The Impact of Organizational Innovation Support, Employee Intrinsic Motivation and Big Five Personality Traits on Employee Innovative Work Behavior

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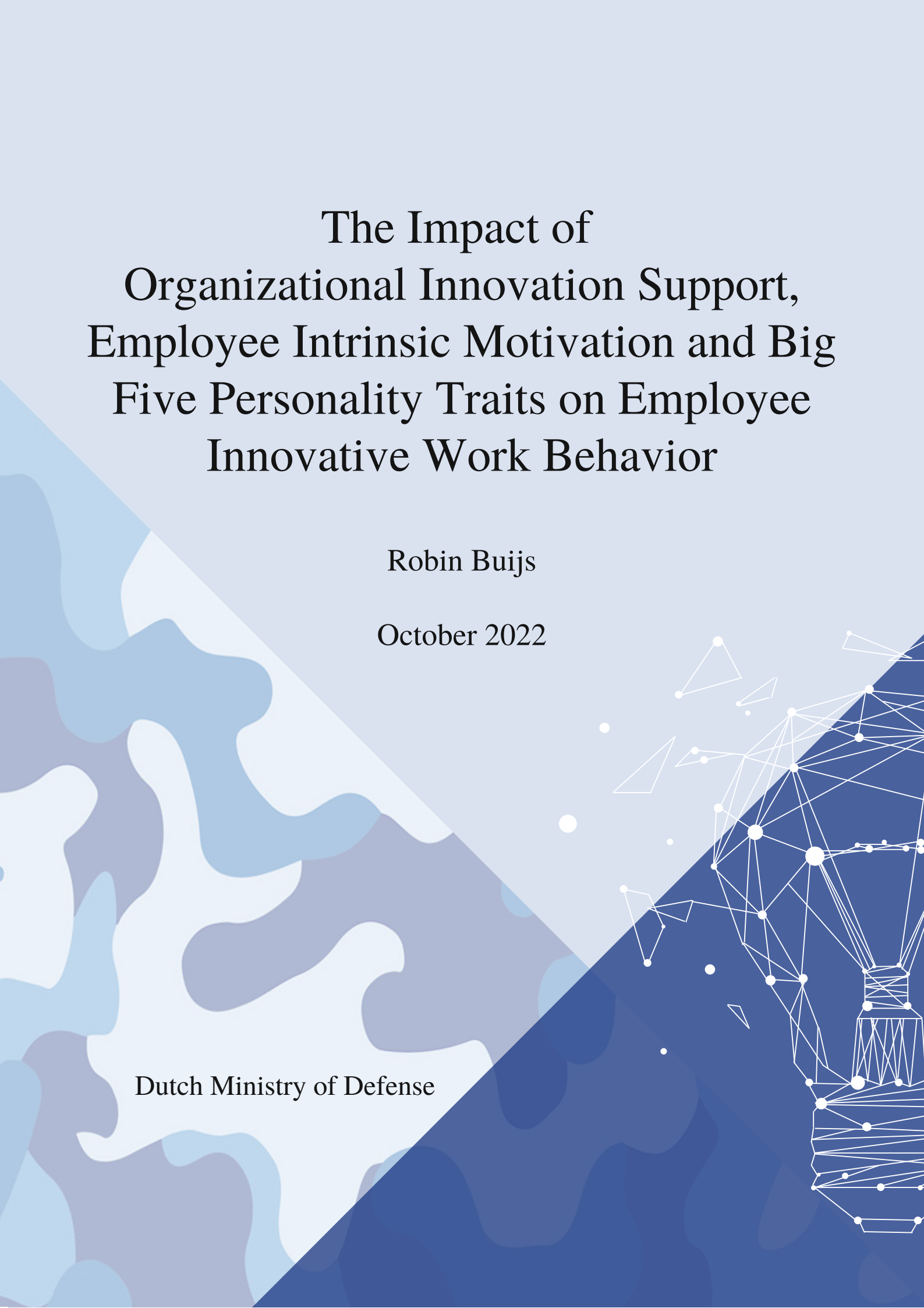

Dutch Ministry of Defense

TU/e School of Industrial Engineering and Innovation Sciences

Master of Science in Innovation Management

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Acknowledgements

This thesis will fulfil the final requirements for the degree Master of Science in Innovation Management at the Eindhoven University of Technology. I am grateful to present my master thesis about how organizational innovation support, employee intrinsic motivation and employee personality are related to employee innovative work behaviour within the Dutch Ministry of Defense.

Employees within the Dutch Ministry of Defense can elaborate upon the gained knowledge of this thesis. Besides, the recommendations can be implemented and contribute to a more effective deterrence level. Academics can use the theoretical knowledge to continue investigating such relationships or create subsequent research. A management summary is provided on the next page, more detailed information can be found in the upcoming chapters.

First, I would thank the Dutch Ministry of Defense for providing the opportunity to graduate in such an interesting company and for showing more than just my workplace. I would like to thank Pascale le Blanc (TU/e supervisor) and Josette Gevers (second assessor) for providing feedback and suggestions during my thesis. Besides, I want to thank the AIR team for their support and openness to assist wherever possible. In particular, Patrick Teluij as my second supervisor at the Dutch Ministry of Defense. I want to share major thanks to my first supervisor Mysha van Lamoen for providing feedback, supporting me during the thesis, always giving a positive tune to continue the process and providing opportunities to get insights into what the Ministry of Defense has to offer. Finally, I want to thank my friends and family for their support and trust during this project.

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Management summary

Problem, purpose, and research question

The Dutch Ministry of Defense was not sure how to positively influence the innovative work behavior of their employees, which encompassed the problem definition of this study. The overarching purpose of this study was to contribute to a more effective deterrence level of The Dutch Ministry of Defense. This can be realized by creating an improved employee innovative work behavior (Şener & Saridoğan, 2011) because innovation is the driving force of organizations toward development and growth in ever-changing needs and markets (Luthans et al., 2007).

The problem definition, purpose of the study, internal strategic and policy documents and a pre-research formed the foundation for the main research question which was stated as:

How are organizational innovation support, employee intrinsic motivation and employee personality related to employee innovative work behaviour within the Dutch Ministry of Defense?

The interplay between individual (employee intrinsic motivation, employee personality traits) and contextual factors (organizational innovation support) resulting in employee innovative work behaviour was the core of this study. These variables were controlled for age, gender, type of function and department because these have a proven relationship with employee innovative work behavior.

Methodology

Employees of the Dutch Ministry of Defense provided quantitative study data by filling out a survey. A total of 186 complete responses were collected. A variety of employees (direct or indirect colleagues of the researcher) were approached for participation at the start of, and during the project. The survey was distributed via email and could be filled in via Intranet (SharePoint) and Internet (Qualtrics). In this email, the respondent was asked to spread the survey within their network etcetera (snowball effect), to reach a higher number of respondent. The data was analysed by using IBM SPSS Statistics.

Results

Only employee intrinsic motivation and openness to experience showed the hypothesized significant positive relation with employee innovative work behavior. All other relationships between the study variables were not significant, and therefore the majority of hypotheses had to be rejected. Also, no evidence was found for the hypothesized mediation and moderation effects. However, a positive relationship between openness to experience and employee intrinsic motivation was found which was non-hypothesized. Moreover, it was found that employee intrinsic motivation mediates the relationship between openness to experience and employee innovative work behavior. Figure 1 shows an overview of all studied relationships, including their significance.

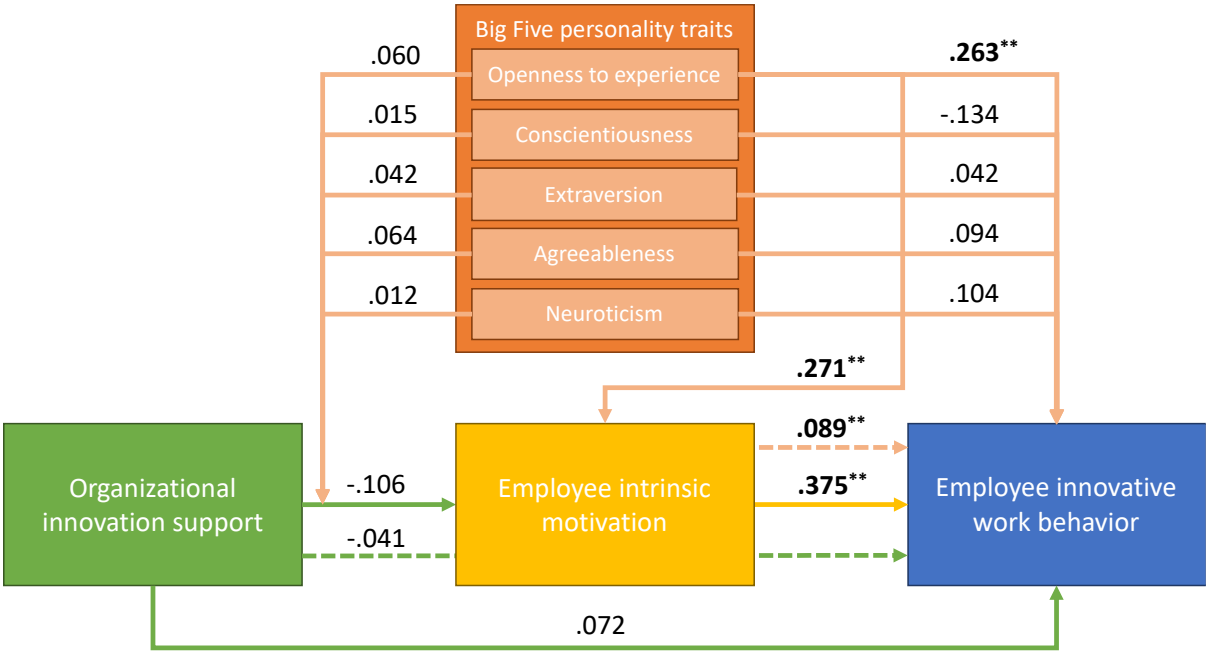


Figure 1: Final research model

Recommendations

The mean per variable in this study and the mean per variable in other studies, with the exact same measures, was compared and showed that, on average, organizational innovation support scored 0.78 lower on a scale from one to five. This negative difference should be a concern for the Dutch Ministry of Defense. Therefore, I would recommend finding out the reason for this relatively low score on organizational innovation support.

Employee intrinsic motivation and openness to experience showed a positive effect towards employee innovative work behavior. Therefore, another recommendation includes that the organization could introduce motivational and personality tests to examine the current amount of intrinsic motivation and openness to experience before hiring new employees which are aimed to work on innovations. This could indicate their fit for innovative work activities.

Besides, employee intrinsic motivation can be enhanced by implementing job crafting interventions (Effendi & Etikariena, 2018), which makes a job more engaging, satisfying, and meaningful. Furthermore, developing mindfulness skills and self-compassion reduces the perception of threats and strengthens openness to experience (Rodríguez-Carvajal et al., 2016). Implementing these recommendations will increase the level of employee intrinsic motivation and openness to experience and thereby enhances employee innovative work behavior.

Table of Contents

List of figures and tables

1. Introduction

"Innovations have played and will play an important role in preventing or determining the outcome of war. Therefore, maintaining the lead in technology and military concepts is crucial to ensure our security and freedom. Because innovations follow each other faster and faster, we and our allies better make sure we innovate the fastest. Where companies lost market share by not identifying new opportunities, we stand to lose something far greater if we do not recognize new developments (chances or threats) in time and act accordingly" (Leyte, Strategic Advisor of Innovation Center FRONT, Ministry of Defense, May 2022). "The number of game changers is endless. Examples vary from chariots & gunpowder to rifled gun barrels, tanks, night vision, laser guidance, radar, jet engines, nuclear technology, drones, autonomous systems, artificial intelligence etc. etc. etc. Besides, the social and cultural environment change as well, which determines our course of action. Consider someone's real identity vs their internet identity in which one could change into whatever they want to be or express, the algorithm that shows information based on your history which can create a perception of reality, the cancel culture etc. We must take into account that we need to think, act, and make decisions differently" (Teluij, Deputy Head of Innovation Department AIR, Ministry of Defense, August 2022).

The Dutch Ministry of Defense is a government-linked company, which can be characterized by executing activities in line with the government (e.g., protecting the country). Government-linked companies are some of the most significant players in achieving the country's mission and vision (Hassan et al., 2021). Hassan et al. (2021) highlight that it is necessary to focus on (more) creativity and innovation among employees in governmental-linked companies because of their significant influence on the government's mission and vision. Furthermore, Smith et al. (2017) underline that innovation is crucial in delivering excellent service because of the ever-changing wants and needs in the market. Therefore, government-linked companies need to increase the standards and perceptions of innovation. Moreover, Tan et al. (2021) highlight that the current global economic landscape is forcing all organizational sectors (including government-linked companies) to remain relevant by innovating their value proposition. How to remain relevant depends on the sector in which a company is active. In case of the Dutch Ministry of Defense, this means being better than or at least as good as the Ministry of Defense of other countries to be a threat, when necessary, like in a war (potential opponents). Despite the importance of innovation, Hassan et al. (2021) found that the G20 countries' innovation score was less than that of global best practices such as Amazon, SpaceX and Apple. They highlight that it is critical for government-linked companies, like the Dutch Ministry of Defense to keep innovating, remain competitive, embrace both domestic and global challenges and employ highly innovative staff.

1.1. Problem definition

Smith et al. (2017); Tan et al. (2021) highlight that the current global economic landscape is forcing all organizations to remain relevant by innovating their value proposition. Hassan et al. (2021) highlight that it is critical for companies to keep innovating, remain competitive, embrace both domestic and global challenges and employ highly innovative staff. Currently, the Dutch Ministry of Defense is not sure how to positively influence the innovative work behavior of their employees. This broad problem definition was the reason to perform this study. First, innovation in general and employee innovative work behavior in particular were

defined to be able to elaborate on this problem definition. Innovation is a process used for developing better products and services, or an action that generates ideas (Amabile et al., 1996). Besides, it is the driving force of organizations toward development and growth in ever-changing needs and markets (Luthans et al., 2007). The influence of innovation in an organization is significant and can be controlled by focusing on the drivers of innovation (Ali, 2019). Schweizer (2004) argues that innovation is the outcome of individual and contextual factors which include an individual's behavior fed by specific personality traits and intrinsic motivation, and the contextual support for innovation from the organization.

Innovation encompasses two stages, which are the generation of new ideas and their implementation (Amabile et al., 1996; Anderson et al., 2004; Hülsheger et al., 2009; West, 1990; Woodman et al., 1993). The term creativity refers to idea generation, and innovation to the subsequent stage of implementing ideas toward better procedures, practices, or products. This study used innovation as the overarching term of both stages, to gain insight into the complete process of innovation from start to end. Innovation within an organization can, among others, be achieved by employee innovative work behavior (Ali et al., 2022). Therefore, the current study takes employee innovative work behavior as the focal outcome variable, which refers to the 1) generation, 2) promotion and 3) implementation of novel and useful ideas (West, 1990). In general, innovative work behavior manifests itself by thinking about; problems in existing working methods, and trends (in the market) that may change or unfulfilled needs of people within the company or market (de Jong & den Hartog, 2007).

1.2. Problem analysis and pre-research

Strategic and policy documents were analysed to get an indication of the current level of innovativeness of the Dutch Ministry of Defense. These documents highlighted the importance of innovation for the organization in the present and (near) future. The documents highlight that innovation contributes to the credible deterrence of the Dutch Ministry of Defense and is therefore seen as valuable. For example, innovation strategy 2018 (Ministry of Defense, 2018) and strategic knowledge and innovation strategy 2021 – 2025 (Ministry of Defense, 2020b) both highlighted the importance of securing innovation within the work environment, culture, and business operations. Strategic plan 2035 (Ministry of Defense, 2020a) highlighted 'strong innovative ability' of employees, and consequently of the organization, as highly important. Finally, the most recent Defense Nota 2022 addressed 'innovative capacity' as a key aspect. To conclude, the strategic significance of innovation is well acknowledged by the Ministry of Defense. Investigating potential improvements regarding innovation is therefore relevant and in line with the vision of the Ministry of Defense to increase the employees' innovative ability and the organization's effective credible deterrence level.

Strategic and policy documents generally describe the desired future state of an organisation. However, creating this future state requires concrete actions by employees. As a form of pre-research, interviews were held to verify whether employees' perceptions of (the importance of) innovation are in line with the vision as described in the strategic and policy documents. Furthermore, the aim of these interviews was to explore the gap between the desired future state and the current state regarding innovation within the Dutch Ministry of Defense. The identification of such gaps may serve as a motivator for future improvements (and therefore as a research topic). More information about the pre-research can be found in Appendix I, in which the procedure, interviewees, analysis, and interview notes are presented.

The three most frequently mentioned topics/ challenges regarding innovation in this pre-research were:

- *Organizational innovation support*: Innovation is not (always) supported by the organization in a way that is preferred by the interviewees. In other words: interviewees perceive not (enough or adequate) support for innovation;
- *Employee intrinsic motivation*: Interviewees perceive that employees are not (always) intrinsically motivated to innovate;
- *Employee innovative work behavior*: Interviewees perceive a lack of innovative work behavior from employees.

As explained by the interviewees, these three topics describe the gap between the current state and the desired future state. In the desired future state, the organization supports employees to innovate. Besides, employees are intrinsically motivated to innovate and express this intrinsic motivation through innovative work behavior.

1.3. Research objective

In case of the Dutch Ministry of Defense, credible deterrence is most important because the main objective is to prevent conflict. Deterrence means discouraging the enemy from taking military action by showing that the costs and risks outweigh the expected gains, which reduces the likelihood of enemy military moves (Snyder, 2015). However, when a conflict occurs, the organization needs to be able to win the conflict. Henderson (2018) highlights that in an age of rapidly advancing technology and ever-changing characters of war, long-held advantages are not guaranteed. Advantages can be products, services or innovations which are beneficial in a certain timeframe but, can be overruled by new innovations. The most important task of the Dutch Ministry of Defense is being prepared to fight and win against threats (Henderson, 2018). Because in war, there is no second chance and innovation can ensure the security of soldiers (Henderson, 2018). In this military context, the important aspects are safety, people, and national wealth instead of machines and profit. Besides, the current war between Ukraine and Russia highlights that such a war does not only happen overseas but also nearby underling the importance of an effective deterrence level of the Ministry of Defense that can be realized through innovation (Şener & Saridoğan, 2011). Therefore, the goal of this study is to contribute to a more effective deterrence level by improving employee innovative work behavior within the Dutch Ministry of Defense.

1.4. Research question

The findings of the pre-research created a starting point for a more detailed literature search on the relationship between the three above-mentioned concepts. When analysing the first articles about (the relationships between) these concepts, a fourth relevant concept was identified. Articles by, amongst others, Ali (2019); Sackett et al. (2017); Schweizer (2004) highlight (employee) personality as a significant driver of innovation outcomes. Therefore, this concept was included in the study - and therefore in the literature search - too. Hence, the main research question is stated as:

How are organizational innovation support, employee intrinsic motivation and employee personality related to employee innovative work behaviour within the Dutch Ministry of Defense?

The interplay between individual (employee intrinsic motivation, employee personality traits) and contextual factors (organizational innovation support) resulting in employee innovative work behaviour will be the core of this study.

1.5. Theoretical and contextual relevance

This research will examine how the combination of individual employee attributes (employee intrinsic motivation, employee personality traits and employee innovative work behaviour) and contextual factors (organizational innovation support) results in employee innovative work behavior as suggested by Nisula & Kianto (2016). Nisula & Kianto (2016) indicated that simultaneously studying both individual and contextual attributes will lead to a more refined insight into how employee innovative work behavior is influenced, compared to examining these relationships separately.

Moreover, this study examined the conceptual model within the context of the Dutch Ministry of Defense. To the best of my knowledge, up till now, hardly any research on employee innovative work behavior has been performed within this (type of) context. The context is unique because of its governmental, non-profit, and military nature. Most previous studies are conducted in non-governmental and profit-oriented organizations.

This chapter gave the introduction and direction of this study. The next chapter provides a review of the literature regarding the variables individually and the potential relationships between each other. Chapter three will focus on the method of investigating the hypothesis. The results will be shown in chapter four after which the conclusion and discussion will be elaborated upon in chapter five.

2. Literature review

In this chapter, the methodology of the literature review will be explained after which the four key concepts of this study (i.e., employee innovative work behavior, organizational innovation support, employee intrinsic motivation and the Big Five personality traits) will be discussed. The structure of each section in this literature review is the same and starts with an introduction to a specific concept and its relevance to the current study. Various definitions of each concept will be compared after which one will be selected for this study. Based on theory and previous empirical findings, the (potential) interrelationships of these concepts/ variables will be discussed, and a hypothesis will be formulated for each relationship in the research model.

2.1. Methodology literature review

Scientific knowledge production, in general, is growing rapidly while at the same time remaining fragmented and multidisciplinary. Because of this, it is hard to keep up to date, as well as assess consistent evidence in a particular area of research. Therefore, performing a literature study is more relevant than ever (Snyder, 2019). The concepts of organizational innovation support, the Big Five personality traits, employee intrinsic motivation, and employee innovative work behavior are used for performing the literature review. The literature review is based on the methodology of Kitchenham (2004).

The literature study started with developing search strings based on the selected variables. All possible combinations of variables were made which resulted in eleven different strings. More information on the search strings and the selection of articles can be found in appendix II. The academic literature site 'Web of Science' was used to find the articles. The first selection (quality assessment) was made based on language, publication date, and the number of citations. First, only articles written in English were selected. Second, only articles written after 2010 were selected to prevent that the current study is based on outdated results. Third, the criteria concerning the number of citations were determined based on the number of available results (articles found with a specific string). Appendix II shows, among others, the number of results per sting. Strings with less than 20 results are less strictly assessed in comparison to strings with more than 20 results, because of the limited availability of articles on that particular topic.

After the first selection (quality assessment), the second selection (abstract assessment) was conducted. The abstract of all selected articles was read to determine if the articles could provide relevant information for this study. The purpose, methodology and findings of the article gave an overview of the content of the article. The relevance of the study was determined based on the link between that information and the goal of this study, these needed to be in line with each other. The second selection provided the final number of articles which were fully read. The last selection (full article review) provided the total number of articles used for the literature review. Articles which did not research relations between the above-mentioned concepts (e.g., due to a wrong interpretation of the abstract by the researcher) were excluded.

Figure 2 provides an overview of the selection procedure. An overview of the final selection of articles that were used in the literature study can be found in Table 1. In the following sections, first, the literature that was found on the dependent variable innovative work behavior is discussed, followed by literature on the independent variables organizational innovation support, employee intrinsic motivation and the Big Five personality traits.

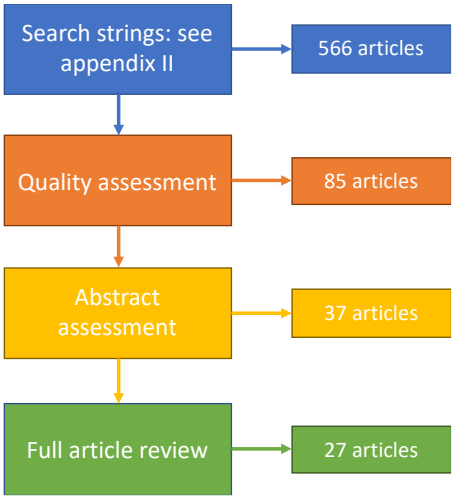


Figure 2: Overview literature study

Table 1: Overview of literature study articles

Article	IWB	OIS	EIM	BFPT	Methodology
Birdi et al. (2016)	DV	IV	IV		Quantitative
Chen et al. (2016)	DV	IV	ME		Quantitative
Madrid et al. (2014)	DV	IV		IV	Quantitative
Zuraik et al. (2020)	DV	IV		IV	Quantitative
Tan et al. (2021)	DV	IV			Quantitative
Lukes & Stephan (2017)	DV	IV			Quantitative
Nisula & Kianto (2016)	DV	IV			Quantitative
Yuan & Woodman (2010)	DV	IV			Quantitative
Chen et al. (2013)		DV	IV		Quantitative
Vishnubhotla et al. (2020)		IV		DV	Quantitative
Ali et al. (2022)	DV		IV		Quantitative
Siyal et al. (2021)	DV		IV		Quantitative
Ritala et al. (2020)	DV		ME		Quantitative
Gupta (2020)	DV		IV		Quantitative
Chiu (2018)	DV		IV		Quantitative
Masood & Afsar (2017)	DV		IV		Quantitative
Yindong & Xinxin (2013)	DV		IV		Quantitative
Malik et al. (2015)	DV		IV		Quantitative
Park & Kim (2022)	DV			IV	Quantitative
Javed et al. (2020)	DV			IV	Quantitative
Ali (2019)	DV			IV	Quantitative
Gupta (2021)	DV			IV	Quantitative
Som & Suradi (2019)	DV			IV	Quantitative
Khalizadeh & Khodi (2021)			DV	IV	Quantitative
Yeh et al. (2020)			DV	IV	Quantitative
McGeown et al. (2014)			DV	IV	Quantitative
Clark & Schroth (2010)			DV	IV	Quantitative
This study	DV	IV	IV/ME	IV/MO	Quantitative

IWB = Innovative Work Behavior
OIS = Organizational Innovation Support
EIM = Employee Intrinsic Motivation
BFPT = Big Five Personality Traits
DV = Dependent variable
IV = Independent variable
ME = Mediator variable
MO = Moderator variable

2.2. Employee innovative work behavior

The ever-changing marketplace with an uncertain business environment, rapidly changing technologies and high competition forced organizations to explore factors that impact employee innovative work behavior (Ángel & Sánchez, 2009; Mumford et al., 2002; Teresa Amabile, 1996). West (1990) mentions that employee innovative work behavior refers to the 1) generation, 2) promotion and 3) implementation of novel and useful ideas. Enhancing behaviors that drive innovation is key for employers and identifying factors that can foster and sustain employee engagement in innovation carries significant implications for enhancing the competitiveness of organizations (Gupta & Singh, 2015; Zhang & Bartol, 2010). Besides, employee innovative work behavior has been widely claimed to be beneficial for organizational functioning because it increases the competitiveness and even is necessary for survival in the current dynamic nature of the business environment because, with innovation, the value proposition of an organization remains relevant (Ali et al., 2022; Janssen, 2000; Oldham & Cummings, 1996; Scott & Bruce, 1994; West, 1990; Yuan & Woodman, 2010).

In general, innovative work behavior manifests by thinking about; problems in existing working methods, and trends (in the market) that may change or unfulfilled the needs of people within the company or market (de Jong & den Hartog, 2007). In addition, Woodman et al. (1993) add activities like proposing new solutions, dealing with the problem from new points of view, and sharing knowledge with others. Innovative work behavior is similar to other change-oriented constructs and demands a willingness to challenge the status quo in work environments (Anderson et al., 2004; Janssen et al., 2004; Yuan & Woodman, 2010) and push for the adoption of novel ideas (Kanter, 1988; van de Ven, 1986; West, 1990). Examples of innovative work behavior are searching for new technologies, applying new work methods, suggesting new ways to achieve objectives, and investigating and securing resources to implement new ideas (Yuan & Woodman, 2010). Besides, an important aspect of employee innovative work behavior is to communicate novel ideas to the organization, e.g., to colleagues and managers (Binnewies et al., 2007; Bledow et al., 2009; de Jong & Wennekers, 2008; Janssen, 2000; Kanter, 1988; Scott & Bruce, 1994).

Various definitions of employee innovative work behavior can be found in literature; however, these are quite consistent. Almost all authors divide employee innovative work behavior into two phases which are the generation of novel and useful ideas and the implementation of those ideas (Åmo & Kolvereid, 2005; Birdi et al., 2016; Chen et al., 2013; de Jong, 2006; Janssen, 2000; Lukes & Stephan, 2017; Madrid et al., 2014; Yuan & Woodman, 2010). Some authors (Leong & Rasli, 2014) divide employee innovative work behavior into four phases including problem recognition, idea generation, idea promotion and idea implementation. However, Leong & Rasli (2014) highlight that problem recognition and idea-generating represent the phase of generating novel and useful ideas, while idea promotion and idea implementation focus on the implementation of those ideas.

As mentioned before, West (1990) mentions that employee innovative work behavior refers to the 1) generation, 2) promotion and 3) implementation of novel and useful ideas. Specifically, the generation of novel ideas involves thinking of, and creating, new approaches and solutions to work-related issues; promotion involves suggesting and seeking sponsorship for novel ideas from relevant others (e.g., colleagues, supervisors, and managers); and implementation entails working on the application of novel ideas. The promotion stage is also

named championing in some of the articles. Scott & Bruce (1994) highlight that the three stages of employee innovative work behavior occur sequentially. The definition of employee innovative work behaviour, developed by West (1990), will be used in this study because it is comprehensive and highly citated (by among others, Chen et al. (2016); Janssen (2000); Javed et al. (2020); Kanter (1988); Madrid et al. (2014); Masood & Afsar (2017); Nisula & Kianto (2016); Scott & Bruce (1994); Som & Suradi (2019); Tan et al. (2021); Yuan & Woodman (2010).

Scott & Bruce (1994); Yidong & Xinxin (2013) conclude that much of the research about employee innovative work behavior essentially deals with what motivates individual innovative behavior. The interactionist perspective of Nisula & Kianto (2016) argues that individual behavior is based on both individual characteristics and contextual factors (Ali, 2019; Zuraik et al., 2020). An important contextual factor could be organizational innovation support. Therefore, the next section will focus on this contextual factor and its effect on employee innovative work behavior.

2.3. Organizational innovation support

Innovation involves interacting with others because it is embedded in a social process (Kanter, 1988; van de Ven, 1986; West, 1990). Innovation is not a one-man job and needs to be supported by others. Therefore, an important aspect of employee innovative work behavior is to receive their feedback and support (Binnewies et al., 2007; Bledow et al., 2009; de Jong & Wennekers, 2008; Janssen, 2000; Kanter, 1988; Scott & Bruce, 1994).

The context in which people work can signal the desire and support for innovative work behavior. Such a context legitimizes innovative work behavior and encourages individuals to not hold back and generate, search for, communicate and implement ideas (Lukes & Stephan, 2017). Amabile et al. (1983) also highlight the influence of the work environment regarding employees' innovative work behavior through the provision of time and resources or social support for engaging in creative activities. They refer to this type of work environment as a supportive work climate (Amabile et al., 1996), which is perceived as being oriented towards creativity and innovative change (Scott & Bruce, 1994).
The terms innovation support, organizational support for innovation and climate for innovation are interchangeably used in literature. In the current study, the term organizational support for innovation will be used. Organisational support for innovation which can manifest as a pro-innovation climate or culture (Amabile, 1988; Kanter, 1988; Scott & Bruce, 1994), delivers organizational values and norms that affect the potential gains and risks associated with employee innovative work behavior (Yuan & Woodman, 2010). Employees working in an organization with strong support for innovation will perceive innovative behavior as more beneficial in bringing performance gains (Yuan & Woodman, 2010). Furthermore, higher levels of organizational support for innovation motivate employees to initiate and persist in innovative behaviors and coordinate their innovative efforts with others (Pirola-Merlo & Mann, 2004; West, 1990).

The definition that will be used in this study is the definition of West (1990) because of its comprehensiveness. West (1990) defines organizational innovation support as the expectation, approval, and practical support of attempts to introduce new and improved ways of doing things in the work environment.

Many authors (among others Amabile et al. (1996); Denti & Hemlin (2012); Oldham & Cummings (1996); Patterson et al. (2005); Scott & Bruce (1994)) studied the influences of managerial/ supervisor support for innovation on innovative work behavior. The findings concerning this more specific aspect of innovation support are interesting when developing a hypothesis about the effects of organizational innovation support because a supervisor communicates the support for innovation on behalf of the organization (Amabile et al., 1996). Managerial support for innovation is described as employees' perception that their direct supervisor is supportive of new and innovative ideas (Oldham & Cummings, 1996). Managers can contribute to the perception that organizational support for innovation is available and they may stimulate employees to engage in innovative work behavior (Amabile et al., 1996; Patterson et al., 2005) by encouraging, recognizing, and rewarding the generation and implementation of novel and useful ideas through resources like personnel, funding, and time (Denti & Hemlin, 2012; Scott & Bruce, 1994). Employees will show innovative behaviour when they feel the support of their manager to think outside the box (Amabile et al., 1996).

The next paragraph focuses on why organizational innovation support and employee innovative work behavior could relate to each other and the findings of previous studies regarding this relationship.

Organizational support for innovation encourages innovative work behaviour because it creates psychological safety for trial and error, reduces the risk involved in innovation attempts (Grant & Ashford, 2008) and legitimates experimentation (Patterson et al., 2005), which is crucial for innovation. In a work environment that promotes innovation, employees have a higher willingness to explore new ideas, create constructive conflicts, take more calculated risks, and challenge the status quo, which are aspects of employee innovative work behavior (Scott & Bruce, 1994). Organizational support for innovation signals that innovative behavior is supported and desired and in turn encourages employees to search for, communicate, not hold back, generate, and implement ideas (Lukes & Stephan, 2017).
Nonetheless, some authors could not find a significant relationship between organizational innovation support and employee innovative work behavior (Oldham & Cummings, 1996). However, in the majority of the studies, organizational innovation support relates positively to employee innovative work behavior (Amabile, 1996; Anderson & West, 1998; Chen et al., 2016; Choi et al., 2011; Çokpekin & Knudsen, 2012; Hülsheger et al., 2009; Hüttermann & Boerner, 2011; Lukes & Stephan, 2017; Mathisen & Einarsen, 2004; Oldham & Cummings, 1996; Scott & Bruce, 1994; Tan et al., 2021; Unsworth & Clegg, 2010; West, 1990). Based on the above, the following hypothesis is formulated:

H_1: Organizational innovation support is positively related to employee innovative work behavior.

As described previous, Ali (2019); Zuraik et al. (2020) found that many factors may support employees' innovative behavior, and these can be categorized into contextual and personal factors. The current section has focused on the context; therefore, the next section will focus on the person. A potentially relevant personal factor for supporting employee innovative work behavior is employee intrinsic motivation.

2.4. Employee intrinsic motivation

Motivation is a psychological attribute that explains why people behave in particular ways (Chiu, 2018). Tremblay et al. (2009) highlight that motivation is important for employees' optimal functioning and the organization's productivity because motivated employees believe in the organization's mission and behave in that direction. In addition, Gupta (2020) underlines that motivation is critical for organizational science and practice. On top of that, Çınar et al. (2011) described that motivation can be used as a tool if organizations understand what moves their employees towards the desired goal.

Innovative work behavior is not a routine behavior, it deals with discovering and implementing novel ideas (Siyal et al., 2021). For this, the employees need intrinsic motivation to help them advance and boost the process of innovation (Edmondson & Lei, 2014). Intrinsic motivation is a specific type of motivation that is developed due to the personal interest of an individual without any external influence (Siyal et al., 2021). Intrinsic motivation is defined by multiple authors (by among others Amabile (1988); Amabile et al. (1996); Birdi et al. (2016); Chiu (2018); Gagné & Deci (2005); Garaus et al. (2016); Malik et al. (2015); Ritala et al. (2020); Ryan & Deci (2000); Siyal et al. (2021); Venkatesh et al. (2003); Yan & Davison (2013)). They all highlight that intrinsic motivation is the tendency to execute a particular activity because of own interest, satisfaction, or positive challenge instead of external rewards. The opposite of intrinsic motivation is extrinsic motivation which concerns a person's decision to exert effort on a task to receive external rewards or avoid punishments (Birdi et al., 2016). However, this type of motivation is not part of this study.

The definition that will be used in this study is the definition of Ryan & Deci (2000) because this one is comprehensive and highly citated (some of them are Ali et al. (2022); Chen et al. (2013); Chen et al. (2016); Chiu (2018); Gupta (2020); Ritala et al. (2020); Siyal et al. (2021); Yidong & Xinxin (2013)). Ryan & Deci (2000) define employee intrinsic motivation as doing an activity for its inherent satisfaction rather than for some separable consequence. When intrinsically motivated, a person is moved to act for the fun or challenge entailed instead of external products, pressures, or rewards. Intrinsic motivation focuses on the inherent tendency to seek out novelty and challenges, extend and exercise one's capabilities, explore, and learn (Ryan & Deci, 2000). Based on the findings of previous studies, the next paragraph focuses on the relationship between employee intrinsic motivation and employee innovative work behavior.

A limited number of articles focused on employee intrinsic motivation for innovation. For example, Grant & Ashford (2008); Parker et al. (2010) show that employees who are more confident and intrinsically motivated in proactively generating and implementing novel solutions at work, show higher levels of innovative work behavior. Besides, Birdi et al. (2016) highlight that regardless of capabilities and skills, innovation will not occur if an individual is not motivated to innovate. The variable employee intrinsic motivation and the theoretical reasoning to develop a hypothesis is based on employee intrinsic motivation in general, due to the scarcity of articles regarding employee intrinsic motivation for innovation.
Intrinsically motivated employees are higher in cognitive flexibility and persistence and, more likely to generate innovative and non-traditional solutions (Chen et al., 2016). According to Woodman et al. (1993), activities like proposing new solutions and dealing with a problem from new points of view are related to employee innovative work behavior. The componential

theory states that intrinsic motivation is a crucial aspect that drives employees to expand their innovative work behavior (Birdi et al., 2016). The componential theory states that an employee's performance is influenced by skills/processes, domain-relevant knowledge/skills, the social environment, and intrinsic motivation (Amabile et al., 1983). Furthermore, the willingness to put in extra effort is considered to result in more successful ideas since more time spent on generating ideas will result in more ideas produced, and by law of averages, will increase the likelihood of more successful ideas (Birdi et al., 2016).

Additionally, previous studies also found a positive relationship between employee intrinsic motivation and employee innovative work behavior. Birdi et al. (2016) highlight the importance of employee intrinsic motivation and have shown a positive and unique relation to idea implementation (not idea generation). Despite, Ali et al. (2022); Chen et al. (2016); Masood & Afsar (2017); Woodman et al. (1993); Yidong & Xinxin (2013); Yu & Meng (2020); Yuan & Woodman (2010) highlight the significant and positive effect of employee intrinsic motivation on both phases of innovative work behavior (idea generation and implementation). Finally, Chen et al. (2016) found that intrinsically motivated employees are higher in cognitive flexibility and persistence and more likely to generate innovative and non-traditional solutions. Based on the above, the following hypothesis is formulated:

H_2: Employee intrinsic motivation is positively related to employee innovative work behavior.

Another interesting relationship is between organizational innovation support and employee intrinsic motivation. Many authors (e.g., Deci et al. (1989); Oldham & Cummings (1996); Ryan & Deci (2000); Shalley & Gilson (2004); van Yperen & Hagedoorn (2003)) studied the influences of managerial/ supervisor support for innovation on employee intrinsic motivation. For example, Shalley & Gilson (2004) mentioned that supervisor support is an important contextual antecedent of employee intrinsic motivation. Organizational support for innovation provides resources like socio-emotional and material support necessary for them to innovate successfully when directing effort toward innovating (West, 1990), and may thereby boost their intrinsic motivation (Ford, 1996).
Besides, previous studies also found that organizational innovation support is positively related to employee intrinsic motivation (Chiu, 2018; Masood & Afsar, 2017; Ritala et al., 2020). Based on the above, the following hypothesis is formulated:

H_3: Organizational innovation support is positively related to employee intrinsic motivation.

Employees with high intrinsic motivation will likely perform innovative work behaviors if they find activities enjoyable and interesting (Ryan & Deci, 2000), which can be influenced by organizational support for innovation (Chiu, 2018; Ford, 1996). In this case, employee intrinsic motivation acts as a mediator between organizational innovation support and employee innovative work behavior. Findings show that supervisor support for innovation is effective in encouraging employee innovative work behavior (Anderson et al., 2014; Oldham & Cummings, 1996), and this effect is mediated by employee intrinsic motivation (Chen et al., 2016). A supervisor who supports innovation values employees' contributions and cares about their well-being (Eisenberger et al., 1986) and this increases innovative work behavior through its positive effect on employee intrinsic motivation (Anderson et al., 2014; Oldham & Cummings, 1996; Shalley et al., 2004; Shalley & Gilson, 2004). This relation occurs because

supportive supervisors value employees' efforts and contributions and show concern for their feelings and needs, thereby promoting employee intrinsic motivation.
Previous studies also found this mediating effect of employee intrinsic motivation. Chen et al. (2016) studied the influences of managerial/ supervisor support for innovation (instead of organizational innovation support) on employee intrinsic motivation and found that employee intrinsic motivation positively mediated the relationship between supervisor support for innovation and employee innovative work behavior. On top of that, Chen et al. (2013) found that organizational innovation support positively motivates members to perform innovative work behavior by enhancing members' intrinsic motivation. Therefore, the hypothesis of this mediating effect will be:

H_4: Employee intrinsic motivation mediates the relationship between organizational innovation support and employee innovative work behavior.

Ali (2019) and Sackett et al. (2017) highlight employee individual personality characteristics as significant drivers of innovation. Therefore, it is deemed interesting to investigate the relationship between personality characteristics and employee innovative work behaviour. Besides, the potential moderating effect of personality traits on the relationship between organizational innovation support and employee intrinsic motivation will be discussed. The Big Five personality traits of McCrea & Costa (1999) will be used to examine these possible relationships and will be discussed in the next sections.

2.5. Big Five personality traits

Personality traits are consistent characteristics that can predict behaviors (Anderson, 2009; Barrick et al., 2013; Funder, 2001). Multiple models of personality traits have been used in research. However, the Big Five personality traits model proposed by McCrea & Costa (1999) is the most widely used and recognized model because of its robustness, generalizability, and comprehensiveness (Baay et al., 2014; Gupta, 2021; Khalilzadeh & Khodi, 2021; Rossberger, 2014). The Big Five personality traits are openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (McCrea & Costa, 1999).

As described earlier, previous studies suggest that employee personality traits are significantly related to the display of employee innovative work behavior (Ahmed, 1998; Eastman et al., 2001; Javed et al., 2020; Park & Kim, 2022). The definition of each of the Big Five personality traits and their relationship with employee innovative work behavior will be discussed in the upcoming sections.

2.5.1. Openness to experience

Openness to experience is the tendency to actively seek new and unconventional ideas with a high degree of intellectual curiosity (Park & Kim, 2022; Som & Suradi, 2019; Venkatesh et al., 2014; Zhao & Seibert, 2006). People with a high level of openness to experience are characterized by being imaginative, inquisitive, artistic, innovative, thoughtful, unconventional, creative, original, and focus on problem-solving (Dragoni et al., 2011; Venkatesh et al., 2014). On the other side, people low on openness to experience tend to be traditional, are not analytical and have a narrow range of interests (Zhao & Seibert, 2006).

Various authors indicate why openness to experience and innovative work behavior relate to each other. Costa Jr & McCrae (1992); Madrid et al. (2014); McCrae & Costa (1997); Scott & Bruce (1994) found that employees with high openness to experience actively explore, promote, and implement novel ideas which is in line with the definition of innovative work behavior by West (1990). Besides, the characteristics of people with a high level of openness to experience like being creative and innovative are in line with the phases of innovative work behavior described by Birdi et al. (2016); Janssen (2000); Leong & Rasli (2014); Lukes & Stephan (2017); Madrid et al. (2014). All characteristics related to openness to experience empower employees to challenge established views and engage in new experiences (Rossberger, 2014). Furthermore, an individual showing high innovative work behavior is willing to experiment, tolerant of ambiguity and takes risks (Kirton & de Ciantis, 1986) which requires openness to experience.
Besides, Ali (2019); Hammond et al. (2011); Hsieh et al. (2011); Sackett et al. (2017) already found that openness to experience has the strongest effect (of all five personality traits) on innovative behavior. Based on the above, the following hypothesis is formulated:

H_{5a}: Openness to experience is positively related to employee innovative work behavior.

2.5.2. Conscientiousness

Conscientiousness is the tendency to actively plan and be goal-oriented with a strong sense of purpose (Venkatesh et al., 2014). People with a high level of conscientiousness are characterized by being well-organized, dutiful, persistent, careful, structured, hard-working, responsible, patient, attentive, independent, trustworthy and achievement-oriented (Barrick & Mount, 1991; Keller & Weibler, 2014; McCrae et al., 2005; Park & Kim, 2022; Park & Jo, 2018; Som & Suradi, 2019; Venkatesh et al., 2014; Weele, 2013).

Conscientiousness can have different influences on employees' innovative work behavior. For example, the propensity of being structured, organized and act achievement-oriented may discourage employee innovative work behaviors because innovative work behavior is, among others, about reacting to trends (in the market) and changing existing work methods which cannot be planned beforehand (de Jong & den Hartog, 2007). However, being hard-working, self-disciplined, and persistent is crucial for creating successful innovations because, among others, investigating and securing resources to implement new ideas can create resistance among colleagues (Yuan & Woodman, 2010). Ultimately, these characteristics of conscientiousness are necessary for pushing innovative ideas towards execution, which is a competence of individuals high on innovative work behavior (Ali, 2019).

Previous findings regarding the relationship of conscientiousness on employee innovative work behavior are not consistent. Kirton & de Ctaxtis (1986); Steel et al. (2012) found no-significant relationship, while Feits (1998); King et al. (1996) found a negative relationship. However, the majority of studies found a positive relationship of conscientiousness on employee innovative work behavior (Ali, 2019; Buchanan, 1998; Eastman et al., 2001; Gupta, 2021; Hsieh et al., 2011; Taggar, 2002). Based on the above, the following hypothesis is formulated:

H_{5b}: Conscientiousness is positively related to employee innovative work behavior.

2.5.3. Extraversion

Extraversion is the tendency to actively engage with the social world (Venkatesh et al., 2014). Individuals with a high level of extraversion are characterized by being optimistic, focused, social, energetic, exuberant, gregarious, assertive, actively seek information to share, action-oriented, warm, willing to try exciting opportunities, and outgoing to experience positive versus negative emotions (Ali, 2019; Funder, 2001; Gupta, 2021; Landers & Lounsbury, 2006; McElroy et al., 2007; Rossberger, 2014; Som & Suradi, 2019; Venkatesh et al., 2014; Zweig & Webster, 2004).

Being active and positive increases the personal interaction necessary for the stimulation of novel ideas because by doing this, different points of view are considered which increases the likelihood of successful innovation (Som & Suradi, 2019; Yesil & Sozbilir, 2013). A positive attitude including being sociable, assertive, and active allows extroverts to successfully create and engage with their social network. In turn, this creates opportunities for knowledge exploration and exploitation (Judge et al., 1999), which are useful in the innovation process. Exploration is defined as looking for a new idea based on new knowledge, which has not been used (Park & Kim, 2022). Exploitation is defined as improving existing knowledge and ideas and extracting value by relying on previous knowledge (Park & Kim, 2022). In addition, characteristics like being enthusiastic and positive-minded enable employees to try new things, which is beneficial for innovative work behavior (Ali, 2019).

Nonetheless, some previous studies did not show a significant relation between extraversion and employee innovative work behavior (Kirton & de Ciantis, 1986; Steel et al., 2012). However, the majority of articles found that extraversion relates positively to employee innovative work behavior (Ali, 2019; Buchanan, 1998; Eastman et al., 2001; Guo et al., 2017; Gupta, 2021; Hsieh et al., 2011; King et al., 1996; F. Patterson & Zibarras, 2017; Weele, 2013). Based on the above, the following hypothesis is formulated:

H_{5c}: Extraversion is positively related to employee innovative work behavior.

2.5.4. Agreeableness

Agreeableness is the tendency to be cooperative and to have a strong need for social harmony (Venkatesh et al., 2014). Individuals with a high level of agreeableness are characterised by being comfortable interacting with one another, decent, honest, reliable, forgiving, optimistic, generous, cooperative, flexible, good-natured, trustworthy, submissive, avoiding of competition and having a high level of compliance with procedural processes (Ali, 2019; Gupta, 2021; Higgins & Kruglanski, 1996; Som & Suradi, 2019; Steel et al., 2012; Yesil & Sozbilir, 2013).

The effect of agreeableness on employee innovative work behavior may be either positive or negative. Some aspects of agreeableness like being cooperative, flexible, and good-natured appear to support employee innovative work behavior (Steel et al., 2012) because employee innovative work behavior includes conducting activities like proposing new solutions, dealing with the problem from new points of view, and sharing knowledge with others (Woodman et al., 1993). Other aspects of agreeableness like submissive behavior and avoidance of competition could have a negative effect on employee innovative work behavior (McCrae et al., 2005; Patterson, 2002; Patterson & Gatto-Roissard, 2009) because employee innovative work behavior demands a willingness to challenge the status quo in work environments (Anderson et al., 2004; Janssen et al., 2004; Yuan & Woodman, 2010) and to push for the adoption of

novel ideas (Kanter, 1988; van de Ven, 1986; West, 1990). However, the implementation of innovation needs efficient management of social networks, which is a skill of an individual high on agreeableness (Rossberger, 2014).

It is not surprising that previous findings on the relationship between agreeableness and employee innovative work behavior are not consistent. Some studies found no significant effect of agreeableness on employee innovative work behavior (Hsieh et al., 2011; Zuraik et al., 2020) while others found a negative effect (McCrae et al., 2005; Patterson, 2002; Patterson & Gatto-Roissard, 2009). However, the majority of the studies found a positive effect (Ali, 2019; Eastman et al., 2001; Gupta, 2021; Rossberger, 2014; Som & Suradi, 2019; Steel et al., 2012). Based on the above, the following hypothesis is formulated:

H_{5d}: Agreeableness is positively related to employee innovative work behavior.

2.5.5. Neuroticism

Neuroticism is the tendency to be emotionally unstable and experience constant negative feelings (Venkatesh et al., 2014). Individuals with a high level of neuroticism are characterised by being anxious, less confident, nervous, stressed, depressed, hopeless, paranoia, and worried (Ali, 2019; Bozionelos, 2004; Gupta, 2021; Som & Suradi, 2019; Uppal et al., 2014; Venkatesh et al., 2014).

Characteristics like being anxious, nervous, depressed, and hopeless indicate that individuals high on neuroticism will experience difficulties exhibiting employee innovative work behavior because it demands the willingness to challenge the status quo in work environments (Anderson et al., 2004; Janssen et al., 2004; Yuan & Woodman, 2010) and to push for the adoption of novel ideas (Kanter, 1988; van de Ven, 1986; West, 1990). Executing such activities requires a charismatic personality and demands emotional stability (Eastman et al., 2001; Hsieh et al., 2011; Kirton & de Ciantis, 1986; McCrae et al., 2005; Rossberger, 2014). Employees high on innovative work behavior tend to be self-confident and emotionally stable (Hsieh et al., 2011; Kirton & de Ciantis, 1986), which are characteristics of employees with low levels of neuroticism.
In line with this, previous findings also indicate that neuroticism is negatively related to employee innovative work behavior (Eastman et al., 2001; Guo et al., 2017; Hsieh et al., 2011; Kirton & de Ciantis, 1986; McCrae et al., 2005; Rossberger, 2014), Based on the above, the following hypothesis is formulated:

H_{5e}: Neuroticism is negatively related to employee innovative work behavior.

2.5.6. Moderation effect of the Big Five personality traits

The moderating effect of personality traits is, to the best of my knowledge, only studied on the mediating relationship of supervisor support to innovative work behavior via intrinsic motivation (Chen et al., 2016). The effects of supervisor behaviors on their employees vary as a function of employee characteristics (Howell et al., 1986), due to the interplay of contextual factors and employee characteristics (Shalley et al., 2004; Woodman et al., 1993; Zhou & Hoever, 2014). This interactionist perspective suggests that supervisor support (contextual factor) interacts with employee characteristics in affecting intrinsic motivation (Chen et al., 2016). Besides, Liu et al. (2011); Zhou et al. (2012) show that contextual factors and employee characteristics are related to innovative work behavior via psychological reactions (e.g., intrinsic motivation).

Research on the interactionist perspective of contextual and employee characteristics showed that employee characteristics (such as self-efficacy, locus of control and creative personality characteristics in general) positively linked to employee innovative work behaviour enhance the positive effect of supportive contextual factors via employee intrinsic motivation (Chen et al., 2016; Oldham & Cummings, 1996; Tierney et al., 1999). However, findings of Liu et al. (2011); Madjar et al. (2002) show that employee characteristics (such as team member autonomy orientation, team support for autonomy and creative personality characteristics in general) can weaken the positive effects of supportive contextual factors in this same relationship.

As Chen et al. (2016) explained, the self-verification theory from social psychology provides a theoretical explanation of the moderating effects of employee characteristics. The self-verification theory proposes that individuals prefer others to see them as they see themselves. For example, individuals who see themselves as extroverted, want others to see them as extroverted (Turner & Reynolds, 2012). Conformation of their self-views creates a positive reaction from the individual in comparison to nonconforming self-views. The person-context interactionist perspective suggests that a contextual factor (organizational innovation support) interacts with employee characteristics (the Big Five personality traits) in affecting employee intrinsic motivation (Chen et al., 2016).
West (1990) defines organizational innovation support as the expectation, approval, and practical support of attempts to introduce new and improved ways of doing things in the work environment. The signal of support shows that employees are understood, valuable and competent. Understanding the characteristics of an individual confirms the self-view of the employee. In turn, the self-verification theory predicts that these employees are more attentive to such support and show more excitement about and interest in their jobs. This line of theorizing is used to develop justification for predicting a moderating role of employee characteristics (the Big Five personality traits) on the mediating effect of organizational innovation support on employee innovative work behavior via employee intrinsic motivation.

The above-mentioned studies did not specify the employee characteristics but examined (e.g.,) employee creative personality in general or used other employee characteristics like self-efficacy and locus of control. Therefore, it is hard to provide a valid theoretical explanation for each of the Big Five personality traits based on these previous findings. However, a link between one of the studied employee characteristics and one of the Big Five personality traits could provide an indication of such a theoretical explanation. For example, self-efficacy refers to an individual's belief in the capacity to execute behaviors necessary to produce specific tasks. Someone could argue that this employee characteristic is more or less in line with one of the Big Five personality traits conscientiousness, which is the tendency to actively plan and be goal-oriented with a strong sense of purpose (Venkatesh et al., 2014). In both cases, the belief to have the capacity to complete the goal seems leading. Adapting this type of reasoning, Chen et al. (2016) argued that supervisor support shows that an employee is recognized, valued, and praised for good performance. The self-confirmation value of supervisor support predicts that efficacious employees are more attentive to supervisor support and react to it more favourably in terms of showing more interest in their jobs. Subsequently, the effect of supervisor support on employee intrinsic motivation should be stronger for individuals high in self-efficacy (Chen et al., 2016).

So, empirical evidence regarding the moderating role of the Big Five personality traits in the relationship between organizational support for innovation and employee innovative work behavior seems inconclusive. Consequently, the moderating effect will be hypothesized but the type of effect (positive or negative) is unclear based on the results of previous studies. Therefore, the following non-directional hypothesis is formulated.

H_6: The Big Five personality traits moderate the mediating effect of organizational innovation support on employee innovative work behavior via employee intrinsic motivation.

2.6. Conclusion

Based on the results of the literature review, several hypotheses on the relationships between the key concepts of this study have been formulated. Combining the hypotheses results in the research model of the current study, which is visualized in Figure 3.

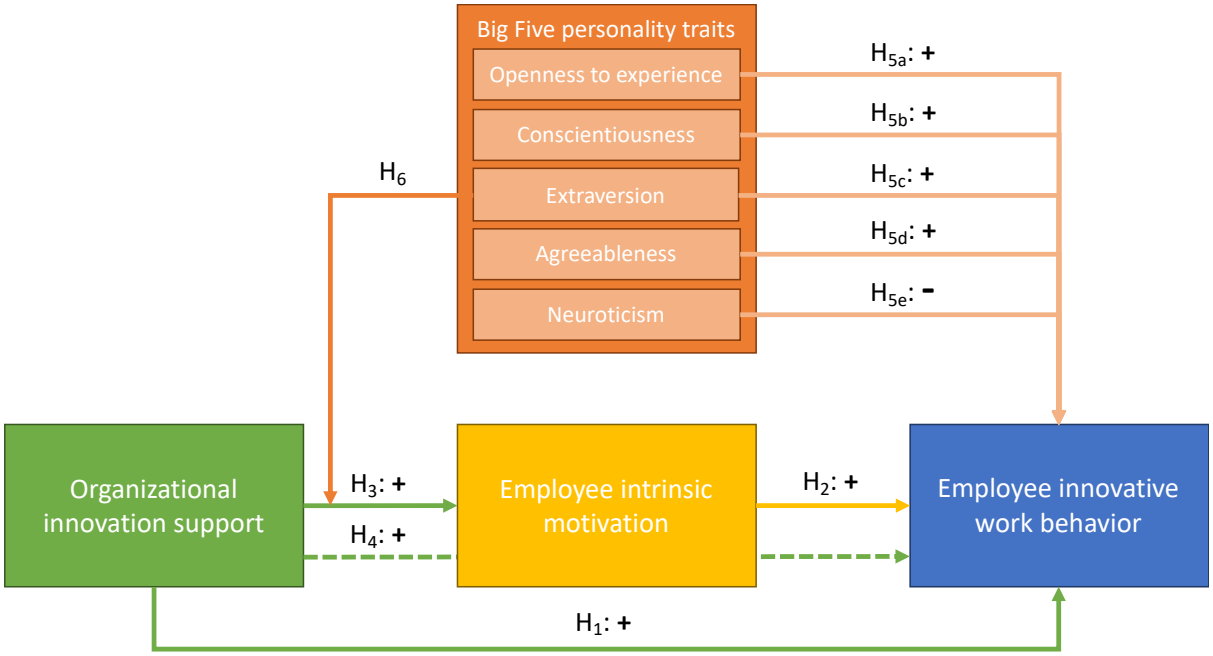


Figure 3: Research model

3. Methodology

This chapter will focus on the methodology used in this study. As described previously, interviews were conducted as pre-research to identify the specific problem areas for the current study. A literature review was performed to gain in-depth insight into the variables included in the research model and their hypothesized relationships. Besides, it was used to select the quantitative measures to assess them. The quantitative data were collected through a survey designed for the employees of the Dutch Ministry of Defense. A survey can reach more respondents with relatively less effort in comparison to interviews, and besides, it does not have a bias from the researcher because the data is filled in by the respondents themselves. Moreover, respondents can decide for themselves when they fill in the survey, which gives them more flexibility (Schmidt, 1997). The purpose of collecting quantitative data via a survey was to statistically test the hypotheses of the current study that were developed based on the literature review (see chapter 2).

An overview of the participants of this study is given in paragraph 3.1. The measures that were used to assess the study variables are described in paragraph 3.2, whereas the control variables are discussed in paragraph 3.3. The procedure of distributing the survey and collecting the data is explained in paragraph 3.4. The way in which the hypotheses were tested is covered in paragraph 3.5. The chapter ends with a conclusion in paragraph 3.6.

3.1. Participants

Participants of the study were employees of the Dutch Ministry of Defense. The survey had a total of 195 responses of which nine were incomplete and therefore deleted. The average age of the remaining 186 respondents was 43.2 years old with a standard deviation of 11.2 years. Most of the respondents are men (71.5%) and the most common type of function was military (55.9%). The CLSK represented the highest input while looking at the department in which the respondents work (44.1%). However, all types of gender, function and department are included in the survey. An overview of descriptive statistics of gender, type of function, and the department in which the employees work are presented in Table 2.

Table 2: Participants statistics (gender, function, and department)

Gender		
	#	%
Men	133	71.5
Woman	50	26.9
Gender neutral	3	1.6
Function		
Civilian	76	40.9
Military	104	55.9
Reservist	6	3.2
Total	186	100.0

Department		
	#	%
KMAR	8	4.3
CLAS	23	12.4
CZSK	9	4.8
CLSK	82	44.1
DOSCO	17	9.1
DMO	28	15.1
BS/DS	19	10.2
Total	186	100.0

3.2. Measures

The measures chosen to assess the variables in the research model were selected based on the following criteria. All represent (one of) the most frequently used measures to study the selected variables, with an (at least) sufficient Cronbach's alpha in previous studies. Besides, to keep the respondents motivated, the shortest possible, validated measures are used to minimize the required response time.

The Cronbach's alpha represents the internal consistency of a measure. It shows the extent to which the measures are content-related (Taherdoost & Lumpur, 2016). It is a way of assessing reliability by comparing the amount of shared variance, or covariance among the items making up a construct to the amount of overall variance. Reliability refers to how consistently the items measure the theoretical concept (Hammersley, 1987). Hinton et al. (2004) suggest four levels of reliability which are excellent reliability (0.90 or above), high reliability (between 0.70 and 0.90), moderate reliability (between 0.50 and 0.70) and low reliability (0.50 or below). The upcoming sub-paragraphs will describe the measures per variable, including their Cronbach's alpha coefficient in the current study.

3.2.1. Employee innovative work behavior

The measure of Janssen (2000) was used to study employee innovative work behavior. The items of the original, other rated measure were reformulated in order to be used as a self-rated measure. It includes nine items that are rated on a seven-point Likert scale ranging from never (1) to always (7), $\alpha = .88$. Examples of questions are "I create new ideas for difficult issues", "I mobilize support for innovative ideas" and "I transform innovative ideas into useful applications".

3.2.2. Organizational innovation support

Organizational innovation support was assessed by using the measure of Anderson & West (1998). The original measure assesses team-level innovation support, and therefore the items were reformulated in order to focus on organizational innovation support. The measure includes eight items that are scored on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5), $\alpha = .63$. Examples of questions are "This organization is always moving toward the development of new answers", "People in this organization are always searching for fresh, new ways of looking at problems" and "Organization members provide practical support for new ideas and their application".

3.2.3. Employee intrinsic motivation

To assess employee intrinsic motivation, the measure of Tierney et al. (1999) was used. The measure includes five items that are scored on a five-point Likert scale ranging from not at all (1) to exactly (5), $\alpha = .82$. Examples of the questions are "I enjoy finding solutions to complex problems", "I enjoy engaging in analytical thinking" and "I enjoy improving existing processes or products".

3.2.4. Big Five personality traits

The measure of Donnellan et al. (2006) was used to assess the Big Five personality traits. It includes 20 items, four for each personality trait, that are scored on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The Cronbach's alpha of openness to experience was .54, which could not be improved by deleting an item but still meets the requirements of Hinton et al. (2004). Furthermore, the Cronbach's alphas were .76 for conscientiousness, .77 for extraversion, .71 for agreeableness and .67 for neuroticism. Examples of the questions are "I have a vivid imagination" (openness to experience), "I get chores done right away" (conscientiousness), "I am the life of the party" (extraversion), "I sympathize with others' feelings" (agreeableness) and "I have frequent mood swings" (neuroticism).

Table 3 gives an overview of the measures that were used to assess each variable in the research model. An overview of the complete survey can be found in appendix III.

Table 3: Measurement per variable

Variable	Measurement	# Items	Scale	Ranging from
Employee innovative work behavior	(Janssen, 2000)	9 items	7-point	Never (1) to always (7)
Organizational innovation support	(Anderson & West, 1998)	8 items	5-point	Strongly disagree (1) to strongly agree (5)
Employee intrinsic motivation	(Tierney et al., 1999)	5 items	5-point	Not at all (1) to exactly (5)
Big Five personality traits	(Donnellan et al., 2006)	20 items (4 per trait)	5-point	Strongly disagree (1) to strongly agree (5)

3.3. Control variables

Next to the variables that are included in the research model, four demographic variables have been found to influence employee innovative work behavior. Therefore, in the analysis, these variables will be controlled for.

First, the studies of Levin (1988) and Rietzschel et al. (2016) found that older employees are less creative and innovative than their younger colleagues. On the other hand, Waldman & Avolio (1986) suggested that innovative work behavior increases with age because complex mental capacities develop across one's lifespan (Baltes & Smith, 1990; Schaie, 1994). Besides, Ericsson (1999); Martin et al. (2007) found that greater experience and expertise (wisdom) grow naturally which implies that the generation of new ideas may increase because of employees' ageing and throughout their work lives. Therefore, in the subsequent analyses, employee **age** was controlled for.

De Jong and den Hartog (2010) found that men are more engaged in innovative work behavior and produce greater innovative output in comparison to women. Besides, Luksyte et al. (2018) found that men are significantly higher rated on creativity and innovative work behavior by their supervisors than women. Therefore, in the subsequent analyses, employee **gender** was controlled for.

Third, the Dutch Ministry of Defense distinguishes three types of employees. An employee is part of the group 'civilian', 'military' or 'reservist'. The difference between these types is that the 'military' and 'reservist' are educated by the Dutch Ministry of Defense and can be dispatched on a mission. Where a 'reservist' works part-time (often beside their civilian job or education) and constitutes the flexible shell of the organization. The group 'civilian' is educated somewhere else and cannot be dispatched on a mission. The difference in education and the possibility to be dispatched on a mission may create differences in innovative work behavior. For example, a military could be more risk-averse (and thereby express less innovative work behavior). When they are at the front line during e.g., a conflict or war, they want to be sure that everything works as planned instead of experimenting in the heat of the moment. This may influence their innovative work behavior in times of peace too. Therefore, in the subsequent analyses, **employee type** was controlled for.

Fourth, the Dutch Ministry of Defense has seven departments: Royal Netherlands Marechaussee (KMAR), Royal Netherlands Army (CLAS), Royal Netherlands Navy (CZSK), Royal Netherlands Air Force (CLSK), Joint Support Command (DOSCO), Defense Material Organization (DMO) and Central staff (BS/DS). Each department focuses on a specific part of defense or support. The difference in focus can create differences in employee innovative work behavior because a specific department could be more innovative by nature and/or perform on a different innovation level than another department. For example, seven years ago, the Dutch Ministry of Defense decided to focus more on the civil market in which the Royal Netherlands Air Force was leading (PIANOO, 2019). They started with applications like 3D printing, and therefore their overall level of innovativeness can be considered higher than that of other departments. Therefore, in the subsequent analyses, **employee department** was controlled for.

3.4. Procedure

As explained, the employees of the Dutch Ministry of Defense provided the quantitative study data by filling out the survey. Respondents were reached via a snowball method. A variety of employees (direct or indirect colleagues of the researcher) were approached for participation at the start of, and during the project. Such contacts were made during e.g., field trips at other locations of the Dutch Ministry of Defense, network events, via other colleagues, or by coincidence. The survey was spread among these people, who were asked to spread the survey within their network etcetera. Instructions on how to share the survey with other employees were provided. The survey was distributed via email and could be filled in via Intranet (SharePoint) and Internet (Qualtrics). The email had a standard format but was personalized for each individual respondent to obtain a higher response rate. This was e.g., done by highlighting the event of acquaintance and mentioning the aspects discussed during the conversation. An example of such an email can be found in Appendix IV. The email request highlighted that the survey was anonymous and confidential. The survey did not ask for names or other traceable information in order to ensure this promise. The survey was estimated to require around six to eight minutes to complete. At the end of the survey, respondents were thanked for their participation. Besides, contact details were provided to get in touch for questions or obtain the result of the study. The survey was open for one month to provide respondents enough time to fill in the survey. The participants who did not share confirmation of receipt of the email were reminded after two weeks.

3.5. Analysis

The data was analysed by using the statistical software platform IBM SPSS Statistics version 28.0.1.0, which was chosen because of the user-friendly interface, robust set of features and reporting possibilities (IBM, 2022). Descriptive statistics were computed, and histograms or bar charts were generated to give an overview of the demographics of the respondents in terms of age, gender, function, and department. Besides, the answers to reverse-formulated items in the survey were recoded. The reliability of the constructs was tested by looking at the Cronbach's alpha (the requirements are given in paragraph 3.1). Items were only deleted if the Cronbach's alpha was below the absolute threshold of 0.50 and could increase in reliability level (e.g., from moderate to high reliability) as developed by Hinton et al. (2004) as described in paragraph 3.1.

The scores of each respondent on each of the variables were computed by adding up the scores on the individual items of a variable and dividing the sum score by the number of items. Next, they were transformed into z-scores. By doing this, the first assumption for correlation analysis was met because the variables need to be continuous to enable computing correlations (Bradburn, 2022). The second assumption was to remove outliers. Besides, the data needs to be normally distributed which is checked by looking at the skewness and kurtosis. The skewness needs to have a value between minus one and one while the kurtosis needs to have a value between minus two and two. Besides, the Shapiro-Wilk test of normality needs to be non-significant to conclude that scores were normally distributed (Bradburn, 2022). Furthermore, a visual inspection of the histogram needs to show a normal distribution. In addition, the dots on the normal Q-Q plot needs to be as close as possible to the line to indicate a normal distribution (Bradburn, 2022). Finally, homoscedasticity was checked. This was done by adding a fit line in total to the scatterplot of the linear regression. The distance between the data points and the line needs to be similar while moving from left to right (Bradburn, 2022).

Next, regression analyses were performed to test each of the hypotheses. In the first step of these analyses, the control variables were added to the regression model to be sure that these variables do not influence the relationship between the independent and dependent variables of interest. To prevent multicollinearity between the predictors, none of the values in the correlation matrix should be above 0.7 (UCLA, 2022). Regarding the residual statistics, the cook's distance (maximum) should not exceed one, while the minimum and maximum values of the standard residuals need to be between negative three and three (UCLA, 2022). Besides, the dots on the PP-plot need to be as close as possible to the line and the values on the x-axis and y-axis in the scatterplot need to be between negative three and three (UCLA, 2022). The R-square value in the model summary shows how many percent of the variance in the dependent variable is explained by the predictor variables (including the control variables). The R-square change of step two shows the unique percentage of variance in the dependent variable explained by the predictor variable of interest. At least model two needs to be significant in the model summary as well as the Anova table (UCLA, 2022). Concerning the coefficients table, the tolerance values need to be greater than 0.1 and the variance inflation factor (VIF) needs to be less than ten. Besides, the standardized coefficients beta shows the direction and strength of the relationship between a predictor variable and the dependent variable (UCLA, 2022).

Mediation occurs if one variable explains the relationship between two other variables. The mediation effect was tested by using the process macro of Hayes (2012) which is in line with the theory of Baron & Kenny (1986). The 'original' step-by-step actions to compute such regression are automated in this macro. The dependent, independent, (potential) mediator and control variables were put into the designated boxes. The functioning of such a mediation effect is depicted in Figure 4. Path a and b are the direct effects from the independent variable to the mediator and from the mediator to the dependent variable. Path c' represents the direct effect of the independent variable on the dependent variable after controlling for the proposed mediator. A distinction is made between partial mediation and full mediation. Partial mediation occurs when the independent variable has both a direct effect (path c') as well as an indirect effect (path a x b) on the dependent variable.

Full mediation occurs when the independent variable only indirectly affects the dependent variable (path a x b). The proportion of the total effect explained by the mediator needs to be at least 80% to claim full mediation (Westfall et al., 2014).

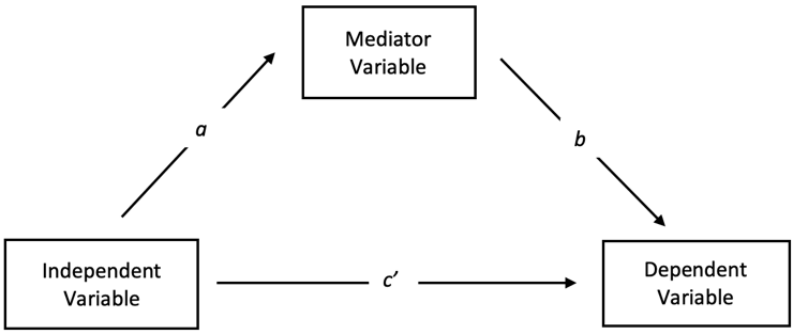


Figure 4: Visual presentation of mediation effect

Model four in the process macro was used to test the mediation effect. Besides, due to the adjusted significance level in this study, a bootstrap confidence interval of 99% was used with 5000 bootstrap samples. A mediation is significant if the bootstrap interval (lower and upper bound) of the indirect effect of X on Y does not include zero. The corresponding effect shows the direction and loading of the mediation. The indirect effect was divided by the total effect to calculate the proportion of the total effect that operates indirectly.

Moderation occurs when a third variable influences the strength or direction of the relationship between an independent variable and a dependent variable. Similar to the mediation effect described in paragraph 4.3.2., the moderation effect is also tested by using the process macro of Hayes (2012). The functioning of such a moderation effect is depicted in Figure 5.

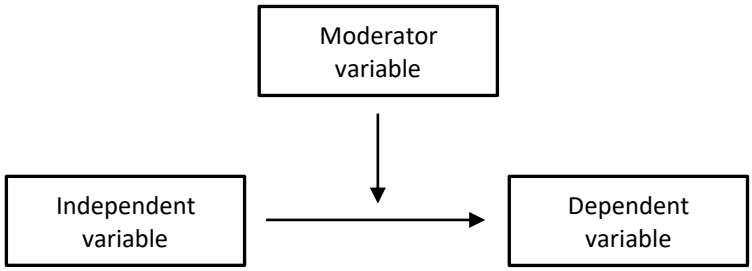


Figure 5: Visual presentation of moderation effect

Model one in the process macro was used to test the moderation effect. Besides, due to the adjusted significance level in this study, a bootstrap confidence interval of 99% was used with 5000 bootstrap samples. The moderation effect occurs if this interaction effect is significant (< 0.007, based on the adjusted significance level). The corresponding Beta coefficient shows the direction and loading of the moderation.

3.6. Conclusion

This chapter gave an overview of the measures that were used to assess each variable in the research model. Survey data were collected via Internet and Intranet. Next, it was explained why some variables were controlled for in the analyses. To conclude, the method of analysing the data in SPSS was elaborated upon from data preparation to hypothesis testing. The next chapter will show the results of the data analysis.

4. Results

This chapter presents the results of the data analysis for the quantitative study. First, descriptive statistics for all study variables are given in paragraph 4.1. The correlations between variables are presented in paragraph 4.2, while paragraph 4.3 describes the results of the regression analyses that were performed to test all hypothesized relationships. Finally, a conclusion is outlined in paragraph 4.4.

4.1. Descriptive statistics

An overview of the descriptive statistics can be found in Table 4. The table shows the following information for each of the study variables: the range of the measure, mean (M), standard deviation (SD), Cronbach's alpha (α) and the number of items. Firstly, the results show that the respondents score relatively high on employee innovative work behavior (M = 4.74, SD = .87) and on employee intrinsic motivation (M = 4.15, SD = .51). Employees also score relatively high on agreeableness (M = 3.97, SD = .57), while they score relatively low on neuroticism (M = 2.07, SD = .69). Another interesting finding is the relatively low score on organizational innovation support (M = 2.82, SD = .60). The standard deviations of all study variables are relatively small, meaning that the answers of the respondents are clustered around the mean.

Table 4: Descriptive statistics (scale, mean, SD, α, and # of items)

Variable	Scale	Mean	SD	α	Items
IWB	1 – 7	4.74	.87	.88	9
EIM	1 – 5	4.15	.51	.63	8
OIS	1 – 5	2.82	.60	.82	5
OTE	1 – 5	3.89	.61	.54	4
Con	1 – 5	3.80	.70	.76	4
Ext	1 – 5	3.21	.73	.77	4
Agr	1 – 5	3.97	.57	.71	3
Neu	1 – 5	2.07	.69	.67	4

IWB = Innovative Work Behavior
EIM = Employee Intrinsic Motivation
OIS = Organizational Innovation Support
OTE = Openness to Experience
Con = Conscientiousness
Ext = Extraversion
Agr = Agreeableness
Neu = Neuroticism

4.2. Correlation analysis

The assumptions for correlation were tested and all requirements were met. The standard significance level for correlations is 0.05 (Cowles & Davis, 1982). However, as multiple (seven) correlations were computed for the dependent variable (innovative work behavior), the chance of committing a type I error increased (Armstrong, 2014). A type I error is the chance for a false positive (incorrectly rejecting the null hypothesis). To protect for type I error, a Bonferroni correction is applied. The downside of this correction is the increase in vulnerability for a type II error (Armstrong, 2014). A type II error refers to failing to reject the null hypothesis when it should actually be rejected. The equation for the adjusted significance level is the original significance level (0.05) divided by the number of correlation analyses on the same dependent variable (seven). Therefore, the adjusted significance level was 0.007 and relationships will only be considered as significant if this significance level is met.

By applying the Bonferroni method, the change of a type I error is reduced back down to around 5% (like the standard significance level for correlations of 0.05 (Cowles & Davis, 1982)). The equation used to prove this is shown below (Armstrong, 2014). The correlation matrix is depicted in Table 5. The significant correlations (based on the adjusted significance level of 0.007) are shown in bold.

$$\text{Significance (adjusted)} = 1 - \left(1 - \frac{0.05}{7}\right)^7 = 0.049 \approx 0.05$$

Table 5: Correlation matrix (N = 186)

	IWB	EIM	OIS	OTE	Con	Ext	Agr	Neu	Age	Gen.	Funct.
IWB	(.876)										
EIM	**.383****	(.631)									
OIS	.077	-.105	(.818)								
OTE	**.256****	**.263****	-.128	(.541)							
Con	-.149	.026	.039	-.135	(.755)						
Ext	.034	.057	-.001	.013	-.106	(.770)					
Agr	.075	.116	-.056	.182	.059	.089	(.710)				
Neu	.109	-.049	-.150	.002	**-.204****	.007	.023	(.673)			
Age	-.139	.003	.051	-.093	.003	.003	.037	-.181			
Gen.	-.088	-.020	-.111	.033	.002	.161	.019	.130	-.069		
Funct.	-.079	-.005	-.073	.103	.092	-.143	-.002	-.111	-.118	-.178	
Depar.	-.127	-.077	.072	-.014	.036	.058	.097	.106	.172	.046	-.105

** Correlation is significant at the 0.007 level (2-tailed).

IWB	=	*Innovative Work Behavior*	*Agr*	=	*Agreeableness*
EIM	=	*Employee Intrinsic Motivation*	*Neu*	=	*Neuroticism*
OIS	=	*Organizational Innovation Support*	*Gen.*	=	*Gender*
OTE	=	*Openness to Experience*	*Funct.*	=	*Function*
Con	=	*Conscientiousness*	*Depar.*	=	*Department*
Ext	=	*Extraversion*			

Table 5 shows that employee intrinsic motivation (r = .383, p <.001) and openness to experience (r = .256, p <.001) were significantly and positively correlated with employee innovative work behavior. Unfortunately, all other relationships between the study variables turned out to be not significant, except for the (unexpected) positive correlation between openness to experience and employee intrinsic motivation (r = .263, p <.001).

4.3. Regression analysis

The correlation analysis provided insights into the bivariate relationships between the study variables. Next, all hypotheses were tested by means of regression analyses. Direct and indirect (mediation) as well as moderation effects were tested.

4.3.1. Direct effects

All hypotheses except H_3 and H_6 examine direct relationships. To test these hypotheses, hierarchical multiple regression analyses were performed. In the first step, the control variables (age, gender, function, and department) were entered into the regression model. The independent variable of interest was added in the second step of the analysis. The direction and loading of the dependent variable are expressed by the standardized Beta coefficients. The value of Beta is always between one and minus one, and the higher the

value, the stronger the effect. The model fit is measured with the F-value which indicates if the variables added in the model significantly improved the prediction. This value needs to be significant to be able to interpret the model. The R^2 of each model provides the explained variance in the dependent variable that is accounted for by the predictors included in the model. The R2 change shows how much 'extra' variance in the dependent is explained by the variable added in the model. As explained in paragraph 4.2, the significance level was 0.007. The results of the analyses of the direct effects are presented below.

Organizational innovation support on employee innovative work behavior

The relationship of organizational innovation support with employee innovative work behavior was hypothesized to be positive (H_1). Model 1 in Table 6 shows that there were no significant relationships of the control variables with innovative work behavior, whereas Model 2 shows that organizational innovation support was not significantly related to employee innovative work behavior ($\beta = .072$, $p = .325$). Besides, Table 6 presents that the R^2 in model one was .054 while the R^2 in model two was .059 and that the F change value was not significant. Therefore, H_1 was rejected.

Table 6: Regression organizational innovation support on employee innovative work behavior (N = 186)

	Model 1		Model 2	
	B	Se B	B	Se B
(Constant)	1.531	.488	1.507	.489
Age	-.013	.007	-.013	.007
Gender	-.234	.150	-.215	.151
Function	-.233	.136	-.221	.136
Department	-.070	.047	-.073	.047
Organizational innovation support			.072	.073
R^2	.054		.059	
F	.038		.325	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

Employee intrinsic motivation on employee innovative work behavior

The relationship of employee intrinsic motivation with employee innovative work behavior was hypothesized to be positive (H_2). Model 1 in Table 7 is unchanged and shows no significant relationships of the control variables with employee innovative work behavior, whereas Model 2 shows that employee intrinsic motivation was significantly positively related to employee innovative work behavior ($\beta = .375$, $p < .001$). Table 7 presents that the R^2 in model one was .054 while the R^2 in model two was .194 and that the F change value was significant. Therefore, H_2 was confirmed.

Table 7: Regression employee intrinsic motivation on employee innovative work behavior (N = 186)

	Model 1		Model 2	
	B	Se B	B	Se B
(Constant)	1.531	.488	1.437	.453
Age	-.013	.007	-.013*	.006
Gender	-.234	.150	-.220	.138
Function	-.233	.136	-.223	.125
Department	-.070	.047	-.051	.043
Employee intrinsic motivation			.375***	.067
R^2	.054		.194	
F	.038		<.001***	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

Organizational innovation support on employee intrinsic motivation

The relationship of organizational innovation support with employee intrinsic motivation was hypothesized to be positive (H_3). Model 1 in Table 8 shows no significant relationships of the control variables with intrinsic motivation, whereas Model 2 shows that organizational innovation support was not significantly related to employee intrinsic motivation (β = -.106, p = .159). Table 8 presents that the R^2 in model one was .007 while the R^2 in model two was .018 and that the F change value was not significant. Therefore, H_3 was rejected.

Table 8: Regression organizational innovation support on employee intrinsic motivation (N = 186)

	Model 1		Model 2	
	B	Se B	B	Se B
(Constant)	.252	.501	.288	.500
Age	.001	.007	.001	.007
Gender	-.036	.153	-.064	.154
Function	-.026	.139	-.043	.139
Department	-.051	.048	-.046	.048
Organizational innovation support			-.106	.075
R^2	.007		.018	
F	.877		.159	

Dependent variable: Employee intrinsic motivation
*Note. *p < .05, **p < .01 and ***p < .007*

Openness to experience on employee innovative work behavior

The relationship of openness to experience with employee innovative work behavior was hypothesized to be positive (H_{5a}). Model 1 in Table 9 again shows no significant relationships of the control variables with employee innovative work behavior, whereas Model 2 shows that openness to experience was significantly positively related to employee innovative work behavior (β = .263, p < .001). Table 9 presents that the R^2 in model one was .054 while the R^2 in model two was .122 and that the F change value was significant. Therefore, H_{5a} was confirmed.

Table 9: Regression openness to experience on employee innovative work behavior (N = 186)

	Model 1		Model 2	
	B	Se B	B	Se B
(Constant)	1.531	.488	1.568	.472
Age	-.013	.007	-.011	.006
Gender	-.234	.150	-.258	.145
Function	-.233	.136	-.282*	.132
Department	-.070	.047	-.072	.045
Openness to experience			.263***	.071
R^2	.054		.122	
F	.038		<.001***	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

Conscientiousness on employee innovative work behavior

The relationship of conscientiousness with employee innovative work behavior was hypothesized to be positive (H_{5b}). Model 1 in Table 10 remains unchanged and shows no significant relationships of the control variables with employee innovative work behavior, whereas Model 2 shows that conscientiousness was not significantly related to employee innovative work behavior (β = -.134, p = .065).Table 10 presents that the R^2 in model one was .054 while the R^2 in model two was .072 and that the F change value was not significant. Therefore, H_{5b} was rejected.

Table 10: Regression conscientiousness on employee innovative work behavior (N = 186)

	Model 1		Model 2	
	B	Se B	B	Se B
(Constant)	1.531	.488	1.464	.487
Age	-.013	.007	-.013	.007
Gender	-.234	.150	-.229	.149
Function	-.233	.136	-.208	.135
Department	-.070	.047	-.067	.047
Conscientiousness			-.134	.072
R^2	.054		.072	
F	.038		.065	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

Extraversion on employee innovative work behavior

The relationship of extraversion with employee innovative work behavior was hypothesized to be positive (H_{5c}). Model 1 in Table 11 again shows no significant relationships of the control variables with employee innovative work behavior, whereas Model 2 shows that extraversion is not significantly related to employee innovative work behavior (β = .042, p = .568). Table 11 presents that the R^2 in model one was .054 while the R^2 in model two was .056 and that the F change value was not significant. Therefore, H_{5c} was rejected.

Table 11: Regression extraversion on employee innovative work behavior (N = 186)

	Model 1		Model 2	
	B	Se B	B	Se B
(Constant)	1.531	.488	1.536	.489
Age	-.013	.007	-.013	.007
Gender	-.234	.150	-.246	.151
Function	-.233	.136	-.224	.137
Department	-.070	.047	-.071	.047
Extraversion			.042	.074
R^2	.054		.056	
F	.038		.568	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

Agreeableness on employee innovative work behavior

The relationship of agreeableness with employee innovative work behavior was hypothesized to be positive (H_{5d}). Model 1 in Table 12 again shows no significant relationships of the control variables with employee innovative work behavior, whereas Model 2 shows that agreeableness is not significantly related to employee innovative work behavior (β = .094, p = .211). Table 12 presents that the R^2 in model one was .054 while the R^2 in model two was .063 and that the F change value was not significant. Therefore, H_{5d} was rejected.

Table 12: Regression agreeableness on employee innovative work behavior (N = 186)

	Model 1		Model 2	
	B	Se B	B	Se B
(Constant)	1.531	.488	1.572	.489
Age	-.013	.007	-.013	.007
Gender	-.234	.150	-.237	.149
Function	-.233	.136	-.235	.135
Department	-.070	.047	-.076	.047
Agreeableness			.094	.073
R^2	.054		.063	
F	.038		.195	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

Neuroticism on employee innovative work behavior

The relationship of neuroticism with employee innovative work behavior was hypothesized to be negative (H_{5e}). Model 1 in Table 13 shows no significant relationships of the control variables with employee innovative work behavior, whereas Model 2 shows that neuroticism is not significantly related to employee innovative work behavior (β = .104, p = .168). Table 13 presents that the R^2 in model one was .054 while the R^2 in model two was .064 and that the F change value was not significant. Therefore, H_{5e} was rejected.

Table 13: Regression neuroticism on employee innovative work behavior (N = 186)

	Model 1		Model 2	
	B	Se B	B	Se B
(Constant)	1.531	.488	1.476	.489
Age	-.013	.007	-.011	.007
Gender	-.234	.150	-.253	.150
Function	-.233	.136	-.213	.136
Department	-.070	.047	-.079	.047
Neuroticism			.104	.075
R^2	.054		.064	
F	.038		.168	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

4.3.2. Mediation effect

The mediation of employee intrinsic motivation on the relationship between organizational innovation support and employee innovative work behavior was hypothesized (H_4). However, this mediation effect is rejected because H_3 already showed that the non-significant relationship between organizational innovation support and employee intrinsic motivation. Therefore, it is not possible to have a mediating effect of employee intrinsic motivation on the relationship between organizational innovation support and employee innovative work behavior. Therefore, H_4 was rejected.

4.3.3. Moderation effects

The moderating effects of the Big Five personality traits on the relationship between organizational innovation support and employee intrinsic motivation, as hypothesized in H_6, will be discussed in the upcoming sections. An overview of the moderation output including an explanation of how to read the output is provided in Appendix V.

Moderation openness to experience

According to hypothesis H_{6a}, the relationship between organizational innovation support and employee intrinsic motivation is moderated by openness to experience. Table 14 shows that the interaction effect was not significant (β = .060, p = .434). Therefore, H_{6a} was rejected.

Table 14: Regression moderation openness to experience on the relationship between organizational innovation support and employee innovative work behavior (N = 186)

	Model 1		Model 2		Model 3	
	B	Se B	B	Se B	B	Se B
(Constant)	1.531	.488	1.568	.472	.310	.485
Age	-.013	.007	-.011	.006	.004	.007
Gender	-.234	.150	-.258	.145	-.091	.150
Function	-.233	.136	-.282*	.132	-.097	.136
Department	-.070	.047	-.072	.045	-.041	.048
Organizational innovation support			.072	.073	-.079	.073
Openness to experience			.263***	.071	.269***	.073
Interaction (OIS * OTE)					.060	.076
R^2	.054		.122		.295	
F	.038		<.001***		.021*	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

Moderation conscientiousness

According to hypothesis H_{6b}, the relationship between organizational innovation support and employee intrinsic motivation is moderated by conscientiousness. Table 15 shows that the interaction effect was not significant (β = .015, p = .840). Therefore, H_{6b} was rejected.

Table 15: Regression moderation conscientiousness on the relationship between organizational innovation support and employee innovative work behavior (N = 186)

	Model 1		Model 2		Model 3	
	B	Se B	B	Se B	B	Se B
(Constant)	1.531	.488	1.464	.487	.314	.505
Age	-.013	.007	-.013	.007	.001	.007
Gender	-.234	.150	-.229	.149	-.063	.155
Function	-.233	.136	-.208	.135	-.049	.141
Department	-.070	.047	-.067	.047	-.048	.049
Organizational innovation support			.072	.073	-.107	.075
Conscientiousness			-.134	.072	.035	.075
Interaction (OIS * Con)					.015	.074
R^2	.054		.072		.019	
F	.038		.065		.841	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

Moderation extraversion

According to hypothesis H_{6c}, the relationship between organizational innovation support and employee intrinsic motivation is moderated by extraversion. Table 16 shows that the interaction effect was not significant (β = .042, p = .589). Therefore, H_{6c} was rejected.

Table 16: Regression moderation extraversion on the relationship between organizational innovation support and employee innovative work behavior (N = 186)

	Model 1		Model 2		Model 3	
	B	Se B	B	Se B	B	Se B
(Constant)	1.531	.488	1.536	.489	.327	.505
Age	-.013	.007	-.013	.007	.001	.007
Gender	-.234	.150	-.246	.151	-.092	.157
Function	-.233	.136	-.224	.137	-.028	.140
Department	-.070	.047	-.071	.047	-.051	.048
Organizational innovation support			.072	.073	-.105	.075
Extraversion			.042	.074	.069	.076
Interaction (OIS * Ext)					.042	.078
R^2	.054		.056		.023	
F	.038		.568		.753	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

Moderation agreeableness

According to hypothesis H_{6d}, the relationship between organizational innovation support and employee intrinsic motivation is moderated by agreeableness. Table 17 shows that the interaction effect was not significant (β = .064, p = .380). Therefore, H_{6d} was rejected.

Table 17: Regression moderation agreeableness on the relationship between organizational innovation support and employee innovative work behavior (N = 186)

	Model 1		Model 2		Model 3	
	B	Se B	B	Se B	B	Se B
(Constant)	1.531	.488	1.572	.489	.327	.499
Age	-.013	.007	-.013	.007	.001	.007
Gender	-.234	.150	-.237	.149	-.065	.154
Function	-.233	.136	-.235	.135	-.047	.139
Department	-.070	.047	-.076	.047	-.052	.048
Organizational innovation support			.072	.073	-.097	.075
Agreeableness			.094	.073	.137	.077
Interaction (OIS * Agr)					.064	.073
R^2	.054		.063		.036	
F	.038		.195		.479	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

Moderation neuroticism

According to hypothesis H_{6e}, the relationship between organizational innovation support and employee intrinsic motivation is moderated by neuroticism. Table 18 shows that the interaction effect was not significant (β = .012, p = .888). Therefore, H_{6e} was rejected.

Table 18: Regression moderation neuroticism on the relationship between organizational innovation support and employee innovative work behavior (N = 186)

	Model 1		Model 2		Model 3	
	B	Se B	B	Se B	B	Se B
(Constant)	1.531	.488	1.476	.489	.316	.506
Age	-.013	.007	-.011	.007	.001	.007
Gender	-.234	.150	-.253	.150	-.057	.156
Function	-.233	.136	-.213	.136	-.054	.141
Department	-.070	.047	-.079	.047	-.040	.049
Organizational innovation support			.072	.073	-.115	.076
Agreeableness			.104	.075	-.058	.078
Interaction (OIS * Agr)					.012	.082
R^2	.054		.064		.021	
F	.038		.168		.805	

Dependent variable: Employee innovative work behavior
*Note. *p < .05, **p < .01 and ***p < .007*

4.3.4. Additional analyses

The majority of the hypothesized relationships were not confirmed. However, results showed that employee openness to experience and intrinsic motivation were significantly positively correlated (r = .263, p <.001). Therefore, we performed an additional regression analysis for this (unexpected) direct relationship too.

Model 1 in Table 19 shows no significant relationships of the control variables with employee intrinsic motivation, whereas Model 2 shows that openness to experience was significantly positively related to employee intrinsic motivation (β = .271, p < .001). Table 19 presents that the R^2 in model one was .007 while the R^2 in model two was .078 and that the F change value was significant.

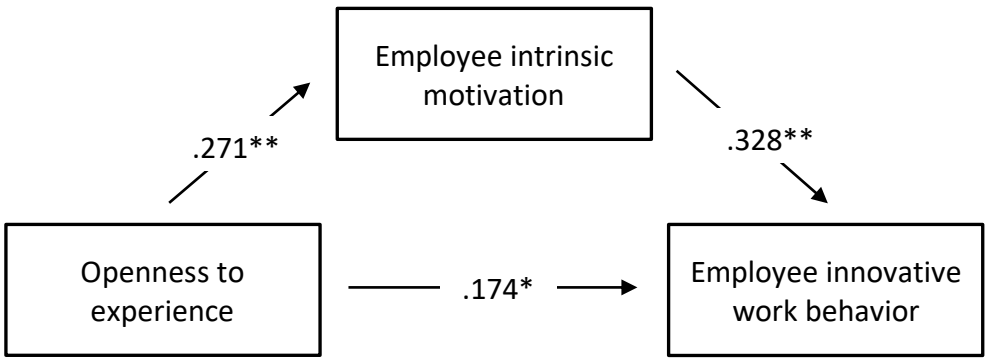
Table 19: Regression openness to experience to employee intrinsic motivation (N = 186)

	Model 1		Model 2	
	B	Se B	B	Se B
(Constant)	.252	.501	.290	.484
Age	.001	.007	.003	.007
Gender	-.036	.153	-.061	.148
Function	-.026	.139	-.077	.135
Department	-.051	.048	-.052	.046
Openness to experience			.271***	.072
R^2	.007		.078	
F	.877		<.001***	

Dependent variable: Employee intrinsic motivation
*Note. *p < .05, **p < .01 and ***p < .007*

As findings showed that both employee intrinsic motivation (H_3) and openness to experience (H_{5a}) are positively related to employee innovative work behavior, an additional analysis was performed to test a possible mediation effect of employee intrinsic motivation on the relationship between openness to experience and employee innovative work behavior.

The same method as explained in paragraph 3.5 was used to test this new insight. Path a (between openness to experience and employee intrinsic motivation) was significant (β = .271, p < 0.001). Path b (between employee intrinsic motivation and employee innovative work behavior) was also significant (β = .328, p < 0.001). Path c' (between openness to experience and employee innovative work behavior) was not significant due to the adjusted significance level (β = .174, p = .013). The visual presentation of these results is given in Figure 6.



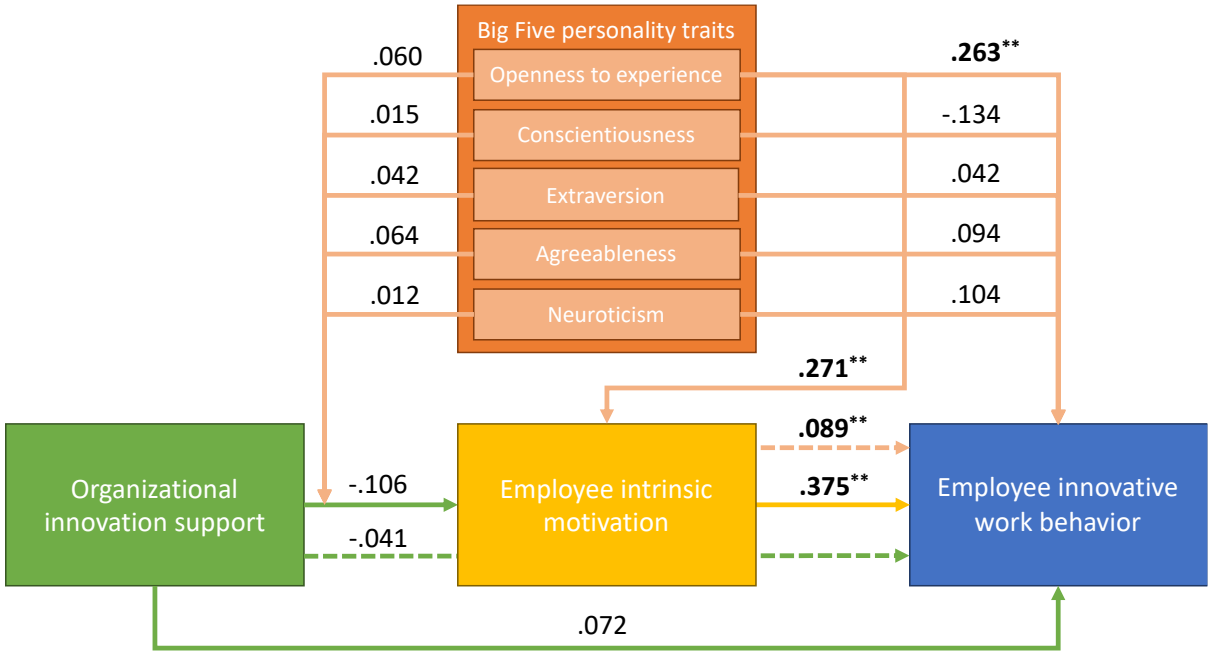
* Significant at the 0.05 level (2-tailed)
** Significant at the 0.01 level (2-tailed)

Figure 6: Mediation of IM on the relationship between OTE and IWB

The total effect of openness to experience on employee innovative work behavior was significant (β = .263, p < 0.001). The lower (.016) and upper (.212) bound of the bootstrap confidence interval did not include zero, which supports a significant positive mediation effect of employee intrinsic motivation on the relationship between openness to experience and employee innovative work behavior (β = .089, p < 0.01). The proportion of the total effect of openness to experience on employee innovative work behavior explained by employee intrinsic motivation is 33.84%, which indicates partial mediation (Westfall et al., 2014). An overview of the mediation output including an explanation on how to read the output is provided in Appendix V.

4.4. Conclusion

This chapter presented the results of testing the hypotheses from the conceptual model developed in chapter two. Only employee intrinsic motivation and openness to experience showed the hypothesized significant positive relation with employee innovative work behavior. All other hypothesized relationships between the study variables were not significant, and therefore the hypotheses regarding these relationships had to be rejected. Consequently, no evidence was found for the hypothesized mediation and moderation effects. However, openness to experience proved to be positively related to employee intrinsic motivation which was not hypothesized. Moreover, employee intrinsic motivation was found to partially mediate the relationship of openness to experience with employee innovative work behavior. Figure 7 shows an overview of all relationships between the study variables including their significance. In the next chapter, the results of the study are discussed, and a conclusion is formulated.



Control variables:
Age, Gender, Function & Department

** Significant at the **0.007** level (2-tailed)

Figure 7: Final research model

5. Conclusion and discussion

This study aimed to investigate the relationships between organizational innovation support, employee innovation motivation and the Big Five personality traits with employee innovative work behavior within the Dutch Ministry of Defense. Based on a literature review, theoretical argumentation as well as existing empirical evidence, hypotheses regarding the variables included in the research model were formulated. Data to test the hypotheses was gathered among 186 employees via a survey, and this data was analysed by performing hierarchical multiple regression, mediation and moderation analyses using the statistical program SPSS. Overall, little support was found for the hypothesized relationship in the research model. The results showed that only employee intrinsic motivation ($\beta = .375$, $p < .001$) and openness to experience ($\beta = .263$, $p < .001$) had a significant positive relation with employee innovative work behavior when controlling for employee age, gender, function, and department. Unfortunately, all other hypothesized relationships were not significant. However, the results of additional post-hoc analyses showed that openness to experience was positively related to employee intrinsic motivation ($\beta = .271$, $p < .001$) and that employee intrinsic motivation partially mediated the relationship of employee openness to experience with employee innovative work behavior.

5.1. Theoretical contribution

Due to the limited number of significant relationships that were found, the contribution of the current study towards theory development is modest too. First, this research was (one of) the first that examined the combined relationship of individual employee attributes (employee intrinsic motivation and the Big Five personality traits) and contextual factors (organizational innovation support) with employee innovative work behavior as suggested by Nisula & Kianto (2016). As Nisula & Kianto (2016) indicated, simultaneously studying both individual and contextual attributes, leads to a more refined insight into how employee innovative work behavior is influenced, compared to studies examining these relationships separately. For example, this study showed that not only the personality trait openness to experience but also employee intrinsic motivation relates to employee innovative work behavior. Besides, this study found that employee intrinsic motivation mediates the relationship between openness to experience and innovative work behavior which provides insight into the underlying mechanism relating openness to experience and employee innovative work behavior. Second, this study examined the conceptual model within the context of the Dutch Ministry of Defense. To the best of my knowledge, up till now, hardly any research on employee innovative work behavior has been performed within this (type of) context. Most previous studies are conducted in non-governmental and profit-oriented organizations, whereas this study was conducted in a governmental, non-profit, and military organization. Therefore, this study provides the insight that the relationships between the studied variables could be context specific. Where in this context safety, people and national wealth are most important in comparison to machines and profit in most non-governmental and profit-oriented organisations studied (Henderson, 2018).

Additionally, the manifestation of these variables might differ in the military context in comparison to the earlier studied contexts. Therefore, the mean per variable in this study and the mean per variable in other studies, with the exact same measures, is compared. The ‘mean of other studies’ is based on studies in the literature review. The contexts of these studies were different from the context of this study. Table 20 shows the comparison.

Table 20: Comparison mean per variable of this study vs. other studies

Variable	Scale	Mean this study	Mean other studies	Difference
IWB	1 – 7	4.74	4.52	+ 0.22
EIM	1 – 5	4.15	4.16	- 0.01
OIS	1 – 5	2.82	3.60	**- 0.78**
OTE	1 – 5	3.89	3.98	- 0.09
Con	1 – 5	3.80	3.84	- 0.04
Ext	1 – 5	3.21	3.45	- 0.24
Agr	1 – 5	3.97	3.89	+ 0.08
Neu	1 – 5	2.07	2.91	**- 0.84**

IWB = Innovative Work Behavior
EIM = Employee Intrinsic Motivation
OIS = Organizational Innovation Support
OTE = Openness to Experience
Con = Conscientiousness
Ext = Extraversion
Agr = Agreeableness
Neu = Neuroticism

The mean of 'other studies' is based on:

Employee innovative work behavior	(Chen et al., 2016; Madrid et al., 2014; Nisula & Kianto, 2016; Tan et al., 2021)
Employee intrinsic motivation	(Chen et al., 2013; Gupta, 2020; Masood & Afsar, 2017; Yuan & Woodman, 2010)
Organizational innovation support	(Chen et al., 2013; Madrid et al., 2014; Nisula & Kianto, 2016; Zuraik et al., 2020)
Big Five personality traits	(Clark & Schroth, 2010; Gupta, 2021; Javed et al., 2020; Zuraik et al., 2020)

As depicted in Table 20, organizational innovation support scored 0.78 lower on a scale from one to five in this study compared to other studies. This negative difference could/ should also be a concern for the Dutch Ministry of Defense. Therefore, I would recommend finding out the reason for this relatively low score on organizational innovation support. Figure 8 shows the exact values per study, mean value of these studies and the mean of the Dutch Ministry of Defence.

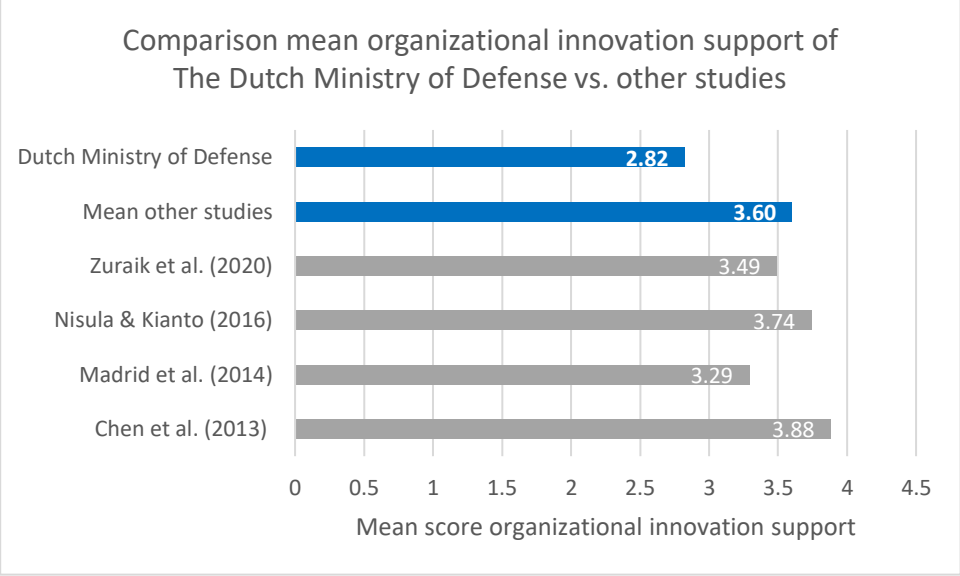


Figure 8: Comparison mean organizational innovation support The Dutch Ministry of Defense vs. other studies

While analysing Table 20, another difference occurs concerning neuroticism which scored 0.84 lower on a scale from one to five. Despite the potential reason for an insignificant relationship, a lower score on neuroticism could have a positive expression on the organization because being low on neuroticism is usually seen as a positive personality trait (Guo et al., 2017). This means that the employee of the Dutch Ministry of Defense, on average, are less emotionally unstable and experience fewer negative feelings (Venkatesh et

al., 2014). Figure 9 shows the exact values per study, mean value of these studies and the mean of the Dutch Ministry of Defence.

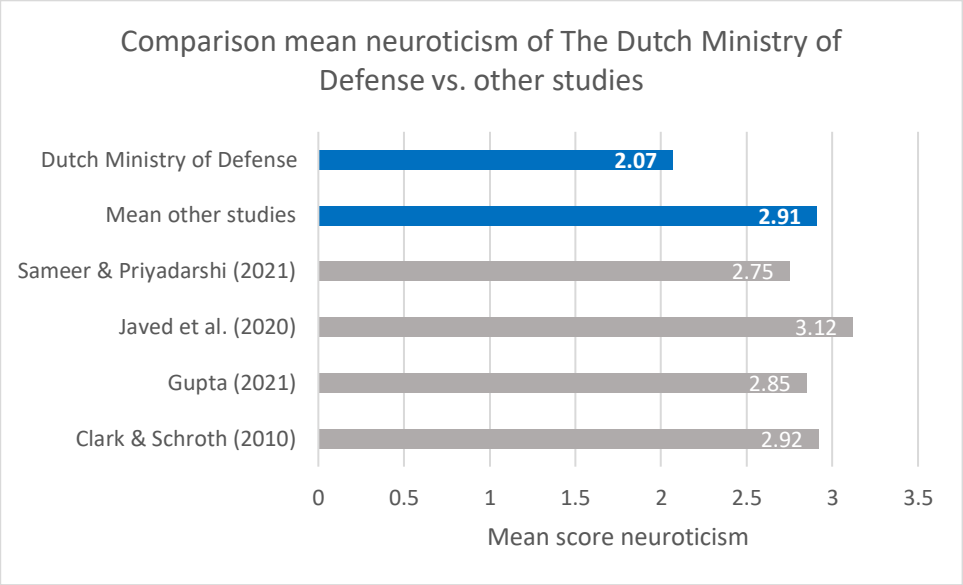


Figure 9: Comparison mean neuroticism The Dutch Ministry of Defense vs. other studies

The study also found evidence for a non-hypothesized relationship between openness to experience and employee intrinsic motivation as well as a non-hypothesized mediating effect of employee intrinsic motivation in the relationship between openness to experience and employee innovative work behavior. Especially the mediation effect between these variables provides a unique theoretical contribution because, to the best of my knowledge, employee intrinsic motivation is only found as a mediator between openness to experience and creativity (Prabhu et al., 2008; Tan et al., 2019). As many authors found, employee innovative work behavior is divided into two phases of which creativity is only one (Åmo & Kolvereid, 2005; Birdi et a., 2016; Chen et al., 2013; de Jong, 2006; Janssen, 2000; Lukes & Stephan, 2017; Madrid et al., 2014; Yuan & Woodman, 2010). Thus, this study found that the mediation effect also occurs in both phases of employee innovative work behavior. Watanabe et al. (2011) found evidence that supports this finding; individuals who are open to experience tend to have a mastery-oriented pattern of behaviors, thoughts and feelings and these patterns are conducive to employee intrinsic motivation, which subsequently positively relate to employee innovative work behavior.

5.2. Practical implications

The goal of this study was to contribute to a more effective deterrence level by improving employee innovative work behavior. The practical implications of this study relate to this goal. As shown previously, employee intrinsic motivation and openness to experience show a positive effect on employee innovative work behavior. The Dutch Ministry of Defense could introduce motivational and personality tests to examine the current level of intrinsic motivation and openness to experience before hiring new employees who are expected to work on innovations. This could indicate their fit for innovative work activities. The Dutch Ministry of Defense currently provides tests to assess the physical ability of a (potential) employee. However, none of these tests focuses on assessing personal characteristics related to innovative work behavior, such as intrinsic motivation, or personality traits of the (potential) employee (Teluij, Deputy Head of Innovation Department AIR, Ministry of Defense,

September 2022). Such tests are valuable for the organization because it provides insights into which people have naturally the highest ability to innovate. In turn, innovation is the driving force of organizations toward development and growth in ever-changing needs and markets (Luthans et al., 2007) and selecting the most suitable employee to innovate enhances this process. Besides, the organization can also try to stimulate the variables that relate to employee innovative work behavior. First, the implications concerning employee intrinsic motivation will be discussed after which the implications regarding openness to experience will be elaborated upon.

Employee intrinsic motivation can be enhanced by implementing job-crafting interventions (Effendi & Etikariena, 2018). Job crafting is defined as making changes regarding job demands and recourses in order to make a job more engaging, satisfying, and meaningful (Demerouti, 2014). Such an intervention is provided (thought e.g., a workshop) to improve the knowledge and skills of employees on how to redesign the current work tasks to better fit their personal needs and preferences and thereby increase employees' intrinsic motivation. Job crafting is a process which starts with the employee. However, managers play a role by being involved in the process of job crafting to align the organization's strategy, improve communication with their subordinates and understand how employees actually perform their jobs (Berg & Dutton, 2007; Schoberova, 2015).
Job crafting generally involves in three stages (Berg & Dutton, 2007). First, an employee needs to be motivated to craft their job. The motivation to start such a process can originate from a variety of reasons. For example, the need and/or desire for job control and meaningful work, interactions with other people, fulfilment of passion or ability to cope with adversity. Second, the employee identifies the crafting opportunities in his/her job and uses one or more techniques to craft their job. Such techniques can be altering the number, type, or nature of tasks by taking additional ones or changing tasks related to one's passion. Besides, one can change interactions with others to build meaningful relationships, expand ones role to make a greater impact, change relationships to cope with adversity etc. Furthermore, the cognitive perception of work can be reframed by e.g., redefining the social purpose of work or changing one's thoughts or beliefs about the job. Third, applying the crafting techniques is associated with specific outcomes for the job crafter. Individual outcomes of job crafting can express in alignment with personal expectations, fulfilment of valued identities, enjoyment, reduction of stress, personal growth and/or increased competence. Job crafting can also positively influence both individual and organizational performance. Therefore, organizations need to start by designing jobs that leave room for crafting to meet the motives, passion and strengths of the employee while meeting relevant organizational goals (Berg & Dutton, 2007). As explained before, job crafting enhances employee intrinsic motivation which consequently has a positive effect on employee innovative work behavior. The chance of successfully implementing this technique within the innovative departments of the Dutch Ministry of Defense is relatively high due to the culture and support of the innovative managers. However, this is not the case everywhere in the organization as explained by Van de Hogen: *"I had two major tasks in my previous (non-innovative) function within the Dutch Ministry of Defense. I preferred one of my tasks over the other one. One of my colleagues experienced the opposite. We could have allocated our work tasks differently if job crafting was implemented within the organization. The intrinsic motivation of me, and my colleague, would have been increased if we were able to switch these tasks"* (Van de Hogen, Innovation Manager of Innovation Department AIR, Ministry of Defense, September 2022).

Furthermore, Rodríguez-Carvajal et al. (2016) found that developing mindfulness skills and self-compassion reduce the perception of threat and enhance openness to experience. Mindfulness is defined as the self-regulation of attention to one's experiences in the present moment with acceptance, curiosity, and openness (Bishop et al., 2004). Creswell (2017) found that two features appear in most definitions of mindfulness. First, it grounds attention and awareness of one's present moment experience. Second, it leads to the adoption of an attitude of openness to experience or acceptance towards one's experience. Individuals high on mindfulness are expected to express higher levels of openness to experience not only to new information but also to different points of view from a broader perspective (Beitel et al., 2005; Kaviani & Hatami, 2016).

Developing mindfulness skills to enhance openness to experience can be done via multiple types of interventions. These can variate from intensive sessions to a couple of minutes per session and from daily to a limited program of a few weeks. Such interventions can be done by a teacher, by using an application or (for those persons with advanced mindfulness skills) by themselves (Creswell, 2017). The effects of these interventions are, next to enhancing openness to experience, focused on physical health (chronic pain, immunity, clinical symptoms, diseases, and health behaviors) and mental health (depression, anxiety, addiction, and additive disorder) (Creswell, 2017). The usability of this implication has also been verified: *"It is possible to attend mindfulness interventions within the Dutch Ministry of Defense. However, these interventions are mostly used to recover from accidents in case of post-traumatic stress disorder or stress-related symptoms instead of enhancing openness to experience. I think these interventions can also be used for applications like openness to experience"* (Dieker, employee of Innovation Department AIR, Ministry of Defense, September 2022). Therefore, I would recommend highlighting the additional benefit of such interventions to use this opportunity to enhance openness to experience, and consequently employee innovative work behavior. Besides, an employee is more eager to think outside the box and try new things when they express more openness to experience.

5.3. Ethical aspects

The aim of the study was to contribute to an effective deterrence level for the Dutch Ministry of Defense and to secure national safety. However, an ethical aspect that should not be neglected is the potential negative impact of a higher deterrence level on enemies. The awareness of this aspect is important. *"The armed forces take action when dialogue has reached its limits. We prefer to help to prevent war, conflict, and injustice. Where possible, we do so without violence. But if necessary, we intervene with due force. Because sometimes words need to be backed up by force. That means we fight for freedom where turmoil reigns, and where it is peaceful, we keep the peace. Where disasters occur, we offer help"* (Ministry of Defense, 2022). As mentioned, the goal is for the greater good in which the mission is to strive for a world of freedom and security. Like in every operation, the target is to focus on the factors that endanger this mission, in which collateral damage should be as low as possible. These motivations remain unchanged regardless of the situation. In a utopia, a Ministry of Defense is not needed anymore because everyone has enough food and drinks, lives in peace and respects each other. Unfortunately, the current war between Ukraine and Russia shows the reality.

The implications, given in paragraph 5.2, do not apply to every possible situation. For example, the Dutch Ministry of Defense acts in times of peace and war. The organization needs to behave differently in each situation. The recommendations presented in paragraph 5.2, and on employee innovative work behavior in general, are preferred in times of peace. During this period, the deterrence level can be improved by innovation. On the other hand, in times of war, structure and hierarchy are extremely important. Employee innovative work behavior is not preferred in such a situation. Therefore, the Dutch Ministry of Defense needs to be aware that this study does not implicate that improving employee innovative work behavior is the best solution in every situation.

5.4. Reflection on non-significant relationships

This paragraph will reflect on the large number of non-significant relationships in this study. At first, as already mentioned in the literature review (chapter 2), contradicting theoretical reasoning and findings are found in literature regarding many of the relationships between the variables under study. The hypotheses were based on theoretical reasoning and previous findings but in all cases, there are articles which provided other substantiations as compared to the majority. This especially occurred for the hypothesis of conscientiousness (H_{5b}) and agreeableness (H_{5d}) to employee innovative work behavior. Second, some of the hypotheses were never studied before, like the moderating role of the Big Five personality traits in the relationship between organizational support for innovation and employee innovative work behavior (H_6). The theoretical foundation of this hypothesis was built on studies that took place in different contexts. It might be because of the differences in the contexts that the hypothesis was non-significant. Besides, the sample size could play a role in finding significant relations.

To conclude, almost all previous studies are performed in a context that is different from the context of this study. This study has a relatively unique context because it is governmental, non-profit, and military nature. In comparison, most previous studies are conducted in non-governmental and profit-oriented organizations. Where in this context safety, people and national wealth are most important in comparison to machines and profit in most non-governmental and profit-oriented organisations studied (Henderson, 2018). Therefore, the findings could deviate from each other. However, it is hard to point in one direction while trying to explain the different outcomes. Some aspects of the research design could still be improved; these adjustments will be described in the future research section in the next paragraph.

5.5. Limitations and future research

Besides the contributions, this study also has some limitations. For example, the data is gathered at one moment in time. The specific status of the respondent and/or company at that moment in time may have influenced respondents' way of filling in the survey. When looking at the variables in this study, personality traits will probably remain more or less stable because someone's personality does not change overnight. On the other side, the variables organizational innovation support, employee intrinsic motivation and employee innovative work behavior can be linked to a particular moment in time. For example, a respondent could feel good about him/herself, have some successful innovative ideas or implementations, and just get permission and support to continue an innovation project and therefore respond (extremely) positive on all sections of the questionnaire. Another limitation is that the survey

was self-rated, and because of that, common method variance (CMV) can occur (Chang et al., 2010). CMV is variance that is attributable to the measurement method rather than to the constructs the measure represents (Podsakoff et al., 2003). Respondents can have a positive or negative bias about themselves and therefore not respond with the same perception as other respondents. Duffy et al. (1998) described those who are generally more satisfied and report the occurrence of pleasant events more frequently as high on positive affectivity.

To cover the limitations, future research could focus on gathering data longitudinally instead of measuring all variables at one moment in time. Besides, the common method variance can be reduced by changing self-rated data into other rated data (where possible). For example, employee innovative work behavior could also be rated by others, e.g., by their supervisor. The other measures (organizational innovation support, employee intrinsic motivation and the Big Five personality traits) are more difficult to rate by others because these measures should represent how the employee perceives organizational innovation support, feel intrinsically motivated and show how someone should characterize themselves by using the Big Five personality traits. These variables need introspection and are therefore difficult to rate by others. Besides, as mentioned in paragraph 5.4, a lot of studies in the literature review were held in non-governmental and profit-oriented contexts. Future research could focus more on studies that are conducted in governmental, non-profit, and military-natured contexts.
Future research could also focus on the different stages of employee innovative work behavior (generation, promotion, and implementation) to find out the influences of these stages in the research model. Each stage might require specific employee skills and possibly different personality traits. For example, the master innovation management at the TU/e is divided into two tracks, the 'business and product creation' track which is focused on the front-end of the innovation process and 'managing innovation processes' which is focused on the back end. Specific competencies are linked to the different stages. The business and product creation track needs creativity and the ability to cope with uncertainty while the managing innovation processes track needs planning, optimization, and a systematic way of working (Rispens, 2021). Organizational innovation support and employee intrinsic motivation probably show a comparable relationship in both tracks because these variables are more universal in this situation. However, this could be different for the Big Five personality traits. For example, openness to experience is the tendency to actively seek new and unconventional ideas with a high degree of intellectual curiosity (Venkatesh et al., 2014). Such personality traits seem more in line with the 'business and product creation' tracks because creativity is important in this track which focuses on seeking new and unconventional ideas. On the other side, conscientiousness is the tendency to actively plan and be goal-oriented with a strong sense of purpose (Venkatesh et al., 2014). This seems more in line with the ‘managing innovation processes’ because planning is an important aspect of this track.
Specific aspects of organizational innovation support (like leadership styles, resource availability, work environment etc.) could be examined separately and more in-depth to find out if these individual aspects do have a significant relationship with employee innovative work behaviour and employee intrinsic motivation. Furthermore, other types of innovation support, like supervisor support and other personality traits such as the VIA classification of character strengths which classifies 24 characteristics into six categories can be researched to find out the relationships of these variables with employee innovative work behaviour and employee intrinsic motivation. Besides, a qualitative instead of a quantitative study could be

performed to gain more detailed insight into factors influencing the scores on the different study variables to find the underlining mechanisms of, for example, organizational innovation support. This could (e.g.,) be done in order to explain the relatively low score of perceived organizational innovation support and to gain more detailed insight into relationships regarding the variables.

To conclude, theoretical contributions and practical implications of this study are addressed in this chapter. Moreover, the ethical aspects of improving innovative work behavior within the Dutch Ministry of Defense are highlighted. A reflection of the insignificant relations is given, limitations are addressed and opportunities to cover these limitations are provided. Besides, opportunities for future research are offered as well.

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Appendix I: Pre-research

The first month of the internship was used to gain insight into the current innovativeness of the Dutch Ministry of Defense. Several interviews were held to get a comprehensive overview of the innovativeness. Open questions regarding this topic were asked without focusing on specific aspects of innovation or pointing into a specific direction. The interviewees were given the opportunity to speak about every innovative topic, challenge, problem, frustration, (possible) improvement, vision etc. to fully express their point of view regarding innovation within the Dutch Ministry of Defense. The last two interviews were used to validate the 'conclusions' of the previous interviews by using a more structured format.

I.1. Procedure

The interviews were held online or on location depending on the distance between the intervewee and interviewer. The interviews had a duration of 30-60 minutes. The interviewees were selected by the mentor of the Dutch Ministry of Defense. People within the innovation community divided over the different military powers were chosen to get a comprehensive overview. The military power of an employee of the Dutch Ministry of Defense is the 'department' in which he or she is working. Besides, an employee of the Dutch Ministry of Defense is part of the group 'civilian', 'military' or 'reservist'. A civilian is an employee how is not educated by the Ministry of Defense, a miliary is. A reservist is a flexible (part time) military and functions as the flexible shell. The interviews were unstructured to semi-structured, some questions were:

- What is your function within the Dutch Ministry of Defense?
- What do you think about innovation (within the Dutch Ministry of Defense)?
- What is the most important thing about innovation?
- How do you experience the innovation process?
- Are you struggling with some innovation related topic?

In total, nine interviews were held (excluding the ongoing conversations with the two supervisors of the Dutch Ministry of Defense. Seven of these interviews were held as described above. The other two interviews were used to validate the previous findings. The findings about innovative work behavior, innovation support and intrinsic motivation were transformed into questions. The questions were still open but focused on these topics. The answers were in line the previous findings. The questions were:

- What do you think about the innovative work behavior of the employees within the Dutch Ministry of Defense?
- What do you think about the innovative support provided by the Dutch Ministry of Defense?
- What do you think about the intrinsic motivation of the employees within the Dutch Ministry of Defense?

I.2. Interviewees

Table 21 shows the gender, civilian/military/reservist, functions, military power, and interview type of the interviews. The number is linked to the notes in the upcoming section. The order of the numbers is not the order of the interviews. These are on purpose randomized.

Table 21: List of interviews including gender, type of function, specific function, military power, and interview type

#	Gender	Civilian/ military/ reservist	Function	Military power	Interview type
1	F	Civilian	Senior advisor business operations	Defense staff	Un-/semi-structured
2	M	Military	Employee modernization program	Army	Un-/semi-structured
3	M	Military	Chief change and innovation management	Navy	Un-/semi-structured
4	M	Military	Head innovation centre AIR (Ambition Innovation Results)	Air force	Structured
5	F	Civilian	Employee change and innovation management	Navy	Structured
6	M	Military	Innovator	Army	Un-/semi-structured
7	M	Civilian	Senior advisor innovation	Military police	Un-/semi-structured
8 9	F M	Civilian Military	Innovator Innovator	Air force Air force	Un-/semi-structured

I.3. Analysis

Similarities and differences in the answers of the interviewees were detected and documented. The most important aspects of all interviews were marked and named (as a particular topic). After doing this, the topics which were the same, or described the same, were put together. The number of times a topic was mentioned is counted and the topics which were mentioned most frequently represented the top three as described in the main text. The content of the topic is summarized based on the input of the interviewees.

I.4. Interview notes

The notes of every interview are given below. The number is linked to the numbers given in Table 21 and correspond with each other.

#1:

In addition to Defense, I also worked in the commercial sector (e.g., bol.com) in the field of logistics. After that, I became interested in innovation and the human side. Also studied technical business administration.

Focused on social innovation and noticed that there is a culture of 'can't, shouldn't'.

Various projects, the largest of which focuses on the use of design thinking. They tried to expand this as much as possible with the idea of 'learning by doing'.
Defense strategy 2035 is very ambitious and requires a lot of power to change

Another project focuses on working in chains and networks. The conclusion is that working in chains does not work and is consistent with rank and file.

Yet another project focuses on the change network with four themes: promoting entrepreneurship, creativity, smart cooperation and active learning.

The innovative employee is everyone in the organization, not the innovation department.

In addition, she would like to see that action is taken on the basis of the current setting, where being deployed and 'normal' work have to be distinguished. The soldier on secondment must be the boss who is 'in control', but therefore gives no room for others. In the 'normal' situation, this must be the case.

Interviews with the higher-ranking men show that there is a fear of divergence. There is a culture of fear, where not everyone dares to say what they think because this has consequences for their future careers. This is negative for the innovation culture.

Walk in the woods with senior men in their own uniform and informally. This has shown that there is no ownership for innovation and that they want to pass it on to the younger employees. However, this does not provide any room from above and this is necessary for the layers below.

Much focused on boss, boss, boss.

Especially the translation of the innovation concept into behavior is difficult. The managers understand it but have no idea what to do with it. It is a system in which they are stuck. She is now busy finding sponsors to support this.

Change management is an important aspect here, because with innovation comes change. The leadership style is very decisive here, because it has to provide the space. To realize innovation, a culture change is needed. Culture is the communication between people.

The three-year system does not help. Keep convincing, start all over again. Why change every three years? This has been in place since 1897, so hold on to it. Effective somewhere for 2 years, which makes it impossible to lead a change process.

Black cross behind the name if you deviate from the standard. Best way to get promotion is to copy the boss (path of least resistance).

The innovative employee must also have the innovative boss. Wording is important here. Targeting the bosses is important.

Talking to bosses with different views. Gaining insight into their points of view.

#2:
For the army, a job description for the innovative employee has been formulated. Other sections of the armed forces have not yet produced one.

Competencies in this description do not (always) correspond to the competition descriptions that the Ministry of Defense uses. There is a noticeable difference in thinking here.

Possible question: what is the innovative mindset and what is the current mindset (and the difference between them). My vision of an innovative mindset and what is the current mindset, and contrast them.

Recommended article: the four paradigms of Philips. According to the interviewee, Defense still works from the industrial paradigm and innovation is focused on the transformation paradigm.

He advises not to throw away the current mindset but to complement it. One part (of Defense) fully focused on innovation and one part a combination of current and innovation.

#3:
Navy (military), specialized in navigation and active in change and innovation management.

Hitching a ride on the commercial market where possible. Determining in which environment I will focus. Innovation is buzz word. Innovation (renewal and modernization) in the DNA otherwise you will not win the war.

Be good at doing an experiment. Innovation only succeeded when it is in use in business. Have become very good at experimenting and short cycling, but implementing creates all sorts of problems. Short cyclical is to arrive at the big goal in small steps. In particular, the fact that it is not part of the current plans means that a lot has to change in the short term and that is difficult. The ability to change within Defense is too low.

Trade unions have a say in the reorganization and expansion. As a result, the pace of innovation is slow.

The Netherlands has a more innovative mindset compared to other countries. No problem in the innovation mindset among the mariners (military).
On paper, everything goes well within the innovation community. Innovation circus/stage; showing how well we are doing. More to the outside world and less internally.

Facilitating department should actually be redundant. Ideally, this should come from the employees themselves. Not innovation but innovation management.

Innovation is not a fixed item on the agenda within the top and therefore does not gain support.

Motivation intrinsic and extrinsic is also good. However, the motivation to change has been reduced.

Everyone is very busy and therefore has less time for change/change capacity. 70/20/10 rule: 70 current work, 20 improvement 10 philosophizing.

Creativity. Yes and no. Creative minds do not fit into bureaucratic organizations. On the other hand, facilitate creativity. Helping to think out of the box.

#4:
Innovation is difficult mature within Defense. For investments of 5 million or more, it takes 5 to 7 years from application to use (far too long). The air force must become more creative. AIR translates innovation within the air force.

Convert innovations in the commercial market to applications within Defense. Good at making prototypes, but implementation is not happening, but implementation is not happening. No motivation for change.

In the new management, projects and innovation become a subject. Improvement is also innovation. It seems that copying is rewarded and thinking outside the box is not rewarded. The climate in which this happens must be improved.

Not invented here syndrome prevails within Defense. The shop floor provides the ideas.

Defense in principle is not an innovative organization. Innovation must be aimed at 'how does it add value to our product'.

Creativity is not rewarded. Higher ranks no creativity, therefore. High degree of learned behavior. Challenge the norm exciting. High rank determines, creativity there is scarce.

Leadership: innovate is recognized, do not leave comfort zone. Primary process influence certain discomfort. Shout it, but don't do it when it gets too close.

Innovation network propagates innovation. Coronel probably doesn't know about it. Believers and non-believers of innovation. More writing than execution.

Different perceptions of innovation. Opinion 'against' innovation: Better to spend money on bombs. 3rd version of opinion written. People disagree. Prototype to be realized, but not implemented. Top down. Paradigm change, not just in technology. Innovation wider than technology.

Resources are not facilitated. Money at the moment. No knowledge or people. Network important -> conditional for current working atmosphere. New manager (who is not familiar with the network) will swim in the organization.

Innovation center only needed if there is a need for facilitation. Strongly bureaucratic. Running the business more important, bigger picture lost sight of (innovation).

Leadership extremely big difference. One for the bigger picture/innovation, the other for practice. Intrinsic/extrinsic motivation. Some do spend money, others 0. Compulsory compliance, you will innovate.

Culture: we don't need it, so we don't have to. Small AIRs made at other locations. It is now about making the employee innovative and not the innovation itself.

Authority forces things. Literally discomfort with innovation.

#5:
Switching functions means that a project is not completed as planned. Implementation difficult, more prototype

In the best case, the department is redundant, capacity is not there and due to daily tasks.

The start-up of this project takes 2/3 years, super slow!

There is no incentive to innovate, this is not rewarded (support for innovation). From leadership this is also not supported (support for innovation).

No motivation because it takes a long time and costs a lot of work. Has been a money issue for a long time.

Change manager needed, capacity not available. Uncertainty to be busy with innovation. Not rewarded.

#6:
Social innovation (study), part of MIND -> innovation dock
Implementation process takes a long time, needs assessment takes 1/2 year. Above a certain amount, a longer process (also via the second chamber, etc.) can take up to 7 years.

Do not describe needs too specifically because otherwise after a certain period (when a new technique has been developed) you cannot switch (300 squads vs. hybrid squad).

Entrepreneurship, analytical ability etc. as competence profile -> focused on Defense material department. Facilitate everything in the work environment (especially digital).

Innovation is change + outcome. Much top down, only innovation much less. Everyone sees the need, but no note to innovate.

The issues of the day are a stumbling block, infiltrating innovation is therefore difficult. Budget is also difficult, each to their own.

Group thinking is one of the competencies - thinking of the big picture instead of the department. No hindrance (participative safety) within the department, probably more within the military environment.

People like to be involved in innovation, but when something is actually changed, it is exciting -> power of change.

Behavior code psychology: not working with friends and family. This makes it difficult to change within one's own team.

Diversity within a team is needed, what should a successful innovation team have.

#7:
Ownership and 'the lead user theory' (the feeling that you can influence your environment) are the two most important aspects for social innovation.

One promising answer is provided by lead-user theory: Users who are ahead of an important market trend and expect high benefits from innovating (lead users) will be most likely to develop attractive innovations (von Hippel, 1986).

The lead user theory is not guided by rank and file which is important for innovation.

One option for research is to examine the contextual factors of innovation. You can also look at what should or should not be changed. You can compare different innovation clubs. Finally, you can also choose a certain theory that focuses on innovation and see if it is (still) applicable.

To be able to innovate in Defense, you need to know where the resources are and where the hurdles are. You have to know where to go and where not to go. A key word here is alignment. Everyone involved must be involved in the project from the start, otherwise you can expect resistance (know and involve your stakeholders). This can cause you to be obstructed. Only from a higher rank is it easier to get something done, because then you get fewer questions. Otherwise, you have to follow the standard route.

Changing ranks every 3 years ensures that there is much less ownership. Often, a certain task is imposed on you instead of being tackled by you. This causes you to lose the capacity to carry out the task in advance. He gave the quote: 'Consistency of purposes is the key to success'.

It takes a lot of perseverance to get something done (being stubborn enough). A way to reduce this is to facilitate the necessary resources. Topic: facilitating innovation management.

Intrinsic motivation is very important in innovation and for him a precondition. In addition, the initiator is the project leader. This is crucial because passing on an idea to someone else (who is not the initiator/ has nothing to do with the idea) will lead to lower/no success. This is called a Chinese volunteer.

Initially, it was indicated that further development in one's own time is a must, but later it became clear that this is a sign that the owner really wants to go for the innovation. Capacity is freed up to set up/run a project. The level of innovation plays a role in this. Less time is freed up for something simpler than a radical innovation.

#8 & 9:
SharePoint environment built with different tiles (aspects within innovation). This was made for the Woensdrecht branch. The initiator of the project is the one leading the project.

The method used focuses on facilitating and letting people speak for themselves. People are rewarded in different ways. They are publicly rewarded with black and gold cords and their appreciation is expressed (intrinsically). There are also financial rewards based on impact. Usually this is about €250 (extrinsic).

The platform makes extensive use of visual images. Videos are made of the initiators explaining the idea and the next steps. The platform is set up very informally and has no standard. This appears to work best within this site.

The COVID-19 measures had a negative effect or the result. It turns out that literally bringing people together results in more innovation.

The initiator is often unable facilitate the innovation completely on his own, but needs other (specialist) knowledge to do so. The interviewees play a facilitating role in this, ensuring that the right specialties come together.

Communication takes place via the platform, but they also discovered that the mechanic does not open the SharePoint page (quickly). Because of this, they chose to also consult other platforms (Instagram) to keep it close to the user.

No fixed conditions are set for an innovation proposal before it is considered. Therefore there is no budget ceiling, no impact etc. This is all to create/maintain the widest possible picture.

Innovation is set up as informally as possible, which increases accessibility. It is kept as simple as possible. This is a conscious choice in a formal organization. Innovation is different and must therefore be approached differently. In the beginning, every project or idea needs too much attention to be set up.

The thread of innovation within Defense is the same for the whole of Defense (must be the same goal). This platform can function as a blueprint with core values and 'proven' stimulation indicators.

To be able to innovate in a fixed organization, one has to go hard against the current. For example, no ranks and positions are appointed, only names. This is to radiate that everyone is equal and that everyone can innovate.

No attention is paid to innovation within the Defense Academy. This is a striking situation because it is acknowledged that innovation is part of the core values, but it is not reflected in the training programme. This is the ultimate way to train someone perfectly, but it is not used.

There are many islands within Defense that often do not know about each other's knowledge and skills, which projects are running and what they can learn from each other. The innovation platform should help with this. Getting in touch with different groups simulates the sharing of knowledge.

A general problem within Defense is the implementation of innovations (on a large scale). Ideas are generated, prototypes are tested and approved, but actual implementation often proves the difficulty.

Appendix II: Search strings literature review

Table 22 shows the criteria concerning the quality assessment.

Table 22: Criteria number of citations

More than 20 results		Less than 20 results	
Year	Criteria	Year	Criteria
2022	None, all selected	2022	None, all selected
2021	> 5 citations	2021	> 3 citations
2020	> 10 citations	2020	> 5 citations
2011 - 2020	> 50 citations	2011 - 2020	> 25 citations

Table 23 shows the search strings of the literature study used to develop the conceptual model.

Table 23: Search string of literature study

#	Search string	Results	First selection	Second selection	Third selection
1	(“innovation support” OR “innovative support” OR “support for innovation”) AND (“innovation motivation” OR “innovative motivation” OR “motivation to innovate” OR “intrinsic motivation” OR “extrinsic motivation”) AND (“Big Five personality traits” OR “five factor personality traits” OR “personality traits” OR “personality factors” OR “Big Five” OR “openness to experience” OR “conscientiousness” OR “ extraversion” OR “agreeableness” OR “neuroticism”) AND (“innovative work behavior” OR “innovative work behaviour” OR “innovative behavior” OR “innovative behaviour” OR “innovation mindset” OR “innovative mindset” OR “innovativeness”)	0	0	0	0
2	(“innovation support” OR “innovative support” OR “support for innovation”) AND (“innovation motivation” OR “innovative motivation” OR “motivation to innovate” OR “intrinsic motivation” OR “extrinsic motivation”) AND (“innovative work behavior” OR “innovative work behaviour” OR “innovative behavior” OR “innovative behaviour” OR “innovation mindset” OR “innovative mindset” OR “innovativeness”)	2	2	2	2
3	(“innovation support” OR “innovative support” OR “support for innovation”) AND (“innovation motivation” OR “innovative motivation” OR “motivation to innovate” OR “intrinsic motivation” OR “extrinsic motivation”) AND (“Big Five personality traits” OR “five factor personality traits” OR “personality traits” OR “personality factors” OR “Big Five” OR “openness to experience” OR “conscientiousness” OR “extraversion” OR “agreeableness” OR “neuroticism”)	0	0	0	0
4	(“innovation motivation” OR “innovative motivation” OR “motivation to innovate” OR “intrinsic motivation” OR “extrinsic motivation”) AND (“Big Five personality traits” OR “five factor personality traits” OR “personality traits” OR “personality factors” OR “Big Five” OR “openness to experience” OR “conscientiousness” OR “ extraversion”	3	1	0	0

	OR “agreeableness” OR “neuroticism”) AND (“innovative work behavior” OR “innovative work behaviour” OR “innovative behavior” OR “innovative behaviour” OR “innovation mindset” OR “innovative mindset” OR “innovativeness”)				
5	(“innovation support” OR “innovative support” OR “support for innovation”) AND (“Big Five personality traits” OR “five factor personality traits” OR “personality traits” OR “personality factors” OR “Big Five” OR “openness to experience” OR “conscientiousness” OR “extraversion” OR “agreeableness” OR “neuroticism”) AND (“innovative work behavior” OR “innovative work behaviour” OR “innovative behavior” OR “innovative behaviour” OR “innovation mindset” OR “innovative mindset” OR “innovativeness”)	2	2	2	2
6	(“innovation support” OR “innovative support” OR “support for innovation”) AND (“innovative work behavior” OR “innovative work behaviour” OR “innovative behavior” OR “innovative behaviour” OR “innovation mindset” OR “innovative mindset” OR “innovativeness”)	49	15	6	4
7	(“innovation support” OR “innovative support” OR “support for innovation”) AND (“innovation motivation” OR “innovative motivation” OR “motivation to innovate” OR “intrinsic motivation” OR “extrinsic motivation”)	12	10	2	1
8	(“innovation support” OR “innovative support” OR “support for innovation”) AND (“Big Five personality traits” OR “five factor personality traits” OR “personality traits” OR “personality factors” OR “Big Five” OR “openness to experience” OR “conscientiousness” OR “extraversion” OR “agreeableness” OR “neuroticism”)	5	5	2	1
9	(“innovation motivation” OR “innovative motivation” OR “motivation to innovate” OR “intrinsic motivation” OR “extrinsic motivation”) AND (“innovative work behavior” OR “innovative work behaviour” OR “innovative behavior” OR “innovative behaviour” OR “innovation mindset” OR “innovative mindset” OR “innovativeness”)	174	37	10	8
10	(“Big Five personality traits” OR “five factor personality traits” OR “personality traits” OR “personality factors” OR “Big Five” OR “openness to experience” OR “conscientiousness” OR “extraversion” OR “agreeableness” OR “neuroticism”) AND (“innovative work behavior” OR “innovative work behaviour” OR “innovative behavior” OR “innovative behaviour” OR “innovation mindset” OR “innovative mindset” OR “innovativeness”)	203	32	7	5
11	(“innovation motivation” OR “innovative motivation” OR “motivation to innovate” OR “intrinsic motivation” OR “extrinsic motivation”) AND (“Big Five personality traits” OR “five factor personality traits” OR “personality traits” OR “personality factors” OR “Big Five” OR “openness to experience” OR “conscientiousness” OR “extraversion” OR “agreeableness” OR “neuroticism”)	230	28	6	4
	Total	566	85	37	27

Appendix III: Survey questions

Innovative work behavior – Janssen (2000)

1) Creating new ideas for difficult issues
2) Searching out new working methods, techniques, or instruments
3) Generating original solutions for problems
4) Mobilizing support for innovative ideas
5) Acquiring approval for innovative ideas
6) Making important organizational members enthusiastic for innovative ideas
7) Transforming innovative ideas into useful applications
8) Introducing innovative ideas into the work environment in a systematic way
9) Evaluating the utility of innovative ideas

The response format was a 7-point scale ranging from 'never' (1) to 'always' (7).

Innovation support – Anderson and West (1998)

1) This team is always moving toward the development of new answers
2) Assistance in developing new ideas is readily available
3) This team is open and responsive to change
4) People in this team are always searching for fresh, new ways of looking at problems
5) In this team we take the time needed to develop new ideas
6) People in the team co-operate in order to help develop and apply new ideas
7) Members of the team provide and share resources to help in the application of new ideas
8) Team members provide practical support for new ideas and their application

5-point scale ranging from 1 = strongly disagree to 5 = strongly agree.

Intrinsic motivation – Tierney et al. (1999)

1) I enjoy finding solutions to complex problems.
2) I enjoy coming up with new ideas for products.
3) I enjoy engaging in analytical thinking.
4) I enjoy creating new procedures for work tasks.
5) I enjoy improving existing processes or products.

5-point scale with (1 = not at all, 5 = exactly)

Big five personality traits – Donnellan et al. (2006)

Openness to experience

1) Have a vivid imagination.
2) Am not interested in abstract ideas. (R)
3) Have difficulty understanding abstract ideas. (R)
4) Do not have a good imagination. (R)

Conscientiousness

1) Get chores done right away.
2) Often forget to put things back in their proper place. (R)
3) Like order.
4) Make a mess of things. (R)

Extraversion

1) Am the life of the party.
2) Don't talk a lot. (R)
3) Talk to a lot of different people at parties.
4) Keep in the background. (R)

Agreeableness

1) Sympathize with others' feelings
2) Am not interested in other people's problems. (R)
3) Feel others' emotions.
4) Am not really interested in others. (R)

Neuroticism

1) Have frequent mood swings.
2) Am relaxed most of the time. (R)
3) Get upset easily.
4) Seldom feel blue. (R)

5-point scale ranging from 1 (strongly disagree) to five (strongly agree). (R) = Reverse Scored

Control variables

1) My age is (fill in a round number):

2) My gender is:
    1. Male
    2. Female
    3. Gender neutral

3) I am:
    1. Civilian
    2. Military
    3. Reservist

4) I work in organization department:
    1. Royal Netherlands Marechaussee (KMAR)
    2. Royal Netherlands Army (CLAS)
    3. Royal Netherlands Navy (CZSK)
    4. Royal Nether-lands Air Force (CLSK)
    5. Joint Support Command (DOSCO)
    6. Defense Material Organization (DMO)
    7. Central staff (BS/DS).

Appendix IV: Example personalized mail with standard format

Goedemiddag XXXXXX,

We hebben elkaar ontmoet bij de fieldtrip in Den Helder van drie maanden geleden. Ik heb toen kort verteld dat ik bezig ben met de master innovatie management en mijn onderzoek naar het innovatieve werkgedrag van de defensie medewerker. Ik wil je graag om hulp vragen. Ik ga dit namelijk onderzoeken met een survey en om goede analyses te kunnen doen heb ik voldoende respondenten nodig. De survey is volledig anoniem en duurt ongeveer 8 minuten. De survey is beschikbaar op Internet en Intranet, de keuze is aan jou.

Omdat mijn netwerk nog niet groot is, zou ik het enorm waarderen als je deze mail door kunt sturen naar je collega's. Ik hoop via jouw andere collega's van DMO (of elders) te benaderen. Ik hoop hiermee een sneeuwbal effect te creëren en de betrouwbaarheid van mijn onderzoek te verhogen. Alvast bedankt voor het invullen en delen!

Link Internet

Link Intranet

Mocht jezelf of een van je collega's nog vragen hebben over de survey of later benieuwd zijn naar het resultaat, dan ben ik te bereiken via rja.buijs@mindef.nl.

Innovatieve groet,

Robin Buijs, AIR

Voorbeeld 'doorstuur mail':
Een afstudeer stagiair onderzoekt het innovatieve werkgedrag van de defensie medewerker en gebruikt daarvoor een survey. Wil je hem helpen met zijn onderzoek? De survey is in te vullen via Internet en Intranet en duurt ongeveer 8 minuten. Alvast bedankt!

Link Internet

Link Intranet

Mocht je vragen hebben over de survey of later benieuwd zijn naar het resultaat van kan je de afstudeer stagiair bereiken via rja.buijs@mindef.nl.

Appendix V: Mediation and moderation output

The mediation and moderation output of the two tested mediation relations and five tested moderation relations including explanation is provided below.

Mediation EIM on the relationship between IS and IWB - (H_4)

The output provided by the process macro for mediation is shown below. As explained in paragraph 4.3.2 the mediation process functions like depicted in Figure 10. The (in)dependent variable and (potential) mediator are listed at the top of the output. The independent variable is variable X (IS, innovation support), the mediator is variable M (IM, intrinsic motivation) and the dependent variable is variable Y (IWB, innovative work behavior).

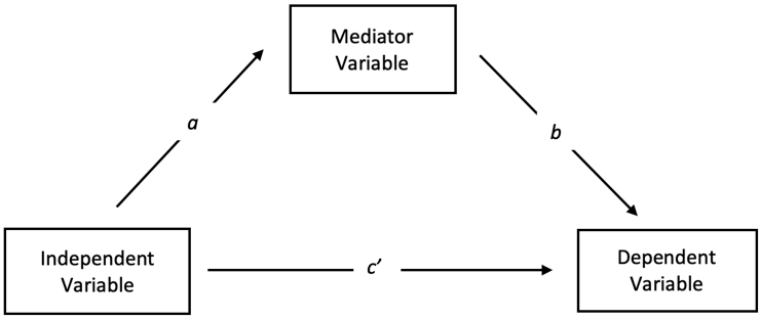

Figure 10: Visual presentation of mediation effect

Certain parts are highlighted and provided with a number to read and explain the output. Number 1 presents the X to M relation (from the independent variable to the mediator variable) which is depicted as path a in Figure 10. Number 2 presents the M to Y (mediator to dependent variable) and X to Y (independent to dependent variable) relations. These relations are depicted as path b and c, respectively. Number 3 shows the total effect of X on Y which is necessary to calculate the proportion of the mediation. Number 4 presents the mediation effect. The mediation effect is significant if the bootstrap interval does not include zero.

```
Model  : 4
    Y  : IWB
    X  : IS
    M  : IM

Covariates:
Age   Gender   Function   Department

Sample
Size:  186

*************************************************************************
```

```
OUTCOME VARIABLE:
IM

Model Summary
R       R-sq     MSE      F       df1      df2        p
.1323   .0175    1.0098   .6413   5.0000   180.0000   .6685

Model
           coeff    se      t       p       LLCI     ULCI
constant   .2881   .4999    .5763   .5651   -1.0133   1.5895
IS        -.1058   .0749   -1.4133  .1593    -.3007    .0891
Age        .0015   .0067    .2156   .8296    -.0161    .0190
Gender    -.0637   .1540   -.4133   .6799    -.4647    .3373
Function  -.0431   .1390   -.3104   .7567    -.4051    .3188
Departm   -.0463   .0479   -.9664   .3351    -.1711    .0785

************************************************************
OUTCOME VARIABLE:
IWB

Model Summary
R      R-sq    MSE     F        df1      df2          p
.4540  .2061   .8205   7.7462   6.0000   179.0000     .0000

Model
           coeff    se      t       p       LLCI     ULCI
constant   1.3953   .4510   3.0938  .0023    .2211    2.5696
OIS         .1133   .0679   1.6693  .0968   -.0634    .2900
EIM         .3867   .0672   5.7559  .0000    .2118    .5616
Age        -.0134   .0061  -2.2053  .0287   -.0292    .0024
Gender     -.1904   .1389  -1.3709  .1721   -.5521    .1712
Function   -.2045   .1253  -1.6312  .1046   -.5308    .1219
Departm    -.0554   .0433  -1.2780  .2029   -.1682    .0574

******************** TOTAL EFFECT MODEL ********************
OUTCOME VARIABLE:
IWB

Model Summary
R      R-sq    MSE     F        df1      df2        p
.2433  .0592   .9669   2.2650   5.0000   180.0000   .0499

Model
           coeff    se      t       p       LLCI     ULCI
constant   1.5067   .4892   3.0803  .0024    .2332    2.7802
IS          .0724   .0733    .9877  .3246   -.1184    .2631
Age        -.0128   .0066  -1.9465  .0532   -.0300    .0043
Gender     -.2151   .1507  -1.4268  .1554   -.6075    .1774
Function   -.2211   .1360  -1.6257  .1058   -.5753    .1330
Departm    -.0733   .0469  -1.5622  .1200   -.1954    .0488
```

1

2

******* TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y ********

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI
.0724	.0733	.9877	**.3246**	-.1184	.2631

3

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
.1133	.0679	1.6693	.0968	-.0634	.2900

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
EIM	**-.0409**	.0288	**-.1191**	**.0327**

4

********************** ANALYSIS NOTES AND ERRORS ******************

Level of confidence for all confidence intervals in output:
  99.0000

Number of bootstrap samples for percentile bootstrap
confidence intervals:
  5000

------ END MATRIX -----

Mediation EIM on the relationship between OTE and IWB - Unhypothesized

The output provided by the process macro for mediation is shown below. As explained in paragraph 4.3.2 the mediation process functions like depicted in Figure 11. The (in)dependent variable and (potential) mediator are listed at the top of the output. The independent variable is variable X (OTE, openness to experience), the mediator is variable M (IM, intrinsic motivation) and the dependent variable is variable Y (IWB, innovative work behavior).

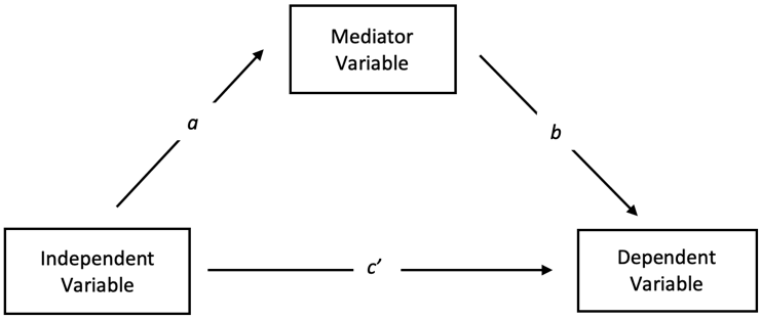

Figure 11: Visual presentation of mediation effect

Certain parts are highlighted and provided with a number to read and explain the output. Number 1 presents the X to M relation (from the independent variable to the mediator variable) which is depicted as path a in Figure 11. Number 2 presents the M to Y (mediator to dependent variable) and X to Y (independent to dependent variable) relations. These relations are depicted as path b and c, respectively. Number 3 shows the total effect of X on Y which is necessary to calculate the proportion of the mediation. Number 4 presents the mediation effect. The mediation effect is significant if the bootstrap interval does not include zero.

```
Model  : 4
    Y  : IWB
    X  : OTE
    M  : IM

Covariates:
 Age   Gender   Function   Department

Sample
Size:  186

**************************************************************************
```

```
OUTCOME VARIABLE:
IM

Model Summary
R       R-sq     MSE      F         df1       df2        p
.2800   .0784    .9472    3.0620    5.0000    180.0000   .0112

Model
            coeff     se       t        p       LLCI      ULCI
constant    .2904    .4836     .6004   .5490    -.9687    1.5494
OTE         .2706    .0723    3.7445   .0002     .0825     .4587
Age         .0032    .0065     .4855   .6279    -.0139     .0202
Gender     -.0611    .1481    -.4122   .6807    -.4467     .3246
Function   -.0771    .1348    -.5720   .5680    -.4282     .2739
Departm    -.0522    .0463   -1.1262   .2616    -.1728     .0684

**************************************************************
OUTCOME VARIABLE:
IWB

Model Summary
R       R-sq    MSE     F         df1       df2         p
.4705   .2214   .8047   8.4820    6.0000    179.0000    .0000

Model
            coeff      se      t         p        LLCI     ULCI
constant    1.4730    .4462    3.3011    .0012    .3112    2.6348
OTE          .1742    .0691    2.5191    .0126   -.0058     .3542
EIM          .3284    .0687    4.7808    .0000    .1496     .5073
Age         -.0119    .0060   -1.9687    .0505   -.0276     .0038
Gender      -.2380    .1366   -1.7426    .0831   -.5937     .1176
Function    -.2565    .1244   -2.0617    .0407   -.5803     .0674
Departm     -.0546    .0429   -1.2737    .2044   -.1662     .0570

******************** TOTAL EFFECT MODEL ***********************
OUTCOME VARIABLE:
IWB

Model Summary
R       R-sq    MSE      F         df1       df2         p
.3492   .1220   .9024    5.0000    5.0000    180.0000    .0003

Model
            coeff     se       t         p        LLCI      ULCI
constant    1.5684    .4721    3.3224    .0011    .3394     2.7973
OTE          .2631    .0705    3.7297    .0003    .0794      .4467
Age         -.0108    .0064   -1.6969    .0914   -.0275      .0058
Gender      -.2581    .1446   -1.7850    .0759   -.6345      .1183
Function    -.2818    .1316   -2.1412    .0336   -.6244      .0608
Departm     -.0717    .0452   -1.5860    .1145   -.1895      .0460
```

1

2

```
******** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y *******

Total effect of X on Y
Effect    se        t         p        LLCI      ULCI
.2631     .0705     3.7297    .0003    .0794     .4467

Direct effect of X on Y
Effect    se        t         p        LLCI      ULCI
.1742     .0691     2.5191    .0126    -.0058    .3542

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
EIM         .0889      .0374      .0157      .2116

****************** ANALYSIS NOTES AND ERRORS ****************

Level of confidence for all confidence intervals in output:
  99.0000

Number of bootstrap samples for percentile bootstrap
confidence intervals:
  5000

------ END MATRIX -----
```

3

4

Moderating effect of OTE on the relationship between IS and IM

The output provided by the process macro by Hayes (2012) regarding moderation is given below. The Y variable is the dependent variable, the X variable is the independent variable and W is the (potential) moderator. The first row of values in bold represent the direct effect of de independent variable to the dependent variable. The second row in bold shows the interaction effect (moderation). The Beta coefficient shows the strength and direction of the effect. The p-values shows if the moderation effect is significant. A value below 0.007 represents a significant effect. The moderation effect is called interaction (Int_1) in the output of the process macro.

```
Model  : 1
    Y  : IM
    X  : IS
    W  : OTE

Covariates:
 Age   Gender   Function   Department

Sample
Size:  186

************************************************************
OUTCOME VARIABLE:
IM

Model Summary
R       R-sq    MSE     F       df1      df2        p
.2950   .0871   .9489   2.4246  7.0000   178.0000   .0214

Model
           coeff   se       t       p      LLCI     ULCI
constant   .3099   .4847    .6395   .5233  -.9520   1.5719
IS        -.0788   .0732  -1.0765   .2831  -.2692    .1117
OTE        .2692   .0734   3.6683   .0003   .0781    .4603
Int_1      .0598   .0763    .7838   .4342  -.1388    .2584
Age        .0034   .0066    .5261   .5995  -.0136    .0205
Gender    -.0907   .1500   -.6047   .5462  -.4813    .2999
Function  -.0972   .1359   -.7151   .4755  -.4510    .2566
Departm   -.0411   .0476   -.8638   .3889  -.1649    .0827

Product terms key:
Int_1    :        IS    x        OTE

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0032      .6143     1.0000   178.0000      .4342

***************** ANALYSIS NOTES AND ERRORS *****************
Level of confidence for all confidence intervals in output:
  99.0000
```

Moderating effect of Con on the relationship between IS and IM

```
Model  : 1
    Y  : IM
    X  : IS
    W  : Con

Covariates:
 Age   Gender   Function   Department

Sample
Size:  186

************************************************************
OUTCOME VARIABLE:
IM

Model Summary
R       R-sq      MSE       F      df1      df2        p
.1376   .0189     1.0196   .4907   7.0000   178.0000   .8405

Model
           coeff   se       t       p       LLCI      ULCI
constant   .3135   .5051    .6208   .5356   -1.0016   1.6287
IS        -.1067   .0754  -1.4159   .1586    -.3030    .0896
Con        .0352   .0747    .4704   .6387    -.1594    .2298
Int_1      .0149   .0736    .2029   .8395    -.1767    .2066
Age        .0013   .0068    .1878   .8512    -.0165    .0190
Gender    -.0634   .1551   -.4086   .6833    -.4673    .3405
Function  -.0493   .1405   -.3509   .7261    -.4150    .3164
Departm   -.0484   .0485   -.9971   .3201    -.1748    .0780

Product terms key:
Int_1    :        IS       x       Con

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0002      .0412     1.0000   178.0000      .8395

***************** ANALYSIS NOTES AND ERRORS *****************

Level of confidence for all confidence intervals in output:
  99.0000

------ END MATRIX -----
```

Moderating effect of Ext on the relationship between IS and IM

```
Model  : 1
    Y  : IM
    X  : IS
    W  : Ext

Covariates:
 Age    Gender   Function    Department

Sample
Size:  186

************************************************************
OUTCOME VARIABLE:
IM

Model Summary
R       R-sq     MSE       F       df1      df2       p
.1522   .0232    1.0153    .6030   7.0000   178.0000  .7530

Model
           coeff   se       t       p       LLCI     ULCI
constant   .3273   .5049    .6482   .5177   -.9874   1.6419
IS        -.1048   .0751  -1.3946   .1649   -.3003    .0908
Ext        .0687   .0759    .9040   .3672   -.1291    .2664
Int_1      .0423   .0782    .5408   .5893   -.1613    .2458
Age        .0013   .0068    .1894   .8500   -.0163    .0189
Gender    -.0924   .1571   -.5882   .5571   -.5015    .3166
Function  -.0284   .1403   -.2027   .8396   -.3938    .3369
Departm   -.0506   .0483  -1.0465   .2967   -.1765    .0753

Product terms key:
 Int_1    :        IS      x      Ext

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0016      .2925     1.0000   178.0000      .5893

****************** ANALYSIS NOTES AND ERRORS ***************

Level of confidence for all confidence intervals in output:
  99.0000

------ END MATRIX -----
```

Moderating effect of Agr on the relationship between IS and IM

```
Model  : 1
    Y  : IM
    X  : IS
    W  : Agr

Covariates:
 Age   Gender   Function    Department

Sample
Size:  186

************************************************************
OUTCOME VARIABLE:
IM

Model Summary
R       R-sq     MSE      F      df1      df2       p
.1885   .0355    1.0024   .9371  7.0000   178.0000  .4792

Model
           coeff   se       t       p      LLCI     ULCI
constant   .3273   .4991    .6557   .5129  -.9723   1.6268
ZM_IS     -.0966   .0748  -1.2924   .1979  -.2913    .0980
ZM_Agr     .1367   .0770   1.7762   .0774  -.0637    .3371
Int_1      .0639   .0726    .8802   .3800  -.1251    .2529
Age        .0014   .0067    .2075   .8359  -.0161    .0189
Gender    -.0654   .1535   -.4260   .6706  -.4650    .3342
Function  -.0471   .1385   -.3402   .7341  -.4078    .3136
Departm   -.0520   .0480  -1.0836   .2800  -.1770    .0730

Product terms key:
 Int_1    :        IS    x      Agr

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0042      .7747     1.0000   178.0000      .3800

***************** ANALYSIS NOTES AND ERRORS *****************

Level of confidence for all confidence intervals in output:
  99.0000

------ END MATRIX -----
```

Moderating effect of Neu on the relationship between IS and IM

```
Model  : 1
    Y  : IM
    X  : IS
    W  : Neu

Covariates:
 Age    Gender   Function   Department

Sample
Size:  186

************************************************************
OUTCOME VARIABLE:
IM

Model Summary
R       R-sq    MSE      F       df1      df2        p
.1439   .0207   1.0178   .5376   7.0000   178.0000   .8052

Model
           coeff   se       t       p       LLCI      ULCI
constant   .3163   .5057    .6255   .5325   -1.0005   1.6331
IS        -.1147   .0761  -1.5072   .1335    -.3127    .0834
Neu       -.0582   .0781   -.7457   .4568    -.2615    .1450
Int_1      .0115   .0818    .1408   .8882    -.2016    .2246
Age        .0005   .0069    .0670   .9466    -.0176    .0185
Gender    -.0568   .1555   -.3651   .7155    -.4616    .3480
Function  -.0544   .1410   -.3859   .7000    -.4214    .3126
Departm   -.0404   .0490   -.8234   .4114    -.1680    .0873

Product terms key:
 Int_1    :        IS    x     Neu

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0001      .0198     1.0000   178.0000      .8882

***************** ANALYSIS NOTES AND ERRORS *****************

Level of confidence for all confidence intervals in output:
  99.0000

------ END MATRIX -----
```