Leadership Training and Leadership Tools in Public Organizations

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Table of Contents

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Chapter 1: Introduction

Public leadership can make a decisive difference for motivating and directing employees to achieve organizational goals and create value for citizens and society (Backhaus & Vogel, 2022; Van Wart, 2013). Public organizations invest many resources into leadership training to equip public managers for this task (Seidle et al., 2016). Unfortunately, leadership training often has small and short-lived effects on leadership behavior, employee outcomes, and organizational goal attainment (Blume et al., 2010; May & Kahnweiler, 2000; Seidle et al., 2016). Existing research (Dvir et al., 2002; Jacobsen et al., 2021; Seidle et al., 2016) focuses rather exclusively on interventions that take place in contexts separated from public managers' day-to-day work such as classroom training, coaching sessions, and feedback sessions. But leadership development is a complex and demanding task that needs to be transferred to their daily work setting (Lacerenza et al., 2017). Adding to the existing literature, this dissertation argues that leadership training combined with leadership tools prompting target behavior in public managers' immediate behavioral context will have strong effects on leadership target behavior and employee outcomes.

I understand leadership tools as tools intended to support leadership behavior, and various types of leadership tools are frequently used as means to support specific leader tasks in personnel management. Typical examples of leadership tools are templates for performance interviewing and employee development. Despite widespread use of such tools, we know little about how they affect manager behavior and employee outcomes and how they may be beneficial in the context of leadership training.

Anchored in the literature on human–computer interaction, comprehensive research demonstrates how persuasive technology can provide support for attitudinal and behavioral change in manifold contexts including physical activity (Monteiro-Guerra et al., 2020), the treatment of mental disorders (McCall et al., 2021), the reduction of energy consumption (Koroleva et al., 2019) (Pierce & Paulos, 2012), and the improvement of learning behavior in educational contexts (Widyasari et al., 2019). Persuasive technology is interactive "computerized software or information systems designed to reinforce, change or shape attitudes or behaviors without using coercion or deception" (Oinas-Kukkonen & Harjumaa, 2009). Such technologies can support attitudinal and behavioral change by guiding reflections, target behaviors, facilitating social commitment, and so on (Oinas-Kukkonen & Harjumaa, 2009).

These insights, however, have not yet been integrated into the leadership training literature (Lacerenza et al., 2017), and even though public leadership is increasingly conducted through advanced information technologies (IT) (Roman et al., 2019), we still know little about how persuasive technologies can be used in the context of public leadership (Van Wart et al., 2019; Wenker, 2022) . Bridging public leadership and persuasive technology literatures, this dissertation explains how leadership tools can support attitudinal and behavioral change among leaders and employees in the context of leadership training in public organizations.

Leadership tools exist in many forms, and research on persuasive technology reveals that the level of interactivity is particularly determinant for technologies' impact on attitudes and behaviors (Wenker, 2022). This dissertation therefore categorizes leadership tools on a continuum from static to dynamic depending on the level of interactive support inherent in the tool. Hard copy or PDF templates for performance interviewing are examples of a relatively static leadership tool because a response from the user is not an inherent part of the tool, and it does not provide feedback to any user responses. Leadership tools that use advanced IT to automatically provide individualized feedback and reminders are more dynamic. An example could be an artificial intelligence leadership tool for employee development that provides personalized reminders and uses advanced algorithms to gather information on the internet to provide feedback on development goals and actions. It is a core argument in the dissertation that dynamic leadership tools can be expected to provide stronger support for attitudinal and behavioral change because they can provide more practical support (e.g., automatic reminders, automatic organizing, or analyzing user input) and social support (e.g., automatic information sharing on goals and performance or chat functionality).

Public organizations have a collective of political leaders as the ultimate principals. This implies that public managers must navigate in a work context characterized by a larger number of influential stakeholders than managers in private organizations (Boye et al., 2022; Boyne, 2002). These multiple stakeholders have complex and often conflicting values and goals (Boye et al., 2022; Boyne, 2002). Political leadership also implies that public managers often have a larger span of control than private managers (e.g., Bohte & Meier, 2001; Bro et al., 2019). In Chapter 2, I argue that these three distinct characteristics of public managers' context imply that ongoing learning and implementing target behavior from leadership training is more challenging in some ways in a public versus a private organizational context. I further argue that it also implies that the combination of leadership training and leadership tools is especially relevant in the public sector.

Based on the outlined gaps in the leadership training literature, insights from research on persuasive technology, and the increasing use of IT in public leadership, the dissertation asks the question: *How does leadership training with static and dynamic leadership tools matter for public manager and employee outcomes in public organizations?*

1.1. Transformational leadership training with leadership tools, dialogues, and outcomes

As a first step in investigating the effects of leadership training combined with leadership tools, I theorize how leadership tools can be used in transformational leadership training. Transformational leadership training poses a relevant case because transformational leadership behavior has been compellingly associated with a wide range of attractive organizational outcomes (Backhaus & Vogel, 2022). An important task in theorizing the use of leadership tools in transformational leadership training is to define the content of such a tool. Although there is debate about how transformational leadership should be conceptualized (van Knippenberg & Sitkin, 2013), scholars generally agree that communicating an organizational vision is a core element (Jensen, Andersen, Bro, et al., 2019; van Knippenberg & Sitkin, 2013; Wright et al., 2012). In line with this perspective, transformational leadership can be understood as "behaviors seeking to develop, share, sustain a vision" with the intent to encourage employees to transcend their own self-interest and achieve organizational goals (Jensen, Andersen, Bro, et al., 2019, p. 10). Therefore, vision communication should be a core element in a leadership tool for transformational leadership.

Arguably, face-to-face dialogue is the most effective way to communicate visions (Jensen et al., 2018), but we still lack knowledge on how dialogues can be conducted and how they affect intended employee outcomes. This dissertation combines transformational leadership theory (Bass & Avolio, 1990; Jensen, Andersen, Bro, et al., 2019; Paarlberg & Lavigna, 2010) with insight from goal-based coaching (Grant, 2020), goal-setting theory (Locke & Latham, 2002), and self-determination theory (Ryan & Deci, 2017) to theorize goal-oriented development dialogues as a fruitful approach in transformational leadership. Based on this theorization, the dissertation provides an understanding of how public manager–employee dialogues in employee development processes may facilitate vision valence, increased psychological needs satisfaction, and organizational performance.

The potential effects of leadership training can be illustrated as a journey that starts with the training itself, leads to changes in leadership behavior, and ultimately influences employee responses and organizational performance

(Kirkpatrick, 1979). As an important employee outcome that can foster organizational performance (Deci et al., 2017), I focus on the satisfaction of psychological needs. Basic psychological needs satisfaction serves as a notable precursor to both well-being and performance in work-related settings (Deci et al., 2017). The significance of satisfying psychological needs is also acknowledged within the field of public administration, where it has been found to heighten job satisfaction (Battaglio et al., 2021), public service motivation (Jensen & Bro, 2018; Vandenabeele, 2014), and work engagement (Breaugh, 2021). Fostering a working environment that nurtures the satisfaction of psychological needs thus becomes a key concern in public leadership.

The self-determination theory recognizes autonomy, competence, and relatedness as three fundamental psychological needs that are innate to human beings, regardless of political, cultural, and economic circumstances (Ryan & Deci, 2017). In addition to these three basic psychological needs, existing literature indicates that the need for meaning plays a vital role for human beings (Martela et al., 2018; Park & George, 2020; Tønnesvang & Schou, 2022). As human beings, we innately seek purpose and meaning in life, and this need compels us to gravitate toward meaningful structures in our surroundings (Park & George, 2020; Tønnesvang et al., 2023). Consequently, when organizational visions offer meaningful horizons, the need for meaning can propel motivation and behaviors that contribute to organizational objectives. As I argue in Chapter 2, this is closely intertwined with another important outcome for public organizations: employees' perceived prosocial impact, which refers to their evaluation of how their job creates value for others and society at large (Bro et al., 2017).

I argue that leadership tools designed to facilitate employee development dialogues affect attitudes and behaviors for both public managers and employees. Leadership tools may affect employees indirectly through the tools' influence on public manager behaviors and directly through their support of the employees' reflections, easing specific employee behaviors and facilitating employees' social commitment to change. The dissertation investigates both the direct effects of static versus dynamic leadership tools on employee needs satisfaction as well as the indirect effect mediated by public managers' use of goal-oriented development dialogues.

In sum, this dissertation argues that leadership training combined with leadership tools has significant and continuous effects on leadership behavior, satisfaction of employee psychological needs, and organizational performance. In addition, dynamic leadership tools provide more support for attitudinal and behavioral change and are, therefore, expected to have stronger effects on intended outcomes. Expected changes in organizational performance rely on altered public manager behaviors as well as employee attitudes and

behavior. Leadership training with leadership tools can affect employee outcomes indirectly through more active leadership behaviors as well as by supporting employee reflections, attitudes, and behavior directly.

1.2. Field experiment within public employment services as empirical approach

To investigate the proposed research question and the outlined expectations, I conducted a field experiment in cooperation with 34 Danish municipalities. The experiment was conducted within the employment service area mainly because conflicting (political) values in this area (see Chapter 3) make goal-oriented development dialogues highly relevant. The effects of transformational leadership depend on value congruence (Jensen, Andersen, & Jacobsen, 2019) and goal-oriented development dialogues intend to communicate the organizational vision in a way that support alignment with employee values. Furthermore, the employment service area is an important part of welfare state services in many countries (Breidahl & Larsen, 2015).

The main responsibility for public employment services in Denmark is placed in 94 job centers at the municipal level. I invited all these job centers to take part in the experiment. The 34 municipalities that volunteered to participate in the experiment cover about a third of the public employment service agencies in Denmark and include 226 job center units, 226 public managers, and approximately 4,500 employees. As displayed in Table 1.1, the public managers were randomized into a control group and two different intervention groups, with the latter groups receiving a two-day transformational leadership training and either a static or dynamic leadership tool. As I discus in Chapter 3, I clustered the randomization on the municipal level to account for the job center units' different contexts. In Chapter 3, I also discuss how I handle the risk of contamination that this clustering implies.

The training as well as the two leadership tools focused on supporting public managers' use of goal-oriented development dialogues. The control group received neither leadership training nor a tool. The design thus imposes experimental variation on (1) the use of static versus dynamic leadership tools and (2) treatment with leadership training combined with leadership tools versus no treatment.[1]

[1] The control group received delayed treatment consisting of leadership training and a leadership tool *after* the final data collection.

Table 1.1. Intervention design: Similarities and differences between the three randomized groups

	Group 1	Group 2	Group 3 (control group)
Two-day leadership training	X	X	-
Static leadership tool	X	-	-
Dynamic leadership tool	-	X	-
Pre- and post-intervention surveys among public managers and their employees	X	X	X
Report for each unit presenting and commenting on development in perceived leadership behavior and employee outcomes from pre- to post-survey	X	X	X
Coaching session for the public manager based on the unit-level report	X	X	X

Note: Report and coaching sessions were provided after the last data collection in the field experiment. However, public managers in all groups were informed – before the experiment was initiated – that they would receive such a report and coaching sessions.

Data on public manager and employee outcomes was collected through pre- and post-intervention surveys among all public managers and employees in the three experimental groups. The post-intervention survey was conducted eight months after the last of the two leadership training days and three months after the last trainer-designed self-training activity, allowing evaluation of the medium-term effects of the intervention. In addition, data on organizational performance was collected from national registers on employment status and other central variables on citizen level.

1.3. Overview of papers in the dissertation

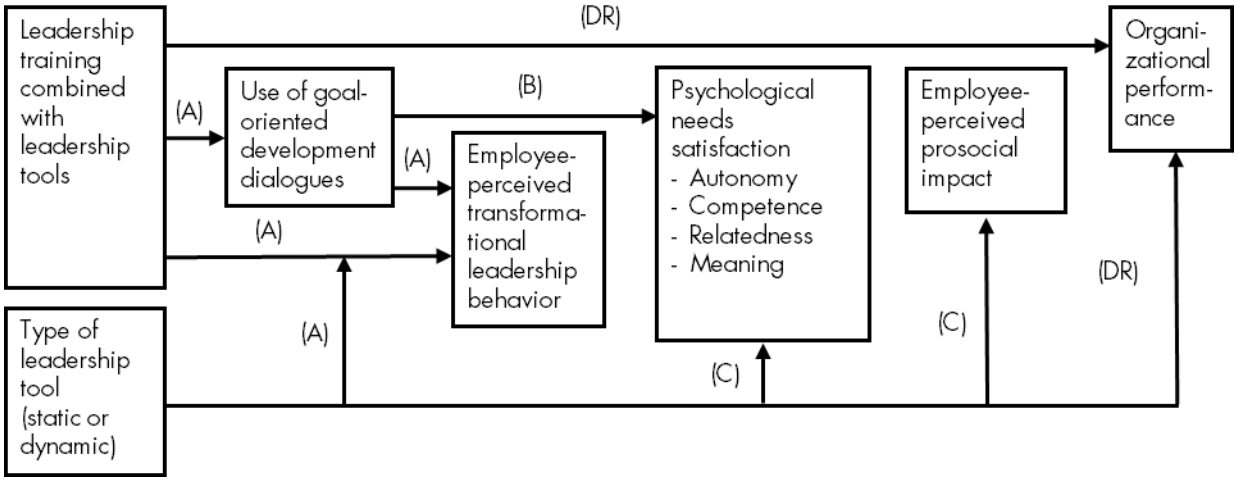
Three papers cover the different research elements and constitute the dissertation together with this report. The report also covers research elements not included in the papers: the outcomes of leadership training combined with leadership tools on citizen level. Table 1.2 reports the titles of the three papers and their publication status. Two of the papers are single authored and one (Paper A) is co-authored with Ulrich Thy Jensen.

Table 1.2. Overview of papers in the dissertation

Paper	Title	Publication status
A	Haunstrup, J.S., and Jensen, U.T. (n.d.). Combining leadership training and just-in-time nudges: A field experiment on learning transfer	Conditional accept in *International Public Management Journal*
B	Haunstrup, J.S. (n.d.). Goal-oriented development dialogues increase need satisfaction among followers: A field experiment on transformational leadership training	Under review in *Review of Public Personnel Administration*
C	Haunstrup, J.S. (n.d.). Dynamic leadership tools supporting psychological needs satisfaction in public organizations: Experimental evidence	Revise and resubmit in *Public Personnel Management*

Figure 1.1 illustrates the role of each paper and this dissertation report in the project. While a similar figure in Chapter 2 presents the overall argument in the dissertation, Figure 1.1 only shows the relations that are explicitly tested empirically in this project.

Figure 1.1. Overview of papers in the dissertation



Note: Letters (A, B, and C) in parentheses indicate the papers addressing the given research elements; see Table 1.2. Letters DR indicates that this research element is addressed in this dissertation report.

1.4. Overview of purposes of the dissertation

This dissertation has four main purposes. First, the dissertation aims to provide a theoretical understanding of how leadership tools can be integrated in leadership training to mitigate the persistent challenge of achieving intended outcomes on public manager and employee level. Second, it aims to investigate the effects of leadership training with leadership tools on manager behavior, employee outcomes, and organizational performance. The third purpose of the dissertation is to discuss the difference between static and dynamic leadership tools and investigate the different effects of these types of tools in

the context of leadership training. Lastly, the dissertation sets out to theorize goal-oriented development dialogues as relevant content of leadership tools in transformational leadership training and to test the effects of such dialogues on the satisfaction of employee psychological needs.

In Chapter 5, I discuss how well the dissertation has succeeded in accomplishing these purposes and how my findings contribute to public leadership theory and practice.

Chapter 2: Theory

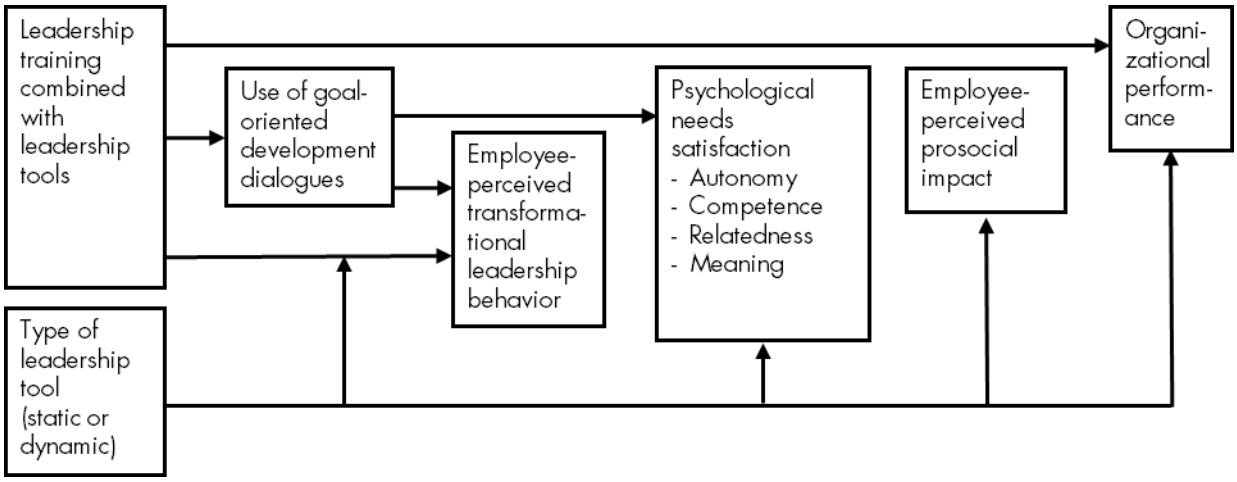
The purpose of this chapter is to provide the dissertations' theoretical framework. Section 2.1 places the dissertation in the leadership training literature and argues how persuasive technology literature can serve our understanding of how static and dynamic leadership tools can mitigate enduring transfer problems and support employee outcomes of leadership training – especially in the public sector.

Section 2.2 presents transformational leadership training as a case for theorizing the relevant content of leadership tools. This chapter imports insights from goal-based coaching, goal-setting theory, and self-determination theory to develop *goal-oriented development dialogues* as a relevant tool in transformational leadership training.

Section 2.3 argues why the satisfaction of employee psychological needs is an important outcome in public organizations and how the facilitation of goal-oriented development dialogues by leadership tools may foster such satisfaction. The section also argues that dynamic leadership tools is expected to have stronger positive effects on needs satisfaction than similar static leadership tools. Then section 2.3 argues how leadership training combined with leadership tools – through effects on public manager behaviors and employee outcomes – may also affect organizational performance in terms of outcomes on citizen level.

Finally, in section 2.4, I sum up the expectations that follow from the theoretical argument outlined in this chapter.

Figure 2.1. Illustration of the overall theoretical argument in the dissertation



2.1. Leadership development and persuasive technology

2.1.1. Leadership training and transfer problems

Leadership training can broadly be defined as training systematically designed to enhance the knowledge, skills, abilities, and other aspects of individuals in leadership positions (Day, 2000; Lacerenza et al., 2017). The overall purpose of leadership training is to cultivate the capability of organizational members to effectively engage in leadership roles and processes that contribute to successful group and organizational performance (Day, 2000).

In the assessment of leadership training effectiveness, outcomes can be classified into four distinct criteria: reactions, learning, transfer, and results (Kirkpatrick, 1979; Lacerenza et al., 2017). Reactions encompass leaders' attitudes towards training, which are relevant because motivation is a precondition for actual learning to occur (Bandura & Wood, 1989; Bandura, 1977). Learning is "a relative permanent change in knowledge or skill produced by experience" (Weiss, 1990, p. 172) and represents new things leaders *can do* following training (Lacerenza et al., 2017). Transfer is leaders' compliance with training target behaviors and represents what leaders *do different* following training. Lastly, results refer to subordinate or organizational outcomes such as motivation, well-being, and performance.

These four evaluation criteria for leadership training effectiveness illustrate how outcomes of leadership training can be seen as a pathway from training over to altered leadership behavior to attitudinal and behavioral change among employees and ultimately organizational performance. Training impact on leader behaviors plays a crucial role in this causal chain. However, leadership development research suggests that many leadership training programs have insignificant or limited and short-lived effects on actual leadership behavior (Blume et al., 2010; Powell & Yalcin, 2010, p. 233; Seidle et al., 2016). When leadership training fails to influence leader behaviors, we face a *transfer problem* (Baldwin & Ford, 1988, p. 63).

Existing research identifies several factors that mitigate transfer problems in leadership training such as leader characteristics (e.g., cognitive ability and personality), training design (e.g., training method, duration, and feedback), and features of the leaders' work environment (e.g., supervisor support) (Baldwin & Ford, 1988; Blume et al., 2010; Lacerenza et al., 2017). While manipulating leaders' cognitive ability or personality is unattainable or impractical, the design of training programs offers greater flexibility. Research has highlighted the importance of action-oriented training (Revans, 1982) and emphasized experiential learning (Kolb & Kolb, 2005) as key factors in effectively translating knowledge and skills into behavioral change. These principles serve as guiding factors for specific models of leadership training transfer

(Holten et al., 2015), emphasizing that leadership training programs should include a combination of activities that (1) enhance conceptual and theoretical knowledge, (2) foster reflection and self-awareness, and (3) promote action and skill development. Aligned with this perspective, Seidle, Fernandez, and Perry (2016, p. 611) conclude that "a combination of coaching, classroom instruction, multisource feedback, and experiential learning significantly impacts individual leader performance and organizational effectiveness." However, even when leadership training programs are designed to offer public managers ample opportunities to reflect on, simulate, and practice new knowledge and skills, as discussed further below, their task overload and complexity in their day-to-day work can still hinder the effectiveness of these programs in changing public managers' behaviors.

Learning and implementing new leadership behaviors is a difficult task demanding substantial time investments and cognitive effort. Leadership training typically encompasses complicated theoretical knowledge, necessitating profound reflection for comprehension as well as iterative contemplation and practice to transform into tangible actions and new habits. However, time and cognitive capacity is a scarce resource among public managers. In general, the human mind has limited cognitive capacity (e.g., Newell & Simon, 1972), which challenges learning transfer (Lacerenza et al., 2017; van Merriënboer et al., 2005), and public managers typically face numerous and complex influences (Kelman et al., 2016), task overload (e.g., Wart et al., 2012), and time pressure (e.g., Bach, 2001) in their day-to-day work. Classroom training, coaching, and feedback sessions may be breathing spaces where overwhelming and conflicting expectations, time pressure, and task overload are put in the background. However, when public managers return to their day-to-day tasks, ongoing learning and implementing target behavior are severely challenged. Thus, tools that support learning and target behavior implementation in the immediate contexts where target behaviors are intended to be carried out are – as I will argue below – expected to increase the behavioral effects of leadership training. Existing literature, however, focuses on leadership development interventions that are separated from the public managers' daily work context (e.g., classroom training, coaching, and feedback sessions) and pays little attention to how public managers' learning and target behavior implementation can be supported in the immediate target behavior situations (Dvir et al., 2002; Jacobsen et al., 2021; Lacerenza et al., 2017; Seidle et al., 2016).

2.1.2. Leadership tools and persuasive technology

I argue that leadership tools designed based on insight from the persuasive technology literature are an effective way to support public managers' learning

and behavioral change as a part of leadership training. Leadership tools can simply be understood as tools designed to support leadership behaviors.

A tool is commonly understood as "something that helps you to do a particular activity" (Cambridge Dictionary, 2023). This functional perspective emphasizes the instrumental value of tools in their ability to assist users in accomplishing specific tasks or goals efficiently (Norman, 1986). Tools can be seen as artifacts with certain affordances (Gibson, 1977) that invite and enable specific behaviors, such as a knife enabling people to cut something or online tools like Doodle enabling people to plan meetings. Tools can be designed to enable physical activities such as slicing bread. They can also be designed to externalize mental processes and provide support for cognitive activities such as math calculations or remembering target behavior from leadership training. Tools can be physical artifacts, conceptual models, or IT systems. In this dissertation, I understand tools as artifacts designed to support specific behaviors. The dissertation aims to provide an understanding of how tools can support outcomes of leadership training; therefore, I focus on tools designed with the specific intention of supporting attitudinal and behavioral change among public managers and employees. As I argue below, such "persuasive technologies" can be expected to influence attitudes and behaviors through four distinct types of support.

When combined with Yukl's leadership definition, leadership tools can be understood as tools designed with the intention of supporting "the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives" (Yukl, 2013). Templates for performance interviewing and employee development dialogues are common examples of leadership tools. The aim of such templates is to support dialogue between leader and employee on *what needs to be done and how to do it* and to motivate employees to contribute to organizational goals. Within public leadership literature, we know little about the effects of using such tools, but research on persuasive technology provides us with a framework that I utilize to describe how leadership tools can support attitudinal and behavioral change in the context of leadership training.

Numerous studies in the field of human–computer interaction have explored the impact of persuasive technology on IT users' attitudes and behaviors (Hamari et al., 2014; Kelders et al., 2012; Oduor & Oinas-Kukkonen, 2021). Persuasive technology can be defined as interactive "computerized software or information systems designed to reinforce, change or shape attitudes or behaviors without using coercion or deception" (Oinas-Kukkonen & Harjumaa, 2009). These technologies encompass various computing systems, including online software, smartphone apps, wearable devices, and embedded

sensors and displays in our environment (Ploderer et al., 2014). They are designed to assist users in achieving their goals related to behavioral change in areas such as health (e.g., physical activity, healthy diet, and therapy for depression), sustainability (e.g., reducing energy consumption and using alternative transportation), and education (e.g., improving learning behavior) (Anagnostopoulou et al., 2018; Koroleva et al., 2019; McCall et al., 2021; Monteiro-Guerra et al., 2020; Oyebode et al., 2020; Pierce & Paulos, 2012; Widyasari et al., 2019).

According to the literature, persuasive technology influences their users' attitudes and behaviors through four types of support: primary task support, human–computer dialogue support, system credibility support, and social support (Fogg, 2003; Oinas-Kukkonen, 2013; Oinas-Kukkonen & Harjumaa, 2009). Primary task support involves IT reducing the effort required by users to perform their desired behavior, thereby increasing the cost–benefit ratio of that behavior. It can also guide users through reflection processes to change attitudes or motivation. An example is the "I Want to Quit" tool on smokefree.gov, provided by the U.S. Department of Health and Human Services, which guides users through a series of questions related to the costs of smoking, motivation to quit, triggers, quitting plans, and strategies for maintaining behavioral change (U.S. Department of Health and Human Services, 2023). The tool supports users' reflections and planning to reduce the costs of making a thoroughly thought-out plan for quitting smoking.

Moreover, IT can provide dialogic support such as sending email or text message reminders for tasks and deadlines or delivering positive reinforcement when users engage in the target behavior. For instance, smokefree.gov offers a smartphone app that sends inspirational messages and cheers when users achieve smokefree milestones (based on user reporting). Additionally, IT can support attitudinal and behavioral change by leveraging the perceived credibility of the system, often through third-party acknowledgments and references to expert knowledge. For example, the persuasive effect of the tools on smokefree.gov could be enhanced by citing expert knowledge and highlighting the government department's ownership of the website.

Lastly, IT can facilitate attitudinal and behavioral change by enabling social interaction. For instance, users can share their goals with others, such as friends or family members who have a vested interest in their smoking habits, and grant them access to monitor their reported behavior. This can foster social commitment towards the desired changes.

Persuasive technologies frequently serve as alternatives to conventional static tools, such as when training apps replace traditional hard copy templates for physical training programs. Unlike static tools, persuasive technol-

ogies exhibit interactivity by dynamically responding to user behavior, for example by sending reminders or processing user-provided information. The degree of interactivity varies among different types of tools, with hard-copy tools representing one end of the static–dynamic continuum while advanced interactive information technology resides at the other end. Dynamic tools provide more change support because the interactivity, for instance, allows such tools to automatically process user-provided information, provide automatic reminders, and function as a communication medium facilitating social support (e.g., Fogg, 2003; Oinas-Kukkonen, 2013; Oinas-Kukkonen & Harjumaa, 2008).

In essence, I argue that persuasive technology can reinforce, change, or shape attitudes and behaviors by guiding user reflections, reducing the efforts required to engage in the target behavior, offering a supportive dialogue, enhancing the credibility of the desired behavior, and facilitating social support. Ceteris paribus, the more interactivity inherent in a persuasive technology tool, the stronger the support for attitudinal and behavioral change it can provide.

The relevance of persuasive technology can also be illustrated through its connection with behavioral science (Oduor & Oinas-Kukkonen, 2018). A basic insight in behavioral science is that every decision environment makes some behaviors easier and more attractive than other behaviors (Thaler & Sunstein, 2021). Decision environments – also known as choice architecture – can be designed with explicit intentions to alter behavior in specific directions while keeping individual freedom and without using substantial economic incentives (Grüne-Yanoff & Hertwig, 2016; Thaler et al., 2013; Thaler & Sunstein, 2021). Designing decision environments in ways that support intended attitudinal and behavioral change without using deception or coercion is at the core of persuasive technology (cf. the previously mentioned definition). In that sense, persuasive technology can be understood as type of technology-mediated choice architecture. In Paper A, I draw on this perspective and use insights from behavioral design to understand how leadership tools can mitigate transfer problems in leadership training.

In the context of leadership training, leadership tools designed as persuasive technology can – I argue – provide practical and social support for attitudinal and behavioral change among both public managers and employees, thus increasing the intended outcomes of the training. First, when leadership tools, for example, use templates to remind public managers of target behavior in the exact context (e.g., an employee development dialogue) of target behavior, they may reduce the cognitive demands of conducting target behavior in the specific situation. In this way, they provide primary task support. Second, when leadership tools send reminders on tasks and deadlines, they provide

dialogic support and increase awareness on target behavior. This may support public managers in prioritizing target behavior over other tasks in a busy work life, helping to overcome the tendency to prioritize short-term tasks over more important long-term goals often seen among public managers (Knies et al., 2021). Simplified information on target behaviors in such reminders may also induce public managers to invest more time and ongoing reflections on translating conceptual knowledge from training into understandings and actions in their daily work. Third, if leadership tools refer to evidence-based knowledge and are presented in a well-designed and professional form, they may provide credibility support that increases public managers' perception of the importance of conducting target behavior. Fourth and last, leadership tools could provide social support if they, for example, facilitated employee feedback on the public manager's target behavior.

Leadership tools are not only expected to affect public manager behaviors but may also affect employee attitudes and behaviors indirectly through influence on manager behaviors. When leadership tools facilitate interaction between public managers and employees, they could also influence employee attitudes and behaviors directly. As I will unfold later in section 2.3, leadership tools can provide primary task support, dialogic support, credibility support, and social support directly to employees in the context of employee development processes. Before I do that, I discuss how the publicness of organizations affects the relevance of using leadership tools in leadership training. I will also introduce transformation leadership training as a relevant case for combining leadership training with leadership tools and clarify how leadership tools can support the transfer and results of this type of training.

2.1.3. Leadership development in politically governed organizations

The aforementioned characteristics of the public leadership context – numerous and complex influences, task overload, and time pressure – arguably relate to public organizations being embedded in political systems. First, public organizations' embeddedness in the political system implies that public managers must navigate in a more complex stakeholder environment than their private organization counterparts (Boye et al., 2022). Public organizations are primarily controlled by political stakeholders who often represent conflicting partisan interests (Meier & O'Toole, 2011). Public managers also encounter a more diverse range of stakeholders, encompassing interest groups, private companies, and the general public (O'Toole et al., 2005). Second, these multiple influential stakeholders often have conflicting values and goals, and politicians might establish goals that are intentionally vague in order to secure

future flexibility and appease multiple stakeholders (Boye et al., 2022; Dahl & Lindblom, 1992). Thus, public managers face numerous and conflicting or ambiguous goals more often than private managers. Third, public managers have a larger span of control than private managers (e.g., Bohte & Meier, 2001; Bro et al., 2019). A high span of control implies that public managers have less time for the individual employee, and as a result, they must use their time more effectively in order to influence their employees in intended directions.

These three differences between public and private managers increase cognitive and time pressures that challenge ongoing learning and implementation of new leadership behaviors in managers' day-to-day work. As such, leadership tools that provide practical support easing learning and implementation, increase social commitment to change, and remind managers of the importance of specific leadership tasks are especially relevant in public organizations.

2.2. Content of leadership tools in transformational leadership training

The expectations about the effects of leadership training and leadership tools that I have outlined above can be further unfolded and exemplified by relating them to a specific type of leadership training. Connecting the arguments to a specific case will also allow me to expand on the knowledge on the *contents* of leadership tools; that is, which specific attitudes and behaviors they can and should affect and how they can do it. I use transformational leadership training as a relevant case for investigating the effects of leadership training with leadership tools and the expected different effects of static and dynamic leadership tools.

My general argument is that static and dynamic leadership tools can support ongoing learning and implementation of target behaviors following public manager training programs. But the content of leadership tools and eventually also the type of support must be adjusted to the target behavior of the specific training program. Although my argument is applicable across various target behaviors, such as ethical, distributed, or transactional leadership, it is particularly relevant for more ambiguous and hard-to-implement leadership behaviors. As I will soon elaborate, transformational leadership can be described as the leader's efforts to develop, share, and sustain a vision, aiming to motivate employees to go beyond their self-interests and achieve organizational objectives (Jensen, Andersen, Bro, et al., 2019, p. 10).

An et al. (2020, pp. 4–5) point out that these behaviors can be abstract and difficult to grasp. Public managers need to evaluate the clarity of their vision, assess the effectiveness of its communication, and find ways to sustain

employee engagement with the vision in the long run. Transformational leadership behaviors also carry strong connotations of socially desirable actions. Many managers may like to perceive themselves as visionary and inspirational, capable of transforming employees' values and activating their higher-order needs. However, empirical research consistently reveals a significant gap between public managers' self-assessments of their transformational leadership behaviors and the assessments made by their employees (e.g., An et al., 2020; Jacobsen & Bøgh Andersen, 2015; Vogel & Kroll, 2019). Therefore, leadership tools providing simplified information on target behavior, structural support, employee feedback, and reminders are expected to be particularly relevant for this leadership approach.

Furthermore, studies have shown that transformational leadership has a positive impact on performance in public sector organizations (Backhaus & Vogel, 2022; Bellé, 2014; Jacobsen et al., 2021), which has generated interest among leadership scholars in understanding how to cultivate transformational leadership behaviors in public managers through training and development programs (e.g., Jensen, 2018). Paradoxically, while transformational leadership holds significant implications for the performance of public organizations, it is time consuming and cognitively demanding to implement. This makes transformational leadership a relevant initial case for illustrating and testing my broader theoretical argument.

Leadership behavior, of course, influence employees less if they do not perceive these behaviors. As I elaborate in section 2.2.1., transformational leadership indeed intends to affect employees. Furthermore, public managers arguably often lack self-awareness and overestimate their application of specific leadership behaviors compared to the evaluations made by their employees (An et al., 2020; Jacobsen & Bøgh Andersen, 2015; Vogel & Kroll, 2019). This is especially the case with socially desirable leadership behaviors such as transformational leadership (ibid.). This dissertation therefore focuses on employee perceived behaviors as the primary indicator of altered public manager behaviors following leadership development interventions.

2.2.1. Transformational leadership and face-to-face communication

Transformational leadership involves behaviors aimed at transforming employees' values, attitudes, and motivation by emphasizing collective goals (Wright et al., 2012, p. 207). It strives to activate employees' higher-order needs and encourages them to prioritize the organization's interests by creating awareness and acceptance of the organization's core purpose (Bass, 1990; Jensen, Andersen, Bro, et al., 2019; Moynihan et al., 2014). Although there are

debates about the conceptualization of transformational leadership (van Knippenberg & Sitkin, 2013), scholars generally agree that articulating an organizational vision is a central component of this leadership approach (Jung & Avolio, 2000; van Knippenberg & Sitkin, 2013; Wright et al., 2012). In line with Jensen and colleagues (Jensen, Andersen, Bro, et al., 2019), this dissertation understands transformational leadership as encompassing three elements: developing an organizational vision, sharing the vision with employees, and sustaining the vision in the long term.

The effectiveness of a clear and compelling vision lies in its ability to motivate selfless employee behavior (Latham & Yukl, 1975; Locke & Latham, 2002; Wright, 2007). However, for an organizational purpose to inspire and influence behavior, employees must be aware of its existence and understand its significance (Moynihan et al., 2014, p. 95). Therefore, the impact of transformational leadership depends on effective communication of the organizational vision.

Among various communication approaches, face-to-face dialogue is considered the most effective method for conveying the organizational vision (Jensen et al., 2018). Dialogue provides additional cues for interpreting messages compared to other communication methods, making it better suited for conveying ambiguous messages like organizational visions. These cues include body language, tone of voice, and the opportunity for spontaneous mutual feedback, all of which help navigate the ambiguity and potential conflicts inherent in communicating an organizational vision. Moreover, face-to-face communication enables public managers to personalize the vision and make it feel authentic to their employees. Authenticity is arguably relevant in transformational leadership where public managers seek commitment based on inspiration rather than extrinsic rewards (Bass & Steidlmeier, 1999). Lastly, public managers can use mutual communication to engage employees in considering the attractiveness of the organizational vision and the way in which their work contributes to its realization, thus fostering a sense of ownership. Face-to-face communication of the organizational vision amplifies the effect of transformational leadership on mission valence (Jensen et al., 2018).

2.2.2. Goal-oriented development dialogues

Although the significance of face-to-face communication for transformational leadership is well established, there is a lack of theoretical guidance on *how* such communication should be conducted. Fortunately, insights from goal-based coaching research can be applied to model face-to-face transformational leadership dialogue. These insights also help understand how such communication may influences employees' values, attitudes, and motivation.

Goal-based coaching draws on goal-setting theory (Locke & Latham, 2002) and self-determination theory (Ryan & Deci, 2017). It focuses on facilitating individuals in regulating and directing interpersonal and intrapersonal resources to better achieve their distal goals (Grant, 2006, p. 153). In an organizational context, the vision serves as the distal goal, and elements of goal-based coaching can be utilized to facilitate employees' understanding and actions in relation to the organizational vision.

The coach's role is typically seen as impartial and facilitative, allowing the coachee to take the lead in defining goals and actions through an egalitarian interaction with the coach (Stober et al., 2006, p. 3). As a result, it is difficult or even impossible for public managers to act as coaches to their subordinates due to the power imbalance and the employee's inability to determine the overarching goal of the coaching process, namely the organizational vision. However, public managers can employ coaching *techniques* if they clearly communicate the overall purpose of the dialogue process: aligning organizational goals and employees' goals with the organizational vision.

To establish a framework for face-to-face transformative leadership dialogue between public managers and employees, Anthony Grant's (2006, 2012) generic model of goal-directed self-regulation can be used in a modified version. This model outlines how distal goals can be achieved through the processes of goal setting, action planning, and evaluation. It emphasizes the use of dialogue to facilitate, guide, and enhance the autonomous motivation of the coachee in attaining their goals (Grant, 2006). This approach aligns well with the principles of transformative leadership, which centers on the attractiveness of common goals and the satisfaction of higher-order needs to drive employees' desire to contribute to the organization (Jensen, Andersen, Bro, et al., 2019).

Two fundamental modifications are required to make Grant's generic model of goal-directed self-regulation applicable as an approach for face-to-face communication of organizational visions between public managers and employees. Firstly, the model must emphasize the organizational vision as the ultimate goal and the reference point for developmental goals, action plans, and evaluation. In transformative leadership, the vision serves to enhance goal achievement and should, therefore, be the central focus of the dialogue process. Secondly, the model should encompass the translation of the vision into the specific work context and tasks of the employee. In a coaching session, the coachee sets the goal, whereas in transformative leadership, the organizational purpose is shared with the employee, and developmental goals emerge from their engagement with the organizational vision. By utilizing coaching techniques within transformative leadership, public managers can employ

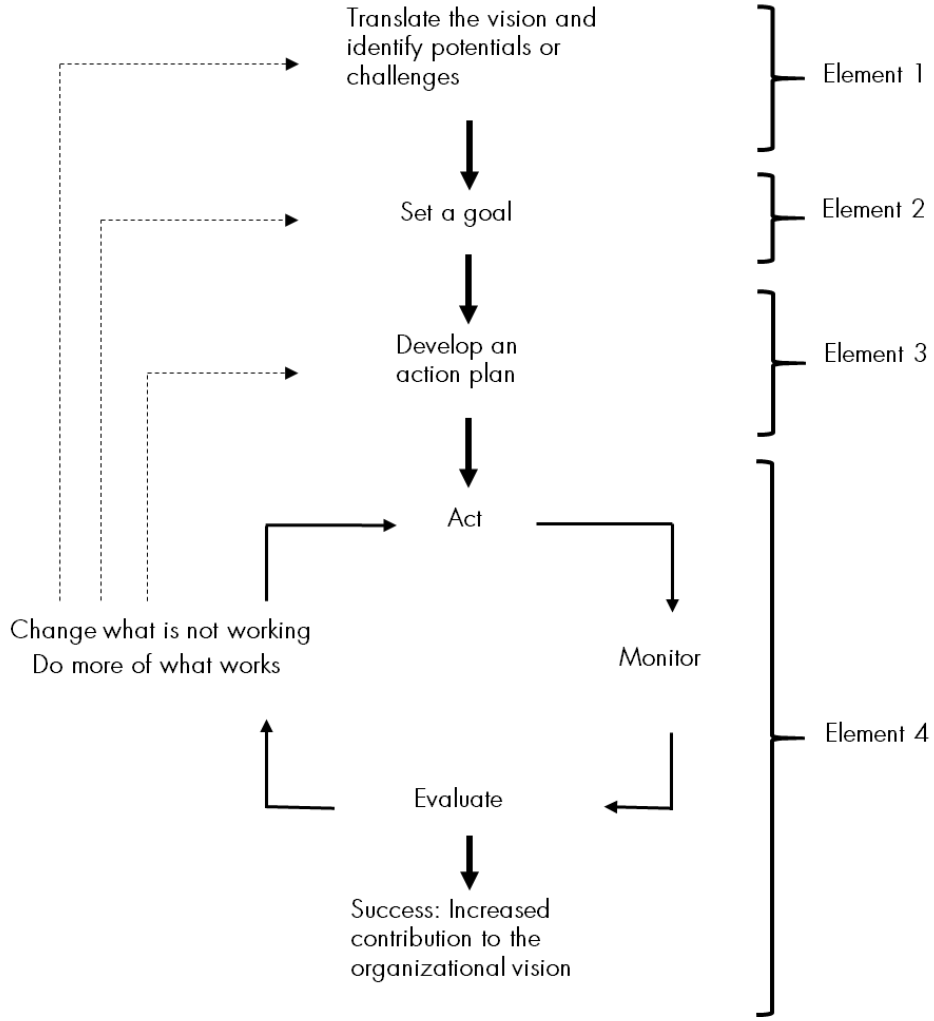
questions as a tool to guide employees through a process that includes (1) developing a sense of ownership over the organizational vision; (2) setting developmental goals to contribute more effectively to the vision; (3) action planning to achieve these goals; and (4) taking action, monitoring progress, evaluating outcomes, and adjusting goals and plans. In this manner, public managers may facilitate, guide, and enhance the autonomous motivation of employees in contributing to the organizational vision.

While dialogue between public managers and employees that translates organizational visions and objectives into daily experiences and work can occur spontaneously and informally, it often takes place within the context of goal-oriented development dialogues. In countries like Denmark, such conversations are mandated by collective agreements (KL & Forhandlingsfællesskabet, 2015) and serve as common and ecologically valid platforms for implementing face-to-face transformative leadership communication following leadership training. Goal-oriented development dialogues are recurring discussions intended to stimulate public manager-employee conversations about the employee's professional growth, how their tasks and efforts contribute to organizational objectives, and as a means to identify barriers to performance (ibid.).

In the subsequent sections, I will elaborate on the four overarching elements of goal-oriented development dialogues. I will elucidate how public managers can utilize goal-oriented development to facilitate the transformation of employees' values, attitudes, and motivation, encouraging them to transcend their self-interest for the benefit of the organization.

I use this theorization to derive expectations regarding the outcomes of goal-oriented development dialogues and to provide an understanding of how such dialogues may be conducted. It is important to stress that I do not intend to test the specific elements of the dialogue process empirically.

Figure 2.2. Face-to-face vision communication: goal-oriented development dialogues



Note: Based on Grant's (2006) generic model of goal-oriented self-regulation

2.2.2.1. Dialogue element 1: Translating the vision and identifying potentials and challenges

As a vital part of the goal-oriented development dialogue process, public managers are intended to facilitate employees' understanding and commitment to the organizational vision. I argue that they can achieve this by asking open-ended questions about the vision and its relevance to employees' work, encouraging reflection and preparation for a development dialogue. Supplementing direct communication of the vision with facilitated considerations is effective because employees are more inclined to be influenced by their own thoughts rather than solely relying on their manager (Aronson, 1999; Bellé, 2014; Wright & Grant, 2010). Additionally, aligning employees' values with the organizational values presented in the vision is vital for the motivational

impact of transformational leadership (Jensen, Andersen, & Jacobsen, 2019). Public managers may bridge this gap in goal-oriented development dialogues by helping employees recognize the connections between their own values and interests and those of the organization. If a mismatch is identified, public managers can promote the organizational values and emphasize the value the organization brings to citizens and society.

Another aspect of the initial phase in the dialogue process is clarifying how the organizational vision relates to employees' core tasks. Employees must understand their contribution to the vision to transcend self-interest and maintain motivation (Jensen, Andersen, Bro, et al., 2019, p. 9). Ambiguity regarding their role in vision realization can have negative effects on employee motivation (Carton, 2018; Paarlberg & Lavigna, 2010; Paarlberg & Perry, 2007). In this dialogue process, public managers are not only intended to create awareness about past contributions but also explore how employees can increase their contributions in the future. This may involve employees acquiring new skills, prioritizing work differently, collaborating with colleagues or clients, or making other changes in their approach. Through face-to-face communication and open-ended reflective questions, public managers can enhance employees' sense of ownership of the goal (the organizational vision) and provide feedback on their perception and role in achieving it (Grant, 2006). This process promotes goal clarity (Grant, 2006), a key factor in employees' commitment to organizational goals (Wright et al., 2012).

2.2.2.2. Dialogue element 2: Facilitating employees to set development goals related to the vision

The second element in the goal-oriented development dialogue process involves assisting employees in establishing a development goal to enhance their contribution to the organizational vision. Transformational leadership aims to influence employee behaviors to improve organizational performance. Breaking down the vision into proximal goals can increase the sense of achievability for employees (Carton, 2018, pp. 336–337; Grant, 2006, pp. 159–160), and setting challenging and relevant goals directs attention, energizes task performance, and promotes persistence (Favero et al., 2016; Locke & Latham, 2002, pp. 706–707).

In the dialogue process public managers must, however, consider different types of goals during the goal-setting phase of the dialogue process. Organizational visions, as distant and abstract goals, inspire employees to go beyond self-interest and work toward a specific purpose (Grant, 2012; Høstrup & An-

dersen, 2020). Proximal goals, on the other hand, are short term and encourage detailed action planning. Combining these two types of goals can enhance long-term performance (Grant, 2006).

Furthermore, an important aspect of goal setting is facilitating that employees' development goals are aligned with their values, needs, and interests. Based on self-determination theory, the self-concordance model emphasizes that goals perceived as autonomously determined by one's authentic self are more motivational than goals perceived as imposed by external pressures (Sheldon & Elliot, 1998). In goal-oriented development dialogues, public managers are, therefore, intended to guide employee reflections in way that fosters such self-concordance while still being aligned with the organizational vision.

As a fundamental coaching technique, public managers can employ open-ended reflective questions to uncover employees' values and interests, establishing connections with organizational values, vision, and goals. This understanding of employees' perspectives is important when facilitating self-concordant development goals that align with the organizational vision. Bridging organizational and personal needs can transform employees' attitudes and assumptions, increasing motivation and efforts to realize the vision (Jensen, Andersen, & Jacobsen, 2019).

2.2.2.3. Dialogue element 3: Facilitating employees' action planning

In the third element of goal-oriented development dialogues, the public manager is intended to assist employees in strategizing and planning actions to reach their developmental objectives. By aiding in action planning and outlining task strategies for goal attainment, the manager can strengthen an employee's ability to self-regulate and foster resilience (Grant et al., 2009). The main outcome of this component is the shift from a contemplative mindset, where the employee evaluates the advantages and disadvantages of various actions and competing goals, to an implementation mindset, where decisions are made and the employee becomes determined and focused on achieving plans and objectives (Grant, 2012). This resolute and focused mindset is associated with higher levels of self-efficacy, self-regulation, and goal achievement (Bandura, 1982).

Throughout the goal-oriented development dialogue process, including this element, the public manager is intended to employ open-ended, reflective questions to activate the individual employee's knowledge, experience, and perspectives. The manager utilizes solution-focused language to:

- Identify areas of development potential (e.g., “In your day-to-day work, when and how do you make the most significant contribution to our vision?”).
- Clarify goals (e.g., Employee: “I really want to improve my relational work with clients.” Public manager: “So, what does effective relational work mean to you?”).
- Discover resources relevant to the developmental goal (e.g., “Can you describe a recent case where you successfully utilized your relational skills to help a client secure and maintain employment?”).
- Prioritize actions related to goal achievement (e.g., “Imagine that three months from now, you have accomplished this developmental goal. Which actions have been the most decisive for your success?”).

2.2.2.4. Dialogue element 4: Facilitate action, monitoring, evaluation, and adjustment

The fourth element in the dialogue process comprises four recurring components: action, monitoring, evaluation, and adjustment. The employee is intended to initiate action based on the action plan while simultaneously monitoring and evaluating their actions. The intention is that the public manager facilitates this process through follow-up dialogues, asking questions such as:

- Are you implementing your actions according to your intentions and plans?
- Are your actions producing the desired effects on the development goals you set?
- Have new behaviors and training translated into new competences and work habits?
- How does this contribute to the organizational goals and vision, and how does it align with your own values and development interests?

The public manager’s role in this element is to support reflection and increase self-insight regarding the connection between the employee’s actions and goal attainment. Based on the evaluation of employee actions, with the organizational vision as the ultimate reference, the manager also assists in adjusting action plans and developmental goals. This facilitates an ongoing learning process where employees gain insight into how their work behaviors contribute to the organization’s purpose as well as their personal values and interests. This, in turn, expectedly fosters integrated and internalized motivation to develop relevant competences and effectively contribute to realizing the organizational vision.

The continuous iterative process of monitoring, evaluating, and adjusting actions also plays an important role in preserving the vision as vital and dynamic within the organization. Through recurring dialogues, the focus remains on developing competences, organizing resources, and prioritizing work to augment contributions to the organizational vision.

Research indicates that high levels of internalized and integrated motivation regulation are associated with performance and well-being at work (Ryan & Deci, 2017). The goal-oriented development dialogues aim to connect employees' personal values and interests with organizational goals and visions to nurture internalized and integrated work motivation. Meeting psychological needs is essential in goal-oriented development dialogues' intention to develop and sustain this motivation in the work setting. In the subsequent discussion, I will argue that goal-oriented development dialogues enhance the satisfaction of employees' central psychological needs.

2.3. Employee and organizational outcomes of leadership training with leadership tools

2.3.1. Psychological needs satisfaction as an important outcome in public Organizations

The satisfaction of employees' psychological needs poses a highly relevant case for investigating the consequences of transformational leadership training including leadership tools for goal-oriented development dialogues. Numerous studies have found that satisfying basic psychological needs enhances autonomous motivation, well-being, and effective performance across various work contexts (Deci et al., 2017). In public administration research, the satisfaction of these needs has been identified as a significant driver of work engagement (Breaugh, 2021), public service motivation (Vandenabeele, 2014), and job satisfaction (Battaglio et al., 2021). Experimental evidence also suggests that psychological needs satisfaction mediates the impact of transformational leadership on public service motivation and work engagement within public organizations (Jensen & Bro, 2018).

According to self-determination theory, three fundamental psychological needs are inherent in human nature, regardless of political, cultural, or economic contexts: autonomy, competence, and relatedness (Ryan & Deci, 2017, p. 564). Autonomy pertains to the need to have control over one's actions, while competence involves feeling capable and effective in social interactions. Relatedness refers to the need for connection, involvement, and a sense of belonging with others (Ryan & Deci, 2017, p. 86). The satisfaction of these needs

facilitates active engagement in tasks and goals that align with personal interests and values (Deci & Ryan, 2000, pp. 238–239). Moreover, individuals naturally internalize the values and regulations of their social groups, including the organizations they belong to, and this internalization is fostered by feelings of relatedness and competence. Consequently, the satisfaction of psychological needs can support motivation and performance within organizational contexts (Deci et al., 2001).

The literature on psychological needs also recognizes meaning as a fourth important psychological phenomenon, with several researchers emphasizing its significance (Martela et al., 2018; Martela & Ryan, 2020; Park & George, 2020; Tønnesvang & Schou, 2022). The pursuit of meaning and purpose in life is inherent to human nature, and the need for meaning is associated with the self-transcendent nature of human existence. This need involves being directed towards something beyond oneself (Frankl, 1966; Tønnesvang & Schou, 2022). In line with Tønnesvang and colleagues (2023), this study understands the need for meaning as encompassing (1) having ideals and values that guide one's life (Riker, 1996), (2) having horizons of meaning beyond oneself to comprehend one's human identity (Taylor, 2018), and (3) collectively organizing society and organizations with other human beings (Redfield, 1960). The need for meaning implies that individuals actively seek out meaning structures present in their surroundings (Tønnesvang & Schou, 2022). Consequently, when the work environment provides favorable conditions for satisfying the need for meaning, it vitalizes motivation to fulfill work tasks and contribute to organizational goals, similar to the satisfaction of needs for autonomy, competence, and relatedness.

In summary, the satisfaction of psychological needs holds significance as an organizational outcome in public organizations since it can foster employee well-being, motivation, and high-quality performance. As I will argue in the following, goal-oriented development dialogues can increase the satisfaction of employee psychological needs. I will also argue that dynamic leadership tools facilitating such dialogue processes can increase employee needs satisfaction to a greater extent than comparable static leadership tools.

2.3.2. Goal-oriented development dialogues and psychological needs satisfaction

Goal-oriented development dialogues have the potential to foster a work environment that promotes the satisfaction of important psychological needs, including autonomy, competence, relatedness, and meaning. These dialogues may enhance autonomy satisfaction by offering a clear vision that empowers employees to independently initiate actions aligned with organizational goals

(for a related argument see, Jensen & Bro, 2018). By explicitly focusing on helping employees bridge the organizational vision with their personal values and interests and allowing them to set self-concordant goals and action plans, goal-oriented development dialogues further intend to support the need for autonomy among employees.

Moreover, employee awareness of how they contribute to the organizational vision may contribute to satisfaction of their need for competence (Jensen & Bro, 2018). Goal-oriented development dialogues are expected to increase competence needs satisfaction by fostering reflection and dialogue on their work in past, present, and future contributions to the organizational vision. Additionally, challenging developmental goals can nurture satisfaction of the need for competence (Deci & Ryan, 2000, p. 260), and as previously argued goal-oriented development dialogue processes intends to contribute to establishing such goals.

Furthermore, I expect that goal-oriented development dialogues foster the need for relatedness by engaging employees in the organizational vision as a shared goal for all members of the organization, including its beneficiaries. This collective focus on connecting the organizational vision with employees' personal values may foster a feeling of being part of an important mission together, promoting an in-group connection and relatedness in the workplace (Jensen & Bro, 2018).

Lastly, goal-oriented development dialogues may contribute to the satisfaction of the need for meaning by linking their work to a desirable future state for the organization: the vision. By doing so, these dialogues are intended to provide a horizon of meaning beyond the individual employee, activating higher-order needs. In public organizations, visions can emphasize the organization's societal orientation and its aim to create value for citizens and society, thus offering meaningful horizons beyond the employees themselves (Høstrup & Andersen, 2020).

In summary, goal-oriented development dialogues are expected to play a notable role in supporting the satisfaction of psychological needs. Leadership tools can arguably increase public managers' use of such dialogues and thus *indirectly* contribute positively to employee needs satisfaction. Nevertheless, as I argue below, leadership tools can also contribute *directly* to employee needs satisfaction, and dynamic tools have a greater capacity to accomplish this compared to static tools.

2.3.3. Static and dynamic leadership tools and psychological needs satisfaction

Leadership tools that utilize questions to help employees translate the organizational vision into their work context and tasks – like in goal-oriented development dialogues – can enhance satisfaction of the need for autonomy. Leadership tools can provide templates for employees' preparation, for dialogue with their manager, and for their follow-up in goal-oriented development dialogue processes. When visions provide the overall guidance of employees' work, employees are more likely to take independent actions that contribute to organizational goals (Jensen & Bro, 2018). Leadership tools guiding goal-oriented development dialogues can explicitly encourage employees to reflect on how they can utilize their knowledge and experience to enhance their contribution to the organizational vision. By assisting employees in connecting the organizational vision with their personal values and interests and supporting them in creating self-concordant development goals and action plans, leadership tools further support employees' need for autonomy.

Furthermore, leadership tools for employee development can facilitate a reflection process that highlights how employees' work contributes to the realization of the organizational vision, thereby enhancing the satisfaction of the need for competence (Jensen & Bro, 2018). Such a tool can prompt employees to set challenging developmental goals, which also nurtures satisfaction of their need for competence (Deci & Ryan, 2000, p. 260).

In addition, when leadership tools invite employees to reflect on the organizational vision as a common goal for all organization members, it will expectedly foster a sense of belonging and connection among employees (Jensen & Bro, 2018). This effect may be reinforced when the tools prompt reflections on how employees can improve cooperation with other members to achieve shared goals. Questions stimulating reflections on how the organization contributes to citizens and society can additionally foster a sense of connection with the organizations' beneficiaries. Moreover, by emphasizing the connection between personal values and the organizational vision in goal-oriented development dialogues, the perception of working together on an important mission is likely to increase, satisfying the need for relatedness.

Lastly, a leadership tool for employee development can potentially support the satisfaction of the need for meaning by helping employees relate their work tasks to the desirable future state of the organization, as reflected in the vision. Specifically, I expect the tool to contribute to providing a broader sense of purpose and meaning beyond individual employees. Organizational visions in public organizations may emphasize creating value for citizens and society,

further increasing the sense of meaning and purpose (Høstrup & Andersen, 2020).

In summary, leadership tools designed to support goal-oriented development dialogues can play an important role in supporting the satisfaction of employee psychological needs. This argument applies to static as well as dynamic leadership tools. However, a dynamic tool has the potential to provide greater support compared to a similar static leadership tool in various ways. By considering the categories that describe the effects of persuasive technology (Oinas-Kukkonen & Harjumaa, 2008), it can be argued that dynamic tools offer enhanced primary task support, dialogue support, credibility support, and social support for satisfying psychological needs in employee development processes, surpassing the capabilities of similar static tools.

2.3.4. Different levels of support inherent in static versus dynamic leadership tools

While both static and dynamic leadership tools can guide employees through development processes, dynamic tools arguably offer greater support by automating the process flow and providing interactive responses to employee inputs. In this way, a dynamic tool may provide stronger primary task support in the employee development process. Dynamic tools can automatically prompt employees to prepare for development dialogues, reflect on goals and action plans aligned with the organizational vision, and provide overviews of their progress. After development dialogues, dynamic tools can facilitate the monitoring, evaluation, and adjustment of actions related to development goals. By guiding employees through these steps, dynamic tools may streamline the development process and foster continuous reflection on the link between the organizational vision and individual behaviors, values, and development interests.

Additionally, dynamic leadership tools can offer dialogic support that is not possible with static tools. They can send reminders to employees about task deadlines, goals, and evaluations, ensuring ongoing awareness of the organizational vision and opportunities for development. The perceived credibility of a tool can also influence user attitudes and behaviors, and dynamic tools with an interactive software design may be seen as more trustworthy and up-to-date compared to static tools. Moreover, dynamic tools can provide active web-links to research-based knowledge and third-party endorsements that support the development approach suggested by the tool, further engaging employees in its usage. On the other hand, although static tools do not provide active web-links, some employees may perceive the credibility of a

static leadership tool provided in hard copy to be stronger due to its tactile nature.

Lastly, a dynamic leadership tool can foster social support by facilitating dialogue between public employees and their manager regarding the organizational vision and employee development. The tool can provide real-time updates to the manager on employees' progress in preparing for the development dialogue process. It can automatically encourage employees to share their preparation with the manager and streamline the process with a simple click. Additionally, the tool can send reminders to both the manager and employees regarding tasks, goals, and evaluations while facilitating chat-based communication between them on these topics. As a result, a dynamic leadership tool can enhance social commitment, enabling individuals to reflect on their development and the way in which they contribute to the organizational vision and to take action based on their goals and plans.

Leadership tools supporting employee needs satisfaction can be one among other important mechanisms at play when leadership training is designed to ultimately increase organizational performance in public organizations. In the last part of this chapter, I will explain how transformational leadership training designed with use of leadership tools can contribute to increasing employee-perceived prosocial impact and organizational performance in terms of outcomes on citizen level.

2.3.5. Dynamic leadership tools and employee perceived prosocial impact

Employee-perceived prosocial impact refers to the extent to which employees experience that they can contribute to the welfare of other people and society at large through their daily work activities (Bro et al., 2017). Theoretically, this employee outcome is closely connected to the need for meaning and constitutes a supplement to psychological needs satisfaction as a relevant outcome of leadership development interventions.

The aspiration to serve public interest can be considered a normative basis for public sector employment (Perry & Wise, 1990). When employees perceive that their tasks contribute significantly to society and the well-being of others, it can potentially enhance the meaningfulness they derive from their jobs (Bellé, 2014). This perceived meaningfulness may, in turn, serve as a source of motivation for employees to invest more effort (Bellé, 2014). And just as organizational visions can potentially provide employees with a meaningful perspective (as previously discussed), they may also amplify the perception of prosocial impact.

Organizational visions in public organizations sometimes emphasize the organization's commitment to creating value for citizens and society (Høstrup & Andersen, 2020). I expect that contemplating how one's work aligns with such organizational visions will enhance employee awareness of the impact their actions have on others and society. Moreover, a process of developing competences that focuses on increasing employee contributions to the vision may further bolster the perceived (and actual) prosocial impact. Therefore, if leadership tools for employee development can facilitate employees' reflection on the organizational vision and address their need for purpose, they could potentially also foster an increased awareness of how their actions affect others and society. Consequently, employee-perceived prosocial impact is a relevant outcome to examine in order to further test the different effects of static and dynamic leadership tools.

2.3.6. Transformational leadership training with leadership tools and its potential effects on organizational performance

Although public manager behaviors and employee outcomes are important and may be stated as outcomes in their own right, organizational performance also represents a relevant goal of leadership training (Kirkpatrick, 1979). Performance is "the actual achievement of a unit relative to its intended achievements, such as the attainment of goals and objectives" (Jung, 2011, p. 195). And although it is a long journey from leadership training over altered manager behaviors and employee outcomes to organizational performance, I will argue that leadership training can potentially affect organizational outcomes – even on citizen level.

Only a few studies have investigated the causal effect of leadership training on performance (Dvir et al., 2002), and – to my knowledge – only one field experiment within public leadership has identified direct causal effects of leadership training on citizen level. However, this study by Jacobsen and colleagues (2021) only identifies significant effects of some of the investigated leadership training programs and on some of the investigated citizen outcomes. Existing research is thus sparse and shows mixed effects of leadership training on organizational performance.

Nevertheless, leadership training can influence organizational performance through its effects on leadership behaviors and employee attitudes. Research shows that such behaviors and employee attitudes do affect organizational performance (DeGroot et al., 2000; Dumdum et al., 2013; Fuller et al., 1996; Judge & Piccolo, 2004; Wang et al., 2011) – (Deci et al., 2001; Kim, 2005; Yu, 2023). This is the case with transformational leadership behavior, because the communication of a clear and attractive organizational vision can

activate employees' higher-order needs and encourage them to prioritize the organization's interests (Bellé, 2014; Dvir et al., 2002; Jacobsen et al., 2021). Satisfaction of employees' psychological needs can contribute to organizational performance, because need satisfaction contributes to intrinsic and integrated work-related motivation (Deci et al., 2001). As a final outcome of leadership training relevant for this dissertation, employee-perceived prosocial effect can increase employee performance (Bellé, 2014). Perceptions of task significance arguably make employees experience their jobs as more meaningful, and this can motivate them to exert more effort (Bellé, 2014). Thus, if leadership training combined with leadership tools – as I have argued above – can affect such outcomes, it follows logically that such interventions can also affect organizational performance. Still, research shows that citizen outcomes are influenced by various factors other than employee and manager variables (Bryson et al., 2002; Lechner, 2002; Sianesi, 2004). These additional factors, combined with significant random variation, make it more likely to identify significant effects of leadership training on employee outcomes rather than on more distant and unpredictable citizen outcomes.

2.4. Summing up the theoretical expectations

The outlined theoretical argument in this chapter suggests expectations that can be subject to empirical investigation. Leadership training combined with leadership tools can be presumed to have strong effects on leadership behaviors. The type of leadership tool is expected to moderate this causal relationship: Dynamic leadership tools are expected to have stronger effects than static leadership tools. More specifically, transformational leadership training with a leadership tool designed to support goal-oriented development dialogues is expected to increase employee psychological needs satisfaction. I presume this relationship to be mediated through public managers' use of such goal-oriented development dialogues. Leadership tools designed for goal-oriented development processes are expected to affect employees *indirectly* through altered public manager behaviors but also *directly* through employees' use of these tools. Dynamic leadership tools are expected to have a stronger impact on employee needs satisfaction and perceived prosocial impact than similar static tools. Lastly, the theoretical argument implies that transformational leadership training with leadership tools may also have a positive impact on organizational performance.

Chapter 3:
Research design, data, and methods

To investigate the causal effects of leadership training combined with static or dynamic leadership tools, I conducted a field experiment involving 34 Danish municipalities, 226 public managers and their approximately 4,450 employees. In this field experiment, I randomly assigned the participating public managers to leadership training combined with a static or a dynamic leadership tool or to a control group receiving neither training nor a tool. This randomization implies that the observed and unobserved factors that affect outcomes (e.g., leadership behavior, employee needs satisfaction, and organizational performance) are equally likely to be present in the two treatment groups and in the control group (Gerber & Green, 2012). Thus, the field experiment allows me to identify the causal effects of leadership development intervention that combines training and leadership tools and to investigate whether dynamic leadership tools have a stronger impact than static leadership tools.

Although experimental studies are often considered "the gold standard" of empirical research, various factors may still compromise the validity of findings in this type of research. The significant flexibility researchers have in making choices throughout the research process poses such a threat (Simmons et al., 2011). These so-called researcher degrees of freedom can inadvertently or intentionally lead to biased outcomes and false positive results, compromising the credibility of scientific research.

To address this problem, I preregistered the field experiment in October 2020 before I had access to any data from the experiment. In this preregistration, I presented the study's hypotheses, treatments, analysis plan, and design choices as recommended by, for example, Hansen & Tummers (2020) and Nosek et al. (2018). In this way, I minimize biases stemming from undisclosed flexibility in data collection and analysis (Simmons et al., 2011).

3.1. The Danish public employment services area as the empirical case

The field experiment was conducted within public employment services in Denmark. The public employment service system in Denmark is anchored in 94 local job centers. These job centers are organized as part of the municipalities, and they have various responsibilities: They assist the unemployed in finding jobs, provide services to employers seeking labor or wishing to retain

employees, support individuals with special needs in their job search, and administer the benefits system.

There are several reasons why the Danish public employment service area is relevant for studying the outcomes of leadership training combined with leadership tools. First, employment services are an important part of welfare state services in many countries (Breidahl & Larsen, 2015). Second, the area is characterized by conflicting values, which makes transformational leadership highly relevant (see Chapter 1 for a discussion of this statement). The law clearly states that the overall goal of public employment services in Denmark is to assist the unemployed in quickly finding sustainable employment and support companies in recruiting and retaining employees (Danish Law on Active Labor Marked Policy, 2022). However, conflict about the underlying values and means to achieve this goals are highly salient in many countries, including Denmark (Caswell et al., 2023). In short, politicians, managers, and frontline workers alike strive to reconcile the conflicting values of conditionality (e.g., mandatory activation of unemployed to motivate them to find a job) versus the value of personalized and empowerment-oriented services (support adapted to the individual unemployed). This reflects different understandings of what causes unemployment: lack of incentive or lack of competences (Andersen et al., 2023; Bonoli, 2010; Lindsay, 2007).

The third reason for choosing the employment services area concerns my own experience in the sector and, thus, my ability to design relevant interventions and interpret the results. I have 10 years of top-management experience in this sector, which has granted me insights that enable me to optimize a field experiment in this area. My jobs in this domain have also helped me establish a network, which greatly facilitated the recruitment of participating municipalities. My own experiences with transformational leadership and leadership tools have provided me with a practical understanding of how they impact employee outcomes and organizational performance. These firsthand experiences have supported my theorization process.

The fourth reason for choosing the Danish employment services as the case for the empirical investigation in this dissertation relates to the accessibility of organizational performance data. In Denmark, national registries hold data on a weekly and individual level for all citizens who have been involved in the public employment system. By selecting this specific case, I can utilize objective data to examine how combined leadership training and leadership tools affects organizational performance at the citizen level.

3.2. Recruiting, randomization, and the risk of contamination

All 94 job centers were invited to participate in the project. The invitation was sent via email and included a detailed five-page description of the project focusing on the potential organizational benefits from participating in the leadership development program. Out of the 94 job centers, 34 decided to join. I held meetings to discuss the project with manager teams in 27 of the participating job centers. Some meetings were virtual (23), while others were in person (4). Seven job centers decided to participate without a meeting but had a subsequent meeting with me in the roles as project owner, trainer, and researcher. Four job centers participated with only some of their units. Thirty-five job centers declined the offer, and 25 did not respond despite reminders.

The recruitment process is important for how voluntary participation in the project was. In most cases, it was not up to the individual manager to decide whether to participate, and employees have generally not been involved in the discussion.[2] Thus, although the experiment represents a case of voluntary participation at least at the municipal level, voluntariness varies at the lower hierarchical levels.

As previously mentioned, the participating public managers were randomly assigned to two intervention groups (receiving leadership training and either a static *or* a dynamic leadership tool) and a control group (receiving no training and no tool). The randomization process was completed by September 1 before the distribution of the pre-intervention survey among the participating public managers and their employees.

The randomization was stratified on the municipal level because I expected municipality-specific factors to influence the development of leadership behavior, employee outcomes, and organizational performance. Examples of such municipality-specific factors are leadership culture in the job centers, values, and focal points in the local political governance of the area, as well as the characteristics of the job centers' target group and structure of the local labor marked. To ensure an equal number of public managers in each group, the randomization was conducted within each participating job center using proportional stratification.

This stratification within the job centers, however, comes with the cost of increased risk of contamination. Three overall sources of contamination pose a challenge to the project. Firstly, there is concern that public managers in the control group may have had access to (parts of) the leadership tools or insights from the leadership training. Secondly, public managers in the intervention

[2] Three municipalities consulted employees in the work committee before deciding to take part in the leadership training program and the experiment.

groups may have gained access to the other intervention group's leadership tool. Thirdly, the awareness of being a part of a leadership development experiment might, in itself, affect public managers' and employees' attitudes and behaviors. To mitigate the first two of these risks, certain measures have been implemented.

While it is straightforward to prevent control group managers from participating in the leadership training, information sharing between the two intervention groups as well as with control group managers poses a risk. Colleagues within the same municipality (assigned to all three groups) often work closely together and are used to supporting each other and sharing all relevant information. To reduce this information sharing, all public managers in the two intervention groups signed an agreement not to share any course materials or any aspects of the leadership tool with anyone until end of the experiment in February 2022. Additionally, access to the dynamic tool was restricted to managers in the dynamic intervention group, and unauthorized sharing of the license was monitored with no such access detected.

However, despite these measures, there are still challenges related to contamination. Control group managers are aware that they are part of an experiment evaluating their leadership behavior, outcomes among their employees, and their units' performance. They are also aware that they – in an anonymized form – will be compared with their colleagues, some of whom received transformational leadership training and leadership tools to support this task. This awareness is likely to have prompted them to step-up and take actions on their own to improve their leadership. They might have searched for information about transformational leadership on their own, for instance, or they may even have been attending leadership training in other contexts. Such training is easily available for most managers in the Danish public sector.

This anticipated "step-up effect" makes the design of the field experiment more conservative as this variant of the Hawthorne effect reduces the difference between the two intervention groups and the control group. Similarly, if colleagues have shared information on the training and the tools across the three groups, it also makes the test more conservative.

The randomization strategy and the handling of contamination risk are also an example of the manner in which I have attempted to balance practical and research considerations in the experiment design. Leadership development interventions may have even stronger effects if managers working together can participate together. This makes it possible to share experiences and elaborate understanding on all three learning levels (cf. section 2.1.3.) with close colleagues in the day-to-day work setting. It also allows leaders of the managers to support the learning process, for example by following up on leadership development goals individually and collectively.

For the sake of generating data with enough statistical power to answer the stated research question and to be able to account for differences between municipalities, I have – as mentioned – chosen to assign managers from the same municipality to different groups, thus denying the opportunity of leadership development as a collective process in each job center. In the recruitment phase, throughout the training program, and in the follow-up workshop that I have conducted in each municipality, participating managers and their supervisors have complained about this. They have unanimously argued that assigning all managers in the same municipality to the same intervention group would have made much more sense in practice and would indeed have increased the outcomes of the development intervention. This can be seen as an additional reason that this design poses a conservative test of the effects of combined leadership training and leadership tools. Most of the participating public managers and their leaders however recognized that this type of randomization was necessary to be able to attain important new knowledge that is also highly relevant for practice, so I do not expect any substantial negative effects from the choice.

In sum, this section explains the recruitment, randomization, and contamination handling in the field experiment. This section also argues that choices related to stratified randomization in various ways make the design a rather conservative test of the expected outcomes of interventions combining leadership training and leadership tools. For further details about the recruitment and randomization process, please see the technical report.

3.3. The intervention: training and leadership tool

The intervention in the field experiment consisted of a leadership development program that I called “Leadership Tools: Visionary Leadership and Organizational Leadership” (LEVO). I designed the program to enhance transformational leadership skills and behaviors through a combination of teaching and experiential learning. The intervention focused on face-to-face communication aspect of transformational leadership: goal-oriented development dialogues. The intervention involved two days of leadership training, use of a leadership tool, and trainer-planned activities before, in-between, and after the two training days.

3.3.1. Transformational leadership training focused on goal-oriented development dialogues

In the design of the leadership training part of the intervention, I drew on a previous leadership training field experiment that successfully influenced public manager behaviors as well as organizational outcomes: the Leap project

(Boye et al., 2015; Jacobsen et al., 2021). The LEAP project involved three different training programs: a transformational leadership training program, a transactional leadership training program, and a program combining transformational and transactional leadership training. In essence, the leadership training part of the LEVO intervention used the transformational leadership training program from LEAP but without the curriculum and exam and condensed from four to two days of training.

The overall teaching and learning principles are based on the idea that leadership development requires an interactive interplay between learning on three levels (Holten et al., 2015). The first level concerns understanding conceptual and theoretical knowledge about transformational leadership and goal-oriented development dialogues. The second level is about contextualizing this knowledge by reflecting on and translating the conceptual insight in relation to visions, goals, challenges, potential, types of employees, existing concepts for and expectations for employee development processes, and so on within one's own organization and unit. The third level includes training skills and abilities related to learning on the other two levels and planning how to implement these insights in practice.

The participating public managers were introduced to key theoretical insights and research findings related to the goal-oriented development dialogue process model. These included transformational leadership (e.g., Bellé, 2014; Høstrup & Andersen, 2020; Jensen, Andersen, Bro, et al., 2019), solution-focused coaching (Grant, 2017, 2020; Grant & Gerrard, 2020), goal-setting theory (Locke & Latham, 2002), and self-determination theory (Ryan & Deci, 2017; Sheldon & Elliot, 1998). The training incorporated individual and group reflection activities to enhance self-awareness and facilitate the application of theoretical concepts to their specific organizational contexts. Additionally, the managers were tasked with creating their own individual action plans to implement initiatives within their units focusing on goal-oriented development dialogues with employees.

To further promote action-oriented learning, the training included simulated goal-oriented development dialogues among the participating managers during sessions. This approach aimed to equip them with the necessary knowledge, awareness, and practical skills to effectively engage in transformational leadership through face-to-face communication with their employees.

Taken together, the leadership training program combined various teaching, reflection, and feedback formats to support learning concerning transformational leadership and goal-oriented development dialogues on all three learning levels mentioned earlier in this section.

3.3.2. Leadership tools designed to support goal-oriented development dialogues

As the second part of the leadership development intervention, participating managers were provided either a static or a dynamic leadership tool designed for the purpose of this dissertation. I designed the tools to echo the leadership tools discussed in the theory chapter. Both the static and dynamic leadership tools comprise templates that guide the goal-oriented development dialogue process, covering preparation, dialogue, and follow-up. Managers are instructed to initiate these dialogues by requesting employees to prepare for the development dialogue. The tools provide a template with questions regarding the organizational vision and the employees' wellbeing and motivation as well as questions to evoke their reflections on relevant development goals. Employees are encouraged to share their preparation with their manager, who is then instructed to utilize this information as the basis for their own preparation.

The tools also facilitate the dialogue process between public employees and managers by employing open-ended, reflective questions. These questions assist the managers in facilitating the dialogue and employees in setting development goals that align with both the organizational vision and their personal values and interests. Furthermore, the tools guide employees, with the help of reflective questions from their managers, in developing action plans and setting milestones to achieve their development goals.

Next, the tools offer templates for follow-up, enabling ongoing monitoring and evaluation of employees' actions related to their development goals and plans. Employees are prompted to reflect on how their modified behaviors contribute to achieving their development goals and align with their personal development interests, values, and the organizational vision. Templates are designed to support public managers in conducting these learning-oriented follow-up dialogues with their employees.

Through these templates, the leadership tools are intended to provide practical and social support for public managers as well as employees in their respective roles in goal-oriented development dialogue processes. The tools seek to help public managers remember target behavior in the immediate context of the various steps in employee development processes, and they intend to tunnel the employees through a development process guided by the organizational vision. The tools intend to increase the social commitment of public managers and employees to comply with plans and goals in this process and to conduct follow-ups. In this way, the tools may also facilitate the managers' ongoing reflection and learning related to target behavior from the leadership training.

Although the static and dynamic tools share identical templates for preparation, dialogue, and follow-up, they differ in terms of interactivity. The static tool is provided as writable PDFs, and public managers are instructed to use their existing email and calendar software to distribute the templates and keep track of goals, action plans, deadlines, and follow-up. In contrast, the dynamic tool is a software developed specifically with the intention of functioning as a leadership tool for employee development processes. This tool was designed on top of an existing cloud-based leadership tool platform. When a public manager initiates an employee development dialogue process using the dynamic tool, the software automatically sends an email invitation to each employee. This email includes a web link to the tool where employees are guided to prepare for the development dialogue. The dynamic tool reminds employees to share their preparation with their manager and notifies the manager when employees have completed their preparation. Additionally, this tool prompts managers and employees to set deadlines for tasks and follow-ups, sending automated reminders to both parties to support timely progress. Moreover, the dynamic tool automatically generates an overview of tasks and deadlines for both employees and managers, and it provides an integrated chat function for communication related to the development process.

The design of these two leadership tools enables a comparison of the effects of static versus dynamic leadership tools. Although the content of the tools remains the same, the level of interactivity differs. This test, however, is conservative in nature as the static tool also incorporates some interactive elements, such as utilizing email and calendar software to provide reminders and facilitate written communication. For more detailed information about both the static and the dynamic tool, please refer to the technical report. For a video illustrating how the dynamic leadership tool works, please follow this link.

3.4. Drop out, survey data collection, and balance check

A fundamental premise for causal interpretation of findings in field experiments is that the collected data reflects the initial randomization. Dropping out of the leadership development program and missing responses in the data collection process can potentially bias my findings. In this section, I will, therefore, discuss the retention rate (or dropout rate) and the data collection process including response rates. In the last part of the section, I present balance tests that indicate whether the randomization has been successful.

During the intervention period from October 2020 to January 2022, 39 out of the initial 226 public managers in the experiment decided to discontinue their participation. As evidenced in Table 3.1, the primary reasons for

these drop outs were job changes, retirement, and maternity leave, accounting for 29 managers. Additionally, six managers withdrew due to workload concerns, while one manager cited illness as the reason. Three public managers opted out of the program before the training program had even begun.

It is noteworthy that the dropout rates show a relatively similar pattern across the various experimental conditions. Within the two treatment groups, 29 public managers dropped out, while in the control group, ten public managers chose to end their involvement. Furthermore, the reasons for leaving the program were evenly distributed among the different groups. The relatively low drop out rate (17 percent) and the fairly even distribution of reasons for withdrawing from the field experiment indicate that dropping out does not in itself constitute a significant risk of bias.

Table 3.1. Drop out

Reason	Groups			Total
	Control	Treatment 1 (static tool)	Treatment 2 (dynamic tool)	
Changed job position, maternity leave, or retirement	7	9	13	29
Work pressure	2	2	2	6
Illness	0	1	0	1
Program assessed as irrelevant	1	1	1	3
Total	10	13	16	39

Note: Treatment 1 is leadership training combined with a static dialogue process tool, and treatment 2 is leadership training combined with a dynamic dialogue process tool.

Data for all dependent variables – except organizational performance measured on citizen level – was collected in pre- and post-intervention surveys. All public managers and employees in the 226 participating job center units, regardless of experimental group, received identical pre- and post-survey measuring. The pre-survey was conducted in September 2020 before the public managers were informed of their group assignment.

The surveys were distributed electronically along with three reminders. To further boost response rates, public managers were asked to encourage their employees to respond to the survey requests. In total, 205 public managers and 3,392 employees provided complete answers in the pre-training survey to the first section in the survey – the outcome measure on perceived transformational leadership (cf. Table 3.2). This equals response rates of 91% for public managers and 76% for employees. The rates for full responses to the pre-survey equals 88% for the public managers and 62% for the employees.

Table 3.2. Response rates from pre- and post-intervention surveys

	Public managers			Employees		
	Unique individuals	Responses, first section in question-naire	Responses, full question-naire	Unique individuals	Responses, first section in question-naire	Responses, full question-naire
Pre-survey, September 2020	226 (100%)	205 (91%)	200 (88%)	4,442 (100%)	3,392 (76%)	2,759 (62%)
Post-survey, January 2022	187 (100%)	151 (81%)	129 (69%)	3,535 (100%)	2,738 (77%)	1,475 (42%)
Panel	187 (100%)	133 (71%)	120 (64%)	3,535 (100%)	1,695 (48%)	1,041 (29%)

For the post-training survey (January 2022), 151 public managers and 2,738 employees provided responses for the first section in the survey, yielding response rates of 83% for public managers and 77% for employees. Response rates for full responses to the post-survey equals 71% for the public managers and 42% for the employees.

Public managers and employees that responded to both the pre- and post-survey provide me with panel data that can be used for robustness analyses in some of the dissertation's hypotheses tests. A total of 133 public managers and 1,695 employees provided answers to the first section in both the pre- and the post-survey. This equals response rates of 71% (managers) and 48% (employees). Regarding full responses, 64% of the public managers and 29% of the employees provided full responses to both the pre- and the post-survey.

Table 3.3 presents the findings of balance tests conducted to compare the average baseline values of various factors among public managers. These factors include gender, age, education length, managerial seniority, formal leadership training, seniority in the current job, span of control, and employee-perceived transformational leadership behavior. The results indicate that there are no statistically significant differences in these baseline covariates between the experimental groups. This outcome strengthens my confidence in the randomization process and supports the assumption that the experimental groups were initially identical.

Table 3.3. Means and t-test of treatment–control covariate balance at baseline (public managers)

	Mean	Difference		
	Control	Control vs. treatment 1	Control vs. treatment 2	Treatment 1 vs. treatment 2
Gender (1 = male)	0.25	–0.03	–0.12	–0.09
Age (years)	49.80	0.38	–1.15	–1.52
Years of education	16.10	0.03	0.02	–0.01
Managerial seniority (years)	9.32	1.00	–0.56	–1.56
Span of control	22.45	–0.20	0.06	0.26
Formal leadership training (0 = no formal training)	0.74	0.08	0.02	–0.06
Seniority in current organization (years)	11.19	2.70†	1.76	–0.93
Transformational leadership behavior (index on 5-point Likert scale)	4.21	0.00	0.01	0.01

Note: Differences are tested for significance using t-tests. Statistical significance †<.1. *<.05. **<.01. ***<.001. N(control) = 68. N(treatment 1) = 72. N(treatment2) = 65).

Taken together, the low dropout rate, the relatively high response rates, and the absence of significant imbalances indicate that I have solid and unbiased data that allows me to investigate the theoretical expectations in the dissertation.

3.5. Data on organizational performance: citizen level outcomes

As a supplement to my main focus on public manager and employee outcomes of leadership training with leadership tools, this dissertation report also investigates the effects on organizational performance. Setting criteria for evaluating performance in public organizations is not a trivial matter. Several distinctions can be made to describe systematic differences in performance criteria (Andersen et al., 2016). Given that public organizations often face multiple legitimate stakeholders, it is relevant to consider from which stakeholder perspective performance is being assessed. But performance criteria also differ in terms of objectivity/subjectivity, formality, product/process focus, and unit of analysis (Andersen et al., 2016). In my investigation of the organizational performance effects of my leadership development intervention, I focus on formal overall goals stated in the law governing the public employment service area. These goals are formulated by this areas' most important stakeholder, namely the democratically elected parliament. Danish law clearly

states that the overall goal of public employment services is to assist the unemployed in quickly finding sustainable employment and support companies in recruiting and retaining employees (Danish Law on Active Labor Marked Policy, 2022). I therefore use self-sufficiency rates among (formerly) unemployed as an indicator of job centers' organizational performance, i.e., I use an objective performance indicator focused on the citizen outcome of public employment services.

To investigate the effects of leadership training with leadership tools on self-sufficiency among the job centers' target groups, this dissertation combines the aforementioned survey data with administrative data from each unit. The administrative data is collected from administrative registers that have been merged by the National Labor Market Authority in Denmark. These registers form an event history data set that keeps track of and manages public income transfer payments and includes details about periods of employment. The administrative data is utilized to establish eligibility for public cash benefits and to assess whether job centers fulfill their obligations regarding employment services. The data, which is widely regarded as highly dependable (Bagger et al., 2014; IT- og Forskningsministeriet, 2001; Mortensen, 2004), includes individual citizens' employment status and other socio-economic details and forms the basis of average treatment effect analyses of citizen self-sufficiency.

Some of the data sampling and development of analytical approaches on citizen outcomes was done in collaboration with Mette Grønborg Stennicke and Jonas Maibom. However, I am solely responsible for the conducted analyses and interpretation of findings.

Not all participating 226 units have a direct responsibility for a specific citizen target group. Many units share target groups, and some units do not have tasks directly related to unemployed citizens. To validate and supplement survey data on target group responsibility, we contacted each of the participating 34 municipalities. This additional information about the participating units allowed us to identify specific citizen target group responsibility for 108 of the participating units. Using this information, we drew a stock sample consisting of the specific citizens covered by the job center units' targets groups in the week before initiation of the treatment (before the first leadership training day). The effect of the leadership training with leadership tools is then measured as the difference between average accumulated self-sufficiency rates in the control group and the two treatment groups. I present the results of these analyses along with balance checks on these data in Section 4.3 in the results chapter.

3.6. Analytical strategies

Given that randomization worked out as intended and there are no signs of unbalances between the three groups in the field experiment, I use simple average treatment analysis on post-data as the overall analytical strategy in the dissertation. Random assignment solves issues related to observed and unobserved variables that could potentially confound results as it ensures the treatment becomes independent of potential outcomes (Angrist & Pischke, 2008). Thus, even though the pre-survey and the register data allow the inclusion of lagged dependent variables and other covariates, this is arguably redundant. The inclusion of covariates and lagged dependent variables in the average treatment effect analysis in field experiments is, however, a subject of debate.

Although including covariates can reduce the variance of treatment effects, doing so can also reduce the size of the estimated treatment effects and make them more difficult to interpret (Gerber & Green, 2012, p. 88). Moreover, the inclusion of covariates prerequisites a "no interaction" assumption, implying that the treatment effect is constant across different levels of the covariates. However, in practice, this assumption might not hold, and including covariates could obscure or distort the true treatment effects (Gerber & Green , 2012; Imbens & Rubin, 2015). Therefore, I exclude lagged dependent variables and other covariates in the primary analysis in this dissertation and only include them in robustness checks.

The theoretical argument outlined in Chapter 3 implies that the field experimental treatment effect on employee outcomes (perceived transformational leadership behavior, psychological needs satisfaction, and prosocial impact) is mediated by public managers' use of goal-oriented development dialogues. The challenge in estimating this mediation effect is that goal-oriented development dialogues are endogenous in the experiment – as mediating variables often are. This endogeneity is likely to yield a biased estimate when the mediator is treated as an observed variable in relation to the outcome. To solve this problem, I follow recommendations from Antonakis et al. (2010, p. 1083) and Sajons (2020), using the leadership development treatment as an "experimentally randomized instrumental variable."

This solution involves two straightforward steps. First, the intervention is purposely designed to stimulate exogenous variation in public managers' use of goal-oriented development dialogues. Therefore, I can identify the specific portion of the mediator's variation (i.e., managers' use of goal-oriented development dialogues) that can be solely attributed to an external source (i.e., the experimental leadership development intervention). Secondly, I can utilize this variation (exclusively induced by the randomized treatment) when esti-

mating the impact of the mediator (public managers' use of goal-oriented development dialogues) on the desired outcomes. To accomplish this, I employ the econometric technique known as two-stage least squares (2SLS) estimation where my intervention acts as the experimentally randomized instrument (Sajons, 2020) and the use of goal-oriented development dialogues by public managers serves as the instrumented variable. This approach enables me to mitigate the typical bias arising from endogeneity in mediation analyses and estimate the causal effect of public managers' use of goal-oriented development dialogues on employee outcomes.

Experimentally randomized instrument analyses require three conditions to be satisfied (Angrist & Pischke, 2008; Sajons, 2020). First, the instrument must be relevant, meaning it should have a significant correlation with the endogenous explanatory variable, which is the experimental treatment in this case. To test this condition, I utilize ordinary least squares (OLS) to determine whether the intervention in the randomized field experiment increased managers' inclination to engage in goal-oriented development dialogues.

Secondly, the instrument must be randomly or as-if randomly assigned to avoid correlation with omitted variables. This condition is fulfilled as the instrument is the randomly assigned leadership development program.

Lastly, the instrument must solely impact the dependent variables through the endogenous variable (goal-oriented development dialogues), without any direct or indirect effects through other channels after regressing x (goal-oriented development dialogues) on z (treatment) in the first stage. This condition is known as the exclusion restriction. The leadership training and leadership tools provided in the experiment are designed exactly to enable public managers to conduct goal-oriented development dialogues. The training encompasses theoretical and conceptual knowledge on transformational leadership and involves reflection and instruction on conducting transformational leadership behaviors through these goal-oriented development dialogues. Additionally, the provided leadership tool, as previously mentioned, supports this type of dialogue. Consequently, it is plausible that the exclusion restriction is satisfied.

In sum, the dissertation uses simple average treatment effect analyses and 2SLS analyses to investigate the causal expectations outlined in Chapter 2.

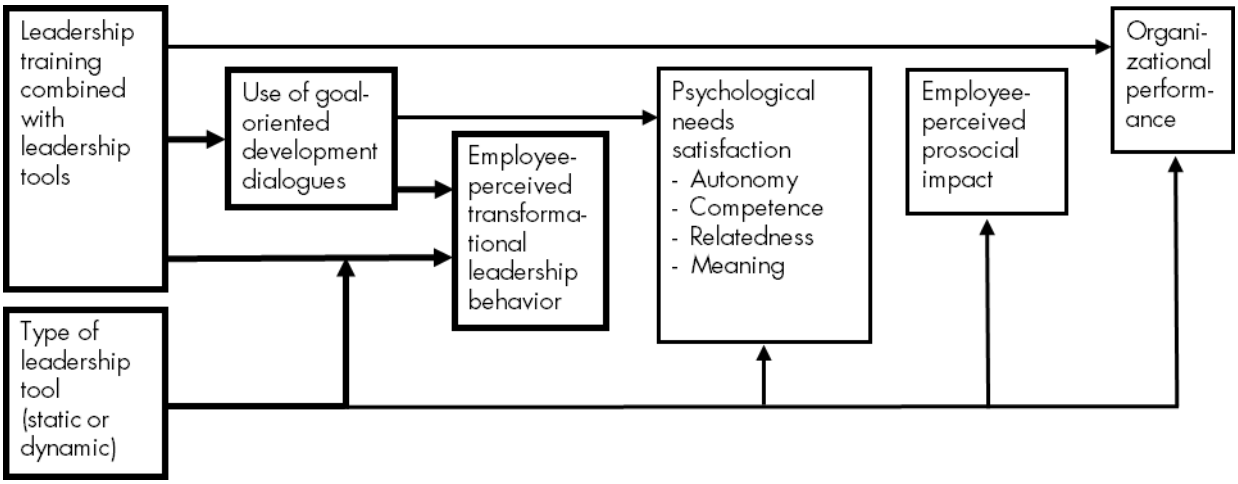
Chapter 4: Main findings

The dissertation's main empirical findings are structured in three overall groups and relate to leadership training combined with leadership tools' effects on (1) public manager behaviors, (2) employee outcomes, and (3) citizen outcomes. This chapter provides an overview of these findings.

4.1. Leadership training with leadership tools: effects on public manager behaviors

Paper A – which was co-authored with Ulrich Thy Jensen – investigates the causal relationships between leadership training with leadership tools on goal-oriented development dialogues and employee-perceived transformational leadership behavior. As illustrated with the bolded lines and boxes in Figure 4.1, this paper also investigates whether these relationships are moderated by the type of leadership tool (static versus dynamic). Finally, Paper A investigates whether the effect of the combined training and tools on employee transformational leadership behavior is mediated by public managers' use of goal-oriented development dialogues.

Figure 4.1. Causal relationships investigated in Paper A



Note: The figure presents all causal relationships that have been investigated empirically in this dissertation. Causal relationships investigated in Paper A are bolded in the figure.

Paper A draws on insights from behavioral science literature to highlight how leadership tools might use nudging techniques to make it easier for public managers to implement target behavior in the aftermath of leadership training programs. In Paper A, the leadership tools developed for this dissertation are,

therefore, referred to as just-in-time implementation nudges provided by static or dynamic software solutions.

As evidenced in Paper A, the field experiment provides strong support for the expected causal effects of combined leadership training and leadership tools on employee-perceived transformational leadership behavior. This result holds true for both variations of the treatment. The estimated average treatment effect is 0.31 on a 5-point Likert scale for the static tool and 0.33 for the dynamic tool. This corresponds to a Cohen's d effect size of 0.34 (static tool) and 0.35 standard deviations (dynamic tool). The highly significant and substantial effects of the treatments are also found when lagged dependent variables and other relevant covariates are included in the analyses, indicating that these findings are robust.

As argued in Chapter 3, leadership training combined with dynamic leadership tools can be expected to have stronger effects on public managers than training combined with static tools. Paper A, however, finds that the difference between the effects of the two treatment variants on transformational leadership behavior is statistically insignificant. Thus, the analyses conducted in Paper A do not support the notion that the type of leadership tool moderates the effect of leadership training with leadership tools on public manager behaviors.

The last main result of Paper A concerns the relationship between public managers' use of goal-oriented development dialogues and the way that employees perceive their managers' transformational leadership behavior. Since there are – as referred above – no significant differences between the two treatment variations effect on employee-perceived use of goal-oriented development dialogues, I collapse the two treatment groups to increase statistical power and for parsimony. The main intention of the leadership development program in the field is to foster public managers' ability to conduct transformational leadership through goal-oriented development dialogues with their employees. Chapter 2 theorized how goal-oriented development dialogues are expected to be an effective way to communicate organizational visions to employees as a central element in transformational leadership. Thus, it is relevant to investigate whether public managers' use of goal-oriented development dialogues mediates the effect of the leadership development intervention on employee-perceived transformational leadership.

The field experiment provides strong evidence in favor of this expectation. As a first step in a 2SLS analysis of the mediation, Paper A finds that employees of managers in the intervention groups perceive a higher usage of goal-oriented development dialogues compared to their counterparts in the control group. The effects size is 0.29 on a 5-point Likert scale corresponding to a Cohen's d of 0.45, suggesting a substantial impact. In the second step of this

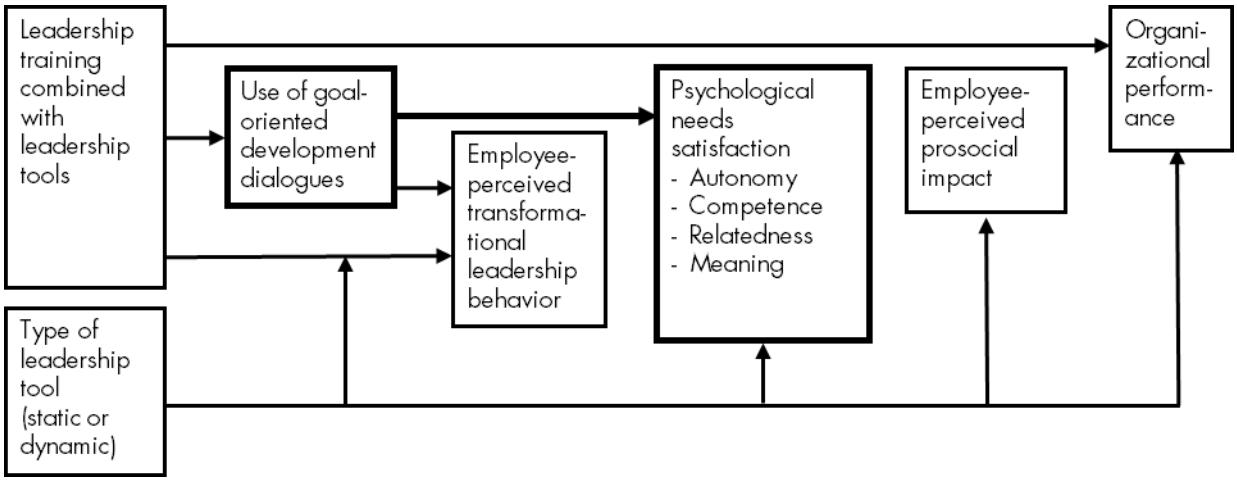
analysis, Paper A provides evidence of a strong causal relationship of the instrumented mediator (public managers' use of goal-oriented development dialogues) on employee-perceived transformational leadership. The effect equals 1.12 on a 5-point scale. This way, the dissertation provides strong support that public managers' use of goal-oriented development dialogues mediates, at least in part, the impact of the combined leadership training and leadership tools on transformational leadership.

4.2. Leadership training with leadership tools: impact on employee outcomes

4.2.1 Effects on needs satisfaction and perceived prosocial impact

As illustrated in Figure 4.2, Paper B investigates how managers' use of goal-oriented development dialogues affects the satisfaction of employees' psychological needs. Just as in the mediation analysis mentioned in section 4.1, I used a 2SLS regression analysis to assess this relationship. Section 4.1 already referred that the treatment substantially and statistically significantly influences public managers' use of goal-oriented development dialogues. Paper B adds evidence that public managers' use of these dialogues significantly increases employee satisfaction of the needs for autonomy (β = 0.35, p < 0.05) and meaning (β = 0.26, p < 0.05). The 2SLS analysis, however, does not provide support for the expected effects of such dialogues on the needs for competence and relatedness.

Figure 4.2. Causal relationships investigated in Paper B



Note: The figure presents all causal relationships that have been investigated empirically in this dissertation. Causal relationships investigated in Paper B are bolded in the figure.

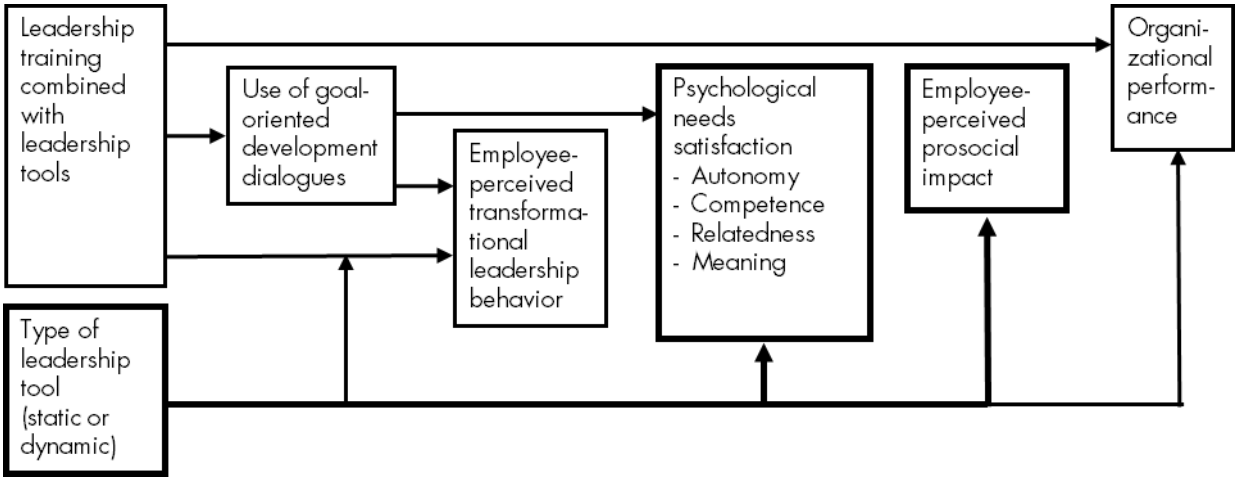
The treatment effects on satisfying employee needs for autonomy and meaning are robust to the inclusion of covariates as well as baseline perceived needs satisfaction in a lagged dependent variable model specification. These findings are also supported by OLS analysis of average treatment effects showing significant causal influence of the treatment on the needs for autonomy and meaning. This analysis also shows insignificant treatment effects on the needs for competence and relatedness.

The results of the 2SLS analysis and the average treatment effects analysis do not, however, imply that a causal relationship between goal-oriented development dialogues and satisfaction of the needs for competence and relatedness is ruled out. These methodological approaches offer highly conservative tests. Nevertheless, the study also provides an opportunity to adopt a less strict analytical approach, allowing for the direct examination of the relationship between goal-oriented development dialogues and the satisfaction of psychological needs, utilizing the longitudinal design. Lagged dependent variable analyses do indeed show highly significant relationships between the use of these dialogues and all four psychological needs. While it is important to acknowledge that the results of this analysis may be influenced by endogenous factors and should not be causally interpreted, they do suggest a relationship between the utilization of goal-oriented dialogues by public managers and the satisfaction of various psychological needs among their employees. These findings emphasize that this study does not exclude the possibility that goal-oriented development dialogues can enhance satisfaction in terms of the needs for competence and relatedness.

4.2.2. Differences in the effects of static and dynamic leadership tools

Further contributing to our knowledge of leadership tools' impact on psychological needs satisfaction, Paper C investigates differences in the effects of static versus dynamic leadership tools on this outcome (cf. Figure 4.3) in the context of leadership training. Employees assigned to a dynamic leadership tool express a higher satisfaction of the need for meaning and stronger perceived prosocial impact compared to those assigned to a similar static leadership tool. However, no significant differences were observed between the dynamic and static tools in terms of their effects on the needs for autonomy, competence, or relatedness.

Figure 4.3. Causal relationships investigated in Paper C

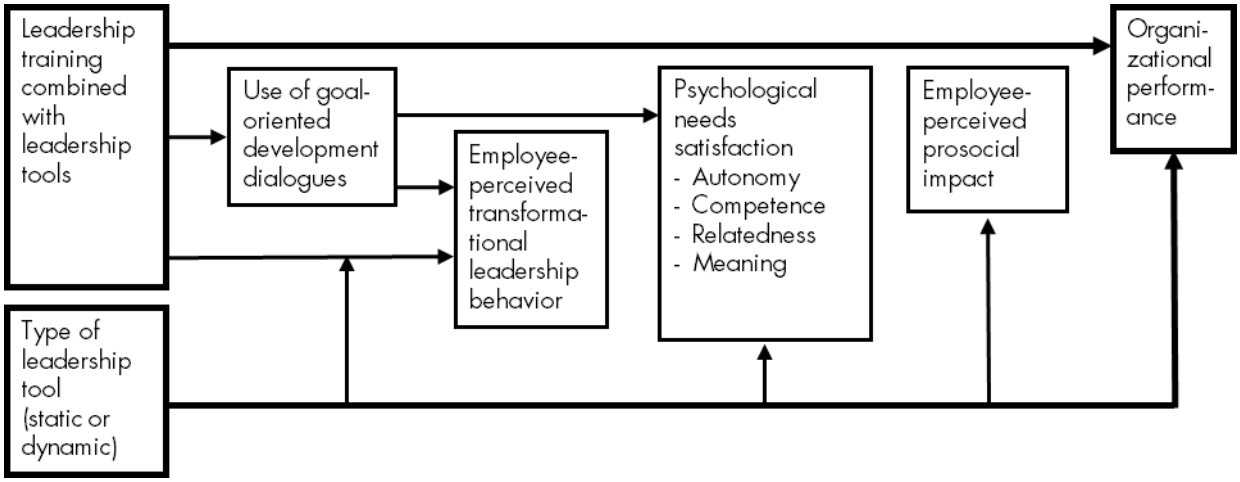


Note: The figure presents all causal relationships that have been investigated empirically in this dissertation. Causal relationships investigated in Paper C are bolded in the figure.

4.3. Leadership training with leadership tools: effects on citizen level

The main focus in this dissertation is to investigate the relationship between leadership training with leadership tools and outcomes on manager and employee level. As previously mentioned, I supplement this focus with investigations of the interventions' effects on organizational performance. As illustrated in Figure 4.4, the purpose of this section is to present my empirical findings related to this subject.

Figure 4.4. Causal relationships investigated in section 4.3



Note: The figure presents all causal relationships that have been investigated empirically in the dissertation. Causal relationships investigated in Section 4.3 are bolded in the figure.

I investigate the relationship between leadership training with leadership tools on citizen level outcomes in four different ways (cf. Table 4.1). I examine

whether there are different effects of the two treatment variants compared to the control group and whether leadership training with the *dynamic* leadership tool has stronger effects than leadership training with the *static* tool. I conduct both types of analyses on a sample of job center units that have a specific citizen target group identifiable in the national administrative registries as well as on a sample limited to citizens covered by a private (though government-supported) voluntary unemployment insurance.

Table 4.1. Overview of included units in analyses of leadership training with leadership tools' effect on (formerly) unemployed citizens' self-sufficiency

	Total number of units	Included units			
		Analyses comparing control group and treatment groups		Analyses comparing static and dynamic treatment groups	
		Only units with insured unemployed as target group	All units with specific target groups	Only units with insured unemployed as target group	All units with specific target groups
Units with insured unemployed as their target group	27	27	27	19	19
Units with other specific employment service target groups	81	-	81	-	59
Units without specific employment service target groups	91	-	-	-	-
Total	226	27	108	19	78

The participating units in the field experiment differ in terms of the characteristics of their target groups. Some units have target groups where all citizens are members of a voluntary unemployment insurance organization (in Danish: "arbejdsløshedsforsikringskasse" or simply "a-kasse"). These are the most socioeconomically advantaged unemployed, and their right to benefits is based solely on them lacking a job. Other units have vulnerable unemployed citizens as their target group – citizens suffering from intrusive somatic, mental, or social disorders besides their status as unemployed. Since these citizens arguably are harder to help into jobs, the units are not directly comparable in terms of self-sufficiency rates among their target groups.

Because of these differences between the target groups, I only include units with one specific target group in the first analyses. I choose units with insured unemployed citizens, because this is the largest group of citizens in the experiment, and because I expect the strongest treatment effect on this more socioeconomically advantaged group of unemployed. I expect that job centers can more easily influence the insured unemployed because they – unlike citizens in many of the other target groups – do not have social problems and mental or somatic disabilities as their primary obstacles to employment. Assisting unemployed in handling such problems and disabilities lies on the periphery or even outside the job centers' competence and responsibility.

4.3.1. Leadership training with leadership tools' influence on citizens' self-sufficiency

As the first step, I investigate whether the combination of leadership training and leadership tools influences citizens' self-sufficiency rates. In this part of the analysis, I collapse the two treatment groups for parsimony and increased statistical power. Later in this section, I will investigate whether the treatments with dynamic and static leadership tools respectively had different effects on citizens' self-sufficiency.

A necessary condition for the validity of my average treatment effect analysis is that this reduced sample of job center units is still balanced. If the treatment and control groups differ systematically, my results will be biased. I therefore conduct a balance check on unit level among the included units because the randomization was initially conducted on this level. I also conduct a balance check on citizen level, because I analyze the relationship between treatment and self-sufficiency on this level. The results of these balance checks are presented in Table 4.2 and 4.3.

Balance checks on citizen level are conducted using standard errors clustered on unit level because the randomization is conducted on this level, and because the following analyses on these data will be conducted using standard deviations clustered on this level. Balance check on unit level and citizen level indicates that the control and treatment groups are balanced on all tested variables (cf. Table 4.2 and 4.3). Thus, these tests suggest that the following average treatment effect analysis is not biased from pre-intervention differences between control and treatment groups.

Table 4.2. Balance check for the treatment groups and control group, only public managers in units with insured unemployed as target group

	Mean		Difference
	Control	Treatment	Control vs treatment
Gender (1 = male)	0.14 (0.38)	0.18 (0.39)	–0.03 [0.85]
Age, years	53.29 (4.57)	49.71 (9.20)	3.58 [0.34]
Education, years	15.85 (0.90)	15.84 (1.73)	0.01 [0.98]
Seniority as manager, years	11.00 (5.72)	8.82 (7.33)	-2.18 [0.49]
Span of control	29.29 (9.47)	22.91 (11.78)	6.37 [0.22]
Formal leadership training (1 = formal training)	0.57 (0.53)	0.71 (0.47)	-0.02 [0.55]
Transformational leadership, index on Likert scale	4.39 (0.48)	4.26 (0.38)	-0.13 [0.49]

Note. The balance check is conducted as t-test on the unit level based on data from the manager pre-intervention survey conducted in September 2020. N(control) = 7; N(treatment) = 17. Standard deviation in parentheses. P-values in brackets

Table 4.3. Balance check for the treatment groups and control group, only insured unemployed citizens

	Mean		Difference
	Control	Treatment	Control vs treatment
Gender (1 = male)	0.49 (0.50) N = 6,132	0.49 (0.50) N = 12,874	0.00 [0.72]
Age, years	41.43 (12.74) N = 6,180	41.07 (12.76) N = 12,972	0.37 [0.71]
Danish citizenship	0.86 (0.35) N = 6,180	0.83 (0.38) N = 12,972	0.03 [0.30]
Higher Education (bachelors' degree or higher level)	0.33 (0.47) N = 6,106	0.32 (0.47) N = 12,813	0.01 [0.81]
Married	0.42 (0.49) N = 6,180	0.41 (0.49) N = 12,972	0.00 [0.89]
Having one or more children	0.43 (0.49) N = 6,180	0.42 (0.49) N = 12,972	0.01 [0.70]
Accumulated self-sufficiency rate during 52 weeks before start of leadership development intervention	17.32 (16.52) N = 6,180	17.10 (16.44) N = 12,972	0.23 [0.59]

Note. Significance level is calculated using standard errors clustered on unit level in regression analyses (OLS). Standard deviation in parentheses. P-values in brackets.

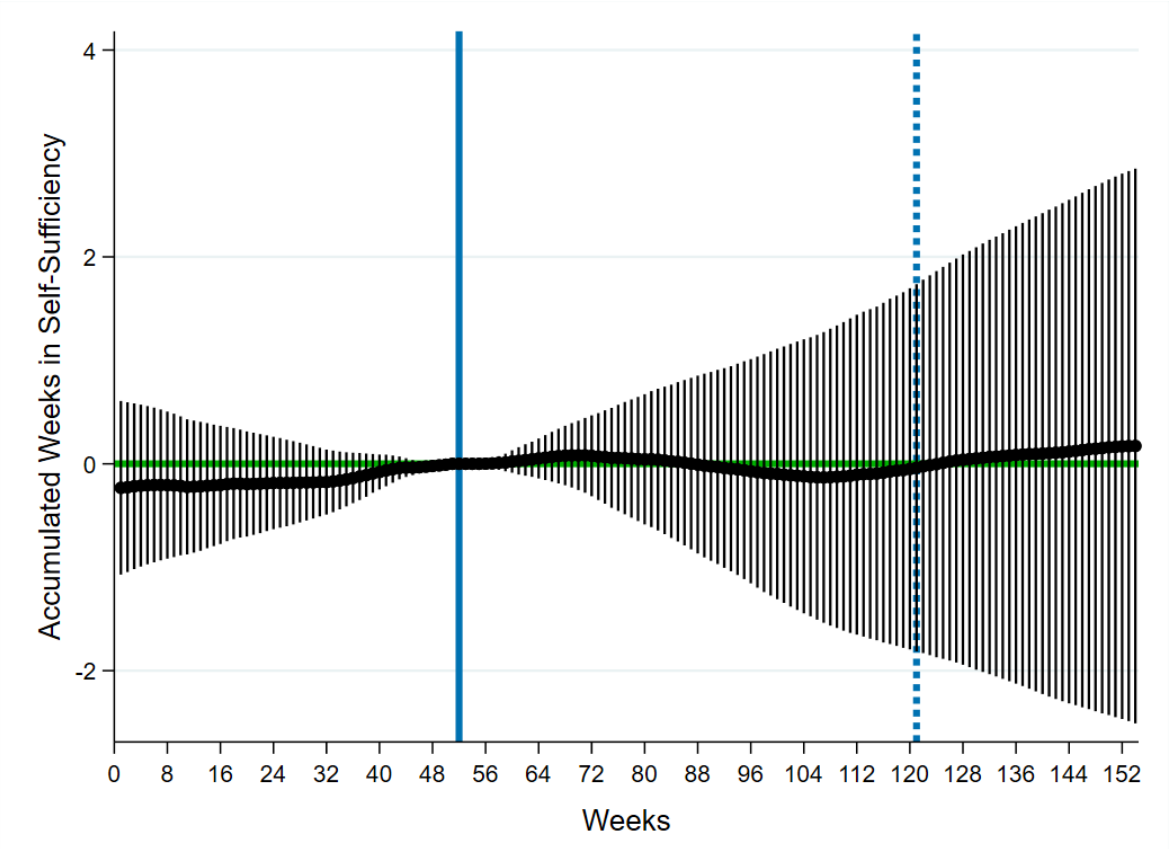
I report the treatment effect on weeks in employment for each week in a long sample window after the experiment started. The outcome is the accumulated number of weeks employed from the start of the experiment until week t, and then I let t vary from 1 to 154 weeks. That is, 52 weeks before treatment start in October 2020 and until 102 months (approximately two years) after. I mark the week the intervention was initiated (week 52) and the week public managers in the control group were enrolled in the training program in February 2022 (week 121). The effect of treatment in week t for individual i (β_t) is estimated in the following regression:

$$W_{it} = \alpha_t + \beta_t T_i + \varepsilon_{it}.$$

Here, W_{it} is the accumulated number of weeks in employment t weeks after the experiment started, T_i denotes treatment status. The treatment effect at time t, β_t, measures the average number of extra weeks spent employed for the treatment group compared to the control group from the beginning of the experiment until t weeks later. I also report the two-sided confidence interval of the effects at 5 percent level. Figure 4.5 shows the effects of the experiment: the 5 percent level confidence intervals include 0 in all 52 weeks up to the intervention (marked with the solid vertical line). These statistically insignificant differences between the two groups indicate that they are balanced in terms of pre-treatment accumulated self-sufficiency. The figure clearly shows that there is no significant difference between the intervention group and the control groups in the post-treatment period. Thus, the analysis does not support the expected effect the leadership development intervention on citizen self-sufficiency.

The confidence interval is very narrow in week 52 because the citizens were selected based on a criterion of unemployment for that week. This means that the citizens in the treatment and control groups are identical in terms of unemployment for that specific week. In the subsequent weeks, the width of the confidence intervals increases in a funnel shape due to variation in how quickly the citizens find employment, resulting in an increasing variance in the number of accumulated weeks of self-sufficiency. Moving backwards in time, the width of the confidence intervals also increases because there are differences in the citizens' history of self-sufficiency.

Figure 4.5. Difference in accumulated weeks of self-sufficiency between treatment group citizens versus control group citizens, insured unemployed only



Note: N = 2,949,408 (19,152 unique individuals). The black horizontal curve shows the difference between accumulated self-sufficiency rates between citizens in the control group versus the two treatment groups. This horizontal line thus shows the average treatment effect of the leadership training with leadership tool on accumulated citizen self-sufficiency rates. Average treatment effects are calculated using Ordinary Least Squares regressions for each of the 154 weeks presented in the figure. The green horizontal line at level 0 indicates the level where there is no difference in the accumulated self-sufficiency rates between the control groups and the intervention groups. The vertical lines for each week show the two-sided 5 percent level confidence interval of the effects. The blue solid vertical line at the 52nd week indicates treatment start, and the blue dashed vertical line at the 121st week indicates the delayed treatment start for public managers in the control group.

The downside of only including units with insured unemployed as target group is that this approach reduces N, and a lot of data collected for this study is not used. I therefore also conduct an analysis similar to the one above on all 108 units in the experiment that have a specific target group of unemployed citizens. To this end, I conduct a balance check on this subset of the experiment to evaluate whether control and treatment groups are balanced for this analysis. I use the same approach as above and find that there are no significant differences between the two groups on the investigated variables (cf. Table 4.4 and 4.5).

Table 4.4. Balance check of the treatment group and the control group, public managers in all job center units

	Mean		Difference
	Control	Treatment	Control vs treatment
Gender (1 = male)	0.11 (0.31)	0.25 (0.44)	–0.14 [0.12]
Age, years	50.61 (7.53)	49.51 (8.02)	1.09 [0.54]
Education, years	16.01 (0.73)	15.87 (1.35)	0.15 [0.58]
Seniority as manager, years	8.41 (6.70)	8.48 (7.57)	-0.07 [0.97]
Span of control	23.66 (9.59)	23.61 (9.55)	0.05 [0.98]
Formal leadership training (1 = formal training)	0.64 (0.49)	0.67 (0.47)	-0.02 [0.82]
Transformational leadership, index on Likert scale	4.16 (0.71)	4.26 (0.46)	-0.10 [0.43]

Note. The balance check is conducted as t-test on the unit level based on data from the pre-intervention survey conducted in September 2020. N(control) = 28; N(treatment) = 72. Standard deviation in parentheses. P-values in brackets.

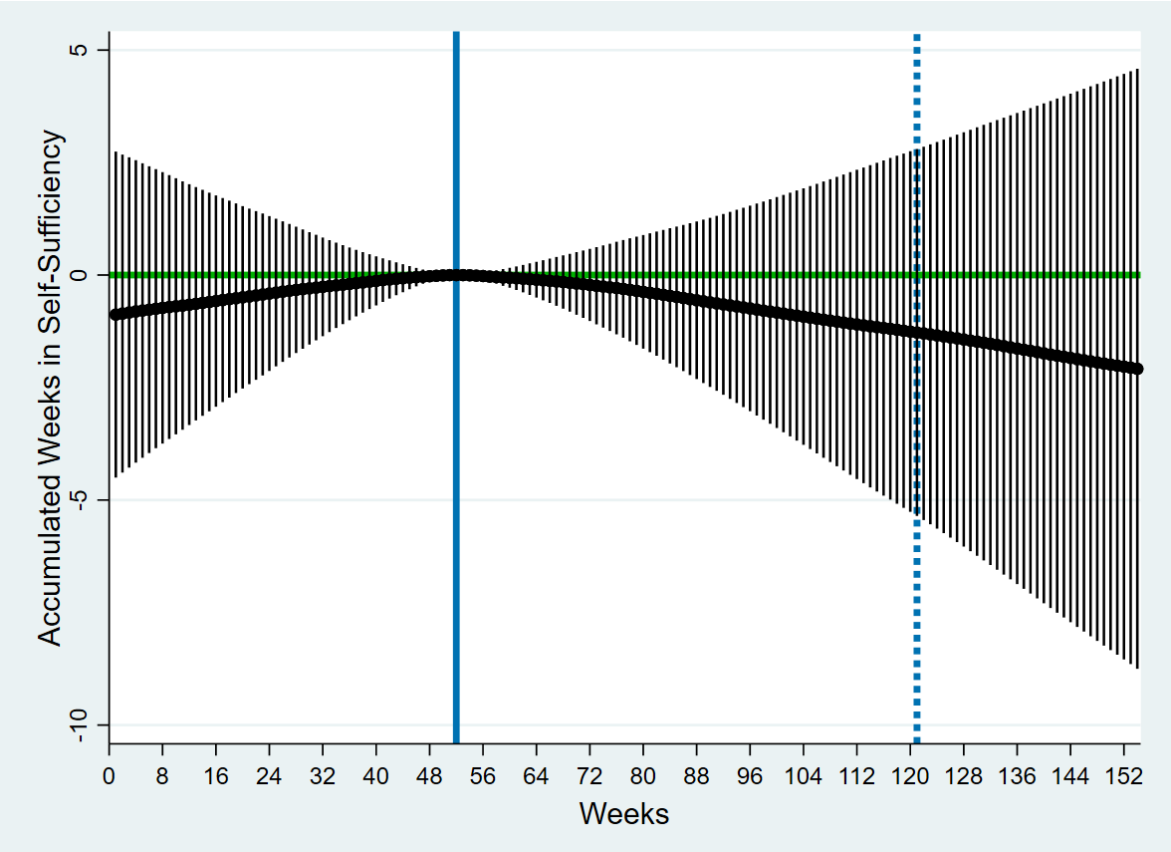
Table 4.5. Balance check of the treatment group and the control group, citizens in all target groups

	Mean		Difference
	Control	Treatment	Control vs treatment
Gender (1 = male)	0.44 (0.50) N = 23,809	0.46 (0.50) N = 55,592	0.02 [0.14]
Age, years	41.60 (12.71) N = 23,945	41.50 (12.68) N = 55,876	0.11 [0.64]
Danish citizenship	0.87 (0.34) N = 23,953	0.86 (0.35) N = 55,894	0.01 [0.87]
Higher Education (bachelors' degree or higher level)	0.24 (0.43) N = 23,481	0.19 (0.39) N = 54,518	0.05 [0.13]
Married	0.35 (0.48) N = 23,953	0.33 (0.47) N = 55,894	0.02 [0.69]
Having one or more children	0.42 (0.49) N = 23,953	0.40 (0.49) N = 55,894	0.01 [0.37]
Accumulated self-sufficiency rate during 52 weeks before start of leadership development intervention	14.79 (18.05) N = 23,953	13.49 (17.63) N = 55,894	1.30 [0.64]
Citizens covered by unemployment insurance, status before intervention start	0.26 (0.44) N = 23,953	0.23 (0.42) N = 55,894	0.03 [0.90]

Note. Significance level is calculated using standard errors clustered on unit level in regression analyses (OLS). Standard deviation in parentheses. P-values in brackets.

Similar to Figure 4.5, Figure 4.6 shows average treatment effects of leadership training with leadership tools on citizen self-sufficiency among job center units responsible for insured as well as various types of vulnerable unemployed and citizens receiving different types of sickness benefits. Despite the inclusion of all the participating units with a specific target group of unemployed citizens, the findings are still inconclusive: The vertical two-side confidence intervals for each of the 154 weeks clearly include 0 indicating that there are no statistically significant differences between accumulated self-sufficiency rates between citizens in the control versus the treatment groups.

Figure 4.6. Difference in accumulated weeks of self-sufficiency between treatment group citizens versus control group citizens, all types of unemployed



Note: N = 12,296,438 (79,847 unique individuals). The black horizontal curve shows the difference between accumulated self-sufficiency rates between citizens in the control group versus the two treatment groups. This horizontal line thus shows the average treatment effect of the leadership training with leadership tool on accumulated citizen self-sufficiency rates. Average treatment effects are calculated using Ordinary Least Squares regressions for each of the 154 weeks presented in the figure. The green horizontal line at level 0 indicates the level where there is no difference in the accumulated self-sufficiency rates between the control groups and the intervention groups. The vertical lines for each week show the two-sided 5 percent level confidence interval of the effects. The blue solid vertical line at the 52nd week indicates the treatment start, and the blue dashed vertical line at the 121st week indicates the delayed treatment start for public managers in the control group.

4.3.2. Differences in the effects of static and dynamic leadership tools on citizens' self-sufficiency

As a final element in the investigation of the citizen level performance effects of leadership training with leadership tools, I examine whether the dynamic leadership tool – as expected – has a stronger effect on citizen self-sufficiency than the static leadership tool. I conduct analyses on the total sample of citizens connected to the two treatment groups in my field experiment as well as analyses where only insured unemployed are included. I start with the latter analysis where citizens included are more comparable than in the total sample.

As in the previous citizen outcome analyses, the first step is to check whether the dataset for these analyses is balanced on the unit level as well as the citizen level. Table 4.6 shows that there are no statistically significant differences between units assigned to the static versus the dynamic treatment group on several relevant background variables and a pre-treatment indicator of the leadership development intervention target behavior. As shown in Table 4.7, I only find one statistically significant difference between citizens in the treatment versus the control group, namely that citizens in the control group on average are 3.72 years older than citizens in the treatment groups. Given that the two groups are balanced on several other background variables – such as prior self-sufficiency rates – I do not expect that this difference will bias the results of the average treatment effect analyses in any substantial way.

Table 4.6. Balance check of the static and the dynamic treatment groups, only public managers in units responsible for insured unemployed

	Mean		Difference
	Static treatment	Dynamic treatment	Static vs dynamic
Gender (1 = male)	0.10 (0.32)	0.29 (0.49)	–0.19 [0.35]
Age, years	50.80 (7.66)	48.14 (11.54)	2.66 [0.57]
Education, years	16.33 (1.00)	15.21 (2.31)	1.11 [0.21]
Seniority as manager, years	10.80 (7.91)	6.00 (5.80)	4.80 [0.19]
Span of control	23.80 (11.66)	21.64 (12.78)	2.16 [0.72]
Formal leadership training (1 = formal training)	0.80 (0.42)	0.57 (0.53)	0.23 [0.34]
Transformational leadership, index on Likert scale	4.23 (0.42)	4.32 (0.35)	-0.10 [0.62]

Note. The balance check is conducted as t-test on the unit level based on data from the pre-intervention survey conducted in September 2020. N(static treatment group) = 10; N(dynamic treatment group) = 7. Standard deviation in parentheses. P-values in brackets.

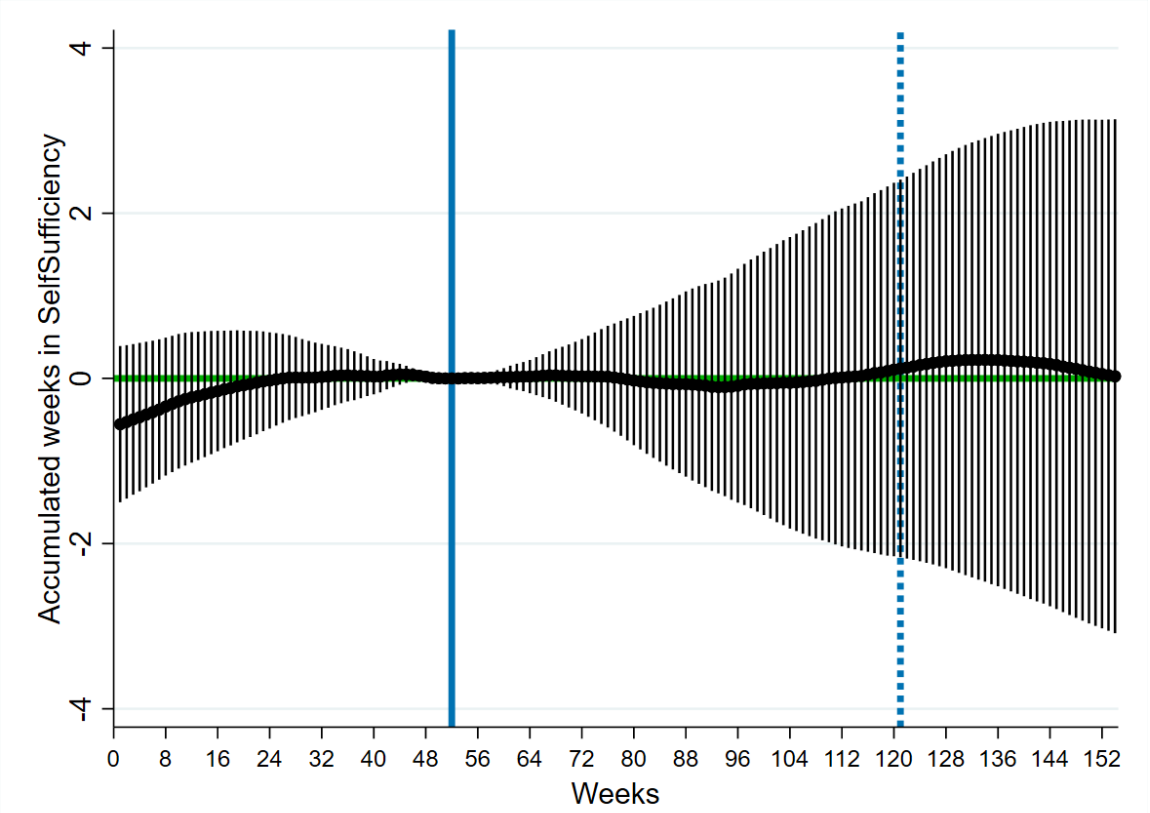
Table 4.7. Balance check of the static and the dynamic treatment groups, only insured unemployed citizens

	Mean		Difference
	Control	Treatment	Control vs treatment
Gender (1 = male)	0.49 (0.50) N = 6,508	0.49 (0.50) N = 6,366	0.00 [0.759]
Age, years	42.91 (12.50) N = 6,551	39,19 (12.75) N = 6,421	3.72*** [0.001]
Danish citizenship	0.84 (0.36) N = 6,551	0.82 (0.39) N = 6,421	0.03 [0.541]
Higher Education (bachelors' degree or higher level)	0.32 (0.47) N = 6,459	0.33 (0.47) N = 6,354	-0.01 [0.890]
Married	0.43 (0.50) N = 6,551	0.39 (0.49) N = 6,421	0.04 [0.244]
Having one or more children	0.43 (0.50) N = 6,551	0.41 (0.49) N = 6,421	0.02 [0.390]
Accumulated self-sufficiency rate during 52 weeks before start of leadership development intervention	17.37 (16.26) N = 6,551	16.82 (16.64) N = 6,421	0.55 [0.266]

Note. Significance level is calculated using standard errors clustered on unit level in regression analyses (OLS). Standard deviation in parentheses. P-values in brackets.

Figure 4.7 shows average accumulated self-sufficiency rates among citizens in the target groups of job center units in the dynamic treatment group compared to average accumulated self-sufficiency rates among citizens in the target group of job center units in the static treatment group. The vertical two-side confidence intervals for each of the 154 weeks clearly include 0 indicating that there are no statistically significant differences in the effect of dynamic leadership tools compared to static leadership tools on citizen self-sufficiency rates.

Figure 4.7. Difference in accumulated weeks of self-sufficiency between dynamic treatment group citizens versus static treatment group citizens, insured unemployed only



Note: N = 1,997,688 (12,972 unique individuals). The black horizontal curve shows the difference between accumulated self-sufficiency rates between citizens in the dynamic treatment group versus the static treatment group. This horizontal line thus shows the average treatment effect of the dynamic leadership tool compared to static leadership tools on accumulated citizen self-sufficiency rates. Average treatment effects are calculated using Ordinary Least Squares regressions for each of the 154 weeks presented in the figure. The green horizontal line at level 0 indicates the level where there is no difference in the accumulated self-sufficiency rates between the control groups and the intervention groups. The vertical lines for each week show the two-sided 5 percent level confidence interval of the effects. The blue solid vertical line at the 52nd week indicates the treatment start, and the blue dashed vertical line at the 121st week indicates the delayed treatment start for public managers in the control group.

In the second and last part of the examination of the expected differences between the effects of static and dynamic leadership tools on citizen self-sufficiency, I included citizens in all target groups. This implies that the citizens included in the analysis are less comparable, but balance checks presented in Table 4.8 and Table 4.9 indicate that there are no statistically significant differences among the tested observable variables. Thus, I conduct the average treatment effect analysis to investigate whether this larger sample of citizens reveals significantly different citizen level outcomes in the static versus the dynamic treatment group.

Table 4.8. Balance check of the static and the dynamic treatment groups, public managers in all job center units

	Mean		Difference
	Static group	Dynamic group	Static vs dynamic
Gender (1 = male)	0.21 (0.42)	0.28 (0.46)	–0.07 [0.50]
Age, years	48.64 (7.59)	50.26 (8.39)	-1.62 [0.40]
Education, years	15.89 (1.22)	15.85 (1.47)	0.04 [0.89]
Seniority as manager, years	7.41 (7.10)	9.38 (7.92)	-1.97 [0.27]
Span of control	24.30 (9.53)	23.04 (9.64)	1.27 [58]
Formal leadership training (1 = formal training)	0.64 (0.49)	0.69 (0.47)	-0.06 [0.62]
Transformational leadership, index on Likert scale	4.27 (0.36)	4.24 (0.53)	0.03 [0.80]

Note. The balance check is conducted as t-test on the unit level based on data from the pre-intervention survey conducted in September 2020. N(static treatment group) = 33; N(dynamic treatment group) = 39. Standard deviation in parentheses. P-values in brackets.

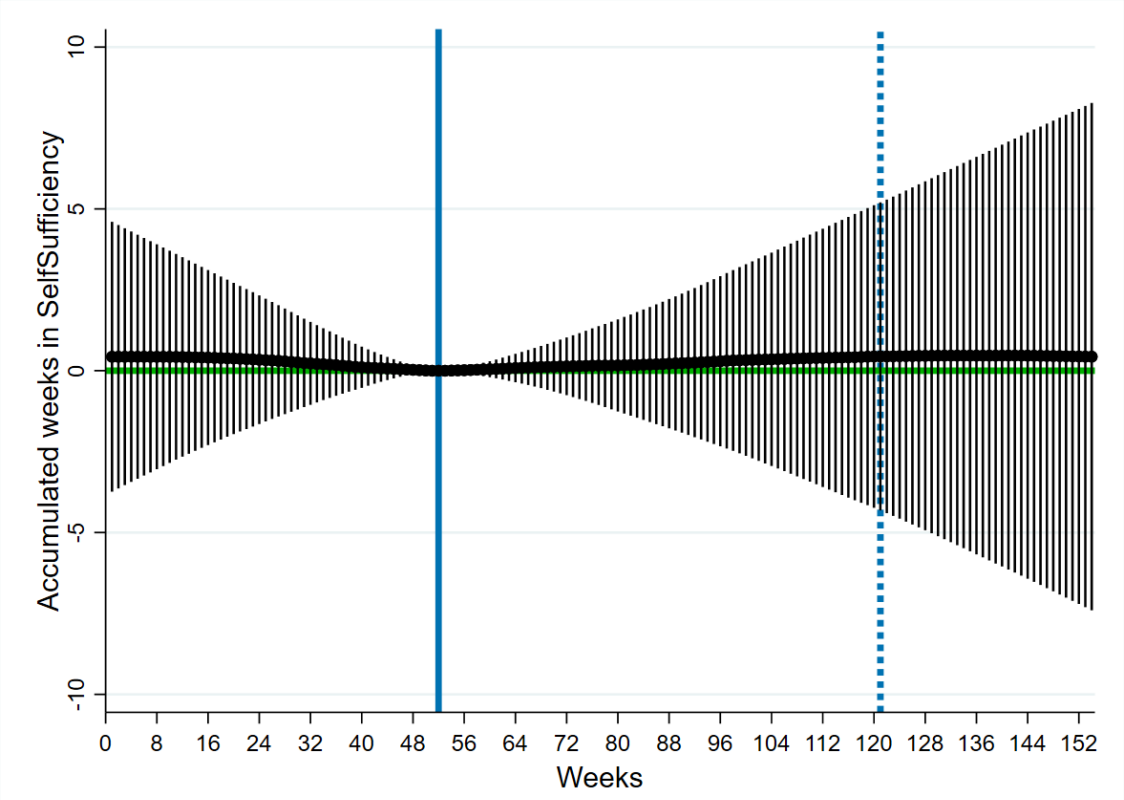
Table 4.9. Balance check of the static and the dynamic treatment groups, citizens in all target groups

	Mean		Difference
	Static group	Dynamic group	Static vs dynamic
Gender (1 = male)	0.54 (0.50) N = 26,246	0.54 (0.50) N = 29,346	0.00 [0.79]
Age, years	42.31 (12.51) N = 26,376	40.77 (12.78) N = 29,500	1.55 [0.33]
Danish citizenship	0.86 (0.35) N = 26,386	0.86 (0.35) N = 29,508	0.00 [0.98]
Higher Education (bachelors' degree or higher level)	0.19 (0.39) N = 25,632	0.19 (0.39) N = 28,886	0.00 [0.83]
Married	0.33 (0.47) N = 26,386	0.33 (0.47) N = 29,508	0.00 [0.98]
Having one or more children	0.41 (0.49) N = 26,386	0.40 (0.49) N = 29,508	0.01 [0.54]
Accumulated self-sufficiency rate during 52 weeks before start of leadership development intervention	13.11 (17.42) N = 26,386	13.83 (17.81) N = 29,508	0.00 [0.84]
Citizens covered by unemployment insurance, status before intervention start	0.25 (0.43) N = 26,386	0.22 (0.41) N = 29,508	0.03 [0.76]

Note. Significance level is calculated using standard errors clustered on unit level in regression analyses (OLS). Standard deviation in parentheses. P-values in brackets.

Figure 4.8 shows the difference between accumulated self-sufficiency rates among citizens in the static treatment group compared to citizens in the dynamic treatment group. This analysis includes job center units responsible for insured unemployed as well as various types of vulnerable unemployed and citizens receiving different types of sickness benefits. Despite the inclusion of all participating units with a specific target group of unemployed citizens, the findings are inconclusive: The vertical two-side confidence intervals for each of the 154 weeks clearly include 0 indicating that there are no statistically significant differences between accumulated self-sufficiency rates between citizens in the control versus the treatment groups.

Figure 4.8. Difference in accumulated weeks of self-sufficiency between dynamic treatment group citizens versus static treatment group citizens, all types of unemployed



Note: N = 8,607,676 (55,894 unique individuals). The black horizontal curve shows the difference between accumulated self-sufficiency rates between citizens in the dynamic treatment group versus the static treatment group. This horizontal line thus shows the average treatment effect of the dynamic leadership tool compared to static leadership tools on accumulated citizen self-sufficiency rates. Average treatment effects are calculated using Ordinary Least Squares regressions for each of the 154 weeks presented in the figure. The green horizontal line at level 0 indicates the level where there is no difference in the accumulated self-sufficiency rates between the control groups and the intervention groups. The vertical lines for each week show the two-sided 5 percent level confidence interval of the effects. The blue solid vertical line at the 52nd week indicates the treatment start, and the blue dashed vertical line at the 121st week indicates the delayed treatment start for public managers in the control group.

4.3.3 Interpreting findings

In this section (4.3), I have presented findings from my empirical investigation of the effects of leadership training and leadership tools on organizational performance. I used accumulated self-sufficiency rates among citizens in job center units from my field experiment as the indicator of organizational performance on citizen level. However, I do not find any statistically significant differences between citizens in the treatment groups, in which the public managers of the unit received leadership training and either a static or a dynamic leadership tool, and citizens in the control group, in which the managers received neither training nor tool. Similarly, analyses did not reveal any substantial variations in accumulated self-sufficiency rates when I compare dynamic and static leadership tools.

An obvious interpretation of these findings would be that leadership training with leadership tools has no significant effect on citizen-level outcomes. An alternative interpretation could be that the effect of the intervention is too small to be detected within the applied research design. It is plausible that the leadership development intervention needs to first influence public managers' behavior, followed by employee attitudes and behaviors, before ultimately affecting citizen behavior related to job seeking and employment. Even though my analysis encompassed a substantial sample size of approximately 12 million observations, the analyses are clustered on no more than 108 job center units, and it may therefore be difficult to detect small effects. The study in this dissertation is designed to be well powered for analyses on public manager and employee level but not for estimating effects on citizen level. Citizen-level effects require more power because they are a distal outcome in contrast to manager outcomes as proximal outcomes and employee outcomes as intermedia outcomes. Effect sizes of distal outcomes are expected to be smaller and thus require more power (Brenner et al., 1995). A third related interpretation highlights the possibility that numerous unobserved citizen factors (Bryson et al., 2002), such as personality traits and skills among unemployed citizens, have influenced self-sufficiency rates and introduced "noise" into the analyses. This would make it much more difficult to detect any effects of the treatment accurately. Detecting distal outcomes generally requires more power because they are more heavily affected by external (i.e. nontreatment) factors (Brenner et al., 1995). These three possible interpretations stress the fact that my findings on the relationship between leadership training with leadership tools on citizen self-sufficiency are inconclusive.

Knowledge about the effects of leadership development interventions on organizational performance is sparce (Dvir et al., 2002; Jacobsen et al., 2021).

However, my findings contribute to this important research area by highlighting that even though leadership development interventions may have significant effects on public manager and employee outcomes, it does not necessarily mean that effects translate into detectable effects on organizational performance level – at least not at citizen level.

These findings give rise to an important question regarding the legitimacy of investments in leadership development interventions and the criteria for assessing their effectiveness. One perspective suggests that investments in such interventions should be considered more legitimate if their effects can be demonstrated (Abner et al., 2021; Avolio et al., 2010; Day et al., 2021), e.g., on citizen-level outcomes. While it can be argued that citizen-level outcomes of leadership development interventions would indeed justify investments, another viewpoint is that public manager and employee outcomes are relevant and justifiable goals in their own right. First, new insights and skills following leadership development programs may be beneficial to the participating leaders because it may increase their job satisfaction if it improves their ability to enact better leadership behavior and if it increases their (sense of) being competent in their jobs. Additionally, previous research has shown that leadership behavior, such as transformational leadership as examined in this study, can have a positive impact on organizational performance (Knies et al., 2016). Second, the well-being of public employees, as indicated by increased levels of psychological need satisfaction observed in this study, can be said to hold intrinsic value. Furthermore, employee well-being prevents employee turnover (Hur & Abner, 2023; Rubenstein et al., 2018), which is important for the public sector in economic terms because recruitment and onboarding are resource demanding. Employee retention is also important because high turnover rates make it more difficult to provide the intended value to citizens and society.

According to Kirkpatrick (1979), organizational performance is just a subset of one out of four relevant criteria for evaluating the effects of leadership training. Organizational performance is part of the "results criteria", which also include employee outcomes such as perceiving their work environment as supportive (Lacerenza et al., 2017). Furthermore, results represent the most distal of Kirkpatrick's (1996) criteria, and it has been argued that "most training efforts are incapable of directly affecting results level criteria" (Alliger et al., 1997, p. 6). Thus, the nature of leadership development interventions necessitates assessing their impact not only on citizen outcomes but also on public manager and employee outcomes. While the current study did not find significant effects of the leadership development intervention on citizen-level outcomes, it is still evident that leadership training with leadership tools can have important organizational effects.

4.4. Summing Up

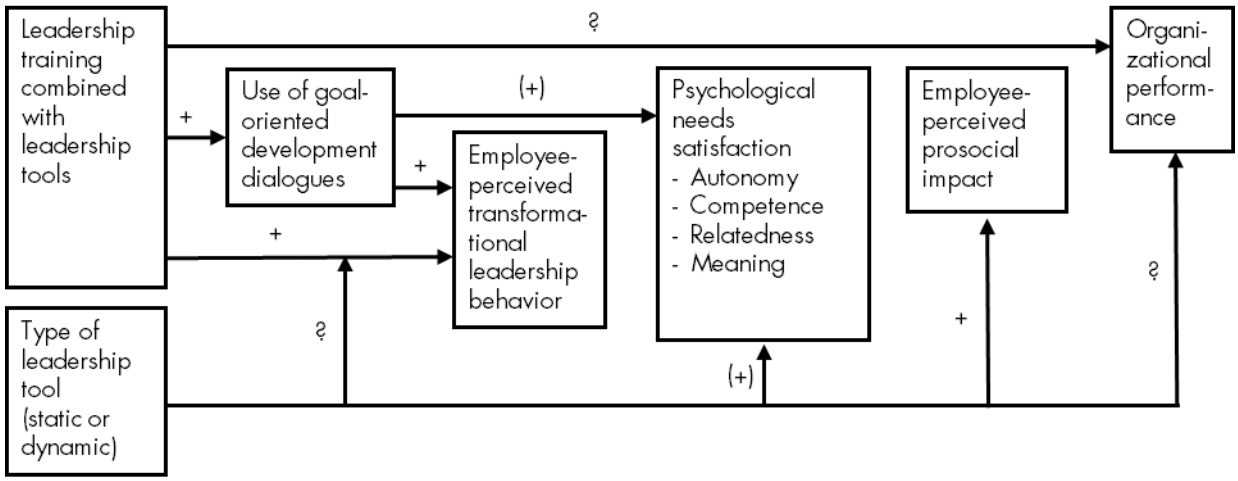
Taken together, the empirical investigations in this dissertation prove that leadership training with leadership tools can indeed increase public managers' use of goal-oriented development dialogues and transformational leadership behavior as perceived by their employees. Moreover, the notion that goal-oriented development dialogues are a relevant communication strategy in transformational leadership is supported by findings showing that leadership development interventions' effect on employee-perceived transformational leadership behavior is mediated by public managers' use of such development dialogues.

In terms of employee outcomes, the empirical findings suggest that goal-oriented development dialogues can increase the satisfaction of psychological needs for autonomy and meaning. The empirical investigation is inconclusive in relation to the causal effects of goal-oriented development dialogues on satisfying the needs for competence and relatedness. Comparisons of static and dynamic leadership tools reveal that the latter has stronger effects on employee need for meaning and perceived prosocial impact. These analyses are inconclusive in terms of differences in the effects of static versus dynamic leadership tools on needs for autonomy, competence, and relatedness.

Despite thorough analysis of objective performance data on individual citizen level, the dissertation is not able to provide a conclusion with adequate certainty about whether the combination of transformational leadership training and leadership tools for goal-oriented development dialogues can increase organizational performance on citizen level.

Figure 4.5 presents an overview of the empirical findings in the dissertation. In the figure, "+" indicates a positive and statistically significant causal relation, whereas "(+)" indicates partial support for a causal relation between two variables. Inconclusive findings are indicated by "?".

Figure 4.5. Overview of empirical findings in the dissertation



Chapter 5: Concluding discussion

The increasing use of IT in public leadership (Roman et al., 2019) and especially two gaps in our existing knowledge motivated the research focus of this dissertation. First, leadership training often has limited and short-lived effects on public manager behaviors and employee outcomes (Blume et al., 2010; May & Kahnweiler, 2000; Seidle et al., 2016), and despite compelling evidence of persuasive technologies' ability to support attitudinal and behavioral change outcomes (Hamari et al., 2014; Kelders et al., 2012; Oduor & Oinas-Kukkonen, 2021; Oyebode et al., 2020), this knowledge has not been integrated into the leadership training literature. The dissertation therefore used insights from persuasive technology literature to provide an understanding of how static and dynamic leadership tools can support ongoing learning and target behavior implementation in leadership training interventions.

Second and more specifically, we know that face-to-face dialogue is an effective way of communicating the organizational vision in transformational leadership, but we know little about *how* transformational leadership training can support public managers in conducting such dialogues. But the coaching literature offers insights in dialogue processes supporting goal commitment, motivation, and behavioral change related to distal goals such as organizational visions. However, these insights have not been utilized to inform how face-to-face dialogues can be conducted in transformational leadership. The dissertation therefore combined transformational leadership literature with insights from the coaching and persuasive technology literatures to theorize content of leadership tools in the context of transformational leadership training: tools supporting goal-oriented development dialogues.

5.1. Answering the research questions

The overall research question in the dissertation is as follows: How does leadership training with static and dynamic leadership tools matter for manager and employee outcomes in public organizations? In the following, I will discuss how the dissertation contributes to existing knowledge and to answering this question.

5.1.1. Do leadership tools mitigate transfer problems in leadership training?

Previous research conducted in the public sector and other domains has yielded valuable findings regarding the design of leadership training programs aimed at facilitating the transfer of learning. This research sheds light on how leadership training can be effectively designed to facilitate the transfer of learning. Notably, studies indicate that effective leadership training should encompass various learning formats, incorporate diverse settings, and include experimental and action-based learning approaches (Holten et al., 2015; Jacobsen et al., 2021; Seidle et al., 2016). Furthermore, the impact of leadership training on learning and behaviors may be influenced by the specific characteristics of the training design (Blume et al., 2010; Lacerenza et al., 2017; May & Kahnweiler, 2000). These insights share a common thread: They primarily emphasize the training of leadership skills and behaviors within a somewhat isolated environment, such as classroom training and feedback or coaching sessions. Undoubtedly, these elements are important for equipping managers with new knowledge and skills. However, these elements are also detached from the real-life context in which public managers carry out their leadership responsibilities on a day-to-day basis. This dissertation provides an understanding of how leadership tools can support ongoing learning and implementation of target behavior in the everyday work following leadership training programs.

The dissertation also shows that leadership training with leadership tools can indeed influence employee-perceived leadership behaviors. However, the research design does not allow me to separate the effect of leadership tools from training effects. Although – as I argue in the limitation section below – this is a deliberate choice, it implies that I cannot conclude about the causal effects of leadership tools. The average treatment effects of the leadership development intervention on leadership behavior, however, exceed the effects of similar interventions. My findings demonstrate effects of leadership training with leadership tools that are equivalent in size to a Cohen's d of 0.39 for employee-perceived transformational leadership behavior and a Cohen's d of 0.45 for employee perception of their manager's use of goal-oriented development dialogues. These effect sizes surpass the average transfer effect of Cohen's d = 0.26 observed in previous studies focusing on interpersonal behaviors within leadership training (Lacerenza et al., 2017, p. 1697). Programs with longer training durations generally yield more substantial outcomes compared to shorter programs (Lacerenza et al., 2017, p. 1703). Thus, it is noteworthy that my two-day training intervention produced stronger effects com-

pared to the average effects reported in previous studies targeting similar behavioral outcomes. Consequently, my findings suggest that the inclusion of leadership tools within leadership training can enhance the behavioral impacts of leadership development programs.

It is also relevant to compare the effects sizes of the present study with the effects sizes of the LEAP project (Boye et al., 2015) because my training design is a condensed version of this leadership training intervention (as mentioned in Chapter 3). Table 5.1 compares these to leadership development interventions. The main differences between the training design in the LEAP project and the LEVO project in this dissertation are the following:

1. In the LEVO project, participating managers were equipped with a static or dynamic leadership tool. Managers received no leadership tools in the LEAP project.
2. The LEVO project included two days of classroom training whereas the LEAP project included four days classroom training.
3. In contrast to the LEVO project, the LEAP project included a curriculum that the participating leaders were intended to read.
4. In the LEVO project, I, as the trainer, had comprehensive leadership experience from the same sector as the participating public managers, and the trainers in the LEAP project did not have such sector-specific leadership experience.

In the LEAP project, the transformational leadership training had insignificant effects on employee-perceived transformational leadership behavior (Jacobsen et al., 2021). Comparing the results of transformational leadership training in this dissertation with results from the LEAP project indicates that leadership training with leadership tools and a sector-experienced trainer clearly has stronger effects than similar training without these characteristics despite them including a curriculum and doubling up on classroom training.

Table 5.1. Comparison of two experimental leadership development interventions, the LEAP project and the LEVO project

	The LEAP project	The LEVO project
Action-learning supported by individual action plans	Yes	Yes
Mixed training methods supporting dynamic learning processes on three levels:	Yes	Yes
knowledge/conceptual understanding		
reflection/awareness		
action/skill building		
Trainer-planned learning groups and meetings	Yes	Yes
Target leadership behavior	Transformational leadership behavior	Transformational leadership behavior with a specific focus on goal-oriented development dialogues
Number of classroom training days	4	2
Curriculum providing theoretical and conceptual knowledge	Yes	No
Trainer with field-specific leadership experience	No	Yes
Access to leadership tools intended to support target behavior	No	Yes
Included sectors	Private sector: banks, schools, and kindergartens Public sector: tax authority, schools, and kindergartens	Public employment service area

5.1.2. Do goal-oriented development dialogues increase psychological needs satisfaction?

The previous section discussed my findings regarding the general argument in this dissertation that static and dynamic leadership tools can support ongoing learning and implementation of target behaviors following leader training programs. But the employee outcomes of such leadership development interventions of course depend on the interventions' specific target behavior. This dissertation theorizes goal-oriented development dialogues as a relevant target behavior for leadership tools in transformational leadership training.

Previous research has provided valuable insights into the overall impact of transformational leadership (for an overview see, e.g., Backhaus & Vogel,

2022) and the appropriate communication mediums to be used in this leadership style (Jensen et al., 2018). However, this dissertation takes a different approach by theorizing *how* public managers can implement transformational leadership through goal-oriented development dialogues and *how* these dialogues can enhance the satisfaction of employee psychological needs. Previous public administration research focuses on the three basic psychological needs for autonomy, competence, and relatedness – well-known from self-determination theory (Ryan & Deci, 2017) – (Battaglio et al., 2021; Jensen & Bro, 2018; Vandenabeele, 2014). This dissertation goes further by also examining the effect of transformational leadership behaviors on the need for meaning.

The field experiment conducted as part of this dissertation reveals that when public managers use goal-oriented development dialogues, it leads to an increase in the satisfaction of their employees' needs for autonomy and meaning. My findings provide more limited support for the expected effects of these dialogues on the needs satisfaction for competence and relatedness. This contrasts with previous studies that have shown transformational leadership to be positively associated with the need for satisfaction of autonomy, competence, and relatedness (Jensen & Bro, 2018).

The differential effects of goal-oriented development dialogues on the four psychological needs suggest that these dialogues contribute more to the satisfaction of some needs than others. Firstly, the strong emphasis on the public manager's facilitation role in the dialogue process may explain why goal-oriented development dialogues particularly contribute to satisfying the need for autonomy. The dialogue approach involves public managers using coaching techniques to empower employees in setting self-concordant development goals, creating their own action plans, and engaging in self-guided learning. These aspects promote employee autonomy and awareness of their own autonomy. This notion aligns with the common perspective that one of the fundamental objectives of transformational leadership is to promote self-leadership (Avolio & Gibbons, 1988) and foster employees' capacity to think autonomously and creatively (Bass & Avolio, 1990b).

Secondly, the consistent emphasis on the organizational vision during the dialogue process may explain the causal effects observed in relation to the need for meaning. Communicating an organizational vision is a fundamental transformational leadership behavior that is expected to stimulate the fulfillment of employee higher-order needs and motivate them to transcend self-interest for the greater benefit of the organization (Antonakis et al., 2003; Bass, 1990; Jensen, Andersen, Bro, et al., 2019; Podsakoff et al., 1990; Wright et al., 2012). The organizational vision has the potential to provide employees with a sense of purpose and significance in their professional lives (Bass, 1990;

Wright et al., 2012, p. 208). Such redirection of focus away from oneself potentially facilitates the satisfaction of the need for meaning (Park & George, 2020; Tønnesvang & Schou, 2022). Moreover, the explicit intention to integrate employee values, needs, and interests with the organizational vision in goal-oriented development dialogues could further strengthen this effect.

Thirdly, the individualized nature of the goal-oriented development dialogues investigated in this dissertation may limit their potential positive effects on the need for relatedness. Transformational leadership arguably promotes teamwork and fosters a sense of relatedness among members working toward the organizational vision (Burns, 1978; Jensen & Bro, 2018). However, the one-on-one setup in goal-oriented development dialogues tends to focus more on individual development processes and individual contributions to the vision. It is possible that team-based goal-oriented development dialogues would be more effective in satisfying the need for relatedness.

Lastly, the goal-oriented development dialogue process emphasizes translating the organizational vision into individual development goals, action planning, and learning. Setting realistic and challenging goals aligned with important value creation can contribute to feelings of competence (Deci & Ryan, 2000; Jensen & Bro, 2018). Therefore, it is surprising that the dissertation does not identify a causal effect of goal-oriented development dialogues on the need for competence. One possible interpretation of this outcome is that public managers generally succeed in utilizing employee development dialogues to support the satisfaction of their employees' need for competence. The inherent focus of employee development dialogues is to nurture competency, and if managers already achieve this objective, the leadership training intervention may not significantly amplify the effect of development dialogues on this psychological need. I use "experimentally randomized instrumental variable analysis" as my main approach for investigating the effect of goal-oriented development dialogues on psychological needs. This way, I only include the variance in public managers' use of such dialogues induced by the leadership development treatment. Thus, goal-oriented development dialogues might affect the satisfaction of the need for competence even though this rather conservative analytical method does not allow me to identify it.

This argument highlights the relevance of supplementing my primary analytical approach for this investigation with alternative (less restrictive) methodologies. In Paper B, I consequently conduct a longitudinal examination of the direct relationship between goal-oriented development dialogues and needs satisfaction. Taking the initial levels of needs satisfaction into account, this analysis reveals highly significant correlations between goal-oriented development dialogues and the satisfaction of the needs for competence and re-

latedness. Although the results of the latter analysis may be influenced by endogeneity, they emphasize that this dissertation does not dismiss the possibility of a causal effect of goal-oriented development dialogues on all four psychological needs examined. This finding is in accordance with the argument that public managers may generally contribute to the fulfillment of the needs for competence and relatedness through their individual and team-based employee development dialogues.

5.1.3. Do dynamic tools have stronger effects than similar static tools?

The dissertation also examines whether the type of leadership tool moderates the effects of leadership training combined with a leadership tool on employee-perceived leadership behavior. It also examines whether a dynamic leadership tool has a stronger impact on employee needs satisfaction than a similar static leadership tool. These expectations are based on findings and arguments from the persuasive technology literature that identifies how dynamic IT can support behavioral change (Hamari et al., 2014; Oinas-Kukkonen & Harjumaa, 2009; Taj et al., 2019). Nonetheless, despite increasing use of IT in public leadership (Roman et al., 2019), public leadership and persuasive technology literatures provide very limited knowledge on the consequences of using IT-based leadership tools (Hamari et al., 2014; Taj et al., 2019; Van Wart et al., 2019; Wenker, 2022).

This dissertation is unable to provide unequivocal answers regarding the extent to which static and dynamic leadership tools have different impacts on relevant leadership and employee outcomes. The empirical results are inconclusive regarding whether the two types of leadership tools have different effects on leadership behavior when combined with leadership training. My findings are also inconclusive with regard to the different effects of the two types of tools in employee needs for autonomy, competence, and relatedness. However, the dissertation demonstrates that dynamic leadership tools for employee development processes can better support the satisfaction of employees' need for meaning and the perceived prosocial impact compared to similar static tools.

Several factors could explain these mixed findings. One possible explanation is that the different effects of the two types of tools are few and small. Another explanation could be that the differences are, in fact, substantial but that it takes a larger sample size to be able to detect the different effects of static and dynamic leadership tools on all the investigated public manager and employee outcomes. Post hoc power analyses indicate that my data is only able to detect differences above approximately 0.1 standard deviations. Yet another

potential explanation is that the effects of the two leadership tools only manifest over a longer period, as the enhanced process support offered by the dynamic tool becomes more important when the salience and memory of the target behavior diminishes over time.

A third possible explanation relates to the design of the tools. The dissertation presents an empirical test comparing static and dynamic leadership tools, essentially conducting a horse race between them. Both tools have the same content, but the static tool includes certain interactive elements. It should be noted that the static tool is not a straw man as it combines writable PDFs with calendar and email software, offering reminders and facilitating ongoing written communication between public employees and managers. The slight disparities in the levels of interactive support provided by the two tools ensure that any identified differences are specifically attributed to the dynamic versus static nature of the tools. However, the "close horse race test" might also mean that I am not able to identify different effects on some of the outcomes, and the conclusion is that I cannot determine whether the two investigated leadership tools have equally weak, strong, or no effects on public manager behavior and on employee needs for autonomy, competence, and relatedness. On the other hand, despite the minor design distinctions between the two tools, the dynamic tool proves significantly more effective in supporting the satisfaction of the need for meaning and employee perception of prosocial impact.

Fourth, the specific content of the leadership tools may play a significant role in determining its effects on different outcomes. Leadership tools rooted in various leadership approaches may, for example, impact the satisfaction of psychological needs differently. The leadership tools examined in this study draw insights from transformational leadership theory (Bass, 1990; Jensen, Andersen, Bro, et al., 2019; Paarlberg & Lavigna, 2010) and aim to facilitate employee reflections on the organizational vision. Transformational leadership theory suggests that organizational visions can be leveraged to motivate employees by infusing their tasks and roles with purpose and meaning (Bass, 1990; Wright et al., 2012, p. 208). Consequently, the primary impact of the leadership tools is likely centered on providing meaningful horizons for employee development. This could explain why I only observe different effects of the static and dynamic tools concerning the need for meaning and perceived prosocial impact.

Building on this line of reasoning, dynamic leadership tools may exhibit stronger effects than static tools in satisfying the need for autonomy if their content is designed to support shared leadership. Including employees in leadership decisions and sharing leadership responsibilities is anticipated to leverage the skills, expertise, and ideas of employees, ultimately enhancing the

appropriateness of decision-making processes (Fausing et al., 2013). If leadership tools are designed to facilitate shared leadership responsibilities and involvement in decision-making, it is reasonable to expect an increase in employees' autonomy needs satisfaction. Similarly, leadership tools aimed at supporting professional development leadership (Lund, 2022) may be expected to promote the satisfaction of the competence need. Moreover, leadership tools intended to facilitate relational leadership and foster strong and productive interpersonal relationships among members of an organization (e.g., Fernandez et al., 2010; Yukl, 2013) may enhance employees' satisfaction of their need for relatedness. These expectations could be interesting avenues for future research.

As a final reflection on the different effects between static and dynamic leadership tools, it can be expected that dynamic tools embodying even greater interactive support would also differentiate their effects more clearly from static leadership tools. Increased interactive support could, for example, involve incorporating artificial intelligence to suggest action plans aligned with employee development goals (primary task support) or automatically sharing performance information with leaders and colleagues (social support). However, it is important to recognize that these forms of heightened support come with inherent risks. If employees perceive that they are being excessively controlled or compelled to adhere to a specific employee development process, it may diminish their sense of autonomy. When public manager interventions are perceived as controlling, it may undermine satisfaction of the need for autonomy and thereby employee motivation (Jacobsen et al., 2014). Diminished autonomy can also undermine the satisfaction of other psychological needs (Corduneanu et al., 2020; Deci & Ryan, 2000; Sheldon & Elliot, 1998). Furthermore, the introduction of artificial intelligence into leadership tools faces challenges due to widespread skepticism and reluctance towards this technology (Dietvorst & Bharti, 2020). In domains characterized by inherent uncertainty, individuals tend to exhibit hesitancy in embracing algorithms (Keppeler, 2023; Longoni et al., 2019).

5.2. Generalization

This dissertation's investigation of leadership training with leadership tools is conducted within the specific context of transformational leadership training for public managers in Danish job centers. A relevant question for discussion is whether and to which extent these findings travel to other parts of the public sector in Denmark, to other countries, and beyond the public sector into the private sector context.

The public employment service area shares central attributes with many other public organizations in Denmark. The area is regulated by law, and the implementation of this law is delegated to the municipal level just like several other central welfare state areas: public daycare, schooling, eldercare, etc. The employees in the investigated job centers are primarily semi-professionals (having a profession-specific educational background in public administration or as a social worker – cf. the technical report), which is also the case in many other public organizations (nurses in healthcare, teachers in public schools, pedagogues in childcare institutions, etc.). The employees in my empirical case are also similar to employees in many other public organizations in the sense that they conduct service regulation tasks as well as service delivery tasks (cf. the technical report). This is typical for many public organizations, and it is important because these types of work tasks attract different types of employees (Kjeldsen, 2014). Job center employees offer counselling and training (service delivery) as well as sanction the eligibility of the unemployed to cash benefits (service regulation) like physicians that both diagnose and treat patients and teachers that both grade and teach students.

These are important examples of similarities between job centers and other widespread types of public organizations that invite the idea that my findings can be generalized to such similar areas. The employment service area is, however, different from the other mentioned organizations when it comes to the level of regulation. The job centers are highly regulated from the national government level (Andersen et al., 2023). On the one hand, it can be argued that this tight regulation makes transformational leadership through goal-oriented development dialogues even more important in this area. The detailed regulation in terms of e.g., national governments' measurements can draw the focus away from the ultimate goal of providing value for citizens and society (Kolstad, 2021), and transformational leadership may reestablish this focus. Empirical investigations suggest that employees in Danish job centers do indeed experience high levels of red tape and that this experience correlates negatively with lower levels of work motivation (Hjelmar et al., 2013). On the other hand, the more detailed legislation also reduces job center managers' autonomy. Reduced manager autonomy might arguably decrease their possibility of conducting leadership (Jacobsen, 2022) and thereby the effect of leadership development interventions in this area. In this way, Danish job centers may be a tough case for showing the positive effects of the combination of leadership training and leadership tools.

The arguments that I have outlined in the dissertation are general and not connected to any specific part of the public sector. These, taken together with

the similarities and differences between the job centers and other typical examples of public organizations, indicate that my findings may be generalizable to other public organizations.

A specific concern regarding the generalizability of my findings to other countries relates to the level of cultural power distance between public managers and their employees. Data for the dissertation is collected in Denmark – a country characterized by high levels of trust (Hofstede 2023) and arguably low levels of manager–employee power distance in local government organizations. The use of coaching-based techniques for communicating the organizational vision is core in the dissertation's "leadership training and tool intervention." The possibility to train, support, and implement such target behavior may be influenced by the levels of trust and power distance in the organizational context. One viewpoint could be that when goal-oriented development dialogues can positively affect needs satisfaction – even in contexts where empathic dialogues between employees and managers are already prevalent – it is plausible to anticipate that these dialogues would yield even more pronounced effects in contexts with power distance and less trust. Conversely, another viewpoint could posit that initial high trust and low power distance serve as prerequisites for the favorable outcomes of such dialogue processes. Consequently, my dissertation emphasizes the importance of further empirical investigation into how initial levels of trust and power distance moderate the impact of goal-oriented development dialogues on psychological needs satisfaction.

Another important reflection on generalizability relates to the differences between public and private organizations, namely the extent to which my findings travel to the private sector. My dissertation suggests that leadership tools can assist public managers in prioritizing important leadership behaviors, such as effectively communicating the organizational vision and facilitating employee reflections on it. I argue that these tools serve several purposes: They serve as reminders for managers regarding their tasks and provide practical support that makes target behaviors more accessible. I also argue that leadership tools can foster social support, which enhances social commitment to ongoing learning and implementation of target behavior from leadership training. These mechanisms are especially relevant in the public context where managers encounter time pressure and task overload due to a broader average span of control (Bohte & Meier, 2001; Bro et al., 2019) and a higher average number of influential stakeholders (Boye et al., 2022; Boyne, 2002) than managers in private organizations. It can also be argued that the need for dialogues focused on the organizational vision is more pronounced in public organizations because they more often face conflicting goals (Boye et al., 2022;

Boyne, 2002). Furthermore, establishing a connection between employee values and interests and the overall vision and objectives of the organization holds greater significance within the public sector. This is particularly important because employees in this sector, on average, are driven to a greater degree by public service motivation and are drawn towards organizations that uphold public sector values (e.g., Wright & Christensen, 2010). Another reason for greater impact of employee reflections and development processes guided by the organizational vision may be that visions centered around benefits for citizens and society tend to have stronger motivational effects (Høstrup & Andersen, 2020), and such visions may be easier and more apparent to develop in public organizations (An et al., 2019). Consequently, the findings of this dissertation may be particularly applicable to the public sector.

On the other hand, empirical evidence from the generic leadership literature indicates positive outcomes of transformational leadership (Wang et al., 2011) and use of managerial coaching (Theeboom et al., 2014) in private organizations. Additionally, psychological needs satisfaction has been found to have significant effects in the private sector as well (Deci & Ryan, 2000). Therefore, it can be also argued that the leadership training with leadership tools focused on goal-oriented development dialogues holds potential for significant impact on both public and private sectors.

5.3. Limitations and future research

This dissertation provides new and robust evidence on how leadership tools can support manager and employee outcomes of leadership training. However, as every other research project, this dissertation has limitations that are important to be aware of.

One limitation is that my field experimental design does not allow for the separation of the leadership tools' effects from the training effects. This is a deliberate choice reasoned by theoretical expectations, research focus, and recruitment and power considerations. I expected to be able to recruit organizational units sufficient to allow a maximum of three randomized groups. I prioritized creating random variation on the type of leadership tool (static versus dynamic) because the increasing introduction of IT in public leadership makes it relevant to investigate dynamic alternatives to more classic static leadership technologies. As I argued in the theory chapter, I also expected the effects of leadership tools to depend on prior training, and it was therefore important that both the static and dynamic leadership tools were combined with a leadership training intervention. Nevertheless, this choice implies that I cannot conclude about the causal effects of leadership tools. But as I hypothesized in

my preregistration of the field experiment, I can conclude that the combination of leadership training and leadership tools indeed has causal effects on leadership behavior and employee outcomes. In addition, comparisons with other similar leadership training experiments indicate that adding a leadership tool to leadership training may, in fact, increase learning transfer and results on employee level (cf. section 5.1.1). The design choice also allowed me to find statistical differences in the effects of dynamic versus static leadership tools. However, I encourage future research to design experiments that allow for the separation of training effects from tool effects.

A second limitation relates to the choice of transformational leadership training as the case for developing content for the intervention. The dissertation uses goal-oriented development dialogues as a case to explore the differential impacts of static and dynamic leadership tools. Employee development, based on individual reflections aligned with the organizational vision, serves as a suitable context for this investigation. Transformational leadership is widely recognized as an effective leadership behavior (e.g., Backhaus & Vogel, 2022), and previous research has demonstrated positive effects of employee vision reflections on important employee outcomes (Bellé, 2014). However, it is also acknowledged that practicing transformational leadership can be challenging (An et al., 2020). On the one hand, this suggests that dynamic leadership tools might be particularly valuable in supporting this demanding form of leadership behavior. On the other hand, less complex leadership approaches like transactional leadership (An et al., 2020) may be even more prone to being affected by dynamic tools. Thus, because dynamic leadership tools demonstrate a greater influence than static tools on employee outcomes within a visionary or transformational leadership context, it is plausible that they could yield similar amplified effects in connection to other leadership styles such as professional development leadership and transactional leadership. For instance, in the context of transactional leadership (Jensen, Andersen, Bro, et al., 2019; Podsakoff et al., 2006), dynamic leadership tools could provide support for employees' planning, optimization, and perseverance regarding contingent rewards tied to their contributions to organizational goals. In the context of professional development leadership (Lund, 2022), dynamic leadership tools could assist employees in reflecting on professional knowledge as it relates to their day-to-day tasks. Yet, the findings of this dissertation are limited to the context of transformational leadership training and tools supporting goal-oriented development dialogues. The findings in this context prompt further exploration of the impacts of dynamic leadership tools when applied to other leadership approaches and tasks.

A third possible avenue for future research on leadership tools relates to the context of their use. This dissertation explores the impact of leadership

tools provided to public managers and employees after managers' participation in leadership training. A central aim of such research could be to determine whether dynamic leadership tools offer stronger support compared to static tools in facilitating the application of *newly* acquired leadership behaviors. The findings in this dissertation suggest that dynamic tools can effectively address the persistent challenge in leadership training of translating public managers' learning into desired outcomes at the employee level. However, it should be noted that the dissertation's specific contextual setting implies that the findings may not be applicable outside the scope of supporting employee outcomes directly associated with leadership training. Nonetheless, since leadership tools are commonly employed without prior training (e.g., performance interviewing templates), future research exploring whether dynamic tools yield different effects compared to static tools on existing public manager and employee behaviors represents a relevant avenue for future investigation.

5.4. Main contributions and implications for practice

The dissertation has three main theoretical contributions that are all related to important implications for practice.

First, the dissertation adds an important theoretical layer to the literature on leadership training by highlighting the importance of supporting public managers to conduct target behaviors in their day-to-day following leadership training; that is, in the immediate behavioral contexts where the manager is expected to enact the target behavior. The dissertation introduces knowledge from persuasive technology literature and describes why leadership tools can be expected to provide practical and social support, mitigating enduring problems by ensuring intended public manager and employee outcomes of leadership training (Blume et al., 2010; Lacerenza et al., 2017). Empirically, the dissertation finds that leadership training combined with leadership tools has strong effects on manager behaviors and employee outcomes. Comparisons with similar leadership training interventions (Jacobsen et al., 2021; Lacerenza et al., 2017, p. 1697) suggest that adding the leadership tool to the leadership training notably increases the behavioral effects. In terms of implications for practice, these findings suggests that HR and training professionals should consider leadership tools as a means to increase the intended effects of leadership training.

Second, the dissertation contributes to transformational leadership literature. Valuable insights have been derived from existing research regarding the overall effects of transformational leadership (Backhaus & Vogel, 2022) as well as the appropriate communication methods to employ within this leadership approach (Jensen et al., 2018). However, this dissertation introduces a

new perspective by theorizing how public managers can enact transformational leadership through goal-oriented development dialogues and how such dialogues can contribute to the satisfaction of employees' psychological needs. Furthermore, the dissertation confirms previous findings indicating that employee reflections on organizational visions can foster important employee outcomes (Bellé, 2014) and adds that dynamic leadership tools in some circumstances seem to provide more support for such reflections than static leadership tools. As an implication for practice, these findings suggest that the use of goal-oriented development dialogues should be considered an important element in transformational leadership training. Such dialogues are also relevant when public managers intend to nurture a working environment that supports employee psychological needs satisfaction. Additionally, public managers should consider using dynamic leadership tools to support transformational leadership and enhance employee satisfaction of the need for meaning.

Third, this study contributes to our comprehension of how the increasing use of dynamic IT in public organizations (Roman et al., 2019) can impact managers and employees. It is important to recognize that IT is never neutral (Oinas-Kukkonen & Harjumaa, 2009). Similar to any decision-making environment, IT inherently facilitates certain behaviors while making others more difficult, less attractive, or less evident (Oduor & Oinas-Kukkonen, 2018). By showcasing the distinct effects of dynamic and static leadership tools on the need for meaning and the perceived prosocial influence, this research supports this notion and encourages future investigations into the potential positive outcomes, as well as the unintended negative consequences, associated with the utilization of different types of IT in public leadership. Furthermore, the findings suggest that dynamic leadership tools are an example of dynamic IT yielding a stronger impact on intended employee outcomes than static tools and should, thus, be considered as a means to support public leadership.

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English summary

This dissertation investigates how leadership training combined with leadership tools can influence manager and employee outcomes in public organizations. Ensuring transfer from leadership training with classroom and coaching sessions outside of leaders' day-to-day work to actual leadership activities can be challenging. The dissertation proposes that leadership training integrated with leadership tools that aim at prompting target behavior in public managers' immediate work context can have strong effects on leadership behavior and employee outcomes.

Leadership tools are various types of tools used to support leadership behavior such as templates for performance interviewing and employee development. Despite their widespread use, little is known about how such tools impact manager behavior and employee outcomes, particularly in the context of leadership training. The dissertation argues that insights from the field of persuasive technology, which explores how interactive computerized systems can shape attitudes and behaviors, can be integrated into the leadership training literature to gain a better understanding of the potential of leadership tools.

The dissertation proposes that leadership tools can be categorized as dynamic or static based on the level of interactivity inherent in the support they intent to provide. Dynamic leadership tools, which utilize advanced information technologies, are expected to provide stronger support for attitudinal and behavioral change in combination with leadership training compared to a similar combination with static tools.

The research question is therefore as follows: How does leadership training with static and dynamic leadership tools impact manager and employee outcomes in public organizations? The dissertation theorizes the use of leadership tools in transformational leadership training, specifically focusing on goal-oriented development dialogues as a core element. These dialogues aim to facilitate vision communication and foster employee psychological needs satisfaction, ultimately leading to improved organizational performance.

To investigate the effects of leadership training with leadership tool, a field experiment was conducted in collaboration with 34 Danish municipalities. The experiment involved 226 public managers and approximately 4,500 employees from job centers within the employment service area. The managers were randomly assigned to three groups. One group received leadership training with a static tool. Another received similar leadership training, but with a dynamic tool. Finally, the control group received neither training nor tool.

Pre- and post-intervention surveys were conducted among managers and employees in all three groups to collect data on leadership behavior and employee outcomes, and organizational performance data was obtained from national registers.

The dissertation consists of this dissertation report and three papers that cover different research elements and contribute to the overall understanding of the topic. The findings support that leadership training with leadership tools can increase employee perceived transformational leadership behavior and satisfaction of some employee psychological needs. The findings also give some support the notion that dynamic leadership tools have stronger effects on satisfaction of employee needs for meaning and perceived prosocial impact. The effects of the leadership training intervention are not detectable on the citizen outcomes in terms of increased self-sufficiency among the job center units' target groups.

Finally, this report discusses implications for practice and how the dissertation contributes to the leadership literature and addresses the research question. The dissertation adds an important theoretical layer to the literature on leadership training by highlighting the importance of supporting public managers in conducting target behaviors in their day-to-day work following leadership training. The dissertation contributes to transformational leadership literature by developing a specific model for vision communication through goal-oriented developmental dialogues. Lastly, the dissertation contributes to our understanding of how the increasing use of dynamic IT tools in the public sector can impact manager and employee outcomes.

Dansk resumé

Denne afhandling undersøger, hvordan ledelsestræning og ledelsesredskaber kan påvirke ledere og medarbejdere i offentlige organisationer. Ledelsestræning, som ikke understøttes af ledelsesredskaber, har ofte begrænsede og kortvarige effekter på ledernes adfærd og på opnåelsen af organisatoriske målsætninger. Den eksisterende forskning på området fokuserer fortrinsvist på ledelsesudviklingsinterventioner, der finder sted adskilt fra lederens daglige arbejde – i form af fx klasserumsundervisning eller ledelsescoaching. Afhandlingen argumenterer for, at ledelsesredskaber kan understøtte ledernes adfærd i specifikke situationer i organisationen. Dermed kan ledelsestræning kombineret med konkrete ledelsesredskaber have stærke effekter på de leder- og medarbejder-outcomes, som træningen ønsker at påvirke.

Ledelsesredskaber er kort sagt redskaber, der er udviklet med henblik på at understøtte ledelsesadfærd, og gængse eksempler på ledelsesredskaber er dialogguides til medarbejderudvikling og sygefraværssamtaler. Selv om brugen af ledelsesredskaber er udbredt, ved vi imidlertid ikke meget om, hvordan det påvirker ledere og medarbejdere – særligt i en ledelsesudviklingskontekst. Denne afhandling kombinerer viden om hhv. ledelsestræning og *persuasive technology* for at skabe en forståelse af, hvordan ledelsesredskaber indvirker på lederes adfærd og medarbejderes opfattelse af deres arbejde. *Persuasive technologies* er IT, der er designet til at understøtte opfattelses- og adfærdsforandringer uden brug af tvang eller manipulation.

Afhandlingen sondrer mellem statiske og dynamiske ledelsesredskaber baseret på graden af indbygget interaktivitet. Dynamiske ledelsesredskaber anvender mulighederne i (avanceret) IT til at levere mere interaktiv understøttelse af adfærdsforandringer end statiske redskaber. Derfor forventes dynamiske ledelsesredskaber at have større effekt på medarbejdere og ledere, når de bliver kombineret med ledelsestræning, end det er tilfældet for tilsvarende statiske redskaber.

Med dette afsæt stiller afhandlingen følgende spørgsmål: Hvordan påvirker ledelsestræning med statiske og dynamiske ledelsesredskaber leder- og medarbejder-outcomes i offentlige organisationer? Afhandlingen teoretiserer brugen af ledelsesredskaber som led i transformationsledelsestræning med målorienterede udviklingsdialoger som omdrejningspunkt. Denne type dialoger mellem ledere og medarbejdere har til formål at formidle organisationens vision, fremme tilfredsstillelse af psykologiske grundbehov og ultimativt at forbedre organisationens målopnåelse.

For at undersøge effekterne af kombinationerne af ledelsestræning og ledelsesredskaber er der som led i afhandlingen gennemført et felteksperiment

i samarbejde med 34 danske kommuner. Eksperimentet blev gennemført som et ledelsesudviklingsforløb på beskæftigelsesområdet i samarbejde med 226 ledere og omtrent 4.500 medarbejdere. Lederne er via lodtrækning fordelt i tre grupper. Den ene gruppe modtog ledelsestræning og et statisk ledelsesredskab. Den anden gruppe modtog samme træning, men et dynamisk ledelsesredskab. Endelig modtog kontrolgruppen hverken træning eller redskab. Data er indsamlet via nationale registre og ved hjælp spørgeskemaer før og efter interventionen.

Afhandlingen består af tre artikler samt denne afhandlingsrapport. De belyser tilsammen forskningsspørgsmålet. Analyseresultaterne peger på, at ledelsestræning kombineret med ledelsesredskaber kan øge medarbejderoplevet transformationsledelse og tilfredsstillelse af nogle af medarbejderes psykologiske grundbehov. Resultaterne peger også på, at dynamiske ledelsesredskaber – sammenlignet med tilsvarende statiske redskaber – kan have større positiv effekt på tilfredsstillelse af medarbejderes behov mening og deres oplevelse af at gøre en forskel for borgerne og samfundet. Effekter af ledelsesudviklingsforløbet kan derimod ikke spores ud på borgerniveauet i form af forøget selvforsørgelsesgrad.

Afslutningsvis diskuterer denne rapport implikationer for ledelsespraksis, samt hvordan afhandlingen samlet set bidrager til ledelseslitteraturen og lykkes med at besvare forskningsspørgsmålet. Afhandlingen bidrager til ledelsesudviklingslitteraturen ved at sætte fokus på betydningen af at understøtte ønskede adfærdsændringer i lederes daglige arbejde. Afhandlingen bidrager til transformationsledelseslitteraturen ved at udvikle en konkret model for visionskommunikation: målorienterede udviklingsdialoger. Endelig bidrager afhandlingen til vores forståelse af, hvordan den stigende brug af dynamiske IT-redskaber i den offentlige sektor kan påvirke outcomes på leder- og medarbejderniveau.