brought to the foreground. We will return to this in Section 6.

Table 3. Set-up of measuring instruments.

Author	Year	Likert scale	Low end	High end	Instructions or sample item	Measures
Hurt et al.	1977	7-point	strongly disagree	strongly agree	I seek out new ways to do things.	Extent/Frequency
Scott & Bruce	1994	5-point	not at all	to an exceptional degree	Please rate each of your subordinates on the extent to which he or she…	Extent/Frequency
Welbourne et al.	1998	5-point	needs much improvement	excellent	Coming up with new ideas	Skill
Janssen	2000	7-point	never	always	With what frequency do you engage in the behaviours listed below?	Extent/Frequency
Axtell et al.	2000	N/A	N/A	N/A	To which extent have you proposed changes to…	Extent/Frequency
Zhou & George	2001	5-point	not at all characteristic	very characteristic	Suggests new ways to achieve goals or objectives	Extent/Frequency
Kleysen & Street	2001	6-point	never	always	In your current job, how often do you…	Extent/Frequency
Hu et al.	2009	6-point	strongly disagree	strongly agree	At work, I come up with innovative and creative notions	Extent/Frequency
de Jong & den Hartog	2010	5-point	never	always	How often does this employee…	Extent/Frequency
Messmann & Mulder	2012	6-point	does not apply at all	fully applies	Asking critical questions	Extent/Frequency
Lukes & Stephan	2017	5-point	fully disagree	fully agree	I try new ways of doing things at work	Extent/Frequency
Lambriex-Schmitz et al.	2020	6-point	does not apply	fully applies	To what extent do the following work activities apply to you?	Extent/Frequency
Messmann & Mulder	2020	6-point	never	very often	How frequently did you carry out the following activities in the last 3 months?	Extent/Frequency

ANALYSIS OF DIMENSIONS

In this section we look at the dimensions of innovative work behaviour that have been identified in the measurement scales. We examine how many dimensions the 13 measuring instruments have conceptualised and measured, and what these dimensions are. We also conduct our own analysis of the behavioural items to see which dimensions could be separated when looking at the items from all the measuring instruments.

Number of dimensions

To start, we identified how many dimensions were conceptualised and measured in the 13 measurement scales that we have analysed. The results can be seen in Table 4.

Table 4. Dimensions in measuring instruments.

Author	Year	Dimensions conceptualised	Dimensions measured	# of items
Hurt et al.	1977	1	1	20
Scott & Bruce	1994	3	1	6
Welbourne et al.	1998	1	1	4
Janssen	2000	3	1	9
Axtell et al.	2000	2	2	6
Zhou & George	2001	1	1	13
Kleysen & Street	2001	5	1	14
Hu et al.	2009	1	1	14
de Jong & den Hartog	2010	4	1	10
Messmann & Mulder	2012	5	4	30
Lukes & Stephan	2017	6	6	20
Lambriex-Schmitz et al.	2020	5	5	44
Messmann & Mulder	2020	4	1	8

Firstly, we see that in most measuring instruments more than one dimensions have been conceptualised and that after the year 2010, this has been the case for all of them. However, only four studies measured innovative work behaviour multi-dimensionally. This seems to indicate that while many researchers see the need to separate innovative work behaviour into two or more dimensions, we do not yet know enough about what these dimensions are, or have not been able to capture the behaviours that describe these dimensions with enough clarity so that it would result in reliable measurement.

Dimensions identified by scale developers

Next, we conducted our own analysis into the dimensions by coding each item in the 13 measurement scales. We did this first in order to not be guided by the dimensions that the scale developers had distinguished. However, for the clarity of this study, we present first the dimensions that the scale developers themselves have identified. These results can be seen in Table 5.

We can see a lot of agreement in the dimensions. While Scott & Bruce (1994), Janssen (2000) and Axtell et al. (2000) saw the initial, creative phase as one dimension, all other scale developers since then have separated it into two dimensions (exploration and idea generation) with the exception of Kleysen & Street (2001) who saw three dimensions. All scale developers bar Axtell et al. (2000) have identified a dimension that has to do with involving other people in the development of the idea, and getting approval for it. This dimension has typically been called championing or promotion, although Lukes & Stephan (2017) saw this dimension as being separated into two to consist of idea communication and involving others.

The opinions of the scale developers become more dispersed when talking about the final stages of the innovation process where the idea comes to fruition. Four developers (de Jong & den Hartog, 2010; Janssen, 2000; Kleysen & Street, 2001; Messmann & Mulder, 2020) see this as one dimension, interchangeably called idea realization, application, or implementation. Three developers (Lambriex-Schmitz et al., 2020; Lukes & Stephan, 2017; Messmann & Mulder, 2012) distinguish two dimensions in this stage, bringing forth behaviours related to reflection, implementation-starting activities, overcoming obstacles, and making the idea sustainable.

Table 5. Dimensions of innovative work behaviour as distinguished in the measurement scales.

Scott & Bruce	1994	Idea generation			Idea promotion		Idea realization	
Axtell et al.	2000	Idea suggestion			Idea implementation			
Janssen	2000	Idea generation			Idea promotion		Idea realization	
Kleysen & Street	2001	Opportunity exploration	Generativity	Formative investigation	Championing		Application	
de Jong & den Hartog	2010	Idea exploration	Idea generation		Idea championing		Idea implementation	
Messmann & Mulder	2012	Opportunity exploration	Idea generation		Idea promotion		Idea realization	Reflection
Lukes & Stephan*	2017	Idea search	Idea generation		Idea communication	Involving others	Implementation starting activities	Overcoming obstacles
Lambriex-Schmitz et al.	2020	Opportunity exploration	Idea generation		Idea promotion		Idea realization	Idea sustainability
Messmann & Mulder	2020	Opportunity exploration	Idea generation		Idea promotion		Idea realization	

Overall, then, there is most agreement on there being four dimensions in innovative work behaviour: exploration, generation, promotion/championing, and realization/implementation. That there should be agreement is not surprising, given that most scale developers have based their items and/or dimensions on the work of previous scholars, as we have already seen. The first stages of the process are well-researched; exploration and generation in the creativity literature (e.g. Amabile, 1988; Shalley & Gilson, 2004) and promotion/championing in the product champion literature (e.g. Howell, Shea, & Higgins, 2005). There is the least agreement on what happens in the realization/championing phase. This may be an indication that we do not have enough clarity yet around what happens when an idea has to be implemented.

Analysis of dimensions

Lastly, we believed that it would be valuable to conduct our own analysis of the behaviours that previous measuring instruments have identified, and see which dimensions we were able to distinguish. Looking at all the 159 behaviours allowed us draw a more detailed picture of the dimensions than individual scale developers have been able to do, since they may only have been looking at six or twelve behaviours.

The analysis was done by two experts in innovation research. Using a list of the 159 behaviours drawn from the measurement scales, the experts independently coded each item, first grouping all items that dealt with the same behaviour (e.g. "Promotes and champions ideas to others" which featured in several scales word by word, and "Push ideas forward so that they have a chance to become implemented" were grouped together to form a sub-dimension). The agreement between the experts on item-level was 62%. This was mostly due to perceived ambiguity in the item descriptions; for example, does the respondent think that the item "Searches out new technologies, processes, techniques, and/or product ideas" implicitly continues with "in order to solve a problem" or "in order to keep up-to-date in one's field"? However, both experts had distinguished the same six broader themes, or dimensions. Table 6 shows the dimensions, sub-dimensions, number of items in each sub-dimension, and example items.

Table 6. Dimensions of innovative work behaviour as distinguished in this study

Sub-dimension	# items	Example item
Recognising opportunities to innovate	11	Look for opportunities to improve an existing process, technology, product, service or work relationship
Re-defining/questioning the problem	6	Define problems more broadly in order to gain greater insight into them
Experimenting with new ways of doing things	4	I try new ways of doing things at work
Improving existing processes, methods, products	14	When something does not function well at work, I try to find new solution
Generating new ideas	14	Generating original solutions for problems
Finding new applications for existing solutions	1	Discussing broader applications of the implemented idea with colleagues outside your team
Persuading others	20	Attempt to convince people to support an innovative idea
Involving other people	11	When I have a new idea, I look for people who are able to push it through
Securing approval & funds	6	I look for and secure funds needed for the implementation of new ideas
Developing plans	7	Develops adequate plans and schedules for the implementation of new ideas
Defining criteria	2	Defining criteria of success for the realization of the idea
Evaluating ideas	4	Evaluate the strengths and weaknesses of new ideas
Turning ideas into practice	10	Working to implement new ideas
Communicating on progress	3	Reporting regularly on the progress of the realization of ideas
Identifying & solving bottlenecks	8	Work the bugs out of new approaches when applying them to an existing process, technology, product or service
Evaluating & monitoring progress	5	Assessing the progress while putting ideas into practice
Taking risks	1	Take the risk to support new ideas
Keeping up-to-date	12	Keeping oneself informed about new concepts/insights within one's professional field
Networking	13	I try to get new ideas from colleagues or business partners

Grouping like behaviours together produced 19 sub-dimensions. We did not worry about having "enough" items in each sub-dimension but rather on the distinctiveness of the items. Thus, we ended up with two sub-dimensions that only have one item: finding new applications for existing solutions, and taking risks. Incorporating these into any of the other sub-dimensions would not have done justice to the distinctiveness of the items. They also provide food for reflection; where do these items originate, and do they bring up aspects of innovative behaviour that are emerging or that have been undervalued in the past?

The 19 sub-dimensions made up six broader dimensions. Four of these are the already reported dimensions that have been identified by many of the scale developers: idea exploration, generation, promotion/championing, and realization/implementation. The value of adding sub-dimensions is that the dimensions become richer: we see more clearly what types of behaviours are included in each dimension. We found that the *exploration* dimension has to do with recognising opportunities to innovate and looking at the problem from different angles so that new aspects can emerge. It also included an element of experimenting. The next dimension is called *idea generation* by many researchers. We chose to call it *developing solutions* to better reflect the fact that the purpose of the innovator is not so much to generate random ideas but to develop a solution to a problem or a challenge that s/he has identified (Taalbi, 2017). In this dimension, the behaviours are related both to generating new ideas, and improving existing processes. This also includes the previously mentioned sub-dimension of finding new applications for an existing solution. Instead of always looking for a solution, it is also possible that one already has a solution and looks for other uses for it. The third dimension is *promoting ideas or solutions*. Here, three types of behaviours are present: involving other people (in order to e.g. discuss the idea further); persuading other people to support the idea; and securing approval and funds (usually from managers). Finally, the *execution* dimension (often called implementation) has also been identified before. We found it to consist of communicating on progress, identifying and solving bottlenecks, evaluating and monitoring on progress, and turning ideas into practice. We noted that the last behaviour is rather vague, and it could be useful to do a deep-dive into whether more specific behaviours can be found.

We also found two dimensions that have not been pre-eminent in past literature on the dimensions of innovative work behaviour. The first of these is the planning dimension. We found altogether 13 items and three sub-dimensions that were related to *planning the execution*, and this seemed to us to be distinct enough from the execution dimension, seeing that the behaviours involved were very different

from the ones in the execution dimension. These behaviours were related to developing plans and schedules, defining criteria for success, and evaluating the ideas and solutions developed in order to see which were worth moving forward with. The second dimension has to do with *building a capacity for innovation*. This dimension is not related to the innovation process but rather to the person's efforts to ensure that they are able to innovate. The dimension consists of behaviours related to being willing to take risks, to keep up to date with one's field (for example by attending trainings or reading up), and to networking in order to both get new ideas from colleagues, customers or business partners, and to know people with whom one can brainstorm ideas with, or involve in executing the plan.

We now have a good picture of what we have been measuring when we have been measuring innovative work behaviour. Introducing sub-dimensions gives us a broader understanding of the types of behaviours that are involved in the innovation process. Our aim has not been to produce a definitive categorisation of innovative behaviours in the workplace but rather to offer one interpretation of the dimensions of innovative work behaviour.

DISCUSSION

Today at the very latest, while in the midst of a global pandemic, we are faced with the absolute necessity to innovate. Employers, managers, and organisations have woken up to realise that in a world where their entire reason for being – their customer base, their product line – might vanish overnight, innovative thinking and behaviour are the lifeblood of a surviving organisation. Equally key is knowing how to feed that behaviour; what kind of managerial support is needed, what kind of HR practices best enhance it, and how jobs can be recrafted so that they foster innovation are but a few questions that we have been looking to answer, and indeed in many cases, have already answered.

But asking and answering these questions is pointless unless we are certain that the innovative behaviour that we have been examining and measuring is the innovative behaviour that employees exhibit, or should exhibit, in organisations today. This is where we have let our practitioners down. In our quest to speedily deliver advice on how innovation can be fostered we have neglected to examine the most fundamental concept of the entire equation: that of innovative work behaviour. We have based our measuring instruments on the work of Kanter and Scott and Bruce without realising that this means that we have been delivering advice on what kind of managerial support or HR practices foster the innovative work behaviour of their time; the 1980s.

In this study we have contributed to the understanding of how innovations can happen in organisations by examining the core concept of innovative work behaviour. We have looked at what kind of research, and how much, is conducted on the topic. We have analysed what we have been measuring (the behaviours), and what we have been measuring it with (the measuring scales).

We found that the study of innovative work behaviour is almost entirely synonymous with the study of which antecedents affect innovative work behaviour, and how. In the past 20 years, the study of innovative work behaviour itself consists of a handful of conceptual and case studies. Yet, the research field has been growing exponentially for the past few years and in 2019, over 60 new studies on innovative work behaviour were published. These are mostly studies on the antecedents to innovative work behaviour and they have been conducted most likely using one of three measurement scales (de Jong & den Hartog, 2010; Janssen, 2000; Scott & Bruce, 1994). There are several issues with these scales. Only the one by de Jong & den Hartog was developed purposefully to serve as a measuring instrument; the other two scales, by Janssen and Scott & Bruce, were born as a bi-product of another study. These two scales also suffer from an overreliance on males in their samples, and the samples were fairly small. All of the three most popular scales ultimately base their understanding of what innovative work behaviour looks like and what should be measured on the work of Kanter (e.g. 1988).

The analysis on the types of behaviours and dimensions of behaviours that are typically measured showed that there is considerable agreement that innovative work behaviour is a multi-dimensional concept. Most commonly, four dimensions were distinguished: idea exploration, generation, promotion/championing, and realization/implementation. However, most (nine out of 13) scale developers ended up measuring innovative work behaviour one-dimensionally, and the four that did measure multi-dimensionally reported difficulties relating to the dimensions. This is a clear indication that we do not understand innovative work behaviour enough yet. We contributed to this understanding by analysing the 159 items from the 13 measurement scales and created sub-dimensions for all of the six dimensions that we were able to distinguish. As a result of this, we were able to bring depth to the four common dimensions in use; instead of the rather vague *implementation* we now understand that this includes behaviours related to turning ideas into practice, communicating on progress, identifying and solving bottlenecks, and evaluating and monitoring progress. We also identified two dimensions that have not commonly been distinguished but which were clearly separate from the four often-used dimensions. These dimensions included behaviours related to planning the implementation of the idea, and building a

capacity for innovation. However, we do not intend for these dimensions to be used to develop a new measurement scale for innovative work behaviour. Instead, we present a snapshot of what types of dimensions we have been measuring so far. The task going forward is to observe whether this picture truly reflects the innovative behaviour of the 2020s; whether these behaviours still make up innovative work behaviour, or whether some behaviours should be added, removed, or their focus or weight changed.

Based on our analyses, we strongly suggest that we return to the roots and conduct research on the concept of innovative work behaviour; not what affects it but what innovative behaviours look like, and what types of innovative behaviours are required in organisations today that produce innovations for the organisation. We should also stop developing measuring instruments that are based on previous literature or measuring instruments as this will only lead to measuring the innovative behaviour as it looked like 20, 30, or even 40 years ago.

Specifically, we suggest that future research on innovative work behaviour should:

1. Openly and curiously explore what innovative behaviours look like at work. Different types of qualitative studies should be utilised to get a broad picture of what the innovation process looks like today, and what behaviours are associated with the different stages.
2. Be done in several contexts to span both the public and the private sector, different industries and a mix of genders.
3. Have cross-cultural samples.

Only once we know how employees behave when they innovate, can we then develop a measuring instrument that measures the innovative work behaviour that organisations want and need their employees to exhibit. Such a measuring instrument needs to attend to the question of what produces innovations: frequency of innovative behaviours or the skill with which the activities are conducted. In other words, should the Likert scale ask "how often do you generate new ideas to a problem" or "how skilled are you at generating new ideas to a problem"? Previous measuring instruments have leaned towards measuring frequency, perhaps as a proxy given that measuring someone's level of competency is difficult. Yet the key is obviously which option produces the desired outcome; do frequent innovative behaviours produce innovations for the company, or do you need to be skilled at innovation in order to do so? The goal for all of these endeavours should be to equip the practitioners with as accurate and reliable knowledge about how to foster innovative behaviours in their employees as possible.

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Insights into the individual innovation process: Updating prevalent understanding

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ABSTRACT

This paper examines individuals' experiences of their innovation process. The aim is to gain deeper insight into the features of individual innovation and thereby update the prevailing theoretical understanding of the concept of individual innovation process. To achieve this, the paper uses a qualitative single case study approach. A systematic data-driven analysis of 34 semi-structured interviews - conducted in an agile product development environment - showed that at the team member level, the individual innovation process consists of six activities: identifying needs, managing constraints, developing solutions, testing, evaluating, and implementing. The paper extends previous understanding by zooming in on the individual experience and highlights the previously unidentified role of individual agency in the innovation process. The study contributes to innovation and management literatures by challenging the current understanding of how individuals innovate, and how this process can be managed.

Keywords: individual innovation process; innovative work behaviour (IWB); individual agency; agile innovation

INTRODUCTION

The individual innovation process lies at the heart of organisational innovation. Recent discussion on the microfoundations of organisational performance supports this argument and emphasises that the individual-level examination needs to be employed in explaining why organisational-level phenomena occur (Felin, Foss, & Ployhart, 2015). Ryan et al. (2018) have raised individual-level elements, such as choice, agency, characteristics, cognitions, and abilities that serve as building blocks for a collective phenomenon (such as organisational innovation) to occur. Therefore, understanding the individual innovation process is crucial in explaining how and why innovations take place in organisations; it is, after all, the individuals who come up with innovative ideas and implement them (Scott & Bruce, 1994). We argue that to support innovative behaviour as one of the employee behaviours that are essential to an organization's success (Černe, Hernaus, Dysvik, & Škerlavaj, 2017), we need to understand what employees understand by innovation and how they implement it in their own work. To address these issues, we need an understanding of how innovations emerge as part of everyday work. Therefore, we use a microfoundational lens (Ryan et al., 2018) and give full attention to the activities of individual agents in an attempt to understand how organisational innovation takes place (Barney & Felin, 2013).

In some of the earliest work on individual innovation, Rosabeth Kanter explored four innovation tasks which *"correspond roughly (but nowhere near exactly) to the logic of the innovation process as it unfolds over time"* (Kanter, 1988, p. 96). The tasks are generating ideas, building coalitions, realising ideas, and diffusing knowledge in order to commercialise the product (Kanter, 1988). Later, Hughes et al. (2018) analysed the definitions of innovation that researchers have commonly used. Their literature review showed that the individual innovation process has been seen to consist of five phases: problem recognition, introducing and modifying new ideas, promoting them, and implementing these ideas. Scott & Bruce (1994), Janssen (2000), and de Jong & den Hartog (2010), among many others, have since built on the work by Kanter to develop measuring instruments that allow the examination of the relationship of different determinants to innovation. Prior research is indeed strongly focused on looking at the antecedents (Anderson, De Dreu, & Nijstad, 2004), and hence, we today have quite a lot of research evidence about the factors influencing innovation (e.g., Anderson, Potočnik, & Zhou, 2014; Hughes et al., 2018). However, due to the dominance of explanatory research settings, the definitions and measures of the individual innovation process have been taken as a given, and thus the true nature of the process has remained obscured.

What this means is that the current knowledge of these innovation "tasks" or indeed the whole individual innovation process still lies on the shoulders of Kanter. Kanter herself (1984) has described the organisational environment of the 1980s as one where managers have to learn how to harness the creative energy of the employees, after years of telling the employees to do as they were told, and similar ideas are echoed by Van de Ven (1986). Now that the employees have had forty years of bringing their innovative spirits to work, it is time to examine what, if anything, this experience has done to the individual innovation process.

To meet our research goal, we conducted an interview study at a MNC in the technology industry. The interviews were held with members of an R&D unit who have worked following agile principles since 2018. We purposefully set out to examine a typical innovation case (such as an R&D unit) to see whether, and how much, the innovation process has changed since the work conducted by Kanter; to find a black swan (Flyvbjerg, 2006; Popper, 2005), if you will. We predicted that an agile team would be a particularly fruitful context for our study, given that agile methods have been hailed as the biggest advancement in innovation in 30 years (Cooper & Sommer, 2016). We reasoned that studying the innovation processes of members of such a team would give us an up-to-date picture of how employees innovate in modern organisations. Additionally, although it has long been understood that agile teams lie at the heart of the success enjoyed by employing agile processes, the people side of the innovation process has largely remained unexplored (Grass, Backmann, & Hoegl, 2020). Our aim is to answer this research question: How do individual team members experience their innovation process in an agile environment?

The data consist of 34 semi-structured in-depth interviews and 24 hours of observing various agile sprint events. The results of the analysis, in which the Gioia methodology was used, show that the individual innovation process differs significantly from how it has been depicted in literature so far. The most notable changes are that a promotion phase is missing from the process, and that managing constraints has emerged as a big and important task for innovators. Additionally, we observed that the role of the individual is that of an active, competent and self-aware agent.

The study contributes to existing literatures in four ways. First, it fills a much-needed gap in the research by examining qualitatively how the innovation process unfolds at the individual level. Second, by conducting an in-depth analysis of how individuals innovate for the first time since the 1980s, we offer radically new insights into the individual innovation process. Third, we show that the individual has a lot of power in the innovation process and is an active and participating agent

in it. Fourth, by showing that at least in one context the innovation process is significantly different to how current measuring instruments operationalise the concept, we raise questions about the suitability and accuracy of the instruments for modern use.

THEORETICAL BACKGROUND

Creativity and innovation have been much-studied topics in management studies and organisational psychology for decades and their exact definitions still raise a debate in research literature. Traditionally, creativity has been seen as the generation of new ideas (Amabile, 1988), and innovation has included both the generation of ideas and their application (West & Farr, 1990).

In some of the earliest work on individual innovation, Rosabeth Kanter found four innovation tasks which individuals engage in when they innovate (Kanter, 1988). These tasks are idea generation, coalition building, idea realisation, and knowledge diffusion (Kanter, 1988). Since then, different tasks have been suggested. Scott & Bruce (1994) and Janssen (2000), for example, differentiated between three phases: idea generation, promotion, and implementation. De Jong & den Hartog (2010) separated idea generation into exploration and generation to end up with four phases. Five (Kleysen & Street, 2001) and even six (Lukes & Stephan, 2017) phases have been proposed.

Hughes et al. (2018) coded the definitions of creativity and innovation from 154 articles and found that researchers have often divided five different stages in the innovation process: problem recognition, introducing new ideas, modifying or adapting new ideas, promoting them, and finally implementing these ideas. An individual who recognises a problem may spot a chance for improvement or a threat that requires attention (de Jong & den Hartog, 2010). The idea that is introduced as a response to the problem may be entirely new (i.e., creative) or new to the context, for example through combining and reorganising information (Kanter, 1988). Modifying an idea involves clarifying and making improvements to it (Perry-Smith & Mannucci, 2017). Promoting an idea requires that the individual finds support for it and gets the right people involved (Howell, Shea, & Higgins, 2005). When an individual implements an idea, it is turned into business-as-usual (Kleysen & Street, 2001).

Anderson et al. were in 2004 concerned that the field of innovation research had become populated by replication-extension studies and lacked theory-driven studies, and by critiquing the state-of-science of innovation research aimed to create some distress in the community to provoke more innovation in innovation

research (Anderson et al., 2004). We were curious to find out whether their advice had been heeded and to this end, the first author conducted a systematic literature review on the topic of innovative work behaviour – which is the term commonly used when referring to the individual innovation process (Anderson et al., 2014) – focusing on articles published in the last 20 years. The results (which are reported in detail in an as-yet unpublished paper) showed that 96% (245 out of 255 articles) of all research published on the topic of individual innovation process fall under the replication-extension category. Two empirical studies had been conducted. The first (Bos-Nehles, Bondarouk, & Nijenhuis, 2017) examined leadership behaviours that lead to innovative work behaviour in subordinates. The second (Messmann & Mulder, 2011) looked at individual-level innovation and how and why employees innovative. However, their study was conducted among vocational teachers, and comparing public sector and private sector innovation is not without its issues (Bysted & Hansen, 2015). The other 8 studies, which were not replication-extension studies or empirical studies, were literature reviews, summaries, or conceptual papers.

The 245 quantitative articles published in the last 20 years have explored the effects of different leadership styles (e.g., Bednall, Rafferty, Shipton, Sanders, & Jackson, 2018), HR practices (e.g., Bos-Nehles, Renkema, & Janssen, 2017), knowledge management (e.g., Battistelli, Odoardi, Vandenberghe, Di Napoli, & Piccione, 2019), and organisational climate (e.g., Shanker, Bhanugopan, van der Heijden, & Farrell, 2017), to mention but a few different types of determinants. To do that, they utilise a measurement scale for innovative behaviour. The most likely used scales are the ones developed by either Scott and Bruce (1994), Janssen (2000), or de Jong and den Hartog (2010); in the systematic literature review it was found that these scales were used in 89% of the studies published since the year 2000. These three measuring instruments, along with the other, less often used instruments, were developed based on literature reviews – usually referring to the empirical work conducted by Kanter (1988) into the four innovation tasks that individuals undertake – and/or using other measuring instruments as the starting point. What this means is that studies conducted today into which factors affect the individual innovation process measure an outdated version of the innovation process because the scale that is used is based on how individuals innovated in the 1980s. Even the newest scale (de Jong & den Hartog, 2010) falls victim to this as it was developed mainly by making improvements to the existing scales; not by conducting a thorough examination of how employees innovate.

To sum up the issues that we discovered with the study of individual innovation processes, there are three major concerns. First, although studies are being conducted continuously on the factors that affect the innovation process, this is

not the same as knowing more about the process itself, given that quantitative research (which is being predominantly conducted) cannot shed light on the process, only on which factors correlate with it and how. Second, the measurement scales used for these quantitative examinations are mainly based on previous literature and not on in-depth exploration on what the individual innovation process looks like. Third, there are no such explorations conducted in the private sector since the year 2000; in fact, it appears that the last time the individual innovation process was looked at in any detail was in the 1980s.

Working life, however, has changed tremendously in the past 40 years. Kanter herself (1984) has described the organisational environment of the 1980s as one where managers have to learn how to harness the creative energy of the employees, after years of telling the employees to do as they were told. The Hudson Institute predicted that employees in the 1990s should know how to read and understand directions, and to do basic math such as adding and subtracting (Johnston & Packer, 1987). Today, robots perform many of the jobs where such skills are needed, and humans are increasingly needed for tasks that require more advanced cognitive skills and cooperation with other people (such as creativity and complex problem solving) (Manyika et al., 2017).

Therefore, there is a need to re-examine what the individual innovation process looks like in organisations today. We chose an agile R&D context for two reasons. First, as our aim was to find whether the individual innovation process still looks the same as it did in the 1980s, we purposefully wanted to study an R&D setting as these were often the object of study in the work leading to the development of measurement scales (Scott & Bruce, 1994; de Jong & den Hartog, 2010). Studying the same context would allow us to make comparisons more easily. Second, very little research has so far been conducted on the people side of the agile innovation process (Grass et al., 2020). This is surprising, given that the individual team members are given such prominence in executing scrum (Cooper & Sommer, 2016). The fact that the human factors are important in the agile model has been brought up by Grass et al. (2020) and their framework for the innovation process at team-level is an important addition to the research literature. Malik, Sarwar, & Orr (2021) showed statistically that team autonomy and agile communication lead to team innovative behaviour. However, as far as we are aware, research on agile innovation processes at the individual level has been scarce.

METHODOLOGY

Research context

The research utilises a single case study which is an appropriate methodology for exploring an intricate phenomenon in a specific context (Yin, 2014). We use a qualitative single case study approach to examine an individual's experience of their innovation process. An intensive case study was chosen as a research strategy for our study because the intention is to delve deeply into one case (Yin, 2014). By utilizing an intensive case study and a variety of data sources, we aim to examine individual innovation in its naturalistic context (Eisenhardt, 1989; Piekkari, Welch, & Paavilainen, 2008). Case study is an appropriate choice for our study where we aim to build new perspectives on existing theory based on qualitative empirical evidence (Eisenhardt, 1989). Although much research already exists on the concept of individual innovation process that it has generally been taken as mature theory research where surveys are used to add specificity to what is already known about the concept, we have argued that there is reason to believe that what is known needs to be re-evaluated, making nascent theory building an appropriate aim (Edmondson & McManus, 2007). For that, qualitative, open-ended data that require interpretation is the best starting point (Edmondson & McManus, 2007).

The case company is a large MNC in the technology industry that manufacture physical products. Agile has increasingly been adopted by such manufacturers operating in the B2B market (Cooper & Sommer, 2016). Agile was developed as a response to the needs of organisations to stay innovative and competitive in a fast-paced, changing environment. In situations with complex problems, unclear solutions, and changing project requirements, agile teams are well-suited to navigate the uncertainty and produce innovative products, services, or business models (Rigby, Sutherland, & Noble, 2018). Agile can be defined as the ability of the project team to change the project plan as a response to changes in customer or stakeholder needs or markets, to achieve better performance in an innovative and dynamic project environment (Conforto, Amaral, da Silva, Di Felippo, & Kamikawachi, 2016). It achieves this using agile methods, the best-known of which is probably scrum. In scrum, self-organising and cross-functional teams deliver work in time-boxed increments called sprints, continuously modifying and developing the product based on feedback (Schwaber & Sutherland, 2020). The teams are empowered, meaning that decisions are taken at the level where there is the most knowledge about the issue at hand (Rigby et al., 2018).

One of the R&D units operating in the agile model since 2018 was chosen for the study. It is typical of manufacturers of physical products to modify agile practices

to suit their needs (Cooper & Sommer, 2016) and indeed, we found that the R&D unit had significantly changed many of the agile-scrum elements based on feedback from the teams. Sprints (time-boxed work efforts which deliver an increment of the product) had been lengthened to approximately 12 weeks from the original 2-4 weeks. Stand-ups or scrums (short daily meetings for reviewing progress and problems) took place weekly rather than daily and lasted for 40 minutes. An additional weekly meeting called technical coffee had been added to facilitate knowledge transfer. The individual team member was highly empowered to execute towards the project goals, self-directed, and working closely with other team members. The scrum master, originally a leadership role for facilitating the work of the agile team, was a team member role in the case company, working alongside other team members on core tasks.

Data collection

34 semi-structured interviews were conducted in two batches: the first in February and March of 2020 and the second in March of 2021. The interviews lasted between 25 and 120 minutes, averaging approximately 50 minutes. Agile team members, product owners, management, and HR were represented in the interviews to get a diverse perspective from different functional areas and positions (Eisenhardt, 1989). An inventory of the participants is presented in Table 1.

The aim of the interviews was to talk about the everyday work of the interviewees and the role of innovation in it. The interviewees were asked questions around three themes. First, the informants were asked how they define innovation. Second, they were asked how their innovation process usually unfolds (e.g., how do they come up with the idea; what do they need to do to get it implemented). The last theme focused on what factors help or hinder the employees' innovation process (e.g., what do you find challenging about innovating at work; what kind of things help you innovate).

Additionally, the two authors observed various sprint events (e.g., stand-ups, retrospectives, and technical coffees) for 24 hours. This allowed us to observe, among other things, the social interaction in the workplace. The authors documented the observations as field notes.

Table 1 Participant inventory.

Interview ID	*Role at time of interview*	*Classification in study*
1	Development manager	Product owner
2	Scrum master	Task team
3	Product manager	Product owner
4	Component expert	Task team
5	Component expert	Task team
6	Method expert	Task team
7	Automation expert	Task team
8	Product manager	Product owner
9	Component expert	Task team
10	Scrum master	Task team
11	Innovation manager	Management
12	Simulation expert	Task team
13	Product manager	Product owner
14	Program manager	Management
15	Project manager	Management
16	Director	Management
17	Component expert	Task team
18	Operational excellence manager	Management
19	Purchasing expert	Task team
20	Innovation manager	Management
21	Agile coach	Team-external
22	Component expert	Task team
23	Product manager	Product owner
24	Component expert	Task team
25	HR director	HR
26	Scrum master	Task team
27	Scrum master	Task team
28	Business unit manager	Management
29	Component expert	Task team
30	Product manager	Product owner
31	R&D director	Management
32	Scrum master	Task team
33	Component expert	Task team
34	HR manager	HR

Data analysis

All 34 interviews were transcribed in verbatim. Qualitative content analysis was used to understand the contextual meanings (Eriksson & Kovalainen, 2016) and to search for the data extracts reflecting individual innovation process. The analysis process was strongly data-driven. Data coding was conducted in NVivo.

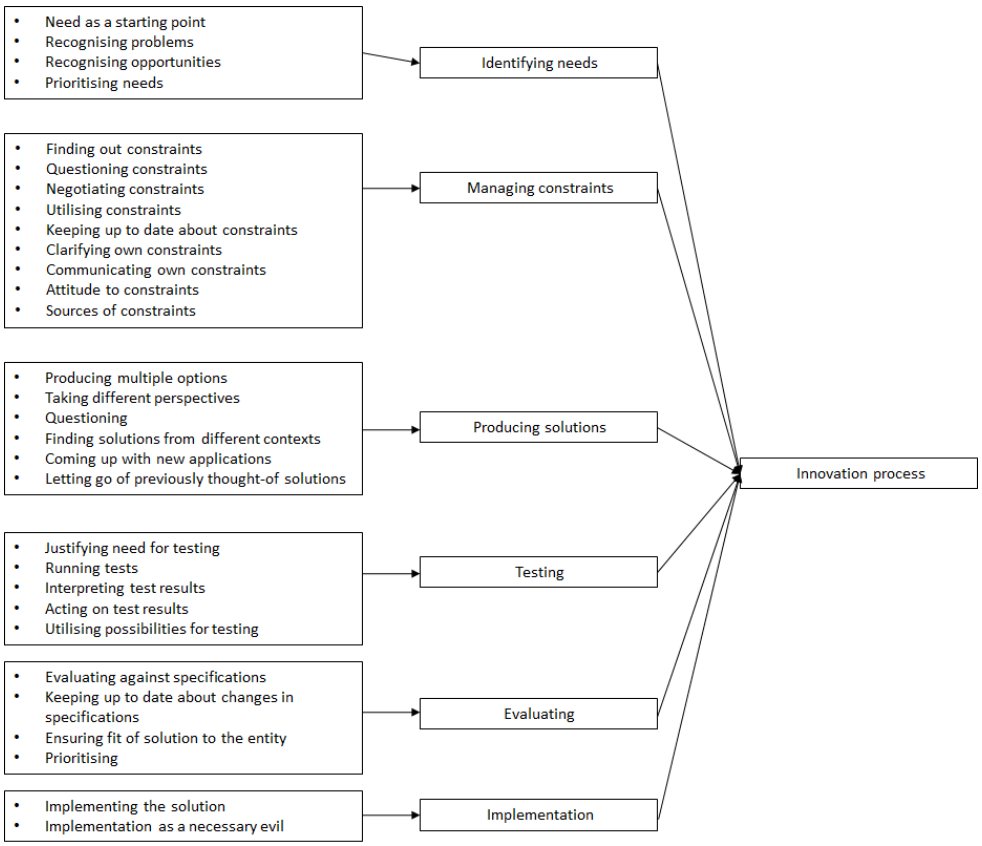

Figure 1 Data structure.

Guided by Gioia, Corley, & Hamilton (2013), we grouped the codings into first-order concepts. The second-order themes followed naturally once the first-order concepts were labelled and led into the aggregate dimension. The resulting data structure is depicted in Figure 1.

RESULTS

The purpose of this study was to understand how individuals experience their innovation process in an agile environment. In our analysis, we noticed that the answers of the interviewees at the management level differed somewhat from the answers of the interviewees at the team member level. The most notable differences were in the definition of innovation and the fact that interviewees at the team member level barely talked about the need to promote their ideas, and interviewees at the management level at least occasionally did refer to such a need. We decided at this point that we would focus our analysis on the team member level to get a better understanding of what the process looks like for them. Our fear was that if we used data collected from respondents with different understandings of what innovation means, we would have to generalise some aspects of the analysis to reconcile the answers of team members and managers together and would lose some of the details in the process. Therefore, we have based our analysis of the innovation process on the 17 interviews conducted with respondents at the team member level. However, all 34 interviews, as well as the field notes, were used to contribute to our understanding of how individuals innovate at the case company.

At the team member level, we observed six activities that individuals engage in: identifying needs; managing constraints; producing solutions; testing; evaluating; and implementing. These steps do not follow each other in a linear fashion – as has also been suggested in previous literature (e.g., Scott & Bruce, 1994) - but instead the process proved to be fluid and iterative. Therefore, we decided to call these *activities* instead of *phases* to steer away from suggesting that one activity would necessarily follow from the previous one.

Activity 1: Identifying needs

That innovation always starts with a need was evident in the interviews. Hughes et al. (2018) called this *problem identification*, and the activity that we identified is very similar in nature. However, the interviewees in our study often used the word *need* and distinguished two types of needs: problems and opportunities. A problem is something that you have to solve (for example, because a part will break when used unless you make it stronger), and an opportunity is something that would be beneficial to solve, but it is not mandatory (for example, the performance of a part could be improved; however, it will work well even if you do not).

Needs come to the attention of the individual in three ways. First, they can be given to them, often by management such as in giving goals for sprints, or by other teams

when they discover that an adjacent part needs to be fixed as a result of changes made to other parts. Second, needs can also be recognised by the individual, for example during simulation. Interviewee no 26 said about recognising needs:

> *They are always pretty obvious, something breaks or the performance of something has to be improved. (…) It comes straight from the calculations.*

In both of these two cases, the role of the individual is quite reactive. However, a third, more active role also emerged in the interviews: one where the individual actively observes the environment to look for opportunities for improvement. Regardless of how the needs enter the individual's radar, they make decisions about which problems deserve attention and which need to be tackled first. There are often difficulties or irritations involved in this step. First, telling apart problems and opportunities is not always clear-cut, as interviewee no 29 explains:

> *It's not terribly easy [to tell which tasks I have to do and which are nice-to-do]. Sometimes I think to myself, "how important is this" and I think, "not terribly important", then someone else comes and says, "why didn't you do that" and I'm like, "umm, well that was… I thought it's not important". So sometimes I do get it wrong.*

Second, the need for active decision-making is also shown by the fact that even when it is clear that something is a problem (i.e., it has to be solved), it may have to be de-prioritised, as interviewee no 32 explained:

> *I have zero time [to work on something that is nice-to-do but not necessary]. At the moment there is just no time. Maybe with some things you even have to turn a blind eye [and hope] that maybe it'll do.*

Activity 2: Managing constraints

Managing constraints is an activity that has been missing in previous literature on the individual innovation process; however, our interviews showed clearly that constraints are a big and important part of innovating. By constraints, we mean conditions that limit the possible solutions to the identified need. We observed two main sources of constraints. The major defining limitations were set at the beginning of the project by management and sales, and these were, at least from the individual team member's point of view, non-negotiable. They set the framework for the project and included such constraints as how much the project can cost and what the legal requirements are. They appeared to have stayed relatively fixed throughout the project although their priority order could change,

causing alterations to the teams' plans, sometimes on short notice. Interviewee no 32 expressed it as follows:

> *The current way of leading this project causes toing and froing. […] We have to change something just because it's discovered that we can save a couple of hundred.*

Most constraints that the individuals dealt with on a day-to-day basis came from the other teams. Because of the nature of their work, the different parts that the teams work on and are responsible for, are all interconnected to form an entity. Changing one thing in one part almost invariably causes a need for changes in another part, or several parts. Therefore, managing constraints came across as a big part of an innovator's job and one that was talked of by all interviewees.

The individual's role in managing constraints starts as soon as a solution to a need is required. First, it is necessary to find out what the constraints are. Although constraints are partially predetermined and fixed, they also have some room for manoeuvring. Second, individuals actively influence the outcome by questioning the constraints and negotiating as much freedom as possible for finding the optimal solution. Interviewee no 23 described this step like this:

> *If there is a ready solution from those who ask for something, I think in general in R&D we don't like that situation but instead we want to know what this product is supposed to do and not what the product should look like or which colour it's supposed to be but we would rather start with that it must be able to do this and this. […] And that gives us the freedom to innovate and find new solutions that we wouldn't otherwise have really thought of.*

Most interviewees' attitude to constraints was accepting; it was understood that it is good to have constraints as long as there are not too many of them. Some even noted that they can take advantage of constraints to create something that might even be better than if there had not been any constraints in the first place, as interviewee no 31 described:

> *When I'm in a situation where I'm missing half the solutions, I usually like it when I just see what I've got and I innovate with that and it turns out pretty good but no one could've guessed that you could do it like that.*

Keeping others and oneself up to date about current constraints was also recognised as an important part of the phase. Actively communicating on any changes as soon as they took place had become a best practice with the agile way

of working, as it was recognised that all changes have repercussions for other teams and their members, as interviewee no 12 explained:

> *Before this project, when we didn't work in an agile way, it could happen that you did calculations for a month and wrote a report and then when you showed people that here are the results, it could happen that things had already changed, designers had changed the design and when you had the results they were already old. […] Now we basically… as soon as we have some results we communicate them, before we start working on any reports because, just so that we don't work on something for nothing.*

In addition to learning about and negotiating on others' constraints, team members also had to clarify for themselves what their constraints are exactly, and communicate these to other teams. The individual agency appears in the following quotation, where interviewee 22 describes the work:

> *What the planning days are good for is that we can let the other teams know what our constraints are and we can force them to prioritise their work so that we get what we need. So it's a sort of negotiation, we can make our needs more visible.*

Activity 3: Developing solutions

The next activity combines both ideating solutions and modifying them. The interviewees talked about this activity as such a rapid back-and-forth process that it made little sense to try to separate the two. Furthermore, it was taken as a given that one has to modify ideas and accept that others do it do. Interviewee no 32 is adamant about it:

> *You cannot be too possessive of your first idea. You should understand it yourself that you have to refine it and come up with other alternatives. It's one of the basic skills of an R&D engineer.*

Developing solutions was described as the fun part of the process, giving the interviewees a sense of satisfaction and reward. Most of our interviewees are male engineers from Finland who are generally quite taciturn in nature, but even their eyes brightened and they turned almost eloquent when they talked about having found a solution to a tricky problem, as interviewee no 26 demonstrates:

> *It's a nice feeling of accomplishment when you think of something that you can do better. If it's not taking it too far, I might even say that it makes me happier.*

When coming up with solutions, four main sources of ideas emerged: own expertise and interest; internal and external social contacts; "innovation accidents", as explained below; and building on existing solutions. When the solutions are the product of one's own thinking process, the innovator's own expertise and interest are valuable sources of innovative ideas, as interviewees no 24 and 30 describe:

> *This is a fairly technical position, and I would say it is an advantage if the other interests, not only around work but also other interests, are focused on technical matters, be they cars or motorcycles etc. Yes, it also supports the work-related issues, if let's say the wrench stays in hand somewhat, it helps me at least a lot.*

> *I watch YouTube a lot. Because YouTube has all the latest things. […] They have this thing where you can watch five of the latest inventions and I watch them and then I try to force a connection between what I just watched and what I'm working on. Figure out how to apply it.*

The above quote embodies an individual's initiative and genuine interest in engines and technology, so that the interest is inherent in leisure activities that may boost innovative behaviour in the work context as well. Some interviewees highlighted such very active individual agency. More common than working on solutions on one's own, however, was describing it as a social process. Interviewee no 26 experiences it like this:

> *When I think of times when I have innovated, it was in the beginning when our group had coffee breaks, coffee table discussions and that's when we threw around ideas and they matured over time and then we returned to the coffee table to discuss them. (…) We didn't have to do anything; what we innovated on, it wasn't given to us as a task. But we had discovered a problem.*

Coffee breaks (which, incidentally, the Finnish employment law stipulates) were mentioned in virtually every interview as a major source of new ideas and as places where ideas are discussed together with colleagues with no rush. Such leisure moments with colleagues over a cup of coffee create a favourable space for the development of new ideas and innovations. In general, personal contacts and social interaction are important for idea generation, as interviewee no 33 says:

> *I talk a lot and with everyone and I think that that's a good quality although not everyone likes it. Time is wasted but it also gives you the contacts that you need. […] Personal relationships are important. I've got some good ideas when I've talked to turners about how we can improve the situation. But if this work is outsourced, it's much more difficult.*

Building social networks that nurture one's creativity is important for innovation to occur but can also seem like a waste of time, as described above. Building and maintaining social contacts partly depends on the individual initiative and activity, but a social network can also develop at the initiative of the employer. Such important networks can also be company-external. Interviewee no 12 sees cooperation and interaction with competitors or university partners as a useful source of new ideas:

> *If we get people from different areas, for example from a university, we get all of these people in the same room and especially into a sauna, it's just on a completely different level when you have many perspectives on the same topic.*

As highlighted in the context of coffee breaks, the quote above also emphasises the importance of informal interaction free of agenda and schedules. Such interaction creates a favourable space and ground for the emergence of innovative ideas. Our findings indicate that sometimes solutions can also come about by accident without deliberate intention to innovate. Interviewee no 33 talked about one such incident:

> *Someone had drawn the graph wrong because he had understood it incorrectly. We others, we saw that it's not correct what he has drawn but actually, it gives us another advantage.*

Such "accidental innovation" can also come about as a result of brainstorming, perhaps to utilise test time, as is the experience of interviewee no 23:

> *There's always a bit of competition about the test times because there's always so much that should be tested. But we'd got some test time and we realised that we'd have time to test some other things as well than just the one we'd got the test time for. So we sat down and we listed ten other possible things that we could test. And we came up with several good ideas that we've had great use of over the years.*

Innovations do not often arise in a vacuum, but their emergence requires exposure to social interaction, as also the above quote illustrates. Finally, solutions can be

built on existing solutions. This seems to be fine when it is not mandated but is seen as killing innovation when that is the expectation. Interviewee no 32 illustrates:

> *It's very rarely that you have to start from scratch. Usually there is always something [you can start with], and even if that is completely new to us, it's a starting point. […] A designer never really thinks of something completely new. We use existing blocks and we rearrange them in a new way. […] But when the orders from management are such that we should copy the old and cheap parts instead of developing something new, and there is a huge time pressure to boot, that in my opinion explains why we are less innovative than before.*

A significant but sometimes underestimated innovation and a different way of ideating solutions is coming up with new applications to existing solutions, as interviewee no 33 recalls doing:

> *Pretty often it's so that when a new technology becomes familiar we find new uses for it. For example, we realised that these solenoid valves are so easy and cheap that although we first only used them in hydraulics we discovered that we can also use them in pneumatics.*

Activity 4: Testing

In the environment where we conducted the interviews, it is essential to test the proposed solutions before they are implemented. The R&D team works on big and expensive products and new parts always have to be tested before they are implemented into the actual product. The tests can either be calculations and simulations (on computer) that are less expensive and easier to organise, or testing the actual physical product which can cost in the tens of thousands of euros. These types of tests often require that a solid business case is built for why the solution should be tested. Often tests are good for identifying needs to work on, as interviewee no 29 finds:

> *You notice in the test results or when you're doing the testing that "oh it works like this, that's not how it was supposed to work" or "it'd be better if it was like this".*

Once the tests are run, the results are interpreted and acted on. Two things stood out here. First, the tests usually generate a lot of information and the interviewees expressed a desire to spend some time going over the results and reports but often lack the time. Here, too, interviewees show active agency by describing how they

would like to pause by the test results and spend more time reviewing them. Second, getting to test the parts that they have been working on is almost a reward in itself as it makes the results of the work a degree more concrete and creates a sense of accomplishment. Interviewee no 26 talks about both:

> *We should have time to look over the test results but we don't. At the stage when we have to become more efficient users of time it is exactly those moments that are cut and a meeting is put in their place. But to have those moments when you can look at the calculations in peace, that would be the best way to develop the product and solve problems before we ship the product to the customer.*

> *There have been some moments of accomplishment. I especially remember getting to see the first version being tested at Christmas and it all looked good. It made me feel like I had succeeded technically, that this might actually turn out good.*

Activity 5: Evaluating

Evaluating takes place continuously in the process: needs, constraints, and solutions all need to be evaluated. Evaluating is a particularly important element of testing due to the scarcity of testing times or resources; knowing which ideas to bring forth for testing eliminates unnecessary work from everyone. The individual can play their part by producing more than one solution so that the evaluation can be done between several competing ideas. Interviewee no 32 thinks of it like this:

> *It would be good if we worked on also other concepts than just the one that we try to push through to the finish line. We should have several different concepts and then in a certain phase we shoot down some of them for rational reasons.*

This "shooting down" is sometimes done by a party external to the team (such as the management group), but often the individual team members with their social network play a big role, too, as interviewee 22 relates:

> *Especially if there are two or more people you already try out those ideas whereas if you're alone then you go, "does this even make sense, should we even test this". But when there's two of you and you decide together that this should be tested, it removes some of the doubt.*

Evaluation also occurs after a solution has been implemented. Here, ensuring that the solution fits the entity is of particular concern, as interviewee no 32 demonstrates:

> *You have a problem, such as part A needs to be connected to part B. And then there's a third part that needs to be put on top of these. It's an entity, it's rare that you can just think about one part. And how do you connect all of these parts together in a way that makes the most sense – it might require that you find a new solution to a totally different part that you weren't looking at in the first place, but the other parts require you to make changes to it. You have to be able to look at the entity.*

Activity 6: Implementing solutions

I'd say that most of our work is executing. Maybe we innovate for 20% of the time in the beginning and the rest is just [regular work]. It's a necessary evil.

> The quote from interviewee 22 is a typical one. The interviews provided a detailed picture of the other four activities but when it came to implementing, it was brushed off with a comment about it being "just work". We did not probe into this because we were interested in the interviewees' own experience of what makes up innovation. While they expressed that implementation is necessary, it was the phase that interested them the least.

Individual agency in the innovation process

Throughout, we observed the active role that the individual takes in managing the innovation process. In this section, we summarise the findings related to individual agency.

Agency was evident in four actions that the individual takes to ensure that their process is smooth and efficient. The first of these actions is the *active pursuit of inspiring social interaction*. We have highlighted above that the individuals experienced the innovation process as highly social, and having trusted, smart colleagues around were seen as beneficial in almost all steps of the process. The interviewees described being active in seeking out colleagues who are not only knowledgeable but also constructive in their interaction style, and also in forming new connections. Interviewee no 22 says:

> *I take the time to call people to just chat. It may not be efficient use of my time right then, but I've found that other people are essential for my innovation process.*

Individual capability and desire for social interaction appeared as cornerstones of innovative behaviour throughout the innovation process. This emphasis on social aspect is not surprising, as the agile method is based on close contact and involvement of project staff. A particularly interesting observation, however, was that in addition to the ability to forge close contacts the interviewees also displayed a strong desire to actively engage in social interaction; even to the detriment of efficiency, as the quote above shows.

Product development innovation appears to be strongly constructed through cooperation between different experts, as one of the interviewees (no 29) put it: *It is about doing things together, juggling ideas between colleagues*. Thus, bringing about innovation requires many levels of social capability. In a product development project, a member of the team collaborates not only with colleagues within his own team but also with experts outside the team. There is also contact with colleagues in other organizational units, for example sales, not to mention parties outside the organization such as suppliers and customers. Successful cooperation in this kind of network requires the ability to communicate both from a purely technical point of view and through more informal interaction.

When we observed weekly meetings and other project events, we noticed an appreciative way of communicating between colleagues. Disagreements cannot be avoided when a group of passionate experts come together. However, the style of interaction we observed reflects an appreciation of the others' knowledge and contribution. We observed expressions such as "thank you", "congratulations" and "well done" frequently at the project team meetings.

The second action relates to *ensuring appropriate cognitive abilities*. Developing one's skills was quite common and was often done by own initiative through reading books and articles, attending trainings or workshops, or consuming information online, such as watching YouTube videos. As well as being an activity often done alone, it could also be done socially, as interviewee no 12 mused:

> *If we get people from different areas, for example from a university, we get all of these people in the same room and especially into a sauna – it's just on a completely different level when you have many perspectives on the same topic.*

Besides actively developing their skills, the interviewees also demonstrated *being highly observant of their environment*. Critical and open attitude towards their surroundings, whether work-related or leisure activities, appeared to be one of the factors supporting individual innovation. It was interesting to note how individuals described exposing themselves consciously to situations and experiences (also outside work context) that support their innovativeness. Such an active detection and exploitation of learning opportunities maximized their chances to have an "innovation accident". Interviewee no 32 put it as follows:

> *It's a good thing if you work with your hands on your spare time. Then you can also factor in how something can be assembled or disassembled when you are designing the product. It gives you an eye for things like how much space you need for your hands when you're using a wrench or something.*

Third, the interviewees described being extremely *self-aware of how they innovate* and what makes them more efficient at innovating. Although many reacted to our questions with a *"I haven't thought of this before",* they demonstrated having subconscious knowledge of what works for them. This could relate to, for example, the kind of brainstorming partner that works best for one's innovation process. Interviewees no 31 and 23 had opposing ideas of who they like to talk to when innovating:

> *I have this one person that I talk to, he's more theoretical [than I am] and likes to shoot down my ideas and I have to try to come up with good arguments from the start so that he's not able to shoot them down. It's so important to have someone to talk to, otherwise it's difficult to come up with new ideas.*

> *Imaginative, positive people who see opportunities instead of limitations; that's who I want to talk to.*

Finally, we observed that it is important that the individuals *believe in their ability to innovate*. Here is where we saw the greatest difference between interviewees at the management level and team level. We saw this as relating to their different definitions of innovation, as illustrated by these excerpts from a manager (interviewee no 28) and a team member (interviewee no 4):

> *[Innovation] is made up of small victories. The way I see it, everything that I do here and we do in this unit, it takes an enormous amount of small victories, small discoveries and so on. There's no such thing as too small. […] I came up with great innovations last week. (Manager interview)*

> *We use technology that has been working well and we optimize it a little bit when needed. It's not like we are inventing a Mars rocket that hasn't been here before. Basically, we pick the best [parts] we already have and put it together. There is limited potential for innovation. (Team member interview)*

DISCUSSION

Theoretical implications

In this paper we respond to the need to study the innovation process in-depth at the individual level (Felin et al., 2015), thus strengthening the theoretical understanding of the neglected people side of the innovation process (Grass et al., 2020). Our research builds theoretical understanding by delving deeply into an individual's experience of the innovation process. In this section, we elaborate on the theoretical contributions of our study.

To start with the innovation process, it has previously been thought to consist of five phases; see Figure 2 for a visualisation. The individual first recognises a problem to be solved. Next, ideas are generated and then modified before they are promoted within and outside the organisation. The last phase is implementing the idea. (Hughes, 2018.) Our study shows that this may not be an accurate picture of the innovation process any longer. Next, we will go through what changes we observed in the process in more detail.

To start off, Hughes et al. (2018), along with many other researchers, describe *phases* or *stages* in the innovation process. We feel this suggests a consecutive nature in the process when in fact, the innovation process is often described as cyclical and involving "two steps forward for one step backwards plus several side steps" (Anderson et al., 2014, p. 1299). We also observed first-hand that the process evolves more in cycles than in consecutive steps. Therefore, we decided to drop *phases* for *activities* which is a more neutral term. To be fair, there is always some degree of consecutiveness; solutions can hardly be implemented before they have been thought of. However, we decided to make this change in terminology to finally reflect the fact that an individual can engage in several different activities at once without implying that one step should necessarily follow from the previous one.

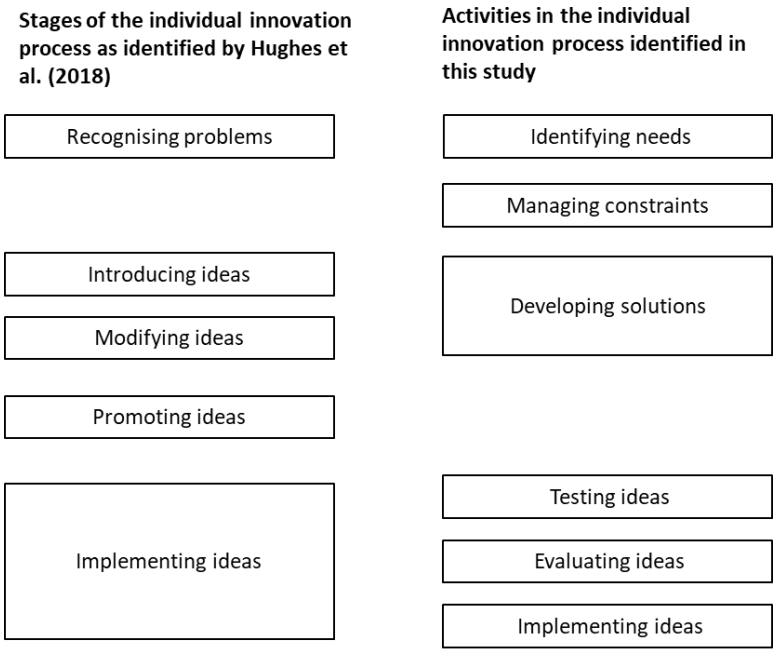

Figure 2 Comparison of the innovation processes conceptualized by Hughes et al. (2018) (left) and this study (right).

Our analysis showed that the innovation process always starts with a need; one does not come up with ideas from thin air but as a response to something that benefits the organisation. This is in line with previous literature (e.g., West & Farr, 1990; Janssen, 2000). We decided to use the term *need* instead of *problem* (as has been done previously) to highlight the fact that there are two types of needs: problems and opportunities. Clearly differentiating the two allows for discussion on whether organisations are only interested in one or the other; whether it is as easy to spot opportunities as it is problems, and whether the innovation process looks the same in organisations with many problems to solve as opposed to organisations that have fewer problems and more opportunities, to name a few interesting topics.

The next activity that we identified is constraints management. While previous research has found that there are many constraints that affect the innovation process (Acar, Tarakci, & van Knippenberg, 2019), managing them has not been identified as a phase or an activity before. Stakeholder management comes conceptually close to constraints management in that it is various stakeholders who bring these constraints to the table. Indeed, stakeholder engagement in innovation is a growing research field (Leonidou, Christofi, Vrontis, & Thrassou, 2020). So far, it has focused on identifying and classifying stakeholders (Vos &

Achterkamp, 2006) and examining the impact of managing for stakeholders and innovation on firm performance (Haefner, Palmié, & Leppänen, 2021). As far as we are aware, the stakeholder management literature has commonly been conducted on the firm level (Urbinati, Landoni, Cococcioni, & De Giudici, 2020) and has not looked into the role of the individual employee in managing the constraints that various stakeholders bring. We argue that to the individual employee, stakeholder management shows itself as an activity that requires managing constraints: finding out and negotiating on constraints given, and clarifying one's own constraints to others. Constraints management as an activity that an individual does in the innovation process is an emerging phenomenon that we identified in this study.

Developing solutions encompasses both idea introduction and modification since, as explained previously, the two were described to be so seamlessly interconnected that to separate them would have been difficult. We did change the word *ideas* to *solutions* to reflect the discussion on creativity relating to generating novel ideas, and innovation having a strong practical component to it (Hughes, 2018). By talking about solutions instead of ideas, the practicality is already implied.

Following Figure 2, the next thing to note is the absence of the promotion phase. We propose three reasons for this. For one, the scope of innovation is smaller in our study. Promotion is needed to build a coalition of supporters to push the idea through (Janssen, 2000), implying that the idea is such in scope that the innovator is "required to do something of greater magnitude than routine activities" (Kanter, 1988, p. 106). In our study, the interviewees were overwhelmingly only innovating on issues related to their own work, rendering promotion unnecessary. The second reason is that the interviewees are all expected to innovate in their jobs and consequently are given more leeway in coming up with new solutions and implementing them without the need to have the solutions promoted. Third, the interviewees indicated that they had little time to develop solutions for opportunities, only for problems. It might be more accepted to implement solutions where a clear problem exists.

We separated testing and evaluating into their own activities and let implementing be the last activity. Some previous research has included testing and/or evaluating in the implementation phase (e.g., de Jong & den Hartog, 2010; Messmann & Mulder, 2012) but we decided to have these as separate activities since they came up clearly in our analysis.

We are clear about the fact that these six activities are context-dependent; to what extent is impossible to say until further research is conducted into other contexts. However, our aim has not been to proclaim that this is the new model of the

individual innovation process and that it is applicable to all contexts. Rather, we had noticed several things to concern us with the study of individual innovation processes; enough to make us want to conduct an in-depth exploration into how individuals experience their innovation process today, in the 2020s. The results show that at least in this context, the individuals experience their innovation process in significantly different ways to how prevalent theoretical understanding would have it. As is appropriate of nascent theory building, the theoretical contribution of our study is a suggestive theory which invites further work on the topic (Edmondson & McManus, 2007).

Moving on from questions related to the activities in the individual innovation process, our results highlight the active role of the individual in it. In reviewing previous literature, the individual appears almost as a puppet with factors such as leadership, HR practices, and organisational culture as the strings that can be used to make the puppet move. This picture has likely emerged as a result of the overwhelming focus on quantitative research methods in studies on the individual innovation process. These employ a more positivist research philosophy that sees individuals as reacting to their environment in a predictable manner (Morgan & Smircich, 1980). Our findings, on the contrary, demonstrate that the individual shows active agency in managing the innovation process. The agency of the individual emerged in the individual's pursuit of inspiring social interaction, nurturing their own thinking and creativity by exposing themselves to new skills and ideas, demonstrating self-awareness in how to improve the process, and simply believing in their own ability to innovate. We argue that individual agency has been a largely neglected theme in prior research focusing on the individual innovation process.

Anderson et al. observed already in 2004 that the innovation research has become routinised with replication-extension studies dominating the field, and Hughes et al. (2018) did not find the situation much improved. By adopting a different approach where we talked to agile team members about how they innovate, we were able to uncover that the individual's experience differs significantly from how it is described in the literature. This means that current research on the individual innovation process does not account for all experiences of the process. This has major implications for how individual-level innovation should be studied. We have here given grounds to believe that the study of the concept should be approached as being in the nascent theory research phase instead of in the mature one (Edmondson & McManus, 2007). To explain why, it is helpful to separate the concept and construct (Gioia et al., 2013) of individual innovation process from each other. We have argued that the construct – the theoretical formulation of the concept that exists to be measured – for individual innovation process is based on

research conducted in the 1980s. However, the concept – the underlying phenomenon of how individuals innovate – may have changed in the meantime as changes have occurred in working life. This might mean that what is measured using the outdated construct no longer leads to innovation in modern organisations and therefore, the advice given to practitioners about how innovative employees should be managed, may be incorrect. Until we know to what extent the construct and concept differ, efforts to understand which determinants affect the individual innovation process through which mechanisms should be paused and more explorative study designs employed instead.

Managerial implications

Our main message to managers is that an individual who attempts to innovate at work is not a puppet that one can "impact" and that by finding the right string, the puppet will innovate more or more efficiently. Instead, the individual is an active and participating agent in the process who is motivated to look after and develop their ability to innovate. A more important task than has previously been thought of may be for managers to ensure that the individual is able to work on their own ability to innovate. Based on our research, this would include tasks such as enabling networks to be built and maintained (e.g., by facilitating coffee breaks and bringing people together from various parts of the organisation and outside the organisation); supporting self-awareness (e.g., through feedback); encouraging the development of cognitive skills (e.g., by organising training); and fostering innovation efficacy (e.g., by making innovations visible and celebrating them).

As one particular development point, we highlight that it would be useful to discuss the definition of innovation. This common sensemaking would allow the different members of the organisation to arrive at a joint understanding on what innovation is in the common context, and what kinds of ideas and innovations are particularly valued.

Limitations and future research

As is often the case, the limitations in this study provide avenues for further research. First to be addressed is the fact that ours is a single case study, the results of which are best thought of as an invitation to conduct further study on the topic. That future research should explore how team-level employees experience their innovation process in other organisations and other industries than technology is a given. It would also be interesting to take other contexts than agile to see to what

extent experiences of the innovation process are dependent on the way the innovation process is managed in the organisation.

We have alluded to the fact that the definition of innovation was different at the management level compared to team level but to further pursue this point was beyond the scope of this paper. To explore this might prove to be fruitful ground for future studies.

Finally, it is important to bear in mind that a successful innovation process is not the end stop but rather a way to achieve innovative outcomes. Future research efforts should be directed at studying whether, and how, innovation processes lead to desired outcomes for organisations.

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