

LEADERSHIP EXPERIMENT AND DEVELOPMENT PROJECT (LEO)

Evaluation of trainings Report

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Note: We want to stress that this report constitutes a program evaluation study and not a peer reviewed academic article. During the evaluation process, different experts expressed concerns about low sample sizes, limiting the capacity of the research to make any valid conclusions about the effectiveness of leadership training interventions. However, after deliberation with the evaluation team and experts, the commissioner of this evaluation report decided to report all analysis on the condition that limitations of the research are reported transparently and so that results can be interpreted correctly.

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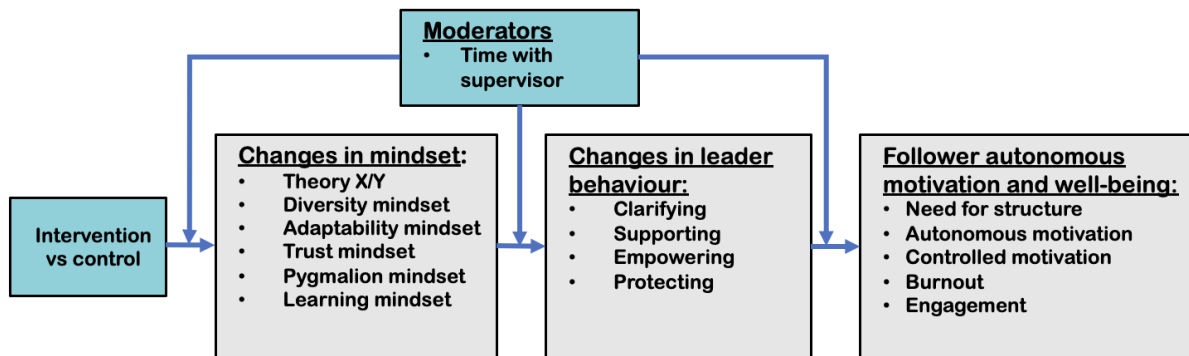
Executive summary

Given the importance of employee motivation and well-being, the ESF call 479 “leadership experiment and development” (cf. ESF call LEO) set out to better understand the effects of leadership development programmes (LDP) on followers’ autonomous work motivation and well-being of employees in organizations. From there, this project aimed to develop best practices and common standards of practice around evaluating and selecting evidence-based LDPs.

To enable this, the researchers evaluated the LDPs of three thematic experts (i.e. leadership development programme providers, subcontracted by Agoria:

- 1) Company A’s programmes focuses on contextualised (i.e. situational but not to be confused with the leadership style “situational leadership) leadership, i.e., what makes a leader effective depends on the situation of the guided employee(s),
- 2) Company B’s programme focuses on motivational leadership, aiming to support the basic psychological needs of employees, and
- 3) Company C’s programme focuses on shared leadership which starts from the premise that within teams multiple people can take on leadership roles.

The original idea was to conduct an Randomised control trial (RCT). However, companies often had a preference to enrol in a specific LDP, so rather than randomizing across organizations we randomized within an organization, i.e., when an organization chose expert X we randomized the waiting-list and control condition in that organization. Furthermore, the sample foreseen for LEO was not large enough to create a valid examination of the conditions under which the LDP’s worked. Hence, the focus of the evaluation shifted to the evaluation of the LDPs individual effectiveness to enable change in leader mindset, leader behaviour and followers motivation and well-being and testing a general model of leadership development, displayed below.



The LDPs were set out in 13 organisations and 92 leaders and their teams, totalling 413 followers. The average response rate across the different LDPs for leaders and followers was 68%, leading to a final sample of 40 leaders and 95 followers for the situational leadership LDP, 26 leaders and 108 followers for the motivational LDP and 146 participants of shared leadership at Time 5. Given the number of usable cases, the statistical power of the analyses done was not on the level that would be required for a peer-reviewed academic article. Nonetheless, the research was able to provide insights and recommendations around leadership development, as outlined below.

The results show that the LDPs could not establish ‘objective’ differences in leader mindset, behavior or follower outcomes as assessed by comparing the answers of the participants before an after the intervention. However retrospective results (i.e., when asking participants after the LDP to compare their experience before and after), participants in the situational LDP reported changes in some

mindset, all studied leader behaviours (i.e., clarifying, supporting, empowering and protecting) and followers basic psychological needs. The shared leadership LDP could establish retrospective changes in some mindsets as well as the autonomy and competence needs. For the motivational LDP no differences were found, except for an unexpected increase in burnout.

The qualitative data extracted from the survey for the situational and motivational LDP indicate that leaders valued taking part in the training. Both leaders and followers felt most leaders had changed over the course of LEO, but also mentioned the COVID-19 pandemic, everyday struggles and high workload as obstacles for these learnings to become obvious in practice.

Examining the relations in the general research model using simple analysis indicated that the leader mindsets were not or only weakly related to leader behaviour, which was strongly and consistently related to follower outcomes. *Latent growth modelling* subsequently established the associations between leader behavior and employee engagement via the satisfaction of the basic needs.

The recommendations for organizations and policy (oriented research) center around the selection of the right type of LDP for organisations, suggestions for future testing of the effectiveness of LDPs, focussing on leader behavior in future LDPs, working towards accreditation and stakeholder management.

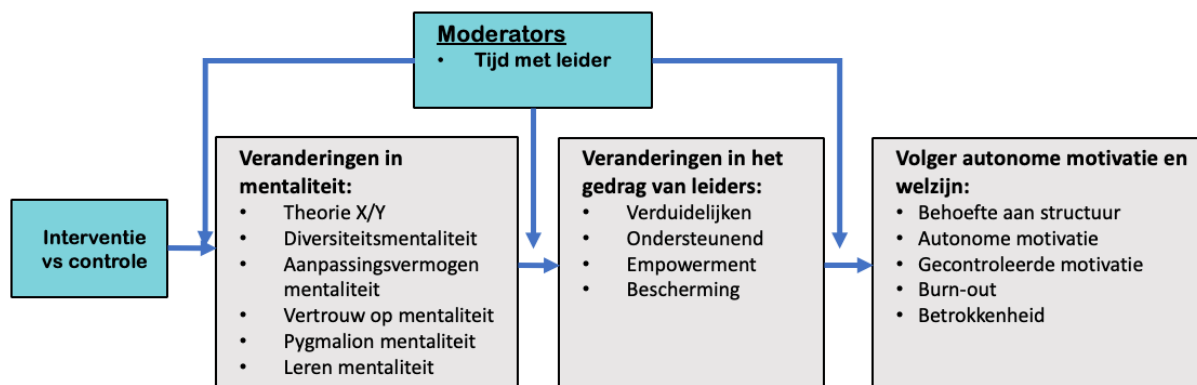
Samenvatting

Gezien het belang van de motivatie en het welzijn van werknemers, was het doel van de ESF oproep 479 “Leiderschapsexperiment en -ontwikkeling” (cf. de ESF oproep LEO) om meer inzicht te krijgen in de effecten van programma's voor leiderschapsontwikkeling (LDP) op de autonome werkmotivatie en het welzijn van volgers. Van daaruit wilde dit project best practices en gemeenschappelijke praktijknormen ontwikkelen rond het evalueren en selecteren van evidence-based LDP's.

Om dit mogelijk te maken, evalueerden de onderzoekers de LDP's van drie thematische experts, in onderaanneming van Agoria:

- 1) Het LDP van bedrijf A gericht op gecontextualiseerd leiderschap, d.w.z. dat wat een leider effectief maakt afhangt van de situatie van de begeleide medewerker(s),
- 2) Het LDP van bedrijf B gericht op motiverend leiderschap, gericht op het ondersteunen van de psychologische basisbehoeften van medewerkers, en
- 3) Het programma van bedrijf C richt zich op gedeeld leiderschap, uitgaande van het uitgangspunt dat binnen teams meerdere mensen leiderschapsrollen kunnen opnemen.

Het oorspronkelijke idee was om een Randomised Control Trial (RCT) uit te voeren. Organisaties hadden echter vaak een voorkeur om zich in te schrijven voor een specifiek LDP, dus in plaats van te randomiseren over organisaties heen, randomiseerden we binnen een organisatie, d.w.z. wanneer een organisatie koos voor expert X randomiseerden we de wachtlijst- en controleconditie in die organisatie. Bovendien was de voor LEO geplande steekproef niet groot genoeg om de omstandigheden waaronder de LDP's werkten goed te kunnen onderzoeken. Vandaar dat de nadruk van de evaluatie verschoof naar de evaluatie van de individuele effectiviteit van de LDP's om verandering mogelijk te maken in de mindset van de leider, het gedrag van de leider en de motivatie en het welzijn van de volgers, en het testen van een algemeen model van leiderschapsontwikkeling, dat hieronder wordt weergegeven.



De LDP's werden uitgevoerd in 13 organisaties en 92 leiders en hun teams, in totaal 413 volgers. De gemiddelde respons voor de verschillende LDP's voor leiders en volgers was 68%, wat leidde tot een uiteindelijke steekproef van 40 leiders en 95 volgers voor het situationeel

leiderschap LDP, 26 leiders en 108 volgers voor het motivationeel LDP en 146 deelnemers aan gedeeld leiderschap op tijdstip 5. Gezien het aantal bruikbare cases was de statistische kracht van de uitgevoerde analyses niet van het niveau dat vereist zou zijn voor een collegiaal getoetst academisch artikel. Desalniettemin kon het onderzoek inzichten en aanbevelingen opleveren over leiderschapsontwikkeling, zoals hieronder beschreven.

De resultaten laten zien dat de LDP's geen 'objectieve' verschillen konden teweeg brengen in de mentaliteit van de leider, het gedrag of de resultaten van de volgers, als we kijken naar de antwoorden van de deelnemers voor en na de interventie. Echter retrospectieve resultaten (d.w.z. wanneer deelnemers na de LDP wordt gevraagd om hun ervaring voor en na de interventie te vergelijken), rapporteren deelnemers aan de situationele LDP veranderingen in een bepaalde mindsets, alle bestudeerde leiderschapsgedragingen (d.w.z. verduidelijken, ondersteunen, bekrachtigen en structureren) en de psychologische basisbehoeften van volgers. Het gedeelde leiderschap LDP kon retrospectieve veranderingen vaststellen in sommige mindsets en in de autonomie- en competentiebehoeften. Voor het motiverende LDP werden geen verschillen gevonden, behalve een onverwachte toename van de burn-out.

De kwalitatieve gegevens uit de enquête voor de situationele en motivationele LDP geven aan dat leiders de deelname aan de training waardeerden. Zowel leiders als volgers vonden dat de meeste leiders in de loop van LEO waren veranderd, maar noemden ook de COVID-19 pandemie, de dagelijkse strijd en de hoge werkdruk als belemmeringen voor deze leerervaringen om in de praktijk duidelijk te worden.

Onderzoek van de relaties in het algemene onderzoeksmodel met behulp van eenvoudige analyse gaf aan dat de leiders mindsets niet of slechts zwak gerelateerd waren aan leidersgedrag, dat sterk en consistent gerelateerd was aan de resultaten van de volgers. Latent growth modelling stelde vervolgens de associaties vast tussen leidersgedrag en werknemersbetrokkenheid via de bevrediging van de basisbehoeften.

De aanbevelingen voor organisaties en beleid (gericht onderzoek) centreren zich rond de selectie van het juiste type LDP voor organisaties, suggesties voor toekomstige testen van de effectiviteit van LDP's, focussen op leidersgedrag in toekomstige LDP's, werken aan accreditatie en stakeholder management.

1 | Introduction

We are happy to provide you with the final report of the impact evaluation of the ESF call “Leadership experiment and development” (cf. the ESF call LEO) (Order number: 20201026). The ESF call LEO was organised and financed by ESF-Flanders of the Flemish Department of Work and Social Economy. The primary goal of this evaluation study is to understand how **leadership development can contribute to employee well-being and motivation**.

1.1 | Aim

Employee well-being and motivation are critical in today’s VUCA world (volatile, uncertain, complex, and ambiguous) (Lawrence, 2013). Within this knowledge economy where technology is widely spread and easily copied, employees are key to making a **strategic difference**. Employee well-being and motivation are key to high-quality performance and proactivity (e.g., Van den Broeck et al. 2021; Xanthopoulou et al., 2021), such that we may assume the employees need to feel well and to be motivated to go the extra mile. This also implies however that the classic focus of organisations on performance and “command and control” is insufficient to make the most of one’s human capital. Recent research has highlighted that leaders may make a difference in increasing employee well-being and motivation (Inceoglu et al., 2018).

In the past decade, **leadership development (LD)** has gained status as a critical enabler for increasing and sustaining the leadership competencies, and – hence – employee well-being and motivation and competitiveness of organizations. Organizations are now operating in a context that is increasingly dynamic and complex – raising the demands to fill critical talent gaps and changing the requirements for the leadership pipeline. Additionally, in light of the recent phenomenon of “the great resignation”, Deloitte’s 2022 industry report identified an increasing demand among workers to get new opportunities and learn on their job. Companies recognise leadership development as a key way to address both the leadership pipeline and retention challenges. The market for leadership development programmes is estimated to be a \$50 billion industry. It is the only learning and development market that continued to grow during the challenging economy of 2022 (McKinsey, 2022). In response to this demand, business schools are focusing on ‘educating leaders’ (DeRue et al., 2011; Kniffin et al., 2020). The cost of such leadership development offerings from a top business school can reach 150,000 US dollars per person (Gurdjian et al., 2014).

However, some scholars have questioned the value and efficacy of these leadership development programs. Conger (2013) observes that much leadership development “has never had the impact that their champions, designers, and sponsors aspire to have.” In his latest book *Leadership BS*, Pfeffer (2015) concludes that “the leadership industry has failed” (p.4)—arguing that there is **scarce evidence that all the money spent on leadership development produces better leaders, and that many leadership development programs are often more problematic and invalid than generally acknowledged**. This comment is echoed by other scholars in the field who have long lamented over the lack of rigorous theoretical grounding and empirical research on leadership development and called for more critical, evidence-based work (Day, 2000; Vongswasdi, et al., 2023).

Without the support of (scientific) evidence and rigorous evaluation, management practice is likely to have dubious value. As Pfeffer & Sutton (2006, p. 78) argued, organisations need to “face hard facts about what works and what doesn’t, understanding the dangerous half-truths that constitute so much conventional wisdom and rejecting the total nonsense that too often passes for sound advice”. Within management research, this concept is called evidence-based management, which refers to translating knowledge and principles based on the best available scientific evidence into organisation practice,

enabling managers to make decisions informed by social science and organisational research (Rousseau, 2006).

Without systematic and rigorous research, it is difficult to know which **leadership development programme (LDP)** is effective and what is not. Admittedly, evaluating the effectiveness of LDPs is a complex process given there are many factors that are involved in influencing the effectiveness of the intervention, including the training criteria, design, delivery, context, and the participants' characteristics (Hoole & Martineau, 2014). As a result, Ling (2012, p. 80) contends that the practice of evaluation tends to "start with optimism and end with modest or immeasurable outcomes." It is not difficult to see why evaluation proves to be a frustrating business and is thus often ignored in practice (Saunders, 2006).

Against this background, the LEO-project pursues two major goals. **As a primary goal, it aimed to understand the effects of leadership development programmes (LDP), both directly on participating leaders as well as indirectly on their followers.** More specifically, **LEO focuses on understanding the net effects of different types of LDP on the autonomous work motivation and well-being of employees in organisations.** This was achieved through the evaluation of three top LDPs in Flanders, Belgium, by collecting data from participating leaders and their followers. The target population of these programmes were supervisors of frontline work teams in Flemish firms and organisations. Secondly, the **LEO-project intended to develop best practices and common standards of practice around evaluating and selecting evidence-based LDPs.** Specifically, through the insights gained from this large-scale impact evaluation trajectory, we sought generalizable best practices that can be used by individual leaders, organisations, and governments to select and evaluate LDPs.

The LEO-project can be seen as an important step towards professionalisation of leadership and its development (i.e., [TED TALK](#)). Indeed, without a common language and standards of practice, leadership development continues to be the "Wild West" of the professional services sector (Beer, Finnstrom, & Schrader, 2016; Sherman & Freas, 2004): There are little to no laws or rules of professional accreditation in place nor a sheriff to enforce agreed-upon standards of quality. As such, any quack can promote a magic cure for what ails leaders and can call themselves a leadership developer, even if certain "potions" end up hurting clients. We have a collective responsibility to change this.

The ESF call LEO thus has both **practical and theoretical relevance.** From a practical point of view, the *ESF call LEO aimed to fill a gap in our understanding of LDPs by providing concrete evidence as to which interventions are effective or not and why and when this is the case.* This may help organisations to choose wisely among the different LDP trajectories on the market and may help the ESF Flanders to guide organisations in choosing their LDPs in an evidence-based manner. From an academic point of view, *LEO contributes to the development of research on whether leadership itself can be developed in a way that leads to meaningful behavioural change and has a meaningful impact on employee motivation and engagement.* Moreover, given that the three selected LDPs stem from different behavioural backgrounds, LEO helps to understand whether/why/under which conditions the new leadership theories (e.g., shared leadership, autonomy supportive leadership) are more or less effective than other somewhat older approaches (e.g., situational leadership).

In the field of leadership studies, we need to do more research combining the theoretical and practical realms so that we can see a) how to develop leadership in general, b) how LDPs should be set up and c) how LDP's can be evaluated. This will allow for better design of LDPs by consultants, better selection of LDPs by organisations and better guidance by organisations such as ESF to help organisations develop their leaders and (more broadly) develop their business, based on scientific evidence.

1.2 | Parties involved

Research team

The evaluation of LEO is executed under the supervision of Prof. Dr. Hannes Leroy, Erasmus University Rotterdam and Prof. Dr. Anja Van den Broeck, KU Leuven.

Prof Dr. Hannes Leroy is an expert on measuring the impact of leadership interventions, serving as the steward of the League of Leadership initiative, an international consortium of top business schools across the world with the mission of creating accreditation standards for evidence-based leadership development programs. His published studies include an analysis of the degree to which business schools use evidence-based practices, as well as a call for further research into the efficacy of leadership interventions. Dr. Leroy has published studies on the effects of leadership on autonomous types of motivation. These include the effects of ethical, authentic and servant leadership on autonomous motivation, the need for structure to support autonomous motivation and how leaders foster intrinsic motivation.

Prof. Dr. Anja Van den Broeck is a work and motivation psychologist and an associate professor at the Faculty of Economics and Business at the KU Leuven. Her research goal is to examine how, and under which circumstances individuals may thrive at work. In her research, she unravels the interplay between job design, well-being, and motivation. She has published over 64-peer reviewed articles in international journals including Academy of Management Annals, Journal of Management and, Journal of Applied Psychology and her work on Self-Determination Theory has been considered among the most impactful papers in the field.

Prof. Dr. Leroy and Prof. Dr. Van den Broeck were assisted by

- **Dr. Erik Waltre**, assistant professor, who brought further unique and highly relevant experience conducting field experiments in the field of leadership,
- **Silian Schaller**, currently conducting a PhD on the topic of leadership development brought relevant experience in evaluating leadership development programmes.
- **Alexandra Androulidaki**, a research assistant at RSM, brought her expertise in quantitative methods and statistics to support with the data analysis.

Furthermore, the team has personally consulted a range of renowned researchers in affiliated disciplines. These include

- Prof. Dr. Lisa Dragoni, a leadership development researcher of Wake Forest University ([LINK](#)),
- Prof. Dr. Steffen Giessner, a leadership researcher of RSM ([LINK](#)),
- Drs. Sonja von Zaar, a qualitative researcher in leadership development of Maastricht University ([LINK](#)),
- Prof. Dr. Birgit Schyns, a leadership researcher of NEOMA business school ([LINK](#)).
- Yaxin Zheng, a PhD candidate at University of Exeter Business School ([LINK](#)).

Throughout the research phase, the research team presented and received input from the Organisation and Personnel Management department of Rotterdam School of Management and the People and Organisations department at NEOMA Business School, which we thank for their valuable input.

ESF-Flanders

The LEO-project is organized and financed by ESF-Flanders of the Department of Work and Social Economy. ESF-Flanders manages the funds allocated by the European Commission from the 'European Social Fund' to the regional Flemish Government in Belgium. The LEO-project is part of the ESF-Flanders Operational programme 2014-2020.

ESF-Flanders of the Flemish Department of Work and Social Economy is also the commissioner of this impact evaluation study and is responsible for support and facilitation of the study, quality assurance, validation of the report via the formal commission of policy stakeholders, reporting the results and recommendations to the European Commission and dissemination to a wide audience of stakeholders (beyond scope of the LEO-project).

The internal working group tasked with monitoring and supporting the progress of the study consists of:

- Steven De Bock (Head of ESF-Evaluation)
- Benjamin Schalembier (Evaluator)
- Sarah Smeyers (project manager)
- Sofie Bogaerts (project manager)

The working group provided steering and input to the research team through official intermittent reports, less formalised alignment meetings and occasional sitting in meetings between the research team and other LEO parties. They have provided guidance on assuring policy relevance and the general success of the project.

Promotor: Agoria

Agoria is the federation of the technology industry of Belgium and is acting as the promotor of this project. They support technology-inspired companies in Belgium that develop and apply innovations to realise growth and progress worldwide, representing over 310,000 employees. Agoria provides promotion, services and consultancy services in the field of – amongst others – Human Capital & Education. Their aim is to support organisations in becoming future proof and learning organisations. Good leadership and developing one's leaders are essential parts of this. In the role of promotor Agoria aimed to not only develop its own knowledge on leadership, as a means to support and guide organisations, but also to help its partner organisations to take part in innovative and effective leadership programs.

As the project's promotor, Agoria's core role was the subcontracting of the three leadership development providers (thematic experts) and the recruitment of participating organisations and teams, a process that involved close collaboration with the research team. Further, Agoria was in charge of communications, chiefly with organisations. They hereto collaborated with the research team, who helped in determining the content of the communication. Given their experience in general HR and people-related topics, Agoria supported the research group in ensuring the research design is of top quality, especially in terms of survey design, communications, and ensuring a sufficient response rate. Finally, Agoria was in charge of developing practitioner oriented engagement and impact as output of the project. Content developed in collaboration with the us (the research team) can be found in appendix 9.8.

Thematic experts

The thematic experts were the three leadership development companies who developed and delivered the LDPs that are evaluated in this report. Below, you will find an overview of these companies.

- **Company A** developed an LDP that uses the specific context, role, and expected results of the leader to define what it focuses on, rather than a predetermined idea of what “good” leadership is. Given its consideration of context, like leader-followers, follower needs, and leader identity, throughout the report, the LDP of this company will be referred to as **Situational Leadership** or **Situational LDP**.
- **Company B** developed an LDP based on Self-determination theory (SDT) and focuses on motivational leadership (or autonomous leadership). Throughout the report, the LDP of this LDP will be referred to as **Motivational Leadership** or **Motivational LDP**.
- **Company C** developed an LDP based on shared leadership such that also those who don't hold a formal leadership position may develop leadership in context. Throughout the report, the LDP of this company will be called **Shared Leadership** or **Shared LDP**.

The central role of the thematic experts was the design and execution of the LDPs. They also assured the research team's understanding of their programme, in terms of used methodologies and intended learning outcomes. This enabled the research group in optimising their research focuses and design (e.g., survey content).

Organisations and their participating leaders and their followers

The participating leaders and their followers came from **13 organisations**. These organisations are mostly from the sectors manufacturing and health care, as well as construction and food. Leaders were mostly first line managers and managed teams of 5-30 members (with larger teams being an exception). In this research, surveys were done with the leader and (a selection of) 3-10 followers so as to keep the time investment of the organisation manageable.

The Shared LDP is distinct from the Motivational LDPs and Situational LDP in that their intervention involves the whole team, rather than just the team leader and (some) of his/her followers. Hence, data collection is done differently for the Shared LDP compared to the two others. For the Shared LDP, all team members get the same surveys, answering questions about themselves as well as providing round robin responses about each other (i.e., they rate every other team member as it was a leader). For the other two trajectories, leaders are asked questions about themselves and their ideas on leadership, whereas followers give responses about their leader and their own well-being.

In total, 57 teams were allocated to the Situational LDP, 35 teams to the Motivational LDP, and 18 teams to the Shared LDP. For the Shared LDP data collection, there were 175 participants and for the Leader/Follower (L/F) data collection (of the Motivational and Situational LDPs), there are 92 leaders and 413 followers.

1.3| Presenting the leadership development programmes

Core to the ESF call LEO were the three leader development programmes (LDP) that were evaluated. Each LDP was designed according to theoretical principles of different styles of leadership, resulting in unique approaches to leadership development.

The first LDP is the **regular/situational LDP**. In the original proposal, this track was known as the regular track as it did not focus on one particular leadership style as an outcome but rather promotes situational leadership skills and behaviours, i.e., picking those leadership skills and behaviours that fit the participating leader, in a specific context with expected short and long term results and in consideration of their followers. that fit the participating leader and a particular follower. The LDP uses a frame of the self, the other, and context to help participants define themselves as leaders in the various elements of leadership (Day & Harrison, 2007). Throughout the report, this track will be called the situational track given its focus on enabling leaders to adjust for leading in a variety of scenarios.

The second LDP is the **motivational LDP**. It is heavily based on the principles of *Self-Determination Theory (SDT)*, a well-established theory on motivation (Deci & Ryan, 2000, Slemp et al., 2018). At its core, the programme teaches participants an SDT-based framework so that they can understand and cater to their followers' distinct needs.

Finally, LDP, **shared LDP** focuses on establishing *shared leadership concepts* and *team identity* in participating teams. The programme is based on research into shared leadership, which posits that team cohesion is a central element in promoting motivation and performance within a team, and that shared leadership is a key means of achieving this team cohesion (Mertens et al., 2021). In contrast to the other two programmes, the full teams participate in the trainings of the LDP, as opposed to just the formal leaders.

Table 1 provides general information (i.e., guiding principles, background) on the LDPs extracted by the research team. Note that appendix 9.6 can be referred to for extensive insights into each programme's design and lay out. Further information on the content and timelines of the programmes can be found in appendix 9.1 .

Notably, while basic information was initially provided about each thematic expert's general approach, a central step for the research team was getting a nuanced understanding of the three programmes to develop the research questions and models. **Four rounds of interviews/meetings** took place with each thematic expert group – three before the data collection and one after.

1. The first meetings focused on getting an **integral understanding** of the methodology /programme design of each LDP. With this, we gained a good understanding of the processes and thematic points of each programme and were able to look at the latest research related to this. Our understanding of the different concepts guiding the LDP, methodology and intended impact, is listed in Table 1. Based on this, we built conceptual models. (April 2021)
2. The second meetings focused on validating the **conceptual models and research design** developed with the thematic experts. Based on the feedback, the models were adjusted, and survey items were developed (June 2021)
3. The third meetings were held to review the proposed **survey items** in their reflection on the intended learning outcomes of the LDPs. Based on feedback, these were adjusted. Surveys were then further developed within the research team and in consultation with external researchers (aforementioned in section 1.2) to better represent the theory. . In addition to these individual meetings, there was a common meeting with all thematic experts, ESF, and Agoria to confirm the final research approach. (July 2021)
4. The final meetings were held to **discuss research results** and the collaboration on the dissemination of the ESF call LEO output. During this meeting, each expert was given personalised insight into results and the mechanisms driving the results were brainstormed. Dissemination was discussed in terms of their involvement and their suggestions for what could be most useful for practitioners. (January 2022)

Table 1: Leadership Development Programmes Overview: The Understanding of the Research Team

	Regular/situational Leadership	Motivational Leadership	Shared Leadership
Central assumptions/ Promoted leadership schemas	<p>The situational LDP does not build on a unified theory about follower motivation and leader influence but is instead based on scientifically identified predictors (behaviours and characteristics) to be used for predicting short and long term effectiveness in motivating and influencing followers (i.e., teams and individuals).</p> <p>Leadership is about impact on results through relations. Each context is specific. We help leaders understanding their specific role (leadership identity and role awareness), understanding the needs of their context and expected results and translating this needs into the right behavior. We help leaders manage and change their behavior in order to increase their impact in the right direction.</p>	<p>The core focus of the motivational LDP is getting participants to understand the impact they have on others. Central to this is bestowing participants with a strong but simple model of self-determination theory (SDT) which they can apply in leadership situations so as to understand their follower’s needs and support the fulfilment of these.</p> <p>The leader takes on various tasks towards the team and the individual team members such as coordinating, delegating, and directing as well as coaching and developing, stimulating creativity, innovation and sharing knowledge.</p>	<p>The core to the Shared LDP’s approach is that team identity is central to achieving motivation among team members and that shared leadership is an effective alternative to traditional, hierarchical (singular) leadership to promoting team identity.</p> <p>Leaders are individuals who influence and facilitate others according to shared objectives. This can be formal or informal. This can be hierarchical (vertical) or shared.</p>
Programme design and approach	<p>With an array of personality tests, frameworks, and exercises, participants are led through the following modules:</p> <p>Leading yourself: self-awareness of one’s tendencies, styles, and identity. Exercises include personality tests and giving “why should others be led by me” speeches</p> <p>Leading teams/others: developing awareness curiosity of the perspectives of others and how to work with this. Exercises involve coaching team members using coaching framework and role games</p> <p>Leading organisations: Understanding to lead in a collective, considering how to lead change and incorporating contextual elements into their leadership. Exercises include a business simulation and defining bigger picture commitments for their future leadership</p>	<p>Self-reflection: Focuses on understanding what motivates them, what are their blind spots so as to promote an openness to development. Exercises include 360-degree feedback and motivation tests. Important is for this to promote intrinsic motivation to change, not extrinsic.</p> <p>Understanding Self-determination theory and the role of motivation.</p> <p>Focus on the team: How to stimulate a sense of responsibility and commitment (i.e., motivation) among employees? Exercises include dialogues with the team, creating positive spirals of learning, as well as learning coaching techniques and principles</p> <p>Monitoring development. Through repeated tests from the beginning of the programme by both participating leaders and their followers, development is assessed, and developmental focus is calibrated.</p>	<p>Promoting team identity: Raise awareness of the importance of the team’s identity for team effectiveness and then defining the team’s shared identity. Exercises include reflecting on team’s core values and assembling them in a trademark.</p> <p>Establishing shared leadership: Readjusting participant’s constructs of leadership towards one of shared leadership. Then based on informal leadership structures, assign leaders of different leadership functions (e.g., motivation, task etc.). Exercises include shared leadership mapping (i.e., identifying informal leadership structures).</p> <p>Anchoring new leadership structure: Reflection throughout the subsequent weeks of step two to assure proper adjustment towards new set up, addressing challenges and focusing team learning objectives.</p>
Intended impact	<ul style="list-style-type: none"> a) Promoting curiosity and openness to development b) Gaining the tools and vocabulary to explore and develop leadership and changed behaviour to increase impact as a leader c) Self-awareness and development of self-narrative d) Greater focus on leader activities 	<ul style="list-style-type: none"> a) Realising own impact on followers in their leader position b) Getting an openness to development c) Developing curiosity towards other’s perspectives d) Gaining the tools and vocabulary (SDT needs) to understand others 	<ul style="list-style-type: none"> a) Increasing team identity b) Seeing leadership as a shared role c) Split leadership role in multiple positions – formalising informal leadership roles

2 | Research design

2.1 | Original research questions

The initial evaluation plan of the LEO-project (as formulated by ESF-Flanders) states two general evaluation questions:

1. **“What is the impact of the three types of leadership training interventions [LDPs] on employee autonomous work motivation and wellbeing?”**

This evaluation question reflects the causal nature of the research design. In addition to investigating ‘if’ there was an impact, it is also relevant to better understand the process of how impact was causally produced. We, therefore, aimed to examine the mediating links in the process, i.e., those variables that explain why and how LDPs may have an impact on employees’ work motivation and well-being. In addition, we wanted to capitalize on the longitudinal nature of the suggested LDP. Such, the following evaluation question was posed: *What do the LDPs develop and how do they have an impact?*

2. **“What variables influence the impact of leadership training interventions [LDPs] on employee autonomous work motivation and wellbeing?”**

Our original proposal suggested a focus on the specific variables at the level of the leader or context (i.e., organisation, the team, or the team member) that influence the impact of the leadership programmes. *What leaders can benefit the most from the LDP? For what teams or team members is this type of leadership the most effective?* These questions tap into the personal and contextual conditions (i.e., a matter of moderation), as well as aspects of the LDP that facilitate or hamper the effectiveness of the LDP.

In developing the evaluation design, some further specifications were made to the above evaluation questions and the way the research was set up, as detailed in section 2.2.

2.2 | Key characteristics of the research focus

During the ESF call LEO, the evaluation team worked closely together with Agoria and the thematic experts to explore the possibilities concerning relevant and feasible evaluation designs. This was an iterative process and, with time, revealed the parameters and limitations at hand and the feasible research design that could be done. The following section provides an overview of the final key characteristics of the research.

- a) LDPs assignment of participating organisations rather than full randomised control

Initially, the plan was to fully randomise the LDP allocation. However, despite the efforts of Agoria, **companies often had a preference to enrol in a specific LDP**. Therefore, the decision was made **to loosen the requirement to fully randomize LDP allocation**. However, within organisations randomisation of teams to the control vs. intervention group for each LDP was maintained.

Benefits: This allows for a greater range of potential participating companies and for us to hit our intended participant numbers.

Drawbacks: Reduced capacity to use randomised control trial (RCT) based analysis to draw conclusions about comparative effectiveness (i.e. for between-company comparison). The data will only allow testing for the individual’s effectiveness (i.e. for a comparison between the intervention and the control group).

Mitigation: Instead of using an RCT-based analysis for between-LDP comparison, we compare the effectiveness of the LDPs against the control group (rather than against each other).

b) Evaluation of each LDP rather than comparing the LDPs on their effectiveness

In discussion with the thematic experts and Agoria, it became clear that the total number of participants (for the intervention and control group) was limited. Unfortunately, this number was **not large enough to create a valid direct scientific comparison** between each of the three LDPs based on a randomized control trial (e.g., comparing differences between LDPs). This would require a much larger sample size. Moreover, and perhaps more importantly, if we wanted to directly compare the three programmes, then it would have required a more controlled design, where various extraneous factors were kept the same across the programmes such as the timings, facilitators, participant's organisation, position, etc. Instead, this project became a field study, which is more fitted to answering other questions, such as what works and what doesn't (and why) within the programmes.

These limitations resulted in the **focus of the evaluation being on the programmes' individual effectiveness, rather than the comparison between LDPs**. This is important to note, especially given that a large part of the measured constructs among leaders and their followers are the same for each programme, which may look for comparison. However, the scientific intention of these common measures was a greater understanding of our general model, in pursuit of a general means of measuring and evaluating LDPs. The questionnaires were developed in collaboration with the experts, to ensure the general model was in line/captured the outcomes they intended to achieve and the original call in evaluating the LDP's effectiveness.

Therefore, the following action plan was used:

1. Gather common data points by measuring changes in leadership behaviour as well as follower autonomous motivation and wellbeing.
2. Use this data to evaluate each of the individual programmes, while also better understanding how to measure and evaluate leadership development (programmes).

Benefits: By measuring each particular LDP against the overall model, we can draw scientific conclusions strong enough to be informative for companies and be published.

Risks: Reduced capacity to use RCT-based analysis to draw conclusions about comparative effectiveness.

Mitigation: Instead of using an RCT-based analysis for between-LDP comparison (we can only use this for evaluating the effectiveness of the LDPs individually), we will make between-LDP comparisons using a comparison of effect sizes.

c) Measuring leader performance

The ESF call LEO set out to assess follower motivation and well-being. Ideally, we would include also objective variables such as other-related performance, sickness absence and turnover, to increase its business relevance. However, as the research developed, it seemed more feasible to limit measurements to self-reported employee motivation and wellbeing as the key-dependent variables and to not include individual or organisational performance outcomes. The main reasons were:

- a) The sample size is too small to compare objective outcomes,
- b) There is a considerable amount of noise between motivation and (organisational) performance, which is influenced by a wide range of factors and
- c) Meta-analytic results already established a link between employee motivation and employee performance (Van den Broeck et al., 2021).

We, therefore, kept the focus on the leader's performance, specified as their ability to motivate followers.

Benefits: This focus aligns more appropriately with the LEO set-up, given its focus on leadership development and – moreover – the ESF call LEO will provide strong and unique data to test this relationship, as the leader behaviour will be influenced by the LDP (i.e., quasi-experimental data), which then will be linked to the leader's own processes and the followers' ratings of their leader.

Risks: The study will not be able to make any claims concerning the relationship between the LDPs and employee performance.

Mitigation: Given the extensive past research on the link between needs fulfilment and motivation and individual performance (Van den Broeck et al., 2016 and 2021), we can rely on this previous research showing that motivation relates to individual performance.

2.3 | Research model

The literature on leadership has a long tradition. At the beginning of the scholarly interest in leadership (Fry, 2003), it was assumed that leaders were born (not made) and the focus was on discovering the inherent characteristics with which future leaders were endowed (e.g., extraversion). Further developments in the literature suggested that leaders could come in different forms and sizes, and that behaviour, rather than inborn characteristics would be predictive of good leadership. Good leaders engaged in task (e.g., clarifying, protecting) or human-related (e.g., encouraging) behaviours (e.g., Yukl, 2012). Hence, leadership development programs would focus on teaching these behaviours, and where and when leaders should engage in these behaviours to be effective. Today, some see such a behavioural approach as too shallow and shift their focus to how (future) leaders **think about leadership**, as only through influencing this thinking, leaders will truly learn to engage in the behaviour at the right time at the right place (Carton, in press).

2.3.1 | General research model

Our general research model (see figure 1 below) highlights **how changes in leader mindsets, because of their participation in the LDP, relates to changes in leader behaviours, which then give rise to follower autonomous motivation and well-being**. This design, along with the specific constructs measured underneath each bucket are not only inspired by the research developments mentioned in the previous paragraph, but also from the conversations held with the experts. These conversations individuated that the trainings were not only to influence leadership behaviour directly (i.e., training the execution of a new, specific behaviour), but more indirectly as well, through changing how the leaders see themselves, the world around them, and specifically how they view leader/followership. With that in mind, we took the suggestions of the experts and merged these with mindsets suggested by literature to promote effective leadership. For example, the situational LDP developers discussed the importance of being open and curious in one's leadership, leading to the inclusion of diversity mindsets. These various mindsets were then incorporated into a general research model, which was asked of all participants, so as to be able to compare the various programmes, in response to the original ask of the ESF call LEO.

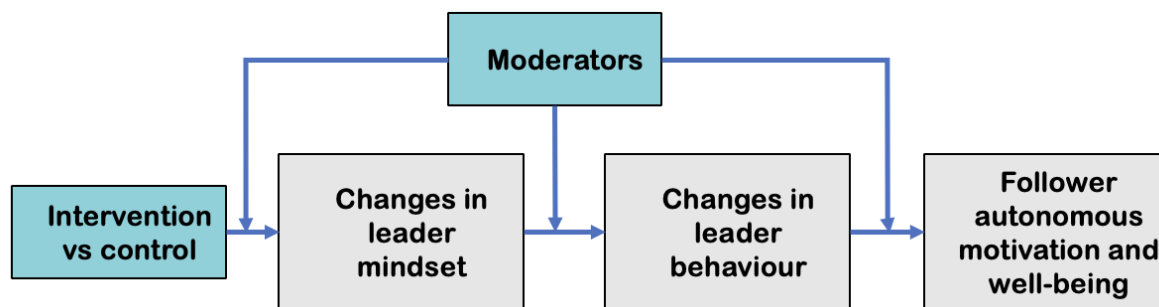


Figure 1: General Research Model

Mindsets or implicit theories that leaders may have about themselves, followers, or the world have been argued to lead to behaviours (Lord et al., 1999; Bargh & Chartrand, 1999). As voiced by Wittgenstein: “Language delimits our thinking” – similarly how leaders speak about themselves, followers, and the world has an impact on how they ultimately behave. That is not to say that behaviour cannot be changed through other means (e.g., behavioural training) but in the relative short space of LDPs, there is no time for frequent and specific behavioural training (akin to parents repeating behavioural rules over several years) – instead development needs to be accelerated in these trajectories. The benefit of changed mindsets is its generalizable application – meaning that while new behavioural habits are specific to a set of conditions (e.g., I will only smile when triggered by a certain behaviour), mindsets are more generalist in that the leader will find different ways to express the mindset depending on the situation.

There are a wide variety of mindsets that could help facilitate the demonstration of leader behaviours. After talking to the experts and considering the unique nature of this project, however, our focus fell first and foremost on what we call *humanistic mindsets*. Rather than focusing on the self-views of leaders (e.g., their identity) or views on leadership (e.g., leadership schemas), humanistic mindsets focus on how leaders view other human beings (i.e., followers) – and thus reveals their fundamental assumptions about other human beings. As leadership concerns influencing or motivating others, we believed that the assumptions we have about the human beings we intend to influence is crucial. For instance, theory Y has the fundamental assumptions that human beings are not lazy but can be intrinsically motivated towards a task. This is important because that assumption may trigger leaders to empower more. Similarly, a diversity mindset (where leaders stay open to others) may encourage leaders to be more supportive to a wide range of different followers. We believe the mindsets selected here would be good predictors of the core leadership behaviours.

Ultimately, mindsets translate into **leader behaviour**. For the behavioural side of the equation, we have used the Big Four model of leadership (Yukl, 2012) that summarizes the past 100 years of leadership research into 4 essential buckets of leader behaviours. This is relevant to our research because it captures all angles to successful leadership behaviours. There are also good reasons to believe that they uniquely map onto to the psychological basic needs (competence, autonomy, relatedness, and security), we know are important for follower autonomous motivation (Van den Broek et al., 2016, 2021). So, for instance empowering leadership behaviour is clearly geared towards autonomy and supporting clearly towards relatedness, which then fuels into followers autonomous and controlled motivation as well as their well-being.

Guided by this general model, the evaluation of the LDPs in the ESF call LEO starts from a focus on how leaders that go through the LDPs (vs. the control groups) change their mindset. These changes in the way leaders think will then fuel changes in their behaviour towards their followers, which impacts followers’ autonomous motivation and well-being.

In the following section (section 2.3.2), we present how we operationalised the generic causal model through different constructs based on scientific literature on leadership.

2.3.2 | Operationalization of the research model into research questions

In this section, we provide an overview of the measured and reported constructs of the research¹. Figure 2 provides an overview of these constructs embedded in the general research model shown in figure 1. In the following sub-sections, each of these constructs are explained, in their origin and how their corresponding research questions.

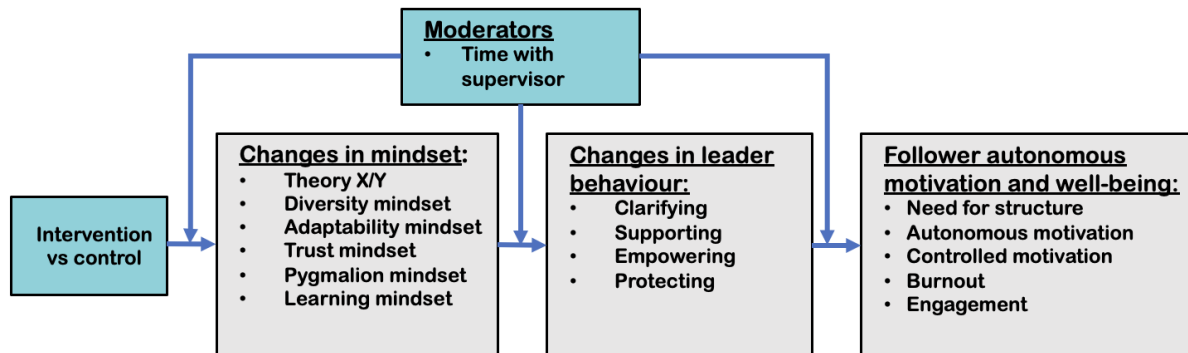


Figure 2: General Research model with measured constructs included

2.3.2.1 | Changes in leader mindset

In line with the recent developments in the literature, the different LDP's thus aim to change how leaders think, i.e., change their mindset. This pertains to

- how they think about being a leader and leadership in general and
- how they think about their followers and what they might need.

To assess the changes in mindset, we rely on the following constructs:

Theory X/Y mindset: The different LDP's aim to influence how leaders think about their employees. We capture this in terms of Theory X and Y mindset. While in a Theory X mindset leaders would assume that followers are lazy and need to be controlled, in a Theory Y mindset, it is expected that followers are proactive but need to be stimulated in the right way for them to direct their energy in the line with the goals of the organisation (Kopelman et al., 2008). We will aim to answer the question: *How do the different LDPs influence leader thinking about their followers in terms of Theory X/Y mindset and how does this influence their subsequent leader behaviour and followers' outcomes?*

Diversity mindset: A diversity mindset (Van Knippenberg et al., 2013) refers to the fundamental belief that there is value in interacting with diverse others. Such a diversity mindset has been shown to

¹Notably, a range of other constructs were measured. However, to keep the report succinct and focused on answering the core research question, they are not reported in this report. For more information on the additional measures, we refer to the contrast overview in appendix 9.1.1. For example, in developing this study, we hypothesised that also the personal and contextual factors of leaders and followers would influence a) the impact of the LDP and b) the relationships between leader mindset, leader behaviors and employee outcomes. The measured personal variables include (for both leaders and followers) personality (HEXACO model), values (Schwartz value theory), and self-concept. The measured contextual variables include organisational perspective on training and work intensity. In addition, as control variables, leader-member social exchange, perceived impact (leader self-rating) and perceived effectiveness (rating of leader by followers), positive/negative affect (both leaders and followers), amount of conflict in teams, and leader's satisfaction with the trainings and rating of trainer's charisma. However, due to the relatively limited number of participants at the onset of this study, these were not included in the analysis.

trigger behaviours from leaders important to listening and being curious about others. Accordingly, aim to answer the question: *How do the different LDPs influence leaders' diversity and how does this influence their subsequent leader behaviour and followers' outcomes?*

Adaptability mindset: An adaptive mindset (VandeWalle, 2001) refers to a leader's ability to switch his/her desired behaviour depending on the situation. This is important as leader may really need to double-down on the satisfaction of needs for certain followers and more for others. In other words, this adaptability mindset should help the leaders in showing situationally contingent leadership. Aligned with this, we check whether leaders do indeed show this need-sensitivity we would expect from adaptable leaders. Given this is an explicit focus of both the situational and motivational trajectories, we will aim to answer the question: *How do the different LDPs influence leader adaptability mindset, and ability to sense and adapt uniquely to each of their follower's needs and how does this influence their subsequent leader behaviour and followers' outcomes?*

Trust mindset: In line with a mindset in line with theory Y, the propensity to trust is defined as the general willingness of an individual to trust another person (Colquit et al., 2007). Research shows that those high on a propensity to trust have little need to excessively control the actions of others – by definition, they are willing to be vulnerable to others, even if that means the others can hurt them. This could have a key influence on whether leaders are willing to empower and autonomously motivate their followers (delegate versus control). We will aim to answer the question: *How do the different LDPs influence leaders' propensity to trust and how does this influence their subsequent leader behaviour and followers' outcomes?*

Learning/Pygmalion mindset: A learning mindset (Dweck, 1999) and Pygmalion mindset (Eden, 1992) refers to the fundamental belief that followers are talented and that they can be developed. When one believes that followers are fixed in their personality – meaning they are who they are and they cannot change - leaders are likely to be less willing to go actively engage in developing their followers. Similarly, a Pygmalion mindset – believing your followers are capable, sets on a self-fulfilling prophecy where leaders see their perceptions about followers enacted. We will aim to answer the question: *How do the different LDPs influence leaders' learning/Pygmalion mindset and how does this influence their subsequent leader behaviour and followers' outcomes?*

In short, regarding leader mindsets, we have the following research question:

- *Research Question 1: How do the different LDPs influence leaders' mindset (i.e., Theory X/Y, trust mindset, Learning/Pygmalion Mindset, Diversity Mindset, Adaptability Mindset – H1a) and how does this influence their subsequent leader behaviour and followers' outcomes (H1b)?*

2.3.2.2 | Changes in leader behaviour

To assess whether the LDPs and the changes in mindset that are assumed to result from LDPs lead to differences in follower motivation and well-being, we want to establish whether the participating leaders also change in their behaviour, as observed by the followers. Hence, we assess:

Leader behaviours: Building on the work of Yukl (2012), Leroy et al. (in progress) have identified the 4 different leadership behaviors (listed below). This summarizes the past 100 years of (effective) leadership and thus gives us a good baseline of the type of behaviours that are motivational to followers (i.e., help to satisfy follower basic needs). These are:

1. **Clarifying** the work to employees so they understand the work that needs to get done by what standards.

2. **Supporting** for employees by showing concern for their ideas and problems and supporting them in the best possible way
3. **Empowering** employees to do a job in a way that they see as best and aligns with their capacities.
4. **Protecting** by providing rules and norms within and outside the organisation.

Specifically, we aim to answer the following questions:

- *Research Question 2: How do the different LDPs influence leader behaviour (i.e., clarifying, supporting, empowering, and protecting – H2a); and how do these behaviours influence followers' outcomes (H2b)?*

2.3.2.3 | *Follower autonomous motivation and well-being*

The primary focus of LEO is to examine the impact of LDPs on follower motivation and well-being as outcomes as described above.

Follower need satisfaction. SDT assumes that people will grow, hold high quality motivation and function optimally (Van den Broeck et al., 2021) when they have their basic psychological needs satisfied. Three needs are deemed essential within SDT: the needs for autonomy (i.e., to function psychologically free), belongingness or relatedness (i.e., to love and care and to be loved and cared for) and competence (i.e., to have an effect on the world). In order to assess whether the LDP's influence leader's capacity to optimally stimulate their employees and in line with how we assess employee autonomous vs. controlled motivation, we will assess the degree to which followers feel satisfied in their needs in their relation to their leader and ask the following question: *To what extent do the different LDPs influence followers' basic need satisfaction?*

Follower need for security. Although SDT assumes that to date there are only three needs which are deemed 'basic' or 'essential', research suggests that security need may be good candidates to be considered as essential for employee functioning as the needs for autonomy, belongingness, and competence (Dweck, 2017). These is also the need for structure, which pertains to the degree to which situations and expectations are clear. Similar to the ABC-needs of SDT, the need for structure and self-esteem have been related to positive outcomes such as well-being (Sheldon et al., 2001). We add them into the evaluation of the ESF call LEO, as these (potentially also: basic) needs have high relevance in the realm of leadership. We ask the following question: *To what extent do the different LDPs influence followers' need for security?*

Specifically, in terms of needs, we thus as the following question:

- *Research Question 3: To what extent do the different LDPs influence followers' satisfaction of the basic needs for autonomy, competence and relatedness, as well as the need for security (H3a); and how do these influence followers' motivation and well-being (H3b)?*

Follower autonomous motivation: In line with the initial intentions of the ESF call LEO, we assess follower motivation by relying on the constructs of controlled (e.g., because of external or internal factors) and autonomous motivation (i.e., engage because one considers the activity at hand important/valuable or fun/interesting) of the Self-determination theory (SDT) (Deci & Ryan, 2000). Notably, we don't focus on employee motivation for work in general, as this type of motivation may depend on various other aspects, such as their job design, the organisational culture etc. Rather, to keep in with the topic of LEO, we assess whether employees autonomously follow their leader or whether they feel obliged or inner pressured to do so. Specifically, we aim to answer the following question:

- *Research Question 4: To what extent do the LDPs trajectories influence followers' autonomous vs. controlled motivation (H4a) and how do these influence followers' well-being (H4b)?*

Follower burnout and engagement. To assess employee well-being, we focus on the complementary constructs of burnout and engagement. Burnout is seen as a three-dimensional syndrome of emotional exhaustion (i.e., feeling drained), cynicism (i.e., a negative, callous, attitude towards work) and a lack of personal accomplishment (i.e., feeling one's efforts are ineffective) (Schaufeli et al., 2002). In contrast, engagement can be defined as a positive, fulfilling, work-related state of mind that is characterized by vigour (i.e., high levels of energy), dedication (i.e., enthusiasm and sense of significance), and absorption (i.e., being fully concentrated). (Schaufeli et al., 2002, p 74). Including both will enable us to answer the questions how the LDPs influence the well-being of employees. Specifically we aim to examine

- *Research Question 5: To what extent do the LDPs trajectories influence followers' engagement and burnout?*

3 | Data collection strategy and plan

3.1 | Participant recruitment and LDP allocation

3.1.1 | Recruitment of organisations

Agoria organised the recruitment of organisations the basis of several criteria. The chief principle for selection was that the organisations were based in Flanders and that they were able to nominate several 1st line leaders who have at least three followers, such that we could have leaders from the same organisation in both the intervention and control group.

During first contacts with potential partner companies and organisations, Agoria received the unilateral feedback that the organisations wanted to make sure that the LDP aligned with their company values. Organisations were not fond of the randomisation (i.e., not knowing which LDP they would get), yet had a (clear) *preference for a particular* LDP. For example, for the Shared LDP, all companies who preferred this LDP already had embraced matrix or self-organising set-ups among the teams they wanted to get involved. These teams already have a strong focus on enabling autonomy for every worker. Such, the decision for this LDP necessitates an aligned company philosophy (in believing in matrix/self-organised organisation) as well as the team role and team dynamics that allow or even flourish from such a design. For the situational and motivational tracks, there was a similar demand of picking the best fit.

3.1.2 | Random assignment to intervention or waiting list control group

The project promoted the *random assignment of LDP participants to either the intervention group or waiting list control group within their organisational clusters*. In other words, if company x provides 6 leaders to participate in one of the LDPs, these 6 were to be randomly assigned to either the intervention or waiting list control group. To note is that the task to allocate leaders was done by the company itself, as there were vital staffing considerations that had to be considered (e.g. some teams were not yet formed at T1). This implies that, while prioritised, groups could not be perfectly randomised (e.g. some intervention vs control teams seem to differ in their hierarchical level).

3.2 | General survey design

The design of the research focused on capturing the developmental trajectory of LDPs participants over time and the corresponding impact on their followers. While the **LDPs ranged from two to four months in length, surveys were collected on a regular basis before, during, and after the LDPs**. This design allows for both capturing the immediate impact of the LDPs and the longitudinal developmental processes of leaders and the impacts of these on their followers. The survey design is captured in the figure below. Use it as reference as you read this section's sub-sections.

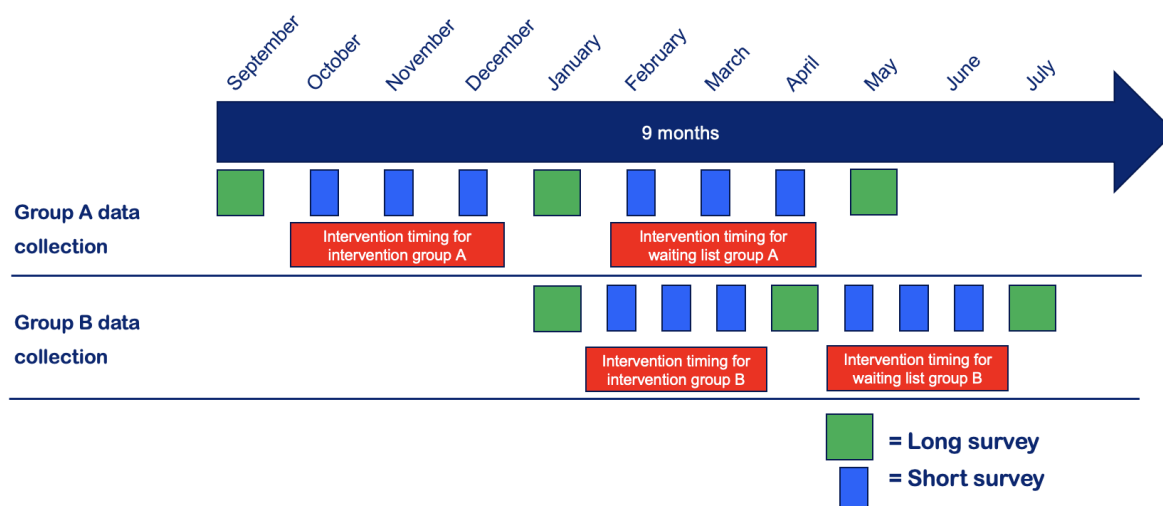


Figure 3: Data collection process

3.2.1 | Survey Timing

Data was captured over 9 data points on two different time interval rhythms: the original monthly collection rhythm (Group A in figure above) and the added 3-week collection rhythm (Group B in figure above). The monthly collection ran from September to May (nine months), whereas the three-week collection ran from January to July (seven months). The reasoning for the two separate trajectories (as the original design was only one) were delays of select intervention timing. These delays were caused by a variety of reasons, ranging from the rise in Covid cases over winter 2021, a cyber-attack on one of the participating companies, and the delay of team formation.

3.2.2 | Intervention vs (waiting list) control groups

The *intervention groups* and *waiting list control groups* received the surveys simultaneously so as to capture the LDPs' effects. This resulted in capturing an intervention/control group comparison, post-intervention development trajectories for the (original) intervention group, and pre-intervention development trajectories for the control group/waiting group.

3.2.3 | Survey length

To maximise the longitudinal data captured without overburdening participants (and increasing dropout rates), **a mixture of longer and shorter surveys was used**. The longer, more occasional surveys entailed items that we did not think require being tracked on a monthly basis. As seen in figure 3, the longer surveys took place at the beginning, middle, and end of the data collection period, allowing for the regular capture of these broader items, as well as serving as pre-/post-data collections for the LDPs.

The *length of the surveys* was subject to careful consideration. The research team's combined experience has shown how challenging field surveys can be at times, especially in maintaining participation rates, especially over multiple measurement points. However, given that the research project also funds a LDP for the organisation and their leaders, the companies are highly invested in the research part as well. Balancing our concern to keep the surveys short and our rich theoretical model resulted in the situational and motivational leader survey being 40 minutes in its long form and 10 minutes in its short form. The Shared LDP surveys had similar timing. The follower survey of the situational and motivational tracks was somewhat shorter, with the long surveys being about 20 minutes and the shorter surveys around 10 minutes.

3.2.4 | Survey content

Across the trajectories, the same concepts were captured. However, given the differences in LDPs, there was some differentiation in the survey design.

For the **Situational and Motivational LDPs**, leaders and followers received different surveys. Leader surveys focused on capturing the elements within the aforementioned general model (mindsets, qualitative questions) (section 2.3.1), whereas the follower surveys focused on identifying behavioural changes in the leaders, as well as the follower's motivation and well-being.

In the **Shared LDPs**, the whole team participated in the LDP and who would become a leader and who would become a follower was only defined during the course of the LDP. As such, it was not possible to pre-emptively delineate leader and follower-oriented items into two separate survey. Such, the whole team received the same survey. This survey consisted of a combination of the items of the leader and follower surveys that the other two LDPs' participants received. Participants were then retrospectively as leaders or followers, allowing us to use the leader-oriented items for individuals promoted to leadership and vice versa for followers. This implies that, in the analysis phase, only the leader data of leaders and the follower data of followers was used. Some constructs were measured with fewer and no qualitative items were included so as to keep the surveys reasonable lengths. Notably, a section of the questionnaire will be a round robin, where the survey participants must answer questions regarding the leader behaviour of each of their colleagues. You can find the surveys in the appendix 9.1.

Category	Variable	Reference	Leader rated					Follower rated				
			T1 Long	T2 Short	T3 Short	T4 Short	T5 Long	T1 Long	T2 Short	T3 Short	T4 Short	T5 Long
Mindsets	Theory X/Y	Kopelman et al., 2008	x									x
	Diversity mindset	van Knippenberg et al., 2013	x					x				x
	Adaptability mindset	VandeWalle, 2001	x					x				x
	Trust mindset	Epitropaki et al., 2017	x					x				x
	Pygmalion mindset	Eden, 1992	x					x				x
	Learning mindset	Dweck, 1999	x					x				x
Behaviours	Clarifying	Yukl, 2012						x	x	x	x	x
	Supporting	Yukl, 2012										
	Empowering	Yukl, 2012						x	x	x	x	x
	Protecting	Yukl, 2012						x	x	x	x	x
Follower needs satisfaction and well-being	Competence satisfaction	Deci & Ryan, 2000						x	x	x	x	x
	Relatedness satisfaction	Deci & Ryan, 2000						x	x	x	x	x
	Autonomy satisfaction	Deci & Ryan, 2000						x	x	x	x	x
	Security satisfaction	Dweck, 2017						x	x	x	x	x
	Autonomous motivation	Inceoglu et al., 2019						x	x	x	x	x
	Controlled motivation	Inceoglu et al., 2019						x	x	x	x	x
	Burnout	Schaufeli et al., 2002						x	x	x	x	x
Engagement	Schaufeli et al., 2002						x	x	x	x	x	

Figure 4 - Measured variables and their survey allocation²

Figure 4 shows an overview of the measured and reported data points from the L/F surveys. To note is that leader rated elements were questions, where the individuals reflected on themselves, whereas follower responses were either reflections on what they perceived their leader thought/enacted or reflections on their own well-being.

² Note that this overview is a reflection of the reported variables. Other variables were measured but are not reported here to keep in with the core research questions of the LEO research project.

3.2.5 | Survey distribution

Surveys were sent out to the *emails* of programme participants and their followers that are provided by the organisations. The surveys were run and collected via Qualtrics, an online survey software, widely used in research. Once collected, the raw data was uploaded to the University's secure online cloud and the data was pseudonymized i.e., any unique, identifiable data (names, teams, emails etc.) were replaced with a unique code, meaning the core data document cannot be linked back to the individuals as explained in our data management plan (in appendix 9.2). From there, all data processed was used in its pseudo-anonymised form, allowing for protection of privacy of participants while still allowing for linking the responses of leaders and their followers or between team members or simply between the different waves of data collection.

3.3. | Survey question selection

3.3.1 | Survey quantitative elements

Appendix 9.1 includes the questionnaires, along with an indication of which items measure with constructs and the scales used.

All measures used in the survey were **pre-validated in prior research**. Based on these original scales we shortened some scales, based on

- validated abbreviated scales where possible,
- the reported factor analyses of these scales in previous research, using the highest loading items if no validated abbreviated scales exist,
- own previous research and the factor analyses based on these samples (e.g., Big X of leadership),
- previous research expertise to choose the most relevant items for this research.

In terms of the **language for the questionnaires**, we start from the scientifically validated questionnaires and use the Dutch versions that were used in previous research where possible. The remaining English questionnaires are translated into Dutch and French using Breslin's (1970) translation back translation method to ensure the validity of the questionnaires.

Throughout the survey rounds, we always asked participants to rate a construct on their current state. However, during the long surveys (surveys one, five, and nine), we also asked participants to provide their **retrospective rating** of 4 months ago alongside their current rating of a construct. By capturing the relative difference between the retrospective and current rating, we are able to **capture perceived changes in the constructs**.

A pre-/post-test assumes that the standard for measuring the concept does not change. However, participating in such a programme may alter how leaders (and their followers) appraise a concept and its measures (Rohs, 2002). For example, leaders (and followers) may not yet fully understand a construct and only gain an understanding of its meaning and breadth through the program. Or before their program, they feel they score e.g., average at the beginning of a program, only to find out that there is so much more to learn. Such scores may also be prone to ceiling or floor effects and don't allow one to take into consideration any specific events that may alter one's answers. They furthermore may suffer from retest effects (Little et al., 2002).

Retrospective measures may overcome these limitations. Such measures are not without criticism either. They have been criticized for suffering from recall bias, yet research suggests that this impact of such a bias is limited (Middel et al., 2006), yet they have also been lauded as psychometrically and practically strong alternatives for pre/post measures (Little et al., 2020). As previous research

suggested that pre-post measures may underestimate the effect of leadership trainings (Rohs, 2002), and both pre-post measures and retrospective measures have benefits and drawbacks, we included **both** to assess the impact of the LDPs.

These questionnaires were presented to a group of research experts to check their **comprehensibility**. This expert pool was made up of colleague researchers from the wider network of the research team who were familiar with the topic of the investigation and experts in terms of survey research.

3.3.2 | Survey qualitative elements

In addition to our survey items probing for quantitative data, the qualitative questions embedded in our research further allows us to gain insight in leaders changed over time. Specifically, we are curious about:

- **Chief learnings:** To capture the learning experience of the leaders, we ask the question: *Reflecting on your own experiences as leader from the past month, please share **as many insights as you have had** on what it means to be an effective leader – highlight your previous thoughts/feelings and how they have changed.* This is built on research on epiphanies, which are defined as a sudden transformation of the self as result of self-referential insights (Dane, 2010). In this case, we explore to what extent the LDP promotes such developmental moments. Using epiphany protocols, we can code and gather the insights people have in a systematic way. From this, we hope to gain a more nuanced insight into the question: “What changes in mindset are triggered in leaders by the LDPs they are participating in?”, without probing these mindsets ourselves. This may allow other changes to emerge inductively.
- **Developmental goals:** Complementary to looking backwards to what they have learned, we also ask leaders what they want to develop in the upcoming months. The question reads as follows: *Based on these insights, formulate goals on how you would like to lead in the coming months (i.e., exactly what you want to try differently).* In this, we intend to systematically code the developmental goals of participants to see which goals/behaviours the leaders intend to experiment with. This will allow us to see whether the train actually targets it’s intended behaviours and allow us to answer: *How does the participating leader intend to translate their mindset changes into behaviours?*

We also probed employees to provide examples of the specific behaviors they saw their leaders engaging in.

3.4 | Division of roles and practical agreements regarding data collection

A chief risk in this design are dropouts, or participants not filling out surveys. As such, it was important to have clarity on how the different parties collaborated to ensure high levels of survey participation.

Despite these attempts, the data collection process was a time-intensive process for the research team, given the bottleneck of only the research team administrating the surveys, meaning they were the only ones able to send and resend surveys, keep track of respondees, troubleshoot issues, etc.

Table 1 - Task distribution among LEO teams

Task	Agoria	Contact person in the organisation	Research team
Inform the organisation (e.g., HR managers) about the data collection in terms of its content and what it requires of them as an organisation	X		X
Set up timing data collection for each of the waves (incl. moment of sending out, individual and collective memories and moment of feedback).	X		X
Collect contact details/identifiers of the participants (to enable the administration of the digital surveys and the link between the data of the different waves)	X	X	
Informing participants and other stakeholders in the organisation about the timing and intention of the measurements		X	X
Invite and send follow-up data collection (e.g., Send reminders) per measurement		X	X
Keeping informed of the response rate within the organisation			X
Encourage participants to fill out the questionnaires	X	X	X
Developing information sessions/content for organisations	X		X

3.5 | Managing threats to validity

3.5.1 | The impact of surveys on participants

A challenge in capturing leadership development through self-reporting was that it can have an impact on the subjects (i.e., asking a leader to reflect on their leadership development could influence their development). While this may lightly affect the development of the intervention group, our waiting group experiences the same survey, meaning the data still provides insight into how the intervention and control groups are distinct in their development.

3.5.2 | Participant fall out

Likely the greatest threat to validity was the fallout of study participants. Past experiences of the research team and of other researchers showed that maintaining consistently high levels of participation proves difficult in field studies (Ghanem et al., 2021). Especially during the control period, when no actual intervention was taking place, there was little tangible incentive to participate. Further, the majority of participants are followers, who do not actually receive any direct form of intervention from the LDP.

Upfront our main approach to this challenge was moving the sense of ownership of participating as close to the participants as possible. Given that the ESF call LEO sponsored the participation of all involved leaders in the various LDPs, the beneficiaries of this are the participating organisations and the leaders who take the LDPs. Therefore, we thought the best way to keep response rate high is to lean on the existing “incentives” of the LDPs themselves and move the feeling of ownership to these beneficiaries. There are multiple elements to how this was achieved.

First, Agoria took ownership of ensuring participation, given their closer communication with the participating organisations. Further, Agoria has incorporated research participation into the contracts with the organisations, reserving the right to withdraw the LDP and/or demand the organisation to pay for the LDPs themselves if a certain participation percentage was not achieved (see below for exact article). Of course, such drastic actions were highly undesirable and not at all our preference but we saw this as a means of stressing a transactional element with the participating organisation – the participation in research is the payment for these LDPs and it is on them to ensure their end of the bargain was fulfilled.

„Voor de deelname aan het project wordt aan de Deelnemende organisatie geen kosten aangerekend. De Deelnemende organisatie verbindt zich er wel toe het hele Project door te lopen en de nodige tijd te geven aan haar personeelsleden om deel te nemen, en dit aan zowel het leiderschapsontwikkelingstraject als het onderzoek, zoals in deze Overeenkomst en bijhorende documenten wordt vastgelegd.

Indien de Deelnemende Organisatie verzaakt aan bovenvermeld engagement zal zij gehouden zijn, tenzij overmacht, de hierdoor gederfde inkomsten van de betreffende expert(en) te vergoeden, overeenkomstig de afgesproken tarieven in dit Project.”

Ownership was further incentivised through a strong communication plan (see appendix 9.4), which involved early communication of their expected actions in achieving a high level of survey participation. This included an introductory session held in August 2021, where HR managers and the leadership of participating organisations got extensive insight into the research, the process involved, and their responsibility in achieving the target survey participation. Ensuring upper management recognised the time investment of participating in surveys as part of the employee’s work activities is essential in enabling participation.

Finally, the research team encouraged participating leaders to recognise and thank their followers for their effort, as direct appreciation may speak more strongly than company policy to them. Leaders were reminded in the survey distributions, and email communications (survey text in appendix 9.1).

3.5.2.1 | Dealing with participant attrition

The first survey proved challenging, given participants’ unfamiliarity with the process, its length, and, importantly, organisations’ overcommitment of follower respondents. Organisations overcommitted with regards to the involvement of the followers in the research. For example, one of the production companies had signed up full teams, meaning that, for the first survey, they had a production stop on some lines to make time for allowing a majority of the (blue-collar) followers to respond. The original amount of survey participants vs those involved in the first survey are shown in Table 2 below. For more information the evolution of participants per round, per track, per team, refer to Appendix 9.1.5.

To deal with all this, we provided extra time to respond, individual support of organisations in terms of communication and process explanation, and by working with organisations to reduce their follower respondent demand so as to make the survey manageable. For teams larger than 6, we reduced the per leader follower respondee list to 6-7 employees. This number was chosen to allow

room for 1-2 people to fall out through natural attrition over the coming months. This was not done for the shared leadership teams, as for these, it was important to get the round-robin results of the full team.

Leaving the buffer was important, as approximately 1/3 of the teams faced attrition of at least 1 member over the coming 4 months due to sickness, maternity leave, switching teams/roles, or job roles. All in all, the attrition faced is reflected in Table 2 below, which shows the attrition per category.

Table 2 - Comparison of actual vs original survey participants

LDP	Respondee type	Actual amount	Original amount
Motivational leadership	Leaders	35	64
	Followers	228	591
Situational leadership	Leaders	57	57
	Followers	185	190
Shared leadership	Teammembers	175	265

3.5.2.2 | Dealing with participant fatigue and non-responders

To have sufficient response rates per round, we set a target of 100% leader response rate and an 80% follower response rate. For the first rounds, this was generally achieved thanks to persistent communication with participants directly (follow-up emails), as well as through close collaboration with the organisational representatives and participating leaders. However, due to the workload of all parties – the research team, Agoria, organisation representatives, and survey respondents – in January 2021, all parties met for a meeting to address this challenge. It was agreed to lower the target response rate to 80% for leaders and 60% for followers and that less pressure would be given by the research team (given the intensive time cost before survey 5 and also due to the incumbent second survey wave cycle). However, response rates dropped further and the data coming out of survey waves 6-9 of Part 1 data collection was limited (shown in Table 3).

The alternative to lowering the response rate demands was to shorten the survey by removing items (and thereby constructs). However, we did not see this as a viable option as we did not want to randomly (out of fear of losing potentially valuable variables) nor selectively (as this would be unethical research practice).

Table 3 - Response rate development of Part A data collection over the 9 surveys

Survey Group A		Survey 1		Survey 2		Survey 3		Survey 4		Survey 5		Survey 6		Survey 7		Survey 8		Survey 9	
Trajectory	Company	% answer (L)	% answer (F)	% answer (L)	% answer (F)	% answer (L)	% answer (F)	% answer (L)	% answer (F)	% answer (L)	% answer (F)	% answer (L)	% answer (F)	% answer (L)	% answer (F)	% answer (L)	% answer (F)	% answer (L)	% answer (F)
Shared LS	Company 1	n.a.	87	n.a.	87	n.a.	87	n.a.	74	n.a.	95	n.a.	85	n.a.	80	n.a.	60	n.a.	60
	Company 2	n.a.	100	n.a.	100	n.a.	94	n.a.	94	n.a.	88	n.a.	76	n.a.	65	n.a.	24	n.a.	29
	Company 3	n.a.	100	n.a.	100	n.a.	100	n.a.	86	n.a.	71	n.a.	57	n.a.	43	n.a.	14	n.a.	29
	Company 4	n.a.	86	n.a.	54	n.a.	54	n.a.	38	n.a.	80	n.a.	81	n.a.	55	n.a.	20	n.a.	20
	Company 5	n.a.	89	n.a.	89	n.a.	83	n.a.	78	n.a.	78	n.a.	61	n.a.	44	n.a.	36	n.a.	33
	Company 6	n.a.	89	n.a.	67	n.a.	89	n.a.	72	n.a.	78	n.a.	56	n.a.	28	n.a.	22	n.a.	33
	Company 7	n.a.	71	n.a.	71	n.a.	86	n.a.	83	n.a.	83	n.a.	50	n.a.	83	n.a.	33	n.a.	33
Mott LS	Company 8	100	54	100	74	100	78	100	74	89	58	89	62	78	58	33	34	56	39
	Company 9	100	40	89	46	89	42	78	56	100	65	89	38	78	13	11	2	11	4
	Company 10	100	87	100	89	100	84	100	76	100	80	78	80	78	58	0	25	22	20
Sit LS	Company 11	93	66	57	61	73	63	67	43	77	63	77	58	50	39	0	35	43	29

3.5.3 | Generalised/lazy answers

In the selection of items, we noticed a trend of items focusing on traits, rather than states concepts (e.g., “I am a leader” vs “I feel like a leader in the last month”). Therefore, a risk arose that people answer questions reflexively based on established self- or other- schemas that don’t necessarily reflect developments in their thoughts in the previous period of time. This could cause a follower consistently ranking their leader low in consideration as that had been how their leader had been for the last 5

years, leading them to not record the increased consideration their leader has actually shown in the last month.

To mitigate the risk of generalisations, the “state” elements of the leader’s self-evaluative sections and follower’s other-evaluative sections were formulated so as to get participants to give two ratings, one asking what their answer would have been one month ago and what it is currently. The added benefit of this design was that we would indirectly be able to capture participant’s interpretation of developmental trajectory – e.g., does the follower perceive their leader to be actually changing? (See Figure 5 for example of the structure used to capture this process).

In hoeverre vertoonde je leidinggevende het volgende gedrag ...

	...in de voorbije maand?					...voor 4 maanden (februari)?												
	Helemaal niet akkoord	-	Niet akkoord	-	Noch akkoord, Noch niet akkoord	-	Akkoord	-	Helemaal akkoord	Helemaal niet akkoord	-	Niet akkoord	-	Noch akkoord, Noch niet akkoord	-	Akkoord	-	Helemaal akkoord
Hij/zij belichtte jouw succes op het werk.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hij/zij gaf erkenning belangrijke bijdragen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hij/zij gaf erkenning voor jouw goede prestaties.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 5 - Example of survey item capturing retrospective development perception

3.6 | Key research design challenges and mitigations

Given this was a field study, several unforeseen challenges arose and had to be adjusted along the way. In this section, we will shortly give an overview of the challenges that arose on a context, company, and individual level. Subsequently, we will highlight the key design adjustments made.

3.6.1 | Organisational level challenges and adjustments

When the data collection started end of 2021, Covid picked up again for its second winter. Aside from having to consider its psychological impacts, it also had implications for the organisation of the LDPs of the ESF call LEO. The LDPs were delayed at different rates for the involved companies and organisations took longer to determine and organise the leaders (and followers) involved. In part, this was mitigated by adjusting the data collection period to a couple of weeks later. However, the delayed formation of teams had a larger impact on some of the control group teams that had not been formed yet, meaning that there was a lower number of control groups than originally planned. Given that it was not possible to “step” into the original survey cycle, **these later-introduced teams were added to a second survey cycle that ran on a three-weekly rhythm (compared to the original four-week cycle)** (refer to figure 3 in section 3.2 section for more information). This additional survey cycle had the same number of data points (nine), so as to allow for comparability. It also ran from January to July 2023 (compared to September 2022 to May 2023 in the original plan), making the final round of measurement challenging due to the summer breaks of several production companies.

3.6.2 | Company level challenges and adjustments

On the company level, unforeseen circumstances, and overestimated teams’ capacity to respond to surveys were also challenges for data collection. A major participating company faced a cyberattack, rendering them unable to stick to the original LDP and survey timing. This organisation’s teams were later added to the three-week survey cycle. The overestimated capacity became evident during the first round of surveys. This resulted in several teams having to reduce the number of follower respondents. This, in turn, decreased the power of our findings but did not inhibit the research.

An additional challenge that arose was an imbalance of intervention vs control groups (i.e. more intervention than control groups). This is result of companies initially providing more intervention groups than control groups (due to staffing limitations) and combined with the aforementioned

adjustements. Together with the general response challenges of individuals in some teams, this resulted in analyses entailing low control groups for some of the companies.

3.6.3 | Individual level challenges and adjustments

Finally, on the level of individual respondents, we saw considerable attrition and survey fatigue over the course of the survey cycle. This would not have been an issue with the original amount of follower respondents but with the reduced number, we faced challengingly low follower respondents in some teams. This resulted in not being able to use all the data, as the respondent count was not high enough during some of the later surveys. **In the final analysis, we only used data from survey rounds 1-5.** Given this period had good respondents for both intervention and control groups, it still provided powerful insight. The limitation of these reduced data points is that we got a lower sample size (lower power of conclusions) and less insight into the retention of learnings.

4 | Data management

4.1 | Data management

The data collection happened:

- In line with the GDPR rules.
- With the approval of the EUR Internal Board of Review (application number: ETH2021-0087)
- Supported by a data management plan, in accordance with RSM standards.

The data management plan is an internal working document that was regularly updated by the researchers. The final version is attached in the appendix 9.2.

In line with the data management plan, participants were provided a summary of the research intent at the start of each survey, with the opportunity to follow a link to the full an in-depth informed consent form (see appendix 9.3). This was provided in English, French, and/or Dutch, depending on the language of the team it was shared with.

4.2 | Data analysis process

The preliminary important step for this dataset was to **clean the data** to have it ready for analysis. This included eliminating non-responses, bad response tendencies, excessively short responses, qualitative data check, etc. Considering the repeated measurements that we had in place, we employed the highest standards to retain only the best quality of data. We regularly checked data quality during the project, to hold organisations accountable for the fact that they should not only give us a high response rate but also a high-quality of responses. This proved to be very difficult, with high efforts being required to retain the response quality and quantity we intended to achieve. Due to these difficulties, after the fifth survey round, a meeting was held with Agoria and organisation representatives. This resulted in agreeing on lower response rate demands to ensure organisations could continue with the research and the research team was able to make more time to run the further, parallel data collection, Part B.

For the final analyses, only survey responses 1-5 were included. The final response amounts per LDP can be found below in Table 4. Fully comprehensive data on a per team per survey level can be found in appendix 9.1.5. Note that the response amounts below imply all teams assigned to a LDP, meaning it combines the intervention and control groups. That implies that intervention group tests will reduce the n size further.

Table 4 - Response amounts for surveys 1-5, grouped by LDP

	Shared Leadership	Motivational Leadership		Situational Leadership	
	Participants	Leaders	Followers	Leaders	Followers
Total respondees	175	35	228	57	185
Survey 1	163	33	169	49	117
Survey 2	136	28	139	40	108
Survey 3	138	27	114	37	109
Survey 4	115	26	111	42	64
Survey 5	146	26	108	40	95

In terms of **analysing the data**, we studied our *general research model*, using a stepwise analysis of intervention data, including qualitative follow-up research. We referred to Leroy et al. (2012) or Choi et al. (2021) for a similar approach. We followed their stepwise recommendations:

- In line with our research questions, a first step was to see whether the LDPs causes some of the changes in the means of the variables over time. Important here will be the comparison between the control and intervention group over time. Following the recommendations of Cook and Campbell (1979) this reflects the most stringent test that the intervention did cause the changes in the data.
- Pooling the data for the motivational and situational LDPs to increase power, we furthermore checked the assumed research model. Already with simply zero-order correlations between our constructs of interests, we could see whether things correlate as we assume (e.g., leader mindsets leading to leader behaviours). This serves as the basis for further analysis. For instance, we may find that a trusting mindset plays no role in predicting leader behaviour or follower motivation, which would make it less relevant to be used in the further analysis and research.
- A final step was to go beyond cross-sectional confirmation of our model, to consider the development of our variables over time. Here, we considered the correlations between the growth of variables. It was not because we find a cross-sectional confirmation of a relationship that it also exists dynamically over time. Such a dynamic relationship was important to establish whether the two variables were indeed causally related, such that the increase of one led to an increase in other variables.

Once the quantitative results are revealed, the qualitative data was used for a more in-depth exploration of the ideas. For instance, the qualitative data was looked into the try to better understand potential changes in leaders(thinking and behavior.

5 | Results

5.1 | Sample size: Explaining discrepancies

As shown in section 1.2, this study's original sample is composed of LDP participants from the 13 involved companies, which operate in a variety of industries. The Situational LDP had 2 companies, one coming from construction and the other from manufacturing. The Motivational LDP had 4 participating companies, 3 from manufacturing and 1 from health care. The Shared LDP has 7 participating companies, 2 from manufacturing, 4 from health care, and 1 from food and drinks. These companies range in size and locality of operations, strategic priorities (e.g. working towards less hierarchical management), involved team's ways of working (e.g. team size, desk vs. assembly work, supervisor contact), and maturity of involved leaders. More information can be found in appendix 9.10.

5.1.1 | From original sample to raw responses

Given the nature of survey based field studies and the context of the LEO research, there is a discrepancy between the original sample size of around 1200 respondees and the actual responses captured (around 700). The chief drivers of this was overpromising by companies, attrition, and non-responses. In addition, the longitudinal design perpetuated this challenge for the randomized control effects, as this required consistent, recurrent responses from the participants. Table 5 provides an overview of the response rates and number of participants used for analysis. The average response rate for the whole study is 68%, which is great, compared to what is usually seen in survey based studies (Anseel et al., 2010). The highest and most stable response rates come from the Shared LDP.

In general, there is a steady general decline in response rates from the start to the end of the data collection period. By survey 5, the number of participants is relatively low (also due to the relatively limited sample in the beginning) reducing the amount of pre-, post- matching (see Table 8 for examples). Specifically at Time 5, the final sample included 40 leaders and 95 followers (28 and 47 of the intervention group) for the Situational LDP, 26 leaders and 108 followers (20 and 75 in the intervention group) for the Motivational LDP and 146 participants of the Shared LDP at Time 5 (68 of the intervention group). Appendix 9.1.5 provides further details on raw response numbers.

Table 5 - Response rates and amounts per LDP per time

	Situational Leadership				Motivational Leadership				Shared Leadership	
	Leaders		Followers		Leaders		Followers		Participants	
	Raw	Percent	Raw	Percent	Total	Percent	Total	Percent	Total	Percent
Total respondees	57		185		35		228		175	
Survey 1	49	86	117	63	33	94	169	74	163	93
Survey 2	40	70	108	58	28	80	139	61	136	78
Survey 3	37	65	109	59	27	77	114	50	138	79
Survey 4	42	74	64	35	26	74	111	49	115	66
Survey 5	40	70	95	51	26	74	108	47	146	83
Average %		73		53		80		56		80

5.1.2 | From raw responses to data used in analysis

Moving from raw responses to analysis, a further reduction of data points was made. Data had to be cleaned, filtering out "lazy answer" and incomplete surveys. In addition, as mentioned before, the randomized control effects required of participants to have responded to each data collection point

to be incorporated. In contrast, the retrospective data relied on data solely derived from the survey 5 data collection round. So as to maximise the analyses strength, we used all quality cases available for each analysis, resulting in a differences in the n size of the various analyses done. Appendix 9.13.2 entails a range of table that provides an overview of the n used per analysis.

Considering the low sample size for some of these analyses, we advise the reader extreme caution when interpreting the results. A lack of power may have resulted in a null-finding whereas in reality there may have been an effect (we were just unable to detect it). Additionally, our research design (i.e., not a controlled lab experient) may have introduced additional confounds that may hinder us from finding a result. We discuss the specific power for each of the analyses later in the document. In the meanwhile, we advise the reader to draw their attention to what the effects we do find, despite potential power restrictions, rather than the effects we don't find.

5.2 | Impact of the LDPs

In this section, we present quantitative results providing insights in the effectiveness of the LDPs. To assess the maginitude of the effects, we rely on the numbers as outlined in Table 6.

Table 6 - Effect size reference table

Very weak	Weak	Moderate	Strong
.00 - .20	.20 - .50	.50 - .80	.80 - 1.20

5.2.1 | Randomized control effects

In a first step, to answer research questions stated above, we examined potential differences in mean scores in our study variables over the different time points. We used repeated measures ANOVAs to assess the differences in the mindset of the leaders, their behaviours and associated employee outcomes as assessed by the participants (on a scale from 1: totally disagree to 9: totally agree) at the different time points (the SPSS syntax used for the main analysis can be found in Appendix 9.12.1). For these analyses responses from control and intervention participants for the different time points were used while participants' participation in a LDP was specified as the between-subjects factor.

Table 7 shows the randomized control effects for the different **leader mindsets** for each of the LDPs at Time 1 and Time 5. Unfortunately, results showed no evidence that the leaders in the intervention groups of the Situational LDP, Motivational LDP and Shared LDPs changes any of their beliefs over time compared to the control group.

Table 7 – Intervention vs control changes over time in leader mindset

		Situational Leadership	Motivational Leadership	Shared Leadership
Leader Mindset	Theory X/Y	$F(1,22) = 2.13, p = .159$	$F(1,20) = .86, p = .366$	$F(1,32) = 2.57, p = .119$
	Diversity Mindset	$F(1,22) = .52, p = .480$	$F(1,20) = .00, p = .975$	$F(1,32) = .57, p = .456$
	Adaptability Mindset	$F(1,21) = .61, p = .443$	$F(1,20) = .55, p = .469$	$F(1,31) = .40, p = .532$
	Trust Mindset	$F(1,22) = 1.60, p = .219$	$F(1,20) = .12, p = .729$	$F(1,32) = 1.73, p = .197$
	Pygmalion Mindset	$F(1,21) = .07, p = .796$	$F(1,20) = .00, p = .997$	$F(1,32) = .14, p = .712$
	Learning Mindset	$F(1,24) = .68, p = .418$	$F(1,20) = .28, p = .605$	$F(1,32) = .85, p = .451$

Reviewing table 7 reveals that, for leader mindsets, no significant changes were found among any of the LDPs. While this is not true for all of the statistical output (see tables 11-14), finding statistical significance was a challenging for the randomized control effects. To better understand this, post

hoc power analyses were done (Section 5.2.3), shedding light on how powered the output was and what would have been necessitated in terms of effect size to achieve significance.

Table 8 shows the mean values of the scores of these beliefs at each of the time points, for the different LDPs. Figures 6-17 show the evolution of the mean values of the scores for intervention vs control groups of each organisation. Note that these organisational intervention/control groups can consist of more than one team. In addition, some companies only had an intervention or a control group. For examples, the Shared LS figures only show nine categories as opposed to 14, which would be expected from the 7 organisations that were involved in the shared LS track. Visual inspection of the scores at Time 1 and Time 5 per organizations³ indicate no floor (extremely low scores) and limited ceiling effects (extremely high scores), which could have limited the observation of changes in mindset among the leaders. The control conditions for the situational and motivational LDP already differed from the intervention groups at the onset of the interventions (e.g., most noticeably for trust mindset), which indicates that randomisation was not done perfectly. The control groups also changed over time, unexpectedly sometimes even more than the experimental condition. This was most noticeable for the control group of the motivational LDP (most noticeable in e.g. Theory XY or adaptability mindset), limiting the possibility that significant effects of the intervention could be found. This gives a loose indication that, even if the analyses was powered enough, significance in change would still not have been found. Finally, these results seem to indicate that the LDPs impacted the leaders' mindset in different ways across the different organizations. Most clearly, these results indicate that the fluctuations did not consistently follow a pattern in which the intervention groups improve, while the control group remained stable or improved less over time.

³ Following the GDPR-guidelines, participants were promised anonymity. Therefore, we don't report back at the level of the leaders and teams, but pooled the data at the level of the organizations, differentiating between intervention and control groups.

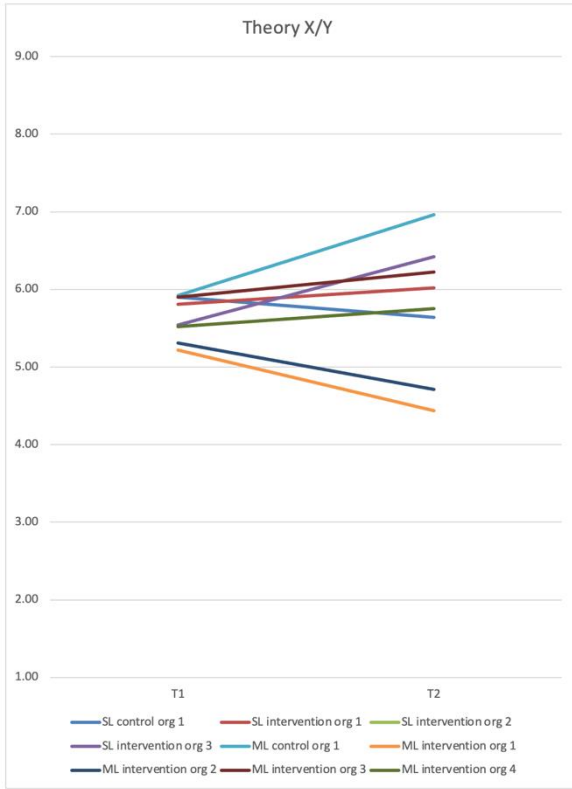


Figure 6 - Change of Theory X/Y over time in Sit. and Moti. LDP

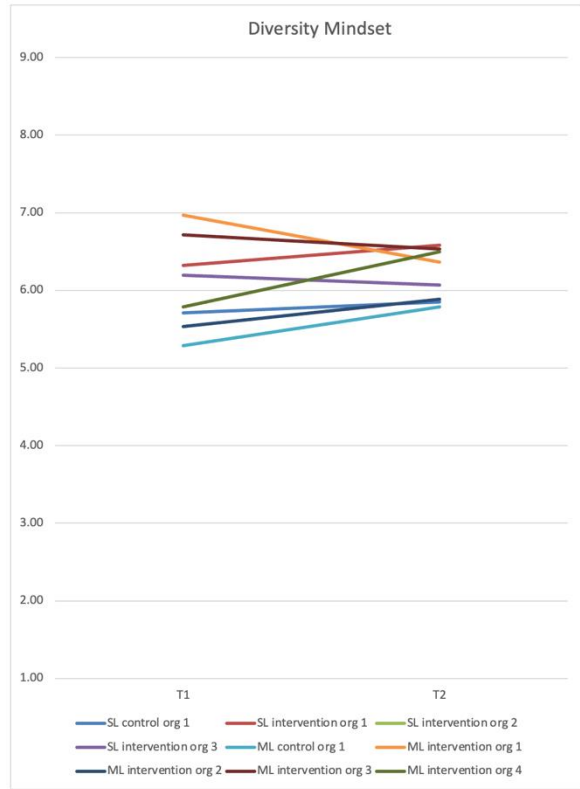


Figure 7 - Change of Diversity Mindset over time in Sit. and Moti. LDP

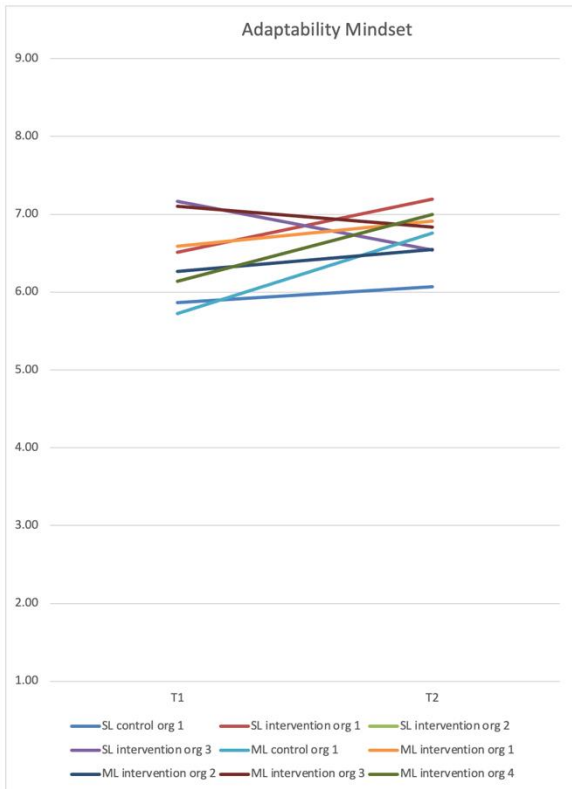


Figure 8 - Change of Adaptability Mindset over time in Sit. and Moti. LDP

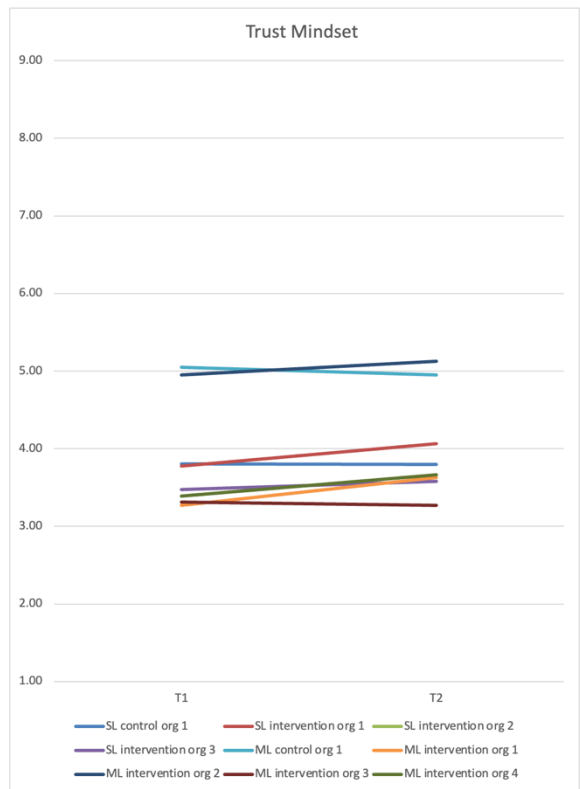


Figure 9 - Change of Trust Mindset over time in Sit. and Moti. LDP

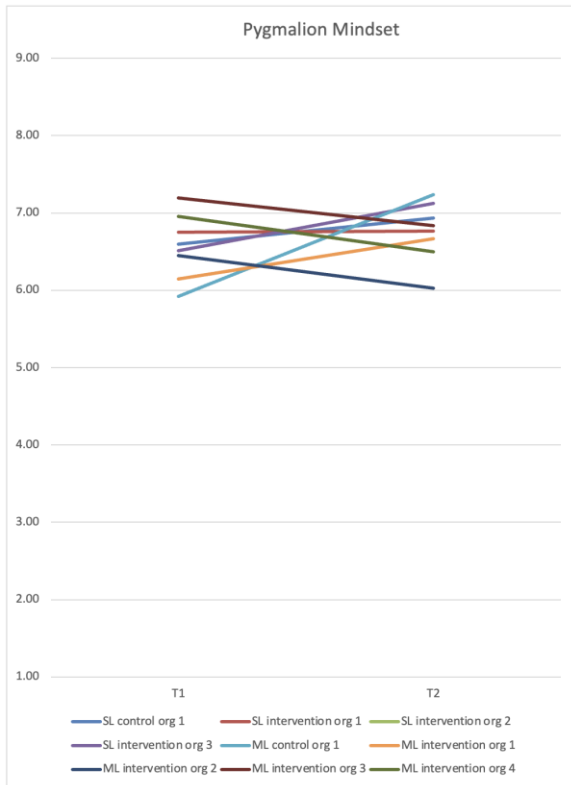


Figure 10 – Change of Pygmalion Mindset over time in Sit. And Moti. LDP

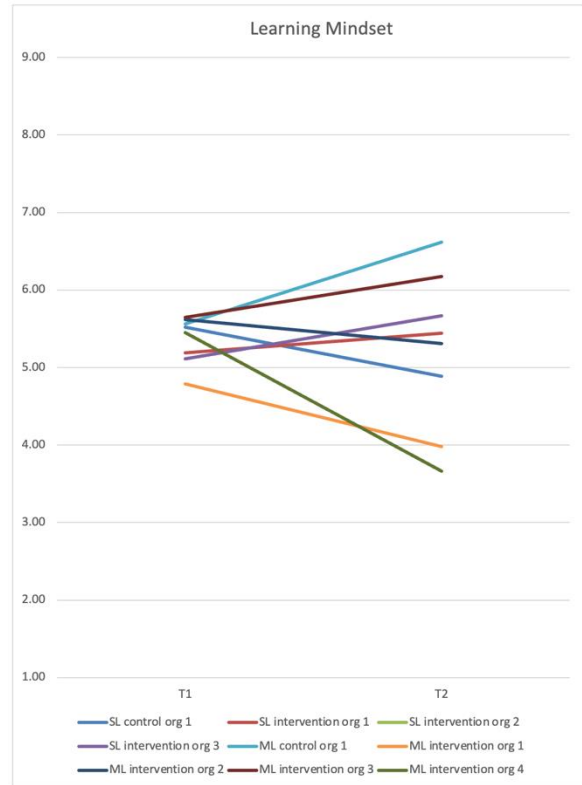


Figure 11 - Change of Learning Mindset over time in Sit. and Moti. LDP

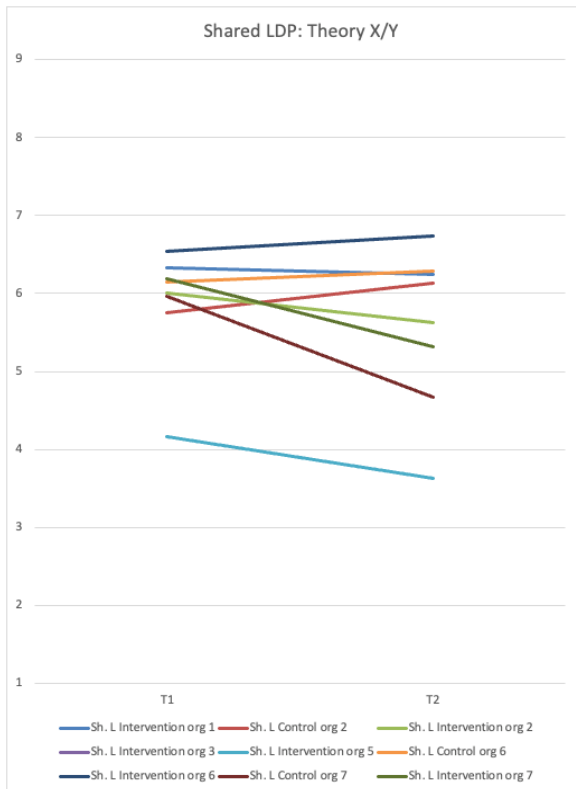


Figure 12 - Change of Theory X/Y Mindset over time in Shared LDP

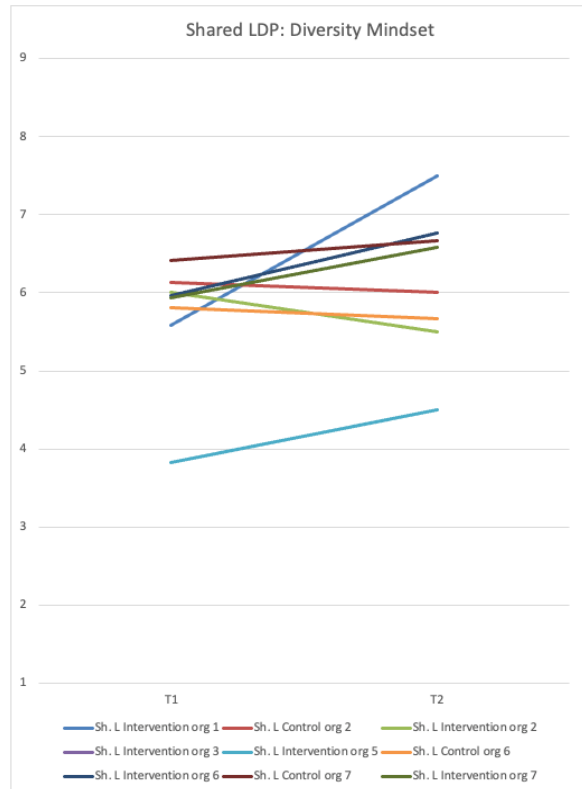


Figure 13 - Change of Diversity Mindset over time in Shared LDP

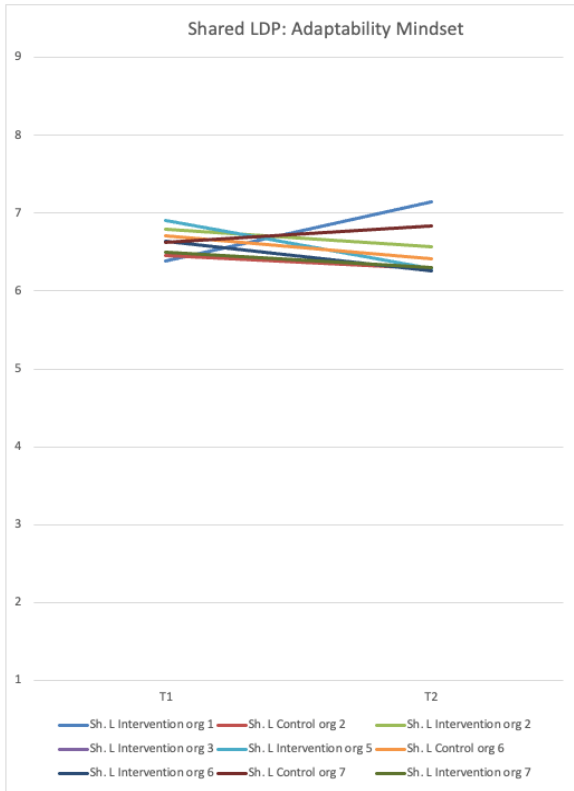


Figure 14 - Change of Adaptability Mindset over time in Shared LDP

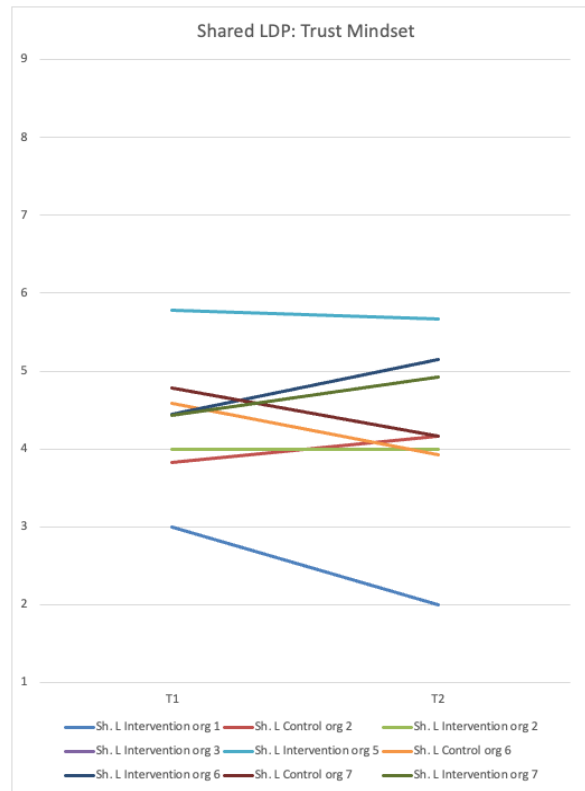


Figure 15 - Change of Trust mindset over time in Shared LDP

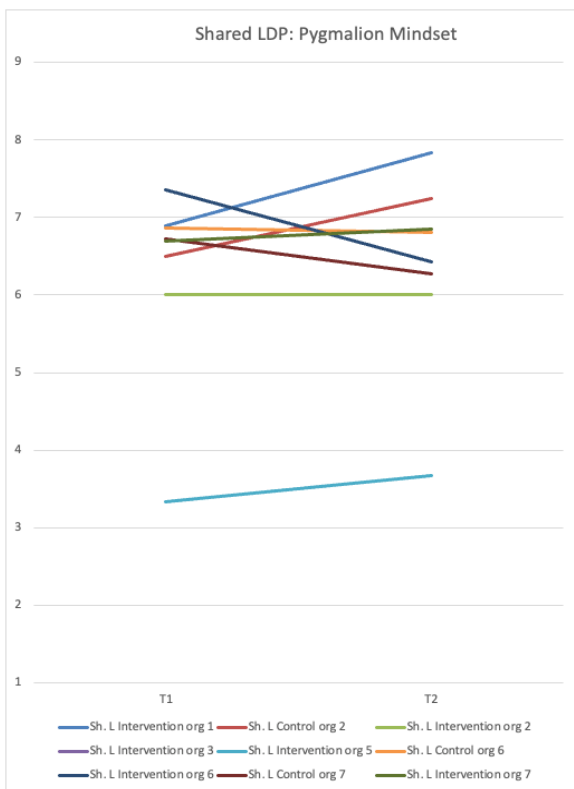


Figure 16 - Change of Pygmalion Mindset over time in Shared LDP

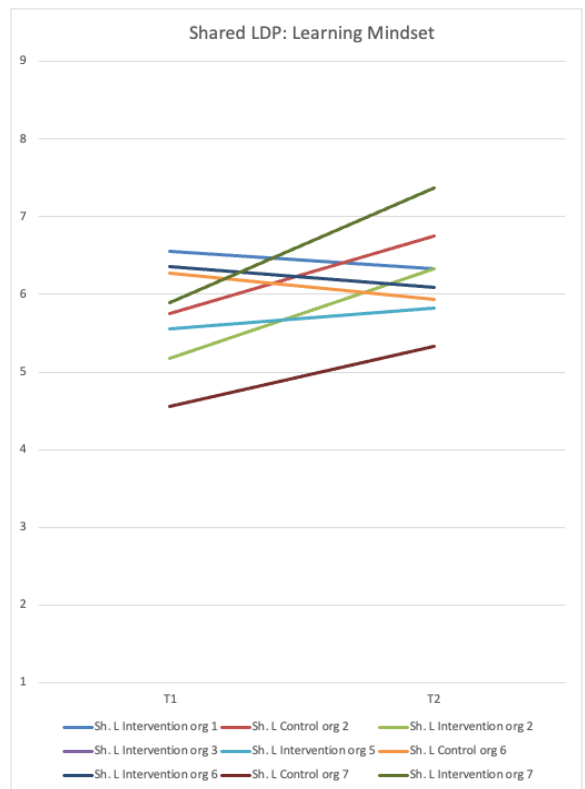


Figure 17 - Change of Learning Mindset over time in Shared LDP

Table 8 – Belief changes before/after LDP per group

	Theory X/Y mindset		Diversity mindset		Adaptability mindset		Trust mindset		Pygmalion mindset		Learning mindset	
	T1	T5	T1	T5	T1	T5	T1	T5	T1	T5	T1	T5
SL control org 1	5,90	5,64	5,71	5,85	5,86	6,07	3,81	3,80	6,60	6,94	5,52	4,88
SL intervention org 1	5,81	6,02	6,32	6,58	6,51	7,19	3,78	4,06	6,75	6,77	5,19	5,44
SL intervention org 3	5,54	6,42	6,20	6,07	7,16	6,54	3,47	3,58	6,52	7,12	5,11	5,67
ML control org 1	5,92	6,96	5,29	5,79	5,73	6,76	5,05	4,95	5,92	7,24	5,56	6,62
ML intervention org 1	5,22	4,44	6,97	6,37	6,59	6,92	3,27	3,63	6,15	6,67	4,79	3,98
ML intervention org 2	5,31	4,71	5,54	5,89	6,27	6,54	4,95	5,12	6,45	6,02	5,62	5,31
ML intervention org 3	5,90	6,22	6,71	6,53	7,10	6,83	3,31	3,27	7,19	6,83	5,65	6,18
ML intervention org 4	5,52	5,75	5,79	6,50	6,14	7,00	3,39	3,67	6,96	6,50	5,45	3,67
Sh. L Intervention org 1	6,33	6,25	5,58	7,5	6,38	7,14	3	2	6,89	7,83	6,56	6,33
Sh. L Control org 2	5,75	6,13	6,13	6	6,46	6,29	3,83	4,17	6,5	7,25	5,75	6,75
Sh. L Intervention org 2	6	5,63	6	5,5	6,79	6,57	4	4	6	6	5,17	6,33
Sh. L Intervention org 3	5,5		8,5		9		2,33		4,33		7	
Sh. L Intervention org 5	4,17	3,63	3,83	4,5	6,9	6,29	5,78	5,67	3,33	3,67	5,56	5,83
Sh. L Control org 6	6,14	6,29	5,81	5,67	6,71	6,42	4,58	3,92	6,86	6,81	6,28	5,94
Sh. L Intervention org 6	6,54	6,74	5,96	6,76	6,64	6,26	4,44	5,15	7,36	6,43	6,36	6,09
Sh. L Control org 7	5,96	4,67	6,42	6,67	6,62	6,83	4,78	4,17	6,72	6,28	4,56	5,33
Sh. L Intervention org 7	6,19	5,31	5,94	6,58	6,5	6,3	4,43	4,93	6,7	6,85	5,89	7,37

Tables 9 shows the randomized control effects for the different **leader behaviours**, as assessed by the participating followers for each of the LDPs. Results indicate that – according to the followers – the leaders in the intervention groups did not significantly change their behaviour in terms of clarifying, supporting, empowering or protecting over time compared to the control group.

Table 9 – Intervention vs control changes over time in leader behaviours

		Situational Leadership	Motivational Leadership	Shared Leadership
Leader Behaviour	Clarifying	$F(4, 88) = .76, p = .553$	$F(4, 180) = .29, p = .885$	$F(4, 144) = .49, p = .743$
	Supporting	$F(4, 92) = .66, p = .620$	$F(4, 184) = .67, p = .614$	$F(3.61, 129.81) = .74, p = .570$
	Empowering	$F(4, 92) = .17, p = .954$	$F(4, 184) = 1.00, p = .411$	$F(3.79, 136.25) = .23, p = .911$
	Protecting	$F(2.98, 68.50) = .55, p = .648$	$F(4, 180) = .77, p = .546$	$F(3.44, 123.69) = .29, p = .859$

Inspection of the mean values of the scores of these behaviours at each of the time points indicate that these are fairly stable over time, in each of the interventions and the control group.

Table 10 provides the mean scores of the leadership behaviors for the LDPs. Figures 18-25 show the evolution of the mean values of the scores for the intervention and control groups of each organisation. Note that these organisational intervention/control groups can consist of more than one team and that some companies may only have had an intervention or a control group. Based on visual inspection, we can conclude that some leaders already scored high on the leader behaviors (e.g. ML intervention in organisation 2 for clarifying), limiting the possibility of future growth. The leaders in the intervention and control groups may already have differed at the onset of the programs and both in the intervention and control group leadership behaviors varied across the five timepoints, yet no systematic incline across all intervention groups could be detected.

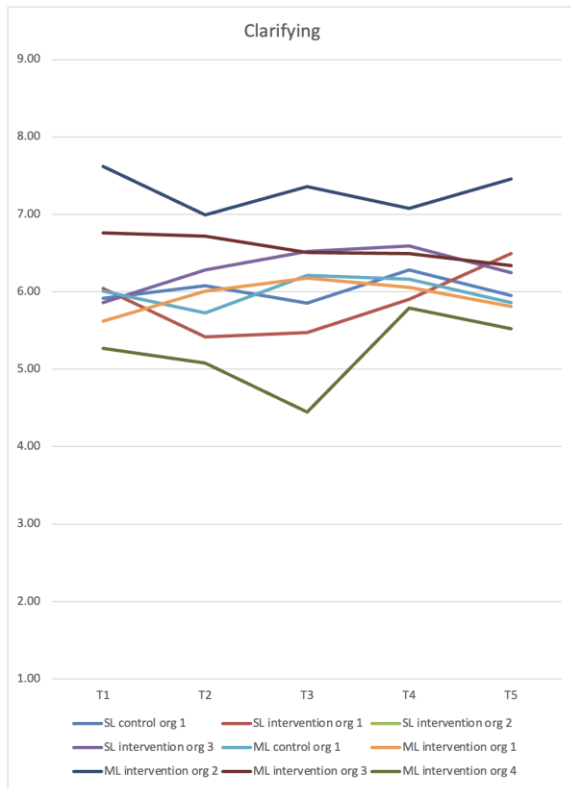


Figure 18 – Change of Clarifying Behaviour over time in Sit. And Moti. LDP

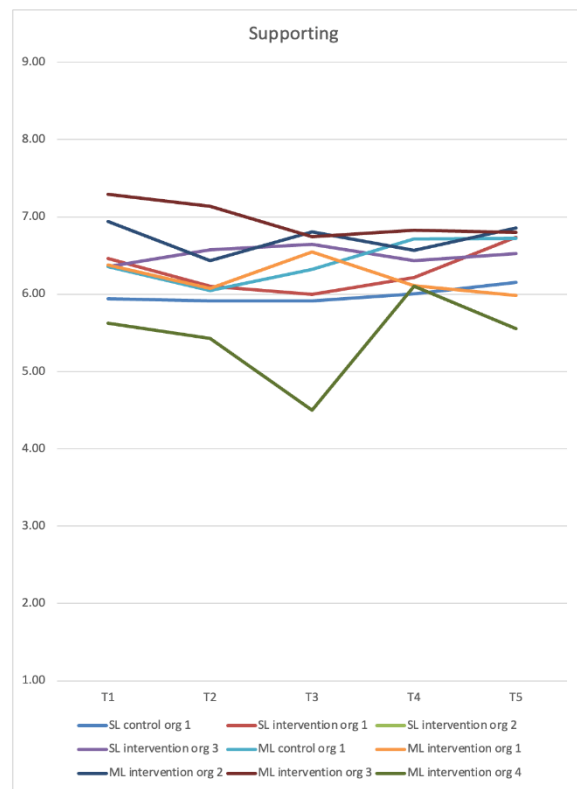


Figure 19 - Change of Supporting Behaviour over time in Sit. and Moti. LDP

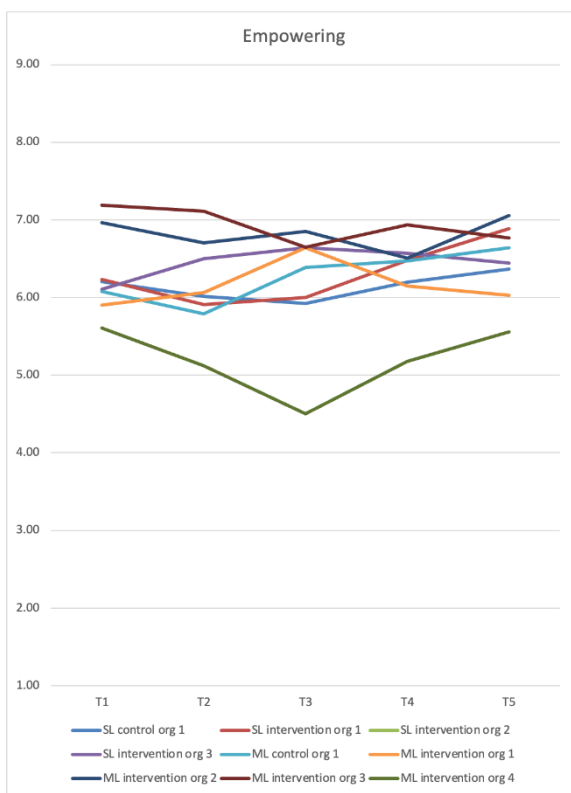


Figure 20 - Change of Empowering Behaviour over time in Sit. abd Moti. LDP

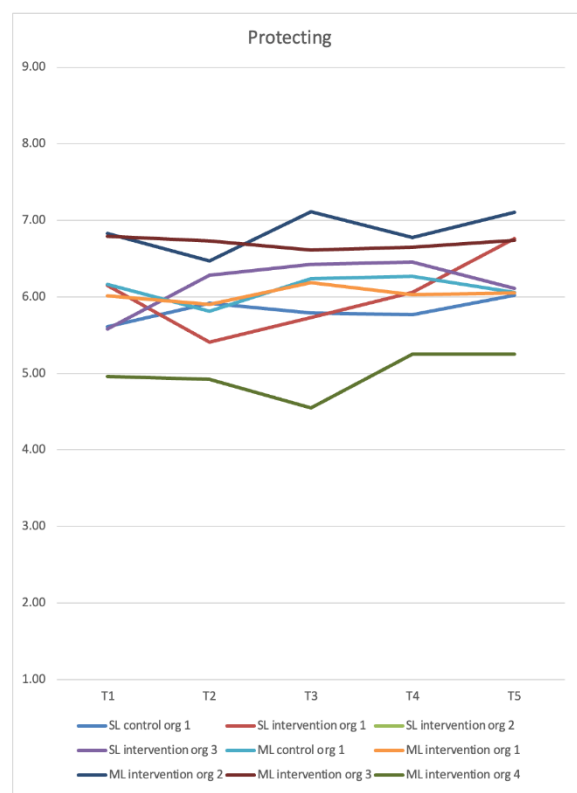


Figure 21 - Change of Protecting Behaviour over time in Sit. and Moti. LDP

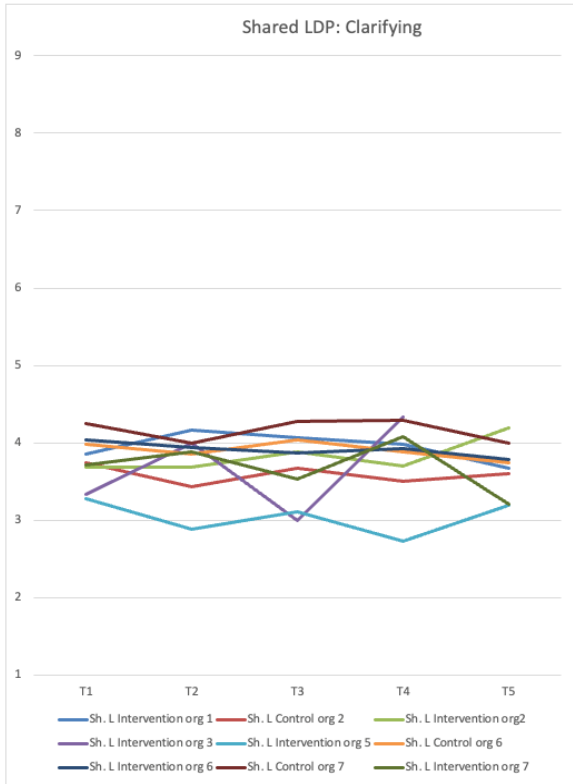


Figure 22 - Change of Clarifying Behaviour over time in Shared LDP

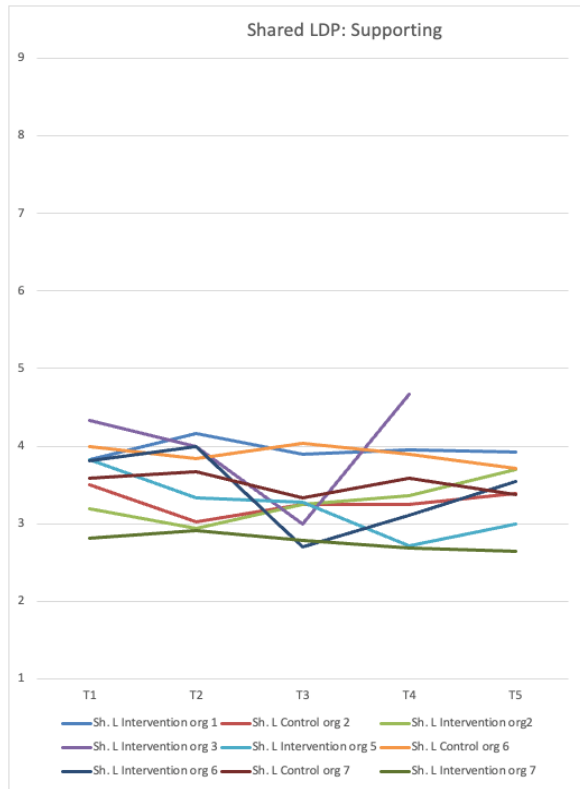


Figure 23 - Change of Supporting Behaviour over time in Shared LDP

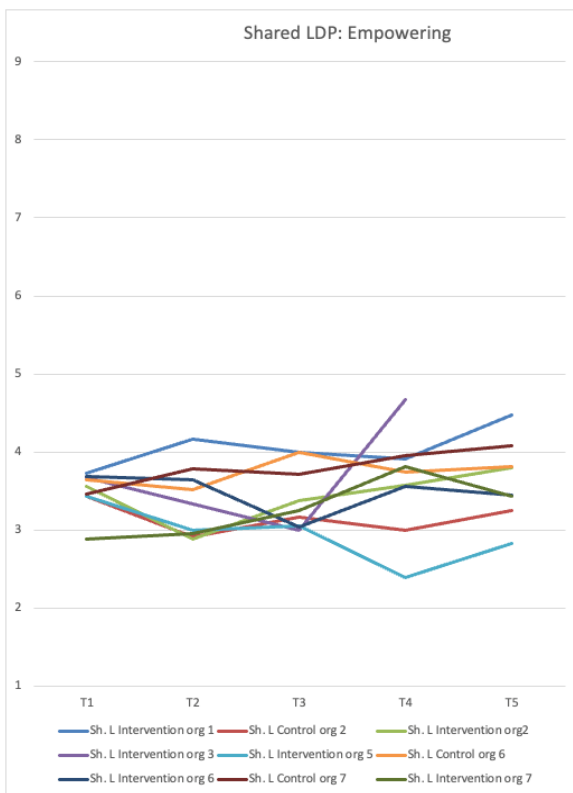


Figure 24 - Change of Protecting Behaviour over time in Shared LDP

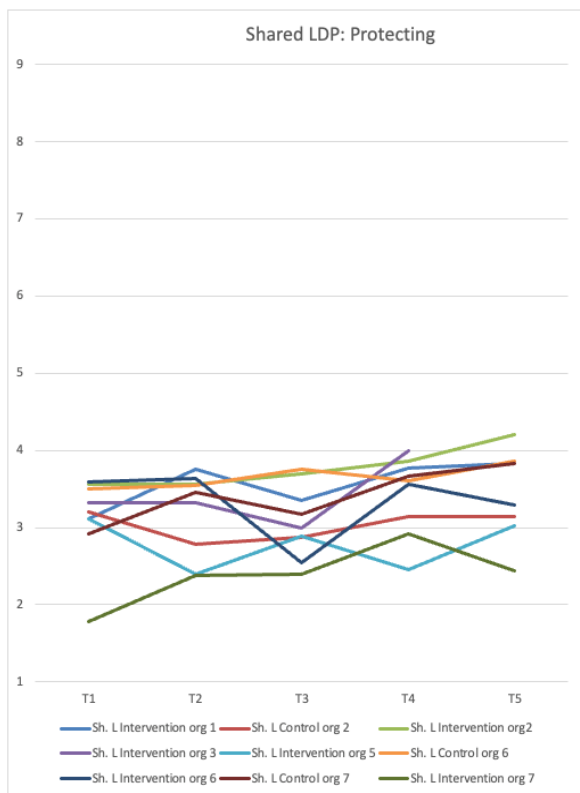


Figure 25 - Change of Empowering Behaviour over time in Shared LDP

Table 10 – Behaviour changes before/after LDP per group

	Clarifying					Supporting					Empowering					Protecting				
	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
SL control org 1	5,92	6,08	5,85	6,28	5,95	5,94	5,91	5,91	6,01	6,15	6,21	6,01	5,93	6,20	6,37	5,61	5,92	5,79	5,77	6,02
SL intervention org 1	6,04	5,42	5,47	5,90	6,49	6,46	6,11	6,00	6,21	6,74	6,23	5,91	6,00	6,48	6,88	6,15	5,41	5,73	6,06	6,76
SL intervention org 3	5,86	6,28	6,52	6,59	6,25	6,35	6,58	6,64	6,43	6,53	6,10	6,50	6,64	6,57	6,44	5,58	6,28	6,43	6,45	6,11
ML control org 1	6,01	5,73	6,21	6,16	5,86	6,36	6,05	6,32	6,72	6,72	6,08	5,79	6,39	6,47	6,64	6,16	5,81	6,24	6,27	6,06
ML intervention org 1	5,62	6,01	6,18	6,06	5,81	6,38	6,08	6,55	6,11	5,98	5,90	6,06	6,64	6,15	6,03	6,01	5,90	6,19	6,03	6,05
ML intervention org 2	7,62	6,99	7,36	7,08	7,46	6,94	6,43	6,81	6,56	6,86	6,96	6,70	6,85	6,51	7,05	6,83	6,47	7,12	6,78	7,11
ML intervention org 3	6,76	6,72	6,51	6,49	6,34	7,29	7,14	6,74	6,83	6,80	7,19	7,11	6,64	6,94	6,77	6,79	6,73	6,61	6,65	6,74
ML intervention org 4	5,27	5,08	4,45	5,79	5,52	5,63	5,43	4,50	6,11	5,56	5,60	5,13	4,50	5,18	5,56	4,96	4,93	4,55	5,25	5,25
Sh. L Intervention org 1	3,85	4,16	4,07	3,98	3,67	3,82	4,16	3,9	3,95	3,93	3,73	4,16	4	3,91	4,47	3,12	3,76	3,36	3,77	3,83
Sh. L Control org 2	3,75	3,44	3,67	3,5	3,61	3,5	3,02	3,25	3,25	3,39	3,43	2,92	3,17	3	3,25	3,21	2,79	2,88	3,14	3,14
Sh. L Intervention org 2	3,69	3,69	3,88	3,7	4,2	3,19	2,94	3,25	3,36	3,7	3,56	2,88	3,38	3,57	3,8	3,56	3,56	3,69	3,86	4,2
Sh. L Intervention org 3	3,33	4	3	4,33		4,33	4	3	4,67		3,67	3,33	3	4,67		3,33	3,33	3	4	
Sh. L Intervention org 5	3,28	2,89	3,11	2,73	3,2	3,83	3,33	3,28	2,71	3	3,44	3	3,06	2,39	2,83	3,11	2,39	2,89	2,46	3,02
Sh. L Control org 6	3,98	3,85	4,04	3,88	3,74	4	3,84	4,04	3,89	3,71	3,65	3,52	4	3,74	3,82	3,5	3,55	3,75	3,6	3,86
Sh. L Intervention org 6	4,04	3,94	3,87	3,93	3,79	3,81	4	2,7	3,11	3,55	3,69	3,65	3,04	3,56	3,45	3,59	3,64	2,54	3,56	3,29
Sh. L Control org 7	4,25	4	4,28	4,29	4	3,58	3,67	3,33	3,58	3,38	3,46	3,79	3,71	3,96	4,08	2,92	3,46	3,17	3,67	3,83
Sh. L Intervention org 7	3,72	3,89	3,53	4,08	3,21	2,81	2,91	2,79	2,69	2,64	2,89	2,95	3,25	3,81	3,43	1,78	2,38	2,39	2,92	2,44

Table 11 shows the randomized control effects for the different **follower outcomes**, as assessed by the participating followers for each of the LDPs. Results indicate that – regardless of the LDP – followers did not report significant changes in terms of the satisfaction of the basic needs for autonomy, competence and relatedness, nor the satisfaction of the need for security. They also did not report any differences in terms of autonomous or controlled motivation, engagement or burnout (with one exception for motivational leadership).

Table 11 – Intervention vs control changes over time in employee outcomes

		Situational Leadership	Motivational Leadership	Shared Leadership
Need satisfaction	Competence	$F(2.59, 59.61) = .62, p = .582$	$F(3.71, 181.80) = .69, p = .588$	$F(3.89, 268.51) = .05, p = .995$
	Relatedness	$F(3.66, 84.31) = 1.16, p = .336$	$F(2.99, 146.48) = .11, p = .953$	$F(3.77, 260.39) = .70, p = .583$
	Autonomy	$F(4, 92) = .17, p = .952$	$F(4, 196) = .83, p = .508$	$F(4, 276) = 1.23, p = .299$
	Security	$F(4, 92) = 1.98, p = .103$	$F(4, 196) = .37, p = .832$	$F(3.57, 246.05) = .61, p = .639$
Follower motivation & well-being	Engagement	$F(2.78, 66.67) = .50, p = .671$	$F(4, 196) = .76, p = .556$	$F(3.65, 248.21) = 1.30, p = .273$
	Autonomous Motivation	$F(2.14, 45.02) = .34, p = .731$	$F(4, 192) = 1.69, p = .153$	$F(4, 280) = .91, p = .459$
	Burnout	$F(2.72, 65.28) = 2.02, p = .126$	$F(3.74, 179.88) = 3.19, p = .017$	$F(4, 272) = .61, p = .659$
	Controlled Motivation	$F(2.28, 50.18) = .73, p = .502$	$F(4, 192) = .57, p = .685$	$F(4, 280) = 2.08, p = .083$

Visual inspection of the mean values at each of the time points (Table 12 and Figures 26 through 41) for the LDP indicate that for some variables, initial scores were already high (e.g. for autonomy satisfaction all mean values at the start of this research were 6.69 or higher). Again, the control groups and the experimental groups seemed to differ but no systematic increase in outcomes of the LDPs could be seen vis a vis the control conditions.

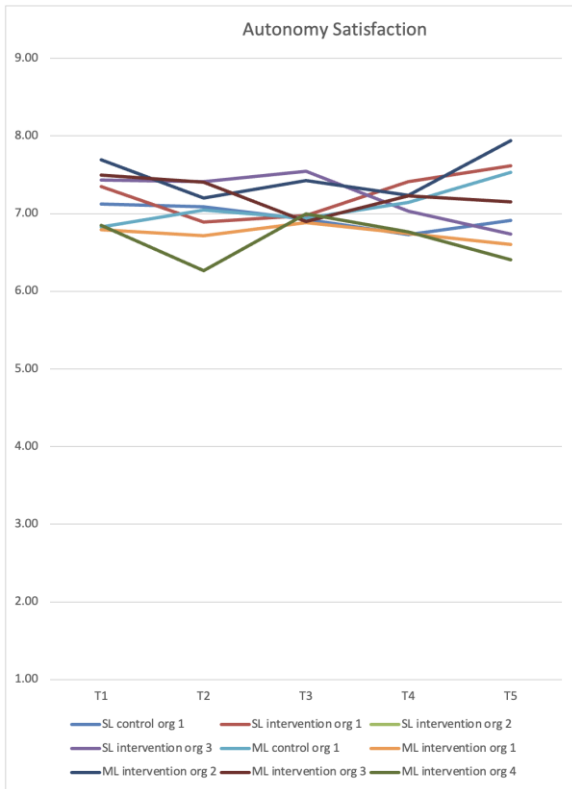


Figure 26 – Change of Autonomy Satisfaction over time in Sit. And Moti. LDP

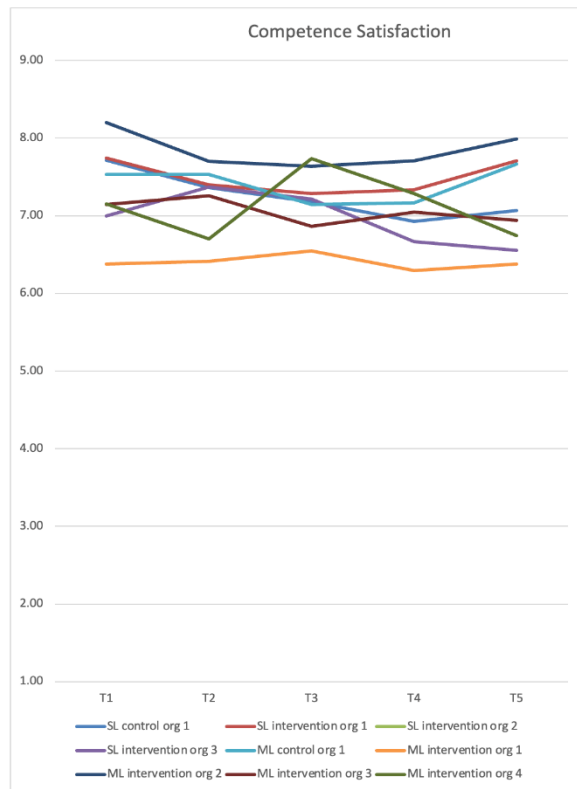


Figure 27 - Change of Competence Satisfaction over time in Sit. And Moti. LDP

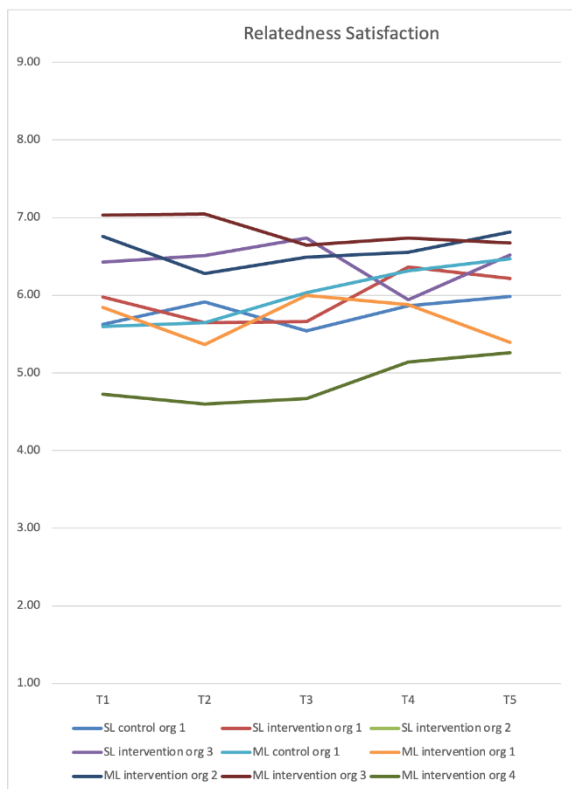


Figure 28 - Change of Relatedness Satisfaction over time

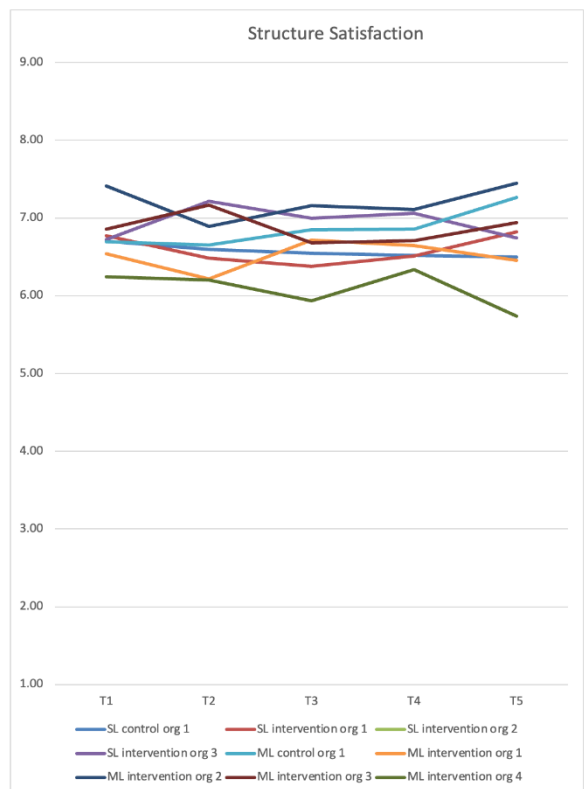


Figure 29 - Change of Competence Satisfaction over time in Sit. And Moti. LDP

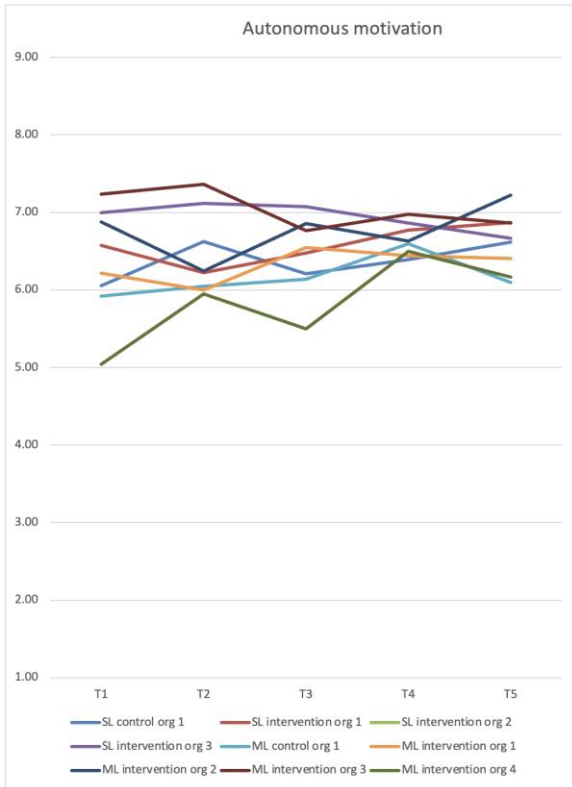


Figure 30 – Change of Autonomous Motivation over time in Sit. And Moti. LDP

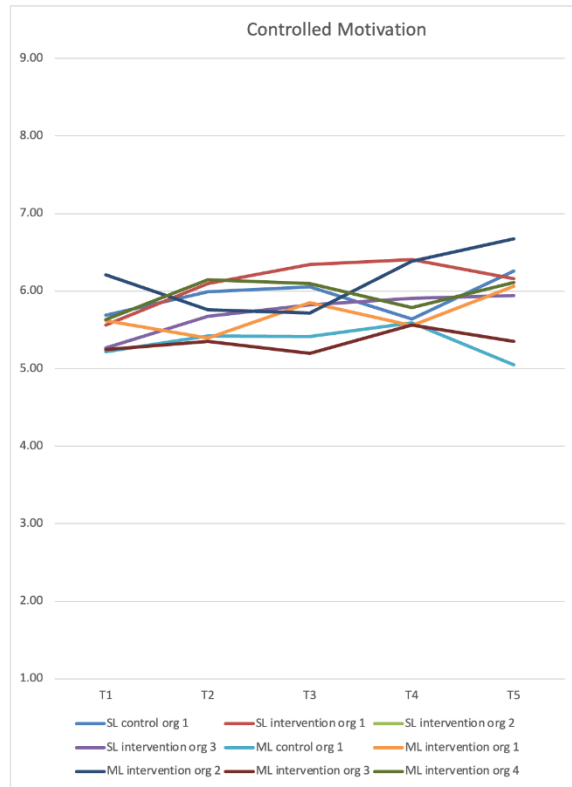


Figure 31 - Change of Controlled Motivation over time in Sit. And Moti. LDP

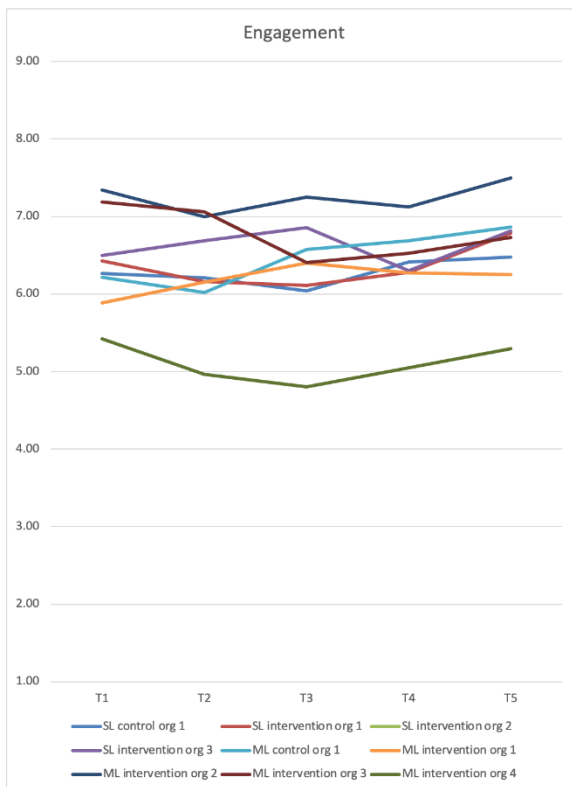


Figure 32 - Change of Engagement over time in Sit. And Moti. LDP

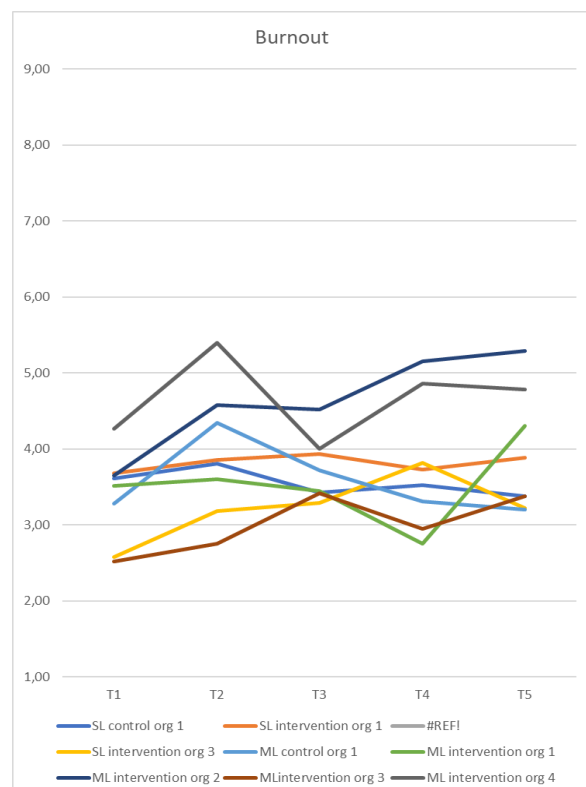


Figure 33 - Change of Burnout over time in Sit. And Moti. LDP

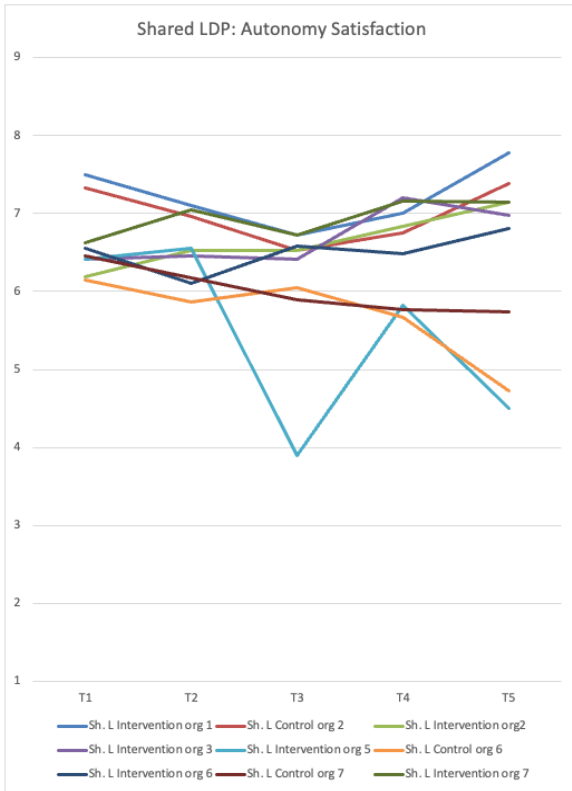


Figure 34 - Change of Autonomy Satisfaction over time in Shared LDP

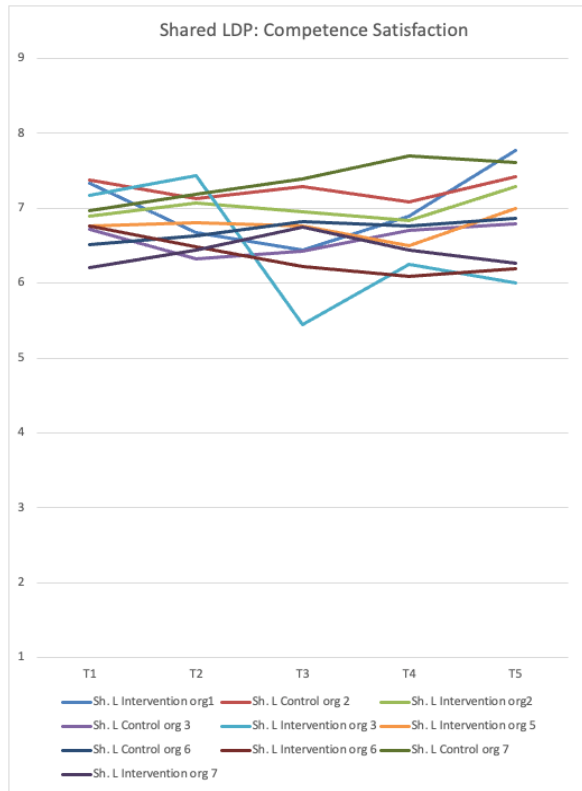


Figure 35 - Change of Competence Satisfaction over time in Shared LDP

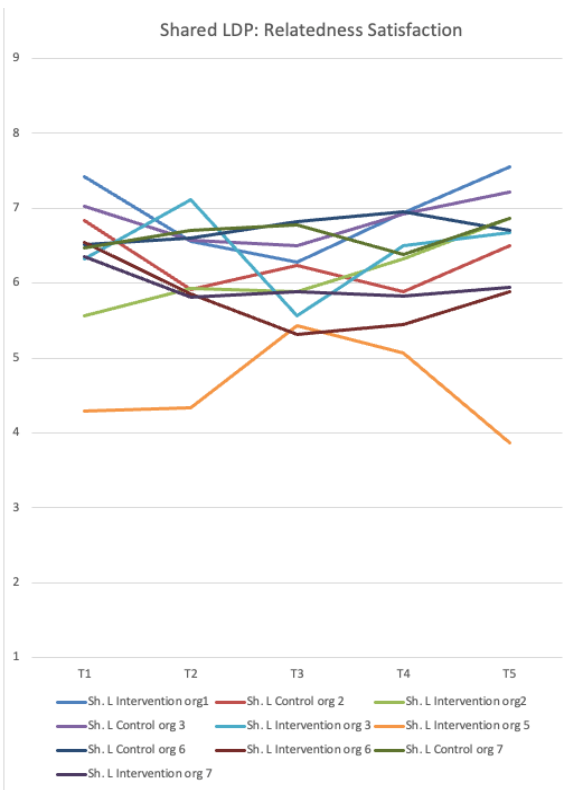


Figure 36- Change of Relatedness Satisfaction over time in Shared LDP

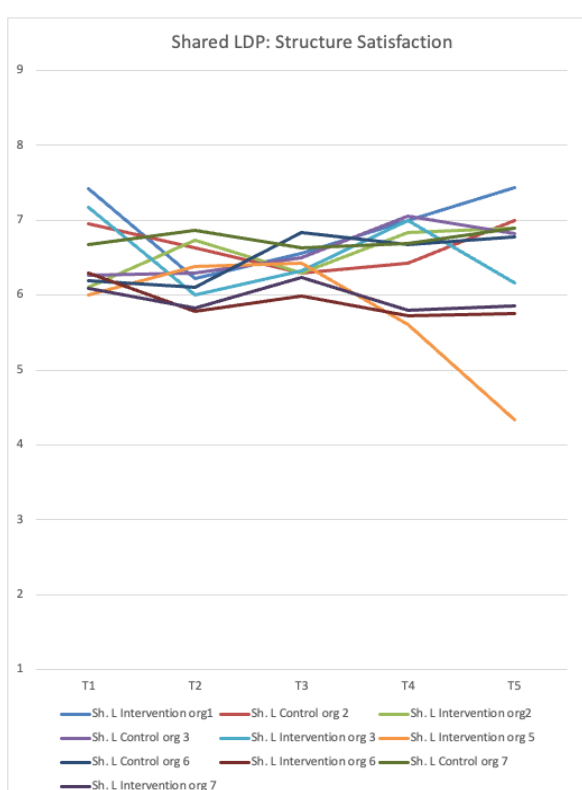


Figure 37 - Change of Structure Satisfaction over time in Shared LDP

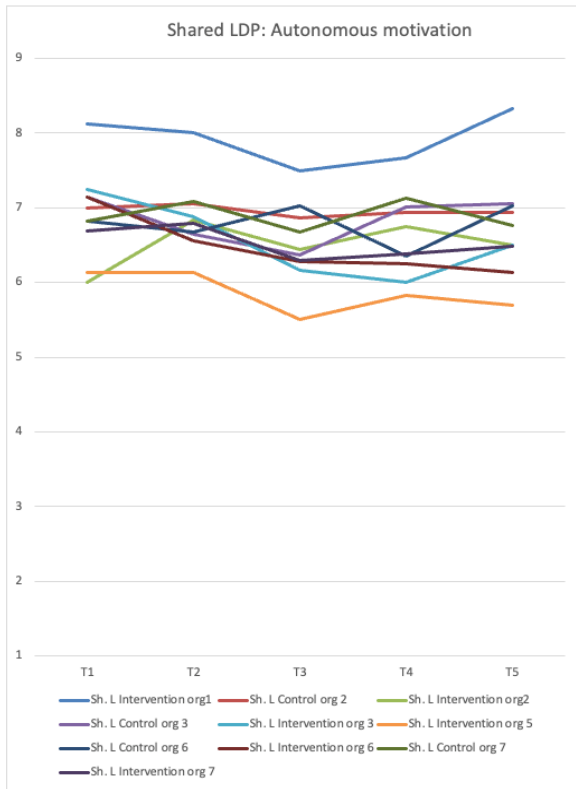


Figure 38 - Change of Autonomous Motivation over time in Shared LDP

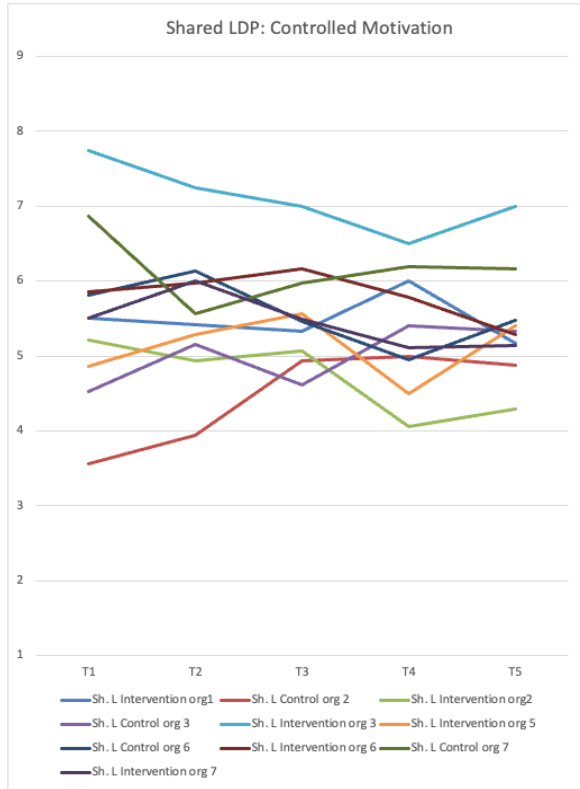


Figure 39 - Change of Controlled Motivation over time in Shared LDP

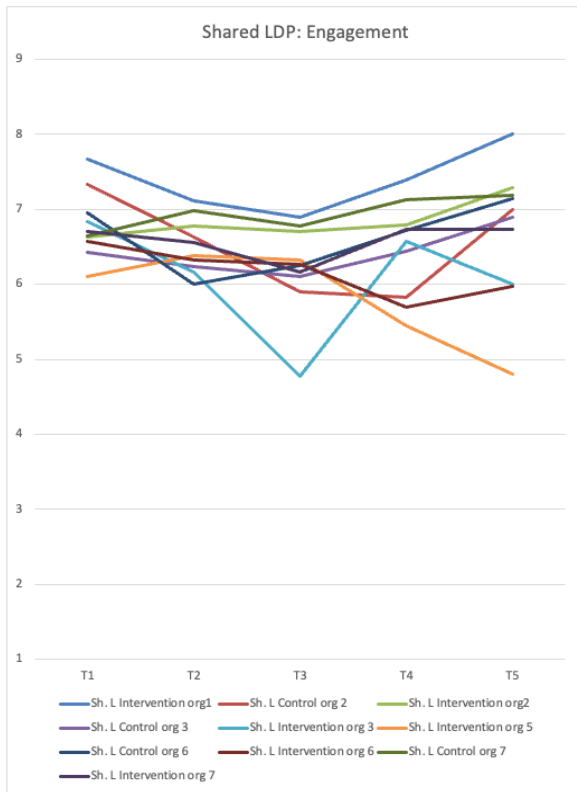


Figure 40 - Change of Engagement over time in Shared LDP

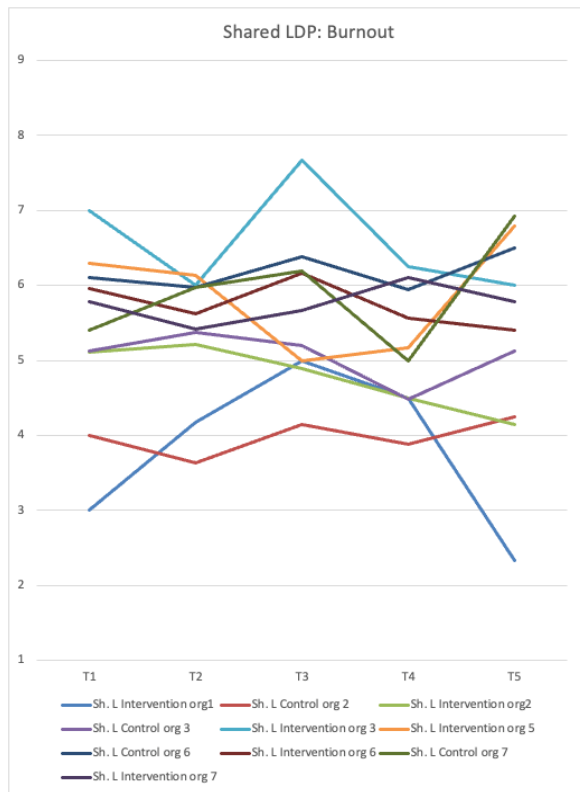


Figure 41 - Change of Burnout over time in Shared LDP

Table 12 – Follower needs satisfaction changes before/after LDP per group

	Autonomy Satisfaction					Competence satisfaction					Relatedness satisfaction					Security Satisfaction				
	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
SL control org 1	7,13	7,09	6,93	6,73	6,91	7,71	7,36	7,18	6,93	7,07	5,63	5,91	5,54	5,86	5,98	6,70	6,60	6,55	6,52	6,50
SL intervention org 1	7,35	6,89	6,97	7,41	7,61	7,74	7,40	7,29	7,33	7,71	5,98	5,65	5,66	6,36	6,22	6,78	6,49	6,38	6,52	6,82
SL intervention org 3	7,43	7,41	7,55	7,03	6,74	7,00	7,37	7,21	6,67	6,56	6,43	6,51	6,74	5,94	6,52	6,72	7,22	7,00	7,06	6,74
ML control org 1	6,83	7,05	6,94	7,15	7,53	7,53	7,53	7,15	7,17	7,67	5,60	5,65	6,04	6,31	6,47	6,69	6,65	6,85	6,85	7,27
ML intervention org 1	6,79	6,72	6,88	6,75	6,60	6,38	6,42	6,55	6,29	6,38	5,84	5,37	6,00	5,88	5,40	6,54	6,22	6,72	6,65	6,46
ML intervention org 2	7,69	7,20	7,43	7,23	7,94	8,20	7,70	7,63	7,71	7,99	6,76	6,28	6,49	6,56	6,82	7,41	6,89	7,16	7,11	7,45
ML intervention org 3	7,50	7,41	6,90	7,23	7,15	7,15	7,26	6,87	7,05	6,94	7,03	7,05	6,64	6,74	6,67	6,86	7,16	6,68	6,71	6,94
ML intervention org 4	6,85	6,27	7,00	6,76	6,41	7,15	6,70	7,73	7,29	6,74	4,73	4,60	4,67	5,14	5,26	6,24	6,20	5,93	6,33	5,74
Sh. L Intervention org 1	7,5	7,11	6,72	7	7,78	7,33	6,67	6,44	6,89	7,78	7,42	6,56	6,28	6,94	7,56	7,42	6,22	6,56	7	7,44
Sh. L Control org 2	7,33	6,96	6,52	6,75	7,38	7,38	7,13	7,29	7,08	7,42	6,83	5,92	6,24	5,88	6,5	6,96	6,63	6,29	6,42	7
Sh. L Intervention org 2	6,19	6,52	6,52	6,83	7,14	6,89	7,07	6,96	6,83	7,29	5,56	5,93	5,89	6,33	6,86	6,11	6,74	6,3	6,83	6,9
Sh. L Control org 3	6,42	6,46	6,41	7,2	6,97	6,72	6,32	6,42	6,71	6,8	7,03	6,57	6,5	6,92	7,22	6,26	6,3	6,5	7,06	6,82
Sh. L Intervention org 3	6,42	6,56	3,89	5,83	4,5	7,17	7,44	5,44	6,25	6	6,33	7,11	5,56	6,5	6,67	7,17	6	6,33	7	6,17
Sh. L Intervention org 5	6,14	5,86	6,05	5,67	4,73	6,76	6,81	6,76	6,5	7	4,29	4,33	5,43	5,06	3,87	6	6,38	6,43	5,61	4,33
Sh. L Control org 6	6,55	6,1	6,58	6,48	6,81	6,52	6,63	6,82	6,76	6,87	6,52	6,6	6,82	6,96	6,7	6,2	6,1	6,83	6,68	6,78
Sh. L Intervention org 6	6,45	6,17	5,89	5,76	5,74	6,76	6,48	6,22	6,09	6,2	6,55	5,86	5,31	5,44	5,88	6,3	5,79	5,99	5,72	5,75
Sh. L Control org 7	6,63	7,04	6,72	7,16	7,14	6,97	7,19	7,4	7,7	7,61	6,47	6,7	6,78	6,38	6,87	6,67	6,87	6,63	6,69	6,89
Sh. L Intervention org 7	5,81	6,36	6,42	6,44	6,51	6,21	6,44	6,75	6,44	6,26	6,35	5,81	5,89	5,83	5,95	6,09	5,83	6,24	5,8	5,85

Table 13 – Follower outcome changes before/after LDP per group

	Autonomous motivation					Controlled motivation					Engagement					Burnout				
	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
SL control org 1	6,05	6,63	6,21	6,39	6,62	5,69	5,99	6,05	5,64	6,26	6,26	6,21	6,04	6,42	6,48	5,44	3,99	4,88	4,00	4,12
SL intervention org 1	6,58	6,22	6,48	6,77	6,87	5,56	6,10	6,34	6,41	6,16	6,43	6,16	6,11	6,28	6,79	5,84	3,96	5,27	3,87	4,06
SL intervention org 3	7,00	7,12	7,07	6,86	6,67	5,27	5,68	5,82	5,91	5,94	6,50	6,69	6,86	6,30	6,81	3,44	3,43	3,45	4,12	3,85
ML control org 1	5,92	6,05	6,14	6,59	6,10	5,22	5,43	5,42	5,59	5,05	6,21	6,02	6,57	6,69	6,87	6,39	4,65	5,54	3,94	3,70
ML intervention org 1	6,21	6,00	6,55	6,44	6,41	5,62	5,39	5,85	5,56	6,06	5,89	6,15	6,40	6,27	6,25	6,48	3,90	5,63	3,16	3,88
ML intervention org 2	6,88	6,24	6,86	6,63	7,22	6,21	5,76	5,71	6,39	6,67	7,34	7,00	7,25	7,12	7,49	6,38	4,42	5,49	5,23	5,07
ML intervention org 3	7,23	7,36	6,77	6,98	6,87	5,24	5,35	5,20	5,56	5,35	7,19	7,06	6,41	6,53	6,73	7,01	3,33	6,15	3,31	3,77
ML intervention org 4	5,05	5,95	5,50	6,50	6,17	5,64	6,15	6,10	5,79	6,11	5,42	4,97	4,80	5,05	5,30	5,00	5,27	4,20	4,86	5,26
Sh. L Intervention org 1	8,13	8	7,5	7,67	8,33	5,5	5,42	5,33	6	5,17	7,67	7,11	6,89	7,39	8	3	4,17	5	4,5	2,33
Sh. L Control org 2	7	7,06	6,86	6,94	6,94	3,56	3,94	4,93	5	4,88	7,33	6,63	5,9	5,83	7	4	3,63	4,14	3,88	4,25
Sh. L Intervention org 2	6	6,83	6,44	6,75	6,5	5,22	4,94	5,06	4,06	4,29	6,63	6,78	6,7	6,79	7,29	5,11	5,22	4,89	4,5	4,14
Sh. L Control org 3	7,15	6,64	6,37	7,01	7,06	4,52	5,16	4,61	5,41	5,33	6,43	6,24	6,1	6,44	6,89	5,12	5,37	5,2	4,48	5,13
Sh. L Intervention org 3	7,25	6,88	6,17	6	6,5	7,75	7,25	7	6,5	7	6,83	6,17	4,78	6,58	6	7	6	7,67	6,25	6
Sh. L Intervention org 5	6,14	6,14	5,5	5,83	5,7	4,86	5,29	5,57	4,5	5,4	6,1	6,38	6,33	5,44	4,8	6,29	6,14	5	5,17	6,8
Sh. L Control org 6	6,82	6,68	7,03	6,36	7,03	5,82	6,14	5,46	4,95	5,48	6,95	6,01	6,25	6,72	7,15	6,1	5,98	6,38	5,94	6,5
Sh. L Intervention org 6	7,14	6,56	6,28	6,25	6,14	5,86	5,97	6,17	5,78	5,28	6,58	6,32	6,26	5,69	5,98	5,96	5,62	6,17	5,56	5,4
Sh. L Control org 7	6,82	7,08	6,67	7,13	6,77	6,87	5,57	5,98	6,2	6,17	6,64	6,98	6,78	7,13	7,19	5,4	5,97	6,2	5	6,93
Sh. L Intervention org 7	6,69	6,79	6,29	6,39	6,49	5,51	6	5,49	5,11	5,14	6,7	6,56	6,17	6,74	6,74	5,78	5,42	5,66	6,11	5,78

Notably, we examined whether the effects of the LDPs were dependent on certain environmental characteristics. While the number of companies (N = 13) in our sample was too small to test for moderation, we examined at the employee level (with more sample size) whether “amount of interaction with the supervisor” moderated the results. This variable was deemed important, as regular contact between the leader and the followers would be important for the followers to notice or experience differences in leader behavior. The results of these two analyses are listed in Appendix 9.12 but showed no moderation effect⁴.

5.2.2 | Retrospective effects

In addition to objectively comparing the scores of the participating leaders and followers in each of the LDPs, we also assessed the more subjective retrospective effects to understand whether the participants experienced any change in the variables of interest. To that end, participants were asked in survey 5 to compare their mindset (for the leaders) and the leader behaviour and their own need satisfaction and well-being (for the followers) at that point in time with their experiences before the training. To analyse such data, Paired-Samples T-tests were used. For these analyses responses from the intervention group were used, all assessed in survey 5.

5.2.2.1 | Leader mindsets

Table 14 indicates that for the Situational LDP, significant differences were found in three out of four aspects of leaders’ mindset. Leaders following this LDP, shifted their mindset to more towards that employees are proactive but need to be stimulated in the right way (Theory X/Y mindset) and that there is value in interacting with diverse others (diversity mindset). They also were increasingly aware that desired leader behaviour may depend on the situation (adaptability mindset). While the effect size for Theory X/Y thinking was weak, evidence for the change in the other two mindsets was strong. This indicates that, based on the retrospective evaluation of the participants, the Situational LDP was successful.

Less positive results were found for the motivational LDP. No changes in leadership mindset could be established.

The Shared LDP was successful in changing the adaptability mindset of the leaders. Similarly, as for the Situational LDP, when looking back at their own trajectory, leaders of the Shared LDP indicated they had shifted their adaptability mindset. Effect size was found to be weak.

⁴ We have explored other interaction effects within the data but found none worth reporting. We are happy to provide the non-significant results upon request.

Table 14 - Perceived change of leader mindsets based on retrospective ratings by leaders

		Situational Leadership	Motivational Leadership	Shared Leadership
Leader Mindset	Theory X/Y	($M_B = 5.15, SD_B = .82$) ($M_N = 5.95, SD_N = 1.19$) $t(9) = -2.48, p = .035$	($M_B = 5.20, SD_B = 1.14$) ($M_N = 5.31, SD_N = 1.07$) $t(19) = -.95, p = .353$	($M_B = 5.36, SD_B = 1.63$) ($M_N = 5.72, SD_N = 1.67$) $t(17) = -1.87, p = .079$
	Diversity Mindset	($M_B = 5.95, SD_B = .89$) ($M_N = 6.78, SD_N = 1.20$) $t(9) = -2.83, p = .020$	($M_B = 5.99, SD_B = .89$) ($M_N = 6.26, SD_N = .97$) $t(19) = -1.87, p = .077$	($M_B = 6.00, SD_B = 1.37$) ($M_N = 6.27, SD_N = 1.47$) $t(17) = -2.03, p = .058$
	Adaptability Mindset	($M_B = 6.67, SD_B = 1.08$) ($M_N = 7.49, SD_N = 1.26$) $t(9) = -3.11, p = .012$	($M_B = 6.17, SD_B = 1.21$) ($M_N = 6.64, SD_N = .92$) $t(19) = -1.66, p = .114$	($M_B = 6.21, SD_B = 1.19$) ($M_N = 6.60, SD_N = 1.26$) $t(17) = -2.49, p = .023$
	Trust Mindset	($M_B = 4.53, SD_B = 1.07$) ($M_N = 3.87, SD_N = 1.30$) $t(9) = 1.75, p = .115$	($M_B = 4.18, SD_B = 1.44$) ($M_N = 4.05, SD_N = 1.29$) $t(19) = .60, p = .555$	($M_B = 4.91, SD_B = 1.61$) ($M_N = 4.79, SD_N = 1.86$) $t(18) = .66, p = .517$
	Pygmalion Mindset	($M_B = 6.20, SD_B = 1.64$) ($M_N = 6.67, SD_N = 1.59$) $t(9) = -1.01, p = .341$	($M_B = 6.23, SD_B = 1.51$) ($M_N = 6.53, SD_N = 1.07$) $t(19) = -1.53, p = .143$	($M_B = 5.91, SD_B = 1.49$) ($M_N = 6.16, SD_N = 1.61$) $t(18) = -1.86, p = .079$
	Learning Mindset	($M_B = 5.67, SD_B = .97$) ($M_N = 5.60, SD_N = 1.23$) $t(9) = .16, p = .877$	($M_B = 5.75, SD_B = 1.49$) ($M_N = 5.35, SD_N = 1.53$) $t(19) = 1.11, p = .279$	($M_B = 6.25, SD_B = 1.37$) ($M_N = 6.39, SD_N = 1.44$) $t(18) = -.90, p = .379$

Note: M_B indicates Mean of the retrospective measure administered, M_N indicates Mean of non-retrospective measure administered.

5.2.2.2 | Leader behaviour

Table 15 indicates that the participants of the Situational LDP felt that they significantly improved their leadership behaviours. They felt they engaged more in explaining the work that needed to get done (clarifying), showing concern for employees (supporting), encouraging employees to do the work as they think it is best (empowering) and providing their employees with clear ethical norms (protecting). Evidence for these effects was weak to moderate.

Less positive results were found for the Motivational LDP and Shared LDP. No changes in leaders' retrospective assessment of their behaviour could be established for either of these LDPs (except for protecting for shared leadership).

Table 15 – Perceived change in leadership behavior based on retrospective ratings by followers

		Situational Leadership	Motivational Leadership	Shared Leadership
Leader Behaviour	Clarifying	($M_B = 6.30, SD_B = 1.39$) ($M_N = 6.68, SD_N = 1.47$) $t(24) = -3.41, p = .006$	($M_B = 6.56, SD_B = 1.32$) ($M_N = 6.62, SD_N = 1.53$) $t(77) = -.64, p = .524$	($M_B = 3.71, SD_B = .52$) ($M_N = 3.51, SD_N = .66$) $t(24) = 1.69, p = .103$
	Supporting	($M_B = 6.51, SD_B = 1.34$) ($M_N = 6.87, SD_N = 1.29$) $t(24) = -2.26, p = .033$	($M_B = 6.63, SD_B = 1.41$) ($M_N = 6.67, SD_N = 1.63$) $t(76) = -.32, p = .750$	($M_B = 3.41, SD_B = .68$) ($M_N = 3.26, SD_N = .80$) $t(24) = 1.08, p = .290$
	Empowering	($M_B = 6.39, SD_B = 1.63$) ($M_N = 6.90, SD_N = 1.52$) $t(24) = -2.33, p = .028$	($M_B = 6.59, SD_B = 1.36$) ($M_N = 6.74, SD_N = 1.53$) $t(77) = -1.31, p = .193$	($M_B = 3.40, SD_B = .66$) ($M_N = 3.49, SD_N = .95$) $t(24) = -.43, p = .672$
	Protecting	($M_B = 6.53, SD_B = 1.38$) ($M_N = 6.91, SD_N = 1.66$) $t(24) = -2.58, p = .016$	($M_B = 6.70, SD_B = 1.27$) ($M_N = 6.76, SD_N = 1.50$) $t(76) = -.614, p = .541$	($M_B = 2.90, SD_B = .88$) ($M_N = 3.21, SD_N = .98$) $t(24) = -2.27, p = .032$

5.2.2.3 | Employee outcomes

Table 16 indicates that followers of the leaders attending the Situational LDP felt more satisfied in their needs for autonomy, competence and relatedness after the LDP than before. They also felt more secure. No differences could be established in their motivation or well-being.

In general, the followers of the leaders attending the Motivational LDP did not report retrospective changes in their needs, motivation or well-being. Burnout, an aspect of employee well-being, forms an exception to this general pattern. Unexpectedly, followers of the leaders attending the Motivational LDP reported to be more burnout after their leaders had attended the LDP compared than before.

The participants of the Shared LDP did report retrospective changes in competence satisfaction: they felt more efficacy after than before attending this LDP. No differences could be established in their motivation or well-being.

Table 16 – Perceived change in employee outcomes based on retrospective ratings by followers

		Situational Leadership	Motivational Leadership	Shared Leadership
Need satisfaction	Competence	(M _B = 7.81, SD _B = 1.13) (M _N = 8.08, SD _N = 1.02) t(24) = -2.41, p = .024	(M _B = 7.03, SD _B = 1.13) (M _N = 7.18, SD _N = 1.16) t(83) = -1.76, p = .082	(M _B = 6.17, SD _B = 1.48) (M _N = 6.57, SD _N = 1.38) t(41) = -2.43, p = .028
	Relatedness	(M _B = 6.05, SD _B = 2.04) (M _N = 6.41, SD _N = 2.01) t(24) = -2.30, p = .030	(M _B = 6.35, SD _B = 1.72) (M _N = 6.48, SD _N = 1.81) t(83) = -1.35, p = .179	(M _B = 5.92, SD _B = 1.11) (M _N = 6.06, SD _N = 1.60) t(41) = -.79, p = .433
	Autonomy	(M _B = 7.37, SD _B = 1.09) (M _N = 7.85, SD _N = 1.02) t(24) = -2.82, p = .009	(M _B = 6.80, SD _B = 1.29) (M _N = 6.89, SD _N = 1.35) t(83) = -1.37, p = .174	(M _B = 5.87, SD _B = 1.52) (M _N = 6.20, SD _N = 1.69) t(41) = -1.47, p = .150
	Security	(M _B = 6.68, SD _B = 1.60) (M _N = 7.09, SD _N = 1.43) t(24) = -2.41, p = .024	(M _B = 6.87, SD _B = 1.20) (M _N = 7.02, SD _N = 1.23) t(83) = -1.65, p = .103	(M _B = 5.63, SD _B = 1.42) (M _N = 5.96, SD _N = 1.50) t(41) = -1.56, p = .126
Follower motivation & well-being	Engagement	(M _B = 6.81, SD _B = 1.47) (M _N = 7.08, SD _N = 1.37) t(24) = -1.43, p = .166	(M _B = 6.97, SD _B = 1.41) (M _N = 6.90, SD _N = 1.56) t(82) = -.526, p = .600	(M _B = 6.18, SD _B = 1.43) (M _N = 6.44, SD _N = 1.61) t(41) = -1.13, p = .267
	Autonomous Motivation	(M _B = 6.82, SD _B = 1.15) (M _N = 7.10, SD _N = 1.21) t(24) = -1.98, p = .060	(M _B = 6.32, SD _B = 1.12) (M _N = 6.40, SD _N = 1.15) t(83) = -1.42, p = .160	(M _B = 6.33, SD _B = 1.24) (M _N = 6.44, SD _N = 1.38) t(41) = -.66, p = .515
	Burnout	(M _B = 3.80, SD _B = 2.14) (M _N = 3.80, SD _N = 2.14) t(25) = .00, p = 1.00	(M _B = 3.88, SD _B = 2.12) (M _N = 4.13, SD _N = 2.24) t(82) = -3.01, p = .042	(M _B = 6.18, SD _B = 1.61) (M _N = 5.16, SD _N = 1.91) t(41) = -1.03, p = .311
	Controlled Motivation	(M _B = 6.20, SD _B = 1.19) (M _N = 6.30, SD _N = 1.44) t(24) = -.48, p = .638	(M _B = 5.85, SD _B = 1.66) (M _N = 5.92, SD _N = 1.69) t(83) = -1.42, p = .288	(M _B = 4.94, SD _B = 1.61) (M _N = 5.10, SD _N = 1.64) t(41) = -1.50, p = .140

5.2.3 | Power analysis

Given the low number of significant findings among both the RCT and retrospective effects, a post hoc power analysis was done to understand whether this is a result of low power or of a truly small effect. To conduct post hoc power analyses, which would result in the computation of the achieved power per analysis, the G*Power tool (Faul et al., 2007) was used. Since two types of analyses were utilized to produce the main results of the study (i.e., repeated measures ANOVA for RCT data, and paired-sample t-tests for retrospective data), both F-tests and t-tests techniques were used in the tool.

To produce the results in the post hoc tables for the repeated measures ANOVAs (See table 17-19), the effect size, total sample size and number of measurements across time were specified. The level of α error probability was kept at a constant of .05 for all analyses. To produce the results in the paired-sample t-tests tables (Se tables 20-22), the effect size and total sample were specified, while, again, α

error probability was kept at a constant of .05. For both test families, analyses were conducted for each variable involved in the main analyses, as reflected in the tables below.

Table 17 – Post hoc power analysis example: Power of repeated measures ANOVA of leader mindsets

		Situational Leadership	Motivational Leadership	Shared Leadership
Leader Mindset	Theory X/Y	$\alpha = .05$, power = .83, effect size = .31, N = 24	$\alpha = .05$, power = .45, effect size = .21, N = 22	$\alpha = .05$, power = .89, effect size = .28, N = 34
	Diversity Mindset	$\alpha = .05$, power = .30, effect size = .15, N = 24	$\alpha = .05$, power = .05, effect size = .01, N = 22	$\alpha = .05$, power = .32, effect size = .13, N = 34
	Adaptability Mindset	$\alpha = .05$, power = .34, effect size = .17, N = 23	$\alpha = .05$, power = .32, effect size = .17, N = 22	$\alpha = .05$, power = .25, effect size = .11, N = 33
	Trust Mindset	$\alpha = .05$, power = .36, effect size = .17, N = 24	$\alpha = .05$, power = .09, effect size = .06, N = 22	$\alpha = .05$, power = .75, effect size = .23, N = 34
	Pygmalion Mindset	$\alpha = .05$, power = .08, effect size = .05, N = 23	$\alpha = .05$, power = .05, effect size = .00, N = 22	$\alpha = .05$, power = .11, effect size = .06, N = 34
	Learning Mindset	$\alpha = .05$, power = .37, effect size = .17, N = 26	$\alpha = .05$, power = .18, effect size = .11, N = 22	$\alpha = .05$, power = .33, effect size = .14, N = 34

Table 18 – Power post hoc calculations for leader behaviour (of repeated measures ANOVA data)

		Situational Leadership	Motivational Leadership	Shared Leadership
Leader Behaviour	Clarifying	$\alpha = .05$, power = .59, effect size = .18, N = 24	$\alpha = .05$, power = .75, effect size = .15, N = 47	$\alpha = .05$, power = .38, effect size = .11, N = 38
	Supporting	$\alpha = .05$, power = .59, effect size = .17, N = 25	$\alpha = .05$, power = .52, effect size = .12, N = 48	$\alpha = .05$, power = .57, effect size = .14, N = 38
	Empowering	$\alpha = .05$, power = .15, effect size = .08, N = 25	$\alpha = .05$, power = .72, effect size = .15, N = 48	$\alpha = .05$, power = .98, effect size = .25, N = 38
	Protecting	$\alpha = .05$, power = .44, effect size = .15, N = 25	$\alpha = .05$, power = .60, effect size = .13, N = 47	$\alpha = .05$, power = .99, effect size = .29, N = 38

Table 19 – Power post hoc calculations for followers’ needs satisfaction, motivation, and well-being (of repeated measures ANOVA data)

		Situational Leadership	Motivational Leadership	Shared Leadership
Need satisfaction	Competence	$\alpha = .05$, power = .49, effect size = .16, N = 25	$\alpha = .05$, power = .54, effect size = .12, N = 51	$\alpha = .05$, power = .09, effect size = .03, N = 71
	Relatedness	$\alpha = .05$, power = .80, effect size = .22, N = 25	$\alpha = .05$, power = .11, effect size = .04, N = 51	$\alpha = .05$, power = .54, effect size = .10, N = 71
	Autonomy	$\alpha = .05$, power = .15, effect size = .08, N = 25	$\alpha = .05$, power = .64, effect size = .13, N = 51	$\alpha = .05$, power = .81, effect size = .13, N = 71
	Security	$\alpha = .05$, power = .97, effect size = .29, N = 25	$\alpha = .05$, power = .28, effect size = .08, N = 51	$\alpha = .05$, power = .49, effect size = .10, N = 71
Follower motivation & well-being	Engagement	$\alpha = .05$, power = .40, effect size = .14, N = 26	$\alpha = .05$, power = .58, effect size = .12, N = 51	$\alpha = .05$, power = .85, effect size = .14, N = 70
	Autonomous Motivation	$\alpha = .05$, power = .28, effect size = .13, N = 23	$\alpha = .05$, power = .93, effect size = .19, N = 50	$\alpha = .05$, power = .68, effect size = .11, N = 72
	Burnout	$\alpha = .05$, power = .97, effect size = .29, N = 26	$\alpha = .05$, power = .99, effect size = .26, N = 50	$\alpha = .05$, power = .49, effect size = .10, N = 70
	Controlled Motivation	$\alpha = .05$, power = .57, effect size = .18, N = 24	$\alpha = .05$, power = .46, effect size = .11, N = 50	$\alpha = .05$, power = .97, effect size = .17, N = 72

Table 20 – Power post hoc calculations for leader mindsets (of paired-sample t-tests data)

		Situational Leadership	Motivational Leadership	Shared Leadership
Leader Mindset	Theory X/Y	$\alpha = .05$, power = .71, effect size = .75, N = 10	$\alpha = .05$, power = .11, effect size = .10, N = 20	$\alpha = .05$, power = .22, effect size = .22, N = 18
	Diversity Mindset	$\alpha = .05$, power = .73, effect size = .77, N = 10	$\alpha = .05$, power = .35, effect size = .29, N = 20	$\alpha = .05$, power = .19, effect size = .19, N = 18
	Adaptability Mindset	$\alpha = .05$, power = .65, effect size = .69, N = 10	$\alpha = .05$, power = .58, effect size = .43, N = 20	$\alpha = .05$, power = .19, effect size = .31, N = 18

	Trust Mindset	$\alpha = .05$, power = .48, effect size = .55, N = 10	$\alpha = .05$, power = .11, effect size = .09, N = 20	$\alpha = .05$, power = .09, effect size = .07, N = 19
	Pygmalion Mindset	$\alpha = .05$, power = .21, effect size = .29, N = 10	$\alpha = .05$, power = .25, effect size = .22, N = 20	$\alpha = .05$, power = .17, effect size = .16, N = 19
	Learning Mindset	$\alpha = .05$, power = .07, effect size = .06, N = 10	$\alpha = .05$, power = .31, effect size = .26, N = 20	$\alpha = .05$, power = .11, effect size = .10, N = 19

Table 21 – Power post hoc calculations for leader behaviours (of paired-sample t-tests data)

		Situational Leadership	Motivational Leadership	Shared Leadership
Leader Behaviour	Clarifying	$\alpha = .05$, power = .36, effect size = .27, N = 25	$\alpha = .05$, power = .10, effect size = .04, N = 78	$\alpha = .05$, power = .47, effect size = .33, N = 24
	Supporting	$\alpha = .05$, power = .38, effect size = .27, N = 25	$\alpha = .05$, power = .08, effect size = .03, N = 77	$\alpha = .05$, power = .25, effect size = .20, N = 25
	Empowering	$\alpha = .05$, power = .47, effect size = .32, N = 25	$\alpha = .05$, power = .23, effect size = .10, N = 78	$\alpha = .05$, power = .13, effect size = .11, N = 25
	Protecting	$\alpha = .05$, power = .33, effect size = .25, N = 25	$\alpha = .05$, power = .10, effect size = .04, N = 77	$\alpha = .05$, power = .49, effect size = .33, N = 25

Table 22 – Power post hoc calculations for followers’ needs satisfaction, motivation, and well-being (of paired-sample t-tests data)

		Situational Leadership	Motivational Leadership	Shared Leadership
Need satisfaction	Competence	$\alpha = .05$, power = .33, effect size = .25, N = 25	$\alpha = .05$, power = .32, effect size = .13, N = 84	$\alpha = .05$, power = .55, effect size = .28, N = 42
	Relatedness	$\alpha = .05$, power = .22, effect size = .18, N = 25	$\alpha = .05$, power = .16, effect size = .07, N = 84	$\alpha = .05$, power = .15, effect size = .10, N = 42
	Autonomy	$\alpha = .05$, power = .71, effect size = .45, N = 25	$\alpha = .05$, power = .15, effect size = .07, N = 84	$\alpha = .05$, power = .37, effect size = .20, N = 42
	Security	$\alpha = .05$, power = .37, effect size = .27, N = 25	$\alpha = .05$, power = .30, effect size = .12, N = 84	$\alpha = .05$, power = .42, effect size = .23, N = 42
Follower motivation & well-being	Engagement	$\alpha = .05$, power = .23, effect size = .19, N = 25	$\alpha = .05$, power = .11, effect size = .05, N = 84	$\alpha = .05$, power = .29, effect size = .17, N = 42
	Autonomous Motivation	$\alpha = .05$, power = .31, effect size = .24, N = 25	$\alpha = .05$, power = .16, effect size = .07, N = 84	$\alpha = .05$, power = .13, effect size = .08, N = 42
	Burnout	$\alpha = .05$, power = .05, effect size = .00, N = 25	$\alpha = .05$, power = .27, effect size = .11, N = 83	$\alpha = .05$, power = .24, effect size = .15, N = 42
	Controlled Motivation	$\alpha = .05$, power = .10, effect size = .08, N = 25	$\alpha = .05$, power = .10, effect size = .04, N = 84	$\alpha = .05$, power = .15, effect size = .10, N = 42

Broadly speaking, the post hoc power analyses demonstrate variable power per analysis but that a low percentage of our findings are powerful enough.

Power can be bolstered through a greater sample size. To address the question of what the desired sample size would be to detect the effect sizes found in the primary analyses with enough observed power, *a priori analyses* were additionally executed. The same tool (i.e., G*Power) was used. For the results referring to the repeated measures ANOVA analyses, the required sample size per analysis was calculated given the effect size (based on the results of the preceding post hoc power analysis) and the number of measurements across time. For the paired sample t-test tables, the effect size was specified (based on the results of the preceding main analyses. For both analysis types, the power level was set at .80 while α error probability was kept at a constant of .05. Results are shown in exemplar Table 23 below but the full range of tables can be found in Appendix 9.13.1.

Table 23 – A priori analysis example: Theoretically required N size for leader behaviours analyses (of paired-sample t-tests data)

		Situational Leadership	Motivational Leadership	Shared Leadership
Leader Behaviour	Clarifying	$\alpha = .05$, power = .80, effect size = .27, N = 90	$\alpha = .05$, power = .80, effect size = .04, N = 3546	$\alpha = .05$, power = .80, effect size = .33, N = 58
	Supporting	$\alpha = .05$, power = .80, effect size = .27, N = 84	$\alpha = .05$, power = .80, effect size = .03, N = 9070	$\alpha = .05$, power = .80, effect size = .20, N = 155
	Empowering	$\alpha = .05$, power = .80, effect size = .32, N = 61	$\alpha = .05$, power = .80, effect size = .10, N = 582	$\alpha = .05$, power = .80, effect size = .11, N = 545
	Protecting	$\alpha = .05$, power = .80, effect size = .25, N = 103	$\alpha = .05$, power = .80, effect size = .04, N = 3364	$\alpha = .05$, power = .80, effect size = .33, N = 58

The *a priori analyses* reflect that, given the effect sizes that came out of the pos hoc analyses, the theoretically required sample sizes were often substantially larger than those that the ESF call LEO could offer. For example, considering table 21, for the situational leadership track, an average of 85 leaders would have been required to have powered findings, compared to the 25 leaders involved in the current analyses. Interestingly enough, this seems to be lower for follower-based data, which is more accessible than leader data. In consideration of future research sample sizes, one must also factor in participant fall-out as well. Further, takeaways and recommendations based on this analysis can be found in section 7.

5.2.4 | Complementary Qualitative survey data

This section presents the results of the qualitative sections that we included in the surveys for the motivational and situational LDP⁵. The goal of this data collect was to act as secondary data to the primary quantitative data. Unfortunately, very few participants added information in these sections of surveys and – if they added something – the responses were fairly short.

Despite these limitations, the qualitative results listed by the leaders and their team of followers at Time 5 may shed light on how the leaders experienced the LDPs, what they have learned and why we may not see the expected changes in the objective data. In this section, ML refers to the leaders of the Motivational LDP and SL refers to the leaders attending the Situational LDP. Follower responses are pooled and indicated as FM and FS, respectively.

5.2.4.1 | Experience of the LDPs

Some leaders argue that (effective) leadership is mostly a matter of stable personal characteristics: *“largely this must be in your nature, you can learn a lot but someone who is really not suitable for it will never be a good leader”* (SL15). Yet most leaders were convinced that leadership is part of both nature and nurture, but that a lot can be gained from learning to improve one’s leadership behavior, either through LDPs or by engaging in leadership in context. Interestingly, the leaders of the situational LDP seemed to refer more to experience on the ground than the leaders of the motivational LDP to become more effective as a leader.

- *“I think you are born with a certain number of talents. These can be further developed by circumstances (context, events, choices, ...). So in this sense they are both born and made.”* (ML2)

⁵ Due to space limitations, no fields for open questions (qualitative) were included in the surveys for the Shared LDP.

- *“Combination of both. I believe that you are born with certain leadership qualities, but you can only use them properly if you can develop yourself sufficiently in this.” (ML27)*
- *“Leadership is a process that involves constant training.” (ML32)*
- *“I don’t think a “born leader” is automatically a better leader than someone who has learned this. I think that every leader should be open to keep learning and look for areas for improvement.” (ML50).*
- *“Leadership can be learned. You can learn certain techniques to get more done from people.” (SL3)*
- *“A person can learn leadership, but the leadership is in a person. You can learn by allowing the company/organisation for which you work to develop you further” (SL37)*
- *“Training courses such as the leadership trajectory can certainly help you to gain certain insights and to be critical of yourself. However, I think experience is the most important factor in development.” (SL101)*
- *“My own leadership was / is being developed by simply executing it on the job. I discuss the difficulties I experience with this with my manager in order to exchange experiences.” (SL113)*

Leaders appreciated the training. The leaders attending the Motivational LDP explicitly mentioned that the training was insightful: *“The training provided many insights.” (ML2)* and appreciated the provided instruments and the scientific base of the course

- *“The leadership compass in particular is a useful instrument for thinking about one’s own actions.” (ML2) and “What is otherwise largely done from a “gut feeling” was given theoretical underpinning thanks to this training ... These insights go further and much deeper than a “gut feeling”” (ML27).*

Leaders of the Situational LDP explicitly expressed their appreciation for the trainers and their approach.

- *“Pleasant trainers who know how to present teaching material in an interesting way, with respect and understanding for everyone’s opinion. The emphasis was mainly on the individual and that the different leadership styles contribute to effective leadership. Had several training sessions with somewhat the same goal, but with a less inspiring view of leadership. To rule instead of to lead.” (SL11)*
- *“I also find leadership training and exercises very instructive. They provide a structured insight in which a lot of recognizability is hidden. The exercises are sometimes confrontational but leave a strong and lasting impression.” (SL114)*

Leaders also mentioned some obstacles in the training itself that prevented them from learning. Leaders lamented that the training was mostly online due to corona:

- *“It is a pity that the training had to take place digitally (corona) but certainly an added value to gain new insights and to be able to exercise it in practice.” (ML27)*
- *“It is a pity that the training ‘loses’ part of its value due to covid”. (ML41)*

And they would value more practical insights:

- *“It has made me realize even more that it is not all that obvious. I expected more from training. More discuss the practical issues and how to tackle them in practice. This was rarely mentioned.” (ML 53)*

The LDPs themselves were experienced as long enough:

- *“There was some good stuff in it, but I think this training could have been done in a much shorter time frame (2 days instead of 8)” (SL48)*

Notably, sharing e.g., their experiences with filling out the surveys was also seen as a valuable aspect of taking part in this research project:

- *“It makes you think about your own actions. These questionnaires make you think about how you function as a leader every so often. After such a questionnaire, you often start working a little more consciously during your job. The questionnaires were sometimes very long, but it is important that we as leaders reflect on what we are doing on a regular basis.” (ML50)*
- *“I hope that these reflections result in higher effectiveness.” (ML2)*

5.2.4.2 | What leaders learned from the LDPs

First, some leaders acknowledged they did **not had changed that much** throughout the trajectories. One leader for example noted: *“Feelings have not changed that much” (ML11).*

Some other qualitative data indicate that some leaders’ **did not develop the humanistic mindset** that were deemed valuable to generate need satisfaction and autonomous motivation among their followers. One leader for example, did not adopt a Theory Y mindset, but rather kept in with a Theory X approach: *“Very many people within the organisation do not have the right attitude and are really dull, constantly look at the efforts of their colleagues and make sure that they do nothing more. They prefer to do as little as possible and live on the sweat of those who nevertheless take the initiative.” (SL44)*

Other leaders, **still adopted a more laissez-faire leadership style**. Employees for example indicated that they found it challenging to give examples of good leader behaviors *“because the manager has no insight into life on the work floor.” “Directs from the desk, if necessary” and “She is not present enough on the work floor” (F-ML7).* Another follower indicated that the leader was not really involved *“I don’t think he’s interested...”(F-ML131).* Or they state *“Arrive at my department and start my work. And when my day’s work is done I go home. In between, like many other colleagues, I have little or no contact with my superior. And if there are problems, he sends an email to his superiors. But he never confronts himself, everything happens behind him. Much to the dismay of most of my colleagues.” (F-ML129).* However, followers may differ in their experience of the same leader. Another follower of the same manager suggest that he or she is actually supportive as the follower reported that he/she could *“express my annoyances” (F-ML129).*

Leaders reported that they had the feeling they learned more about themselves:

- *“get very useful handles that make me think about myself in the first place. I hope that these reflections result in higher effectiveness”. (ML2)*
- *“I feel that communication is much more effective because I have become more confident.” (ML4)*
- *“It just gives a lot of insights and food to think about. Provides many tools to experiment with. The interaction with colleagues during the training also provides inspiration. Also brings people together. He certainly also provided the insight that there are always other ways to approach a problem.” (ML50)*

Such learning about oneself is deemed essential to becoming a good leader:

- *“In my opinion, to become a good leader, you first have to get to know yourself well. You need to know where your qualities lie and what you still need to work on. You must then be able to question your own actions and adjust them if necessary.” (ML 50)*

They also mentioned having learned many different behaviours. In the following section, they are – for the sake of the overview – categorized into Yukl’s big 4 of leadership. To note is that these are not mutually exclusive and some fall into more than one category.

Clarifying

- *“...also check much more than before about how a message comes across and what the expectations are of them towards me.” (ML4)*
- *“They appreciate it when I listen to them, compliment them, give explanations, offer other perspectives that it questions the known, matters, leave silences, name my doubts and insecurities instead of letting them hang in the air.” (ML2)*
- *“Learned to communicate better by using the who, what, why, how questions.” (ML5)*
- *“Making time for conversations with your team members reduces tension, frustrations. Clear communication. Involving employees in projects. Giving feedback. Self-reflection on a regular basis. One on one conversations. Time management. Through more responsibility to give, they develop themselves, they feel involved” (SL54)*
- *I have found that as a leader you should certainly not show too much empathy. In the coming months I would like to find a little more of the happy medium between less empathy and being stricter. (S48)*

Supporting

- *“Yes. I received a compliment about encouraging people (individually or in a team) to reflect. I get this compliment often.” (ML2)*
- *“People say that I give compliments more often, that I also leave more room for feedback from everyone.” (ML4)*
- *“I am more aware of my colleagues, I try to work less solution-oriented but focus on coaching” (ML57)*
- *“I have noticed that I have to enter into conversations more consciously when employees have experienced difficult/difficult moments. I must be aware that these are moments from which we can learn. On the one hand, I want 58employees to know that they can come to me to talk about these situations. I want them to be able to name their feelings and that it feels safe enough for them to be able to talk about it honestly.” (ML50)*
- *“Being open to pause every now and then and make time for a small conversation works wonders. Also naming what went well on a working day does a lot for a person.” (ML51)*
- *“The more it means to be there for people in more difficult personal moments as a coach, even more important than supporting work-related content. Ask small check-in questions about someone’s personal home situation and how it is evolving” (SL111)*
- Yes Leadership training Continuous self-reflection Actively listening to feedback and seeking feedback Connecting more strongly with team members (SL114)

Empowering

- *“Within one of the teams I manage, I tried to place more leadership in the group.” (ML2)*
- *“I also use silences more often, which I used to be afraid to use” (ML4)*

- *“Delegate – I will try to take less work off my team’s hands and give them tools to accomplish the task in a good way themselves. Delegate instead of take over” (ML27)*
- *“How to stimulate my team to work more and more autonomously, by using the right questions and allowing them to acquire new insights in this way.” (ML57)*
- *“I kept away from giving advice and found that more came from the team itself. I involved the colleagues in drawing up a holiday schedule, so the proposal was accepted more quickly.” (ML41)*
- *“1) Feelings have not changed that much, but make an effort to react less emotionally in the event of difficulties. Try to inspire the team members more through positive conversations and give them more responsibility. As a result, the team members are clearly more motivated and are more driven to search/find solutions for issues of all kinds in a creative way. Both technically and socially. Engage in difficult conversations faster and spend more time preparing. 2) Give team members a little more responsibility. My role in this would then focus more on advising and acting more as a mediator.” (SL11)*
- I myself have tried to be open to other people’s ideas and also outsourced more things. I inquire more about the person and how they feel (also within the organisation) and try to take this into account even more. (SL106)

Protecting

- *“Let the group think about problems, bring it into the group Being a leader you are not alone it is all together that we can make it you cannot be the best and have the best idea everywhere, there are other opinions that are also good.” (ML3)*
- Zoom-in/zoom-out approach seems effective – Keep high-level overview but zoom in occasionally to solve problems and show involvement. Participating in hands-on activities with the team from time to time ensures a better connection with the team and new insights into what is going on in the group. (S114)

Leaders not only learned more specific behaviours, but also say they improved more general aspects of being an effective leader such as being more effective, focusing on purpose, ... For example

- *“As a leader you are a centipede who solves all kinds of problems. Now I mainly tackle things faster that can be resolved quickly, unlike a few months ago.” (SL3)*
- *“Learn to lead with more purpose.” (SL20)*

Some also show indirectly that they developed a humanistic mindset that was deemed essential to support follower need satisfaction and autonomous motivation. For example, one leader noted

- *“In the first place, there must be trust from the manager(s) so that you can work sufficiently independently.” (SL101)*

Some followers also recognize a **growth trajectory** among their leaders:

- *“In recent months I have been getting these slightly more often because there are also more individual conversations. He uses these conversations to give recognition or compliments.” And “my manager is always clear and, with small reminders, ensures that we meet the deadlines. In the beginning this was less, but now he does this regularly, meanwhile he also checks how we think about this.” (F-ML2)*

- *“tasks are better distributed, assigned more clearly, positive feedback and negative feedback By telling me that I am doing a good job, I feel that there is recognition for what I do. In general, I continue to have the feeling that she is there and adjusts where necessary, also out of concern.” (F-ML27)*

Leaders indicate they get feedback from their followers that things have changed. *“Yes, from my direct reports, who gave me positive feedback on the way we work” (SL37)*

Notably, particularly in the situational leadership training, followers report their leaders to better at clarifying

- E.g. *“is rectilinear gives even clearer instructions”, (F3) “but also has become even more concerned And takes more time to listen” (F3) – “yet also [what s/he] says still motivates me the same”*
- Echo’s by other followers F11 *“in difficult task across shifts, he supported the decisions I made. In the past, there were only comments afterwards.” And “is now much clearer, used to not listen to ideas that did not come from himself, now sometimes helps with ideas”*
- F15 *“I am getting more and more autonomy in making decisions, New training he followed, clear communication about this, Now there is a short meeting every day about what the day will bring – problems that can/should be addressed”*
- F19 *“NOTHING HAS CHANGED, NOT REALLY INVOLVED COUNTS ON KNOW-HOW FROM ITS GROUP LEADERS OPEN TO CHANGE/ IMPROVEMENT COUNTS ON LEADERSHIP FROM GROUP LEADERS ADVANCED OF FAIR OPEN COMMUNICATIONS FEELS INVOLVED WITH HIS GROUP”*

5.2.4.3 | *Obstacles to put learning into practice*

The responses that were given, provide some insights in why no objective differences were found in the study variables.

Leaders explicitly mentioned contextual effects that prevented them from putting the learnings into practice. The global **COVID-19 pandemic** hampered, for example, the leaders’ effectiveness and employee learning and prevented them to put some things into practice.

- *“In times of crisis it is extremely difficult to be effective. Then I have the feeling that I sometimes fall into ad hoc policy and mainly put out fires and solve problems.... Leading, guiding or coaching people becomes difficult because there is a lack of time and employees who have little resilience during a crisis. In times of crisis, there is no optimal learning climate, which makes it difficult for people to grow.... The functioning of the employees, and therefore also of the organisation are disrupted”. (ML2)*
- *“I would like to do a number of exercises with the entire group at a team meeting about peer reviews for youth situations. Because of corona that was very difficult, now it is allowed again physically, but time will also have to be released.” (ML4)*
- *“With the current situation, ongoing corona projects, internal relocation of workstations, etc.. it is not obvious to keep everyone motivated.” (ML 51)*

This was also recognized by the followers. For example, followers of one particular leader stated: *“Due to covid there is less time or opportunity for this”* and *“Since we had to telecommute we saw and heard each other less.” (FM2s)*

Apart of this large disruptions, leaders also felt inhibited by **struggles** within their team such as high levels of absenteeism: *“Working very frustrating at the moment due to the many absentees and the*

many missing parts" (SL15). High **workload** also made it challenging for leaders to fulfil each of the tasks, including putting the learnings from the trainings into practice. They indicated:

- *"Leadership is only a small percentage of the job."* (ML7)
- *"must admit that the focus on evolving as a leader has been greatly reduced due to the very high workload due to the loss of 2 team members (out of 5 in total). For the time being we have not yet found any replacements, so the work has been divided among the entire team and I therefore also take care of part of it... . The workload is dangerous to be too busy developing".* (SL101)
- *"Currently I am unable to delegate certain tasks. This is because my team members have too much work themselves and cannot take on anything extra. The result is that I take on some of their tasks, so that the things that I should actually be doing are not being achieved."* (SL113)

Notably, the high workload is not only mentioned by the leaders in the LDPs as a boundary condition for being an effective leader. Also in the control condition, when leaders did not yet have had the opportunity to participate, they mention it as a factor limiting their leader effectiveness:

- *"The workload is currently very high, which is understandable given the current situation. More and more is expected of the manager, although the majority are already at the limit. The current policy is to keep giving people extra tasks without them wondering whether this is feasible. Currently we can do the most necessary of the majority of our tasks (some we are forced to omit), but nothing can be carried out fundamentally."* (LS6 – control group)
- *"Fortunately, the workload has decreased somewhat and hopefully I can will continue to work on that"* (SL5) – control condition – being optimistic to focus more on leader effectiveness in the near future)

Notably, the pressuring workload may not only have hampered leaders to put their learnings into practice, but may also limit followers to pay attention to or notice the difference in the leaders' behavior. Upon asking whether they were informed by their followers that they had changed, leaders replied:

- *"Not really: did ask about it, but don't get much more than a "yes okay", little depth, even when I explicitly ask for it."* (SL111) and *"No comments or feedback received. Although I have weekly 1-1 meetings with my team members."* (SL113)

Despite that organisations selected the training they thought would fit best, some participants reported organisational barriers to put their learning into practice, which is also noticed by the followers

- *"the training convinced me to delegate more but the organisation does not always allow this."* (SL44)
- *"he himself has a clear point of view, but can also admit when he is put under pressure by the management that he too sometimes has to make decisions that he does not support 100%! I think this is strong!"* (FML2)

Also **time** seems to play a role. According to some leaders, it was – potentially because of the aforementioned issues – too early to really see effects of the trainings. One leader, for example, lamented the short time frame to learn such complex issues, particularly when the learning did not come natural to them.

- *“I certainly see the added value, but it still doesn’t feel natural. I especially need a lot of practice to integrate the methodologies into my working method” (ML28).*

As indexed by the followers, leaders may have **limited contact** with their followers:

- *“The manager does not know which tasks I do within the project. We talk once a month but has no idea in terms of details and complexity.” (FM1) and there is “little contact” (FS46).*

Whether such limited contact is due to, for example, high workload, remote working or a laissez-faire leadership style remains however unknown.

5.3 | Relations between the leaders’ mindset, behaviours and followers’ outcomes

5.3.1 | Simple analyses

To provide insights in the relations between the leaders’ mindset, behaviours and employee outcomes, we ran simple correlations between these variables at each of the timepoints. These correlations can be found in Appendix 9.9.

In a first step to explore the relations between the variables of our model, we examined the relations between the different constructs at T1 (N=min 313; listwise deletion). It can be concluded that

- the different mindset relate positively to each other (range .12-.50), which is in line with the assumption that they are all humanistic in nature. The mindset of Theory X/Y is an exception in this regard, as it only correlates significantly with having a diversity mindset and a Pygmalion mindset.
- The different leader behaviors also correlated strongly among each other (range .59-.72), indicating that when followers report that their leaders engage in one of the behaviors, they also score them high on the other behaviors.
- In line with the literature, the basic psychological needs for autonomy, competence and relatedness, related strongly with each other (.28-.66), and with the need for security (.42-.66) and the motivational and well-being outcomes, although the latter relations varied from weak (.13) between competence and burnout to strong (.60 between satisfaction of the need for autonomy and autonomous motivation).

At **T1** (when most data was available), the relations between the different part of our model show that...

- Few relationships could be established between the mindsets of the leaders – as reported by the leaders – and their behaviors – as reported by the employees. Only an adaptive mindset was associated with leaders behaviors (i.e., clarifying, supporting and protecting). These relations were rather weak (ranging from .14 to .17).
- Seeing your leader engaging in any of the leadership behaviors (i.e., clarifying, supporting, empowering and protecting) associates positively with the satisfaction of the basic needs for autonomy, competence and relatedness as well as the need for safety, and autonomous motivation. They also related all four positively with employee engagement and negatively with burnout. Clarifying and supporting also associated positively with controlled motivation, yet these relations were weak (.15-.17) and no relations were found between controlled motivation and empowering and/or protecting.

Notably, we examined whether the relations between the variables in our models were dependent on certain environmental characteristics. We examined at the employee level whether “amount of interaction with the supervisor” moderated the assumed relations in our model. This variable was deemed important, as regular contact between the leader and the followers would be important for the followers to notice or experience differences in leader behavior. The results of these two analyses are listed in appendix 9.12.2, but showed no moderation effect⁶.

5.3.2 | Latent growth modeling

Whereas limited associations were found between leader mindsets’ on leader behaviours, the connection between leader behaviour and follower need satisfaction was confirmed and is herein further explored⁷. This was achieved through *latent growth modelling*. As shown below, this technique allowed us to connect the leader behaviour from time n to the follower need satisfaction in time n+1 (IS= Initial status, RC= rate of change).

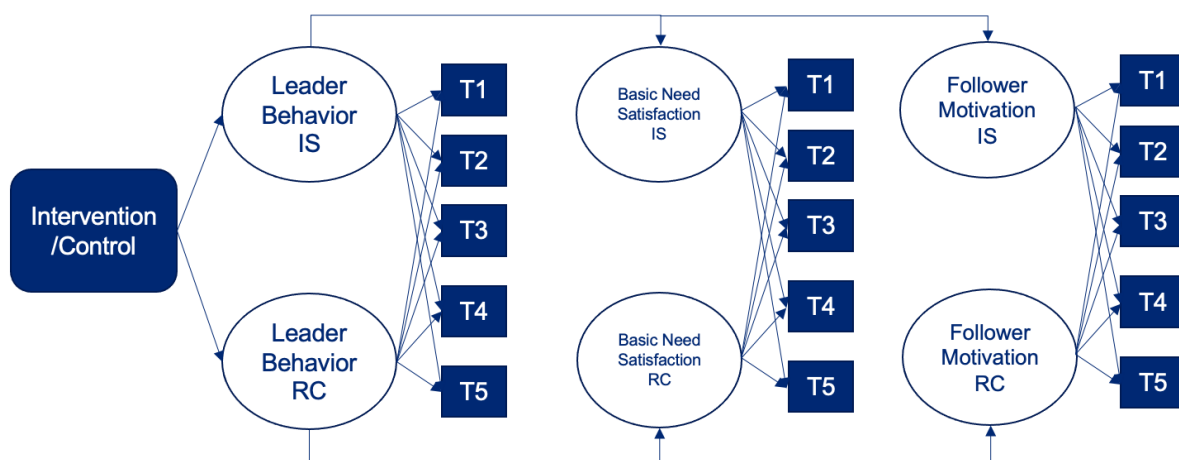


Figure 42 - Leader behaviour and follower need satisfaction connection

We aimed to examine whether three core leadership behaviors that we draw from Yukl’s taxonomy (2012), namely clarifying, supporting, and empowering, are connected to specific types of needs satisfaction in followers and that the relationship between leadership behaviors and followers’ need satisfaction is likely to evolve over time. For example, since definitions of empowering leader behaviors emphasize delegating authority to employees, promoting their self-directed and autonomous decision-making (Sharma & Kirkman, 2015), empowering leadership aligns with the satisfaction of the need for autonomy, which refers to the experience of having choices of imitating action oneself (Ryan & Deci, 2002).

We propose that clarifying leadership behaviors uniquely target followers’ competence needs. According to path-goal theory (House, 1996), followers feel competent in achieving performance when given specific guidance and clarified procedures. Though empowering leadership may also help satisfy competence needs by encouraging subordinates to resolve problems on their own (O’Donoghue & van der Werff, 2021), SDT suggests additional autonomy granted by an empowering leader holds less value in connection with routine and predictable tasks (Gagné & Deci, 2005).

⁶ We have explored other interaction effects within the data but found none worth reporting. We are happy to provide the non-significant results upon request.

⁷ We keep in with Self-determination theory and only explore the associations with followers basic need satisfaction, i.e., satisfaction of the basic needs for autonomy, competence and relatedness, which we think are mostly associated with leader empowering, clarifying, and supporting respectively.

Essentially, such tasks place limits on the extent to which employees can take advantage of the additional latitude granted by empowering leaders. On balance, we would expect to find clarifying leadership is predominantly related with followers' competence needs satisfaction.

We argue that as supporting leaders care for followers' personal well-being, it helps satisfy the need for relatedness – the feeling of being connected to others and having a sense of belongingness in groups (Baumeister & Leary, 1995). As Yukl and his colleagues (2019) elaborated, supporting leaders also encourage cooperation and mutual trust with subordinates, thus building meaningful dyadic relationships with followers and cultivating a psychologically safe climate (Ehrhart, 2004). While empowering leader behaviors may also predict followers' relatedness needs satisfaction by, for instance, asking for their ideas/suggestions when making important work decisions, which is likely to support feelings of belongingness, SDT argues that such sense of relatedness cannot emerge in the absence of secure relationship attachment (e.g., to leaders; Deci & Ryan, 2000). For example, employees may intrinsically enjoy making decisions alone, meaning the activity itself does not satisfy the need for relatedness. Supporting leader behavior, however, plays a role in making subordinates feel they are attached, cared for, thus supporting their need to belong. Therefore, we expect/hypothesize that supporting leadership is the predominant predictor of follower relatedness needs satisfaction.

The tendency to satisfy a relevant need following, for example, a clear demonstration of a given leadership behavior, is aligned with the proposals of SDT theories that need satisfaction varies within individuals over time (Ryan & Deci, 2017), we thus hypothesize that each core leadership behavior can be uniquely linked with a specific dimension of needs satisfaction both cross-sectionally and dynamically.

Hypothesis 1. Cross-sectionally and dynamically, clarifying leadership will be positively related with followers' competence needs satisfaction.

Hypothesis 2. Cross-sectionally and dynamically, supporting leadership will be positively related with followers' relatedness needs satisfaction.

Hypothesis 3. Cross-sectionally and dynamically, empowering leadership will be positively related with followers' autonomy needs satisfaction.

5.3.2.1 | Dynamic Relationship between Needs Satisfaction and Work Engagement

Self-determination theory (SDT) assumes that human beings are proactive organisms that have an inherent tendency to optimize their goals that were previously extrinsically motivated towards autonomously motivated (Deci & Ryan, 2000) – internalize external role demands into a core sense of self. In turn, being true to oneself has been argued and demonstrated to foster more autonomous motivation (Kernis & Goldman, 2006), supporting engagement in one's work (Meyer & Gagné, 2008). In this sense SDT acknowledges a natural process that goes beyond the simple intrinsic versus extrinsic to suggest a continuum of autonomous motivation. Applied to work settings, fulfilment of these needs will contribute to work engagement and increase of the satisfaction of basic needs will involve changes in work engagement. We thus hypothesize that:

Hypothesis 4. Cross-sectionally and dynamically, follower's basic needs satisfaction in terms of (a) competence, (b) relatedness, and (c) autonomy will be positively related with followers' work engagement.

The above hypotheses combine to form three mediation models. We propose that the three fundamental leader behaviors possess the characteristics that are likely to increase follower work

engagement via their influence on each of the three fundamental needs satisfaction. The overall research model is presented in Figure 42.

We ran a latent growth curve model (LGM) (Grimm, Ram, & Estabrook, 2016) to test the hypotheses. Results show that three leadership behaviours had a significant effect on the initial status of competence needs satisfaction. However, only clarifying showed a significant prediction on the rate of change for competence need ($\beta=2.11, p<0.05$). Regarding followers' relatedness need, supporting leadership had the highest significant positive relationship with this need both in terms of initial status ($\beta=1.03, p<0.001$) and rate of change ($\beta=0.75, p<0.01$). Furthermore, empowering leadership predominantly predicts the initial status ($\beta=0.79, p<0.01$) and rate of change ($\beta=0.42, p<0.05$) of autonomy needs satisfaction. For H4, a significant between-individual variation in the rate of change on work engagement was only found to be predicted by the relatedness needs satisfaction ($\beta=1.36, p<0.01$). Therefore, we found partial support for Hypotheses 1 and 4, and Hypotheses 2 and 3 are supported. All results are reported in Figure 2.

Following the recommendations of Iacobucci et al., (2007), we performed the mediation test separately for the cross-sectional and dynamic relationships with 5000 bootstrap iterations. All three leadership behaviours showed an indirect effect on the initial status of work engagement via certain needs satisfaction, whereas in terms of rate of change, only empowering leadership showed an indirect effect ($\beta=4.70, p<0.05$).

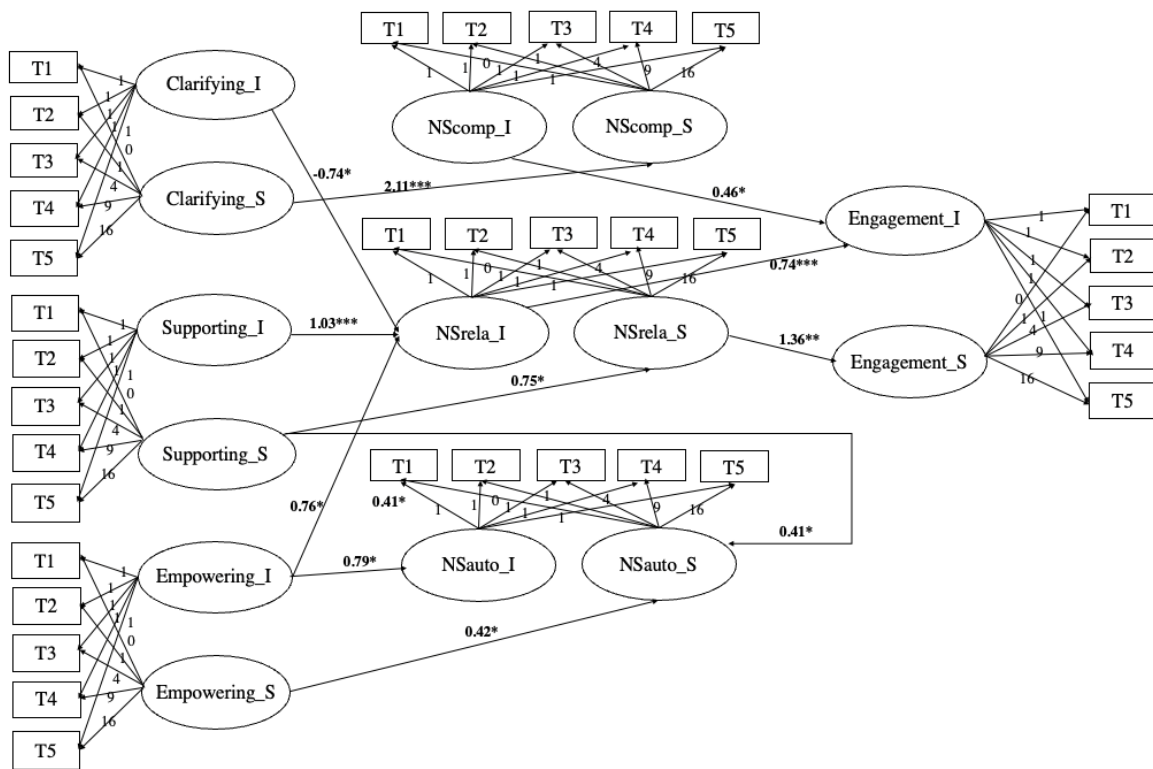


Figure 43 - Results of Latent Growth Model

Note. T1 = Time 1; T2 = Time 2; T3 = Time3; T4 = Time4; T5 = Time5; NScomp = competence need satisfaction; NSrela = relatedness need satisfaction; NSauto = autonomy need satisfaction; I = initial status (i.e., intercept); S = rate of change (i.e., slope).

6 | Answers to the evaluation questions

The ESF call LEO set out to...

- a) ...Understand the impact of the three types of leadership training interventions [LDPs] on employee autonomous work motivation and well-being?
- b) ...Test the general research model linking changes in leader mindsets to changes in leader behaviours, which then give rise to follower autonomous motivation and well-being⁸.

In other words, on the one hand, aimed to understand the impact of the LDPs on the leader mindsets, leader behaviours and employee outcomes and on the other hand aimed to study the relationships between these variables. These research questions can be summarized as in Table 24.

Table 24 - Overview of the evaluation questions

Evaluation aims	Overall aim 1: Understand the impact of the three types of leadership training interventions [LDPs] on employee autonomous work motivation and wellbeing?	Overall aim 2: Test the general research model linking changes in leader mindsets to changes in leader behaviours, which then give rise to follower autonomous motivation and well-being.
Research question 1	How do the different LDPs influence leaders' mindset (i.e., Theory X/Y, trust mindset, Learning/Pygmalion Mindset, Diversity Mindset, Adaptability Mindset – H1a)?	How does leaders' mindset influence their subsequent leader behaviour and followers' outcomes (H1b)?
Research question 2	How do the different LDPs influence leader behaviour (i.e., clarifying, supporting, empowering, and protecting – H2a)?	How do these behaviours influence followers' outcomes (H2b)?
Research question 3	<i>To what extent do the different LDPs influence followers' satisfaction of the basic needs for autonomy, competence and relatedness, as well as the need for security (H3a)?</i>	<i>How do these influence followers' motivation and well-being (H3b)?</i>
Research question 4	<i>To what extent do the LDPs trajectories influence followers' autonomous vs. controlled motivation (H4a)?</i>	<i>How do these influence followers' well-being (H4b)?</i>
Research question 5	<i>To what extent do the LDPs trajectories influence followers' engagement and burnout?</i>	

⁸ Note, as described in Section 2.1, the original research question was “What variables influence the impact of leadership training interventions [LDPs] on employee autonomous work motivation and wellbeing?”. However, due to the set-up of the study, this aim was reformulated.

To examine the impact of the LDPs on leader mindsets, leader behaviours and follower outcomes (aim 1), different measurement approaches were taken: a) pre/post comparison of the rating of each of the constructs, b) retrospective measures in which we asked leaders and followers to compare their situation at T5 with the situation before the training, c) qualitative measures. Section 6.1 describes the results of this analysis. In Section 6.2, we describe factors that may have limited the impact of the different LDPs. In Section 6.3, we describe the results related to relationships between leader mindset, leader behaviour and follower outcomes based on a) the simple and b) the more advanced methodologies (aim 2).

6.1 | Overview of the results of the LDPs impacting leaders and followers (overall aim 1)

Table 25 - Overview of the results of the LDPs impact on leaders and followers, categorised per LDP and data type

Overall aim 1: Understand the impact of the three types of leadership training interventions [LDPs] on employee autonomous work motivation and wellbeing?								
Quantitative analysis						Qualitative measures		
Pre/post comparison			Retrospective measures			situational	motivational	
situational	motivational	shared	situational	motivational	shared			
How do the different LDPs influence leaders' mindset (i.e., Theory X/Y, trust mindset, Learning/Pygmalion Mindset, Diversity Mindset, Adaptability Mindset – H1a)	No significant results were found.	No significant results were found.	No significant results were found.	Significant changes were found in leaders' theory X/Y, diversity, and adaptability mindsets.	No significant results were found.	Significant changes were found in leaders' adaptability mindset.	Results show that some leaders developed their mindsets, especially focused on possibility of learning.	Results show that some leaders developed their mindsets, especially around born vs made themes.
How do the different LDPs influence leader behaviour (i.e., clarifying, supporting, empowering, and protecting – H2a)?	No significant results were found.	No significant results were found.	No significant results were found.	Significant changes were found in leaders' clarifying, supporting, empowering, and protecting behaviours.	No significant results were found.	Significant changes were found in leaders' protecting behaviours.	Results show that leaders generally became more aware of their behaviours and became more intentional.	Results show that leaders generally became more aware of their behaviours and became more intentional.

<i>To what extent do the different LDPs influence followers' satisfaction of the basic needs for autonomy, competence and relatedness, as well as the need for security (H3a)?</i>	No significant results were found.	No significant results were found.	No significant results were found.	Significant changes were found in followers' need satisfaction of competence, relatedness, autonomy, and security.	No significant results were found.	Significant changes were found in followers' need satisfaction of competence.	Results show that some followers have recognised a growth trajectory, noting better recognition.	Results show that some followers have recognised greater support in autonomous decisions.
<i>To what extent do the LDPs trajectories influence followers' autonomous vs. controlled motivation (H4a)?</i>	No significant results were found.	No significant results were found.	No significant results were found.	No significant results were found.	No significant results were found.	No significant results were found.	Little insight into this question could be derived from the qualitative data.	Little insight into this question could be derived from the qualitative data.
<i>To what extent do the LDPs trajectories influence followers' engagement and burnout?</i>	No significant results were found.	No effect on engagement but an unexpected significant increase in burnout.	No significant results were found.	No significant results were found.	No effect on engagement but an unexpected significant increase in burnout.	No significant results were found.	Little insight into this question could be derived from the qualitative data.	Little insight into this question could be derived from the qualitative data.

Table 25 shows an overview of the results of the LEO research project, in terms of answering the research questions in relation to the LDPs and the data collection approach. Unfortunately, when comparing participants' answers at the different points in time using pre-/post-comparison, no differences could be found in any of the leaders' mindsets or behaviours, or followers' needs, motivation or well-being for any of the three LDPs. This means that – using these more **objective measures** – **none of the LDPs proved to cause any differences in the leaders or the follower outcomes** – reflecting a null outcome for the LDP-related part of research questions 1-5 in terms of the quantitative pre/post comparisons.

The lack of significant results could potentially be due to the low sample size in each of the groups. The low starting numbers of leaders in each group and the dropout within the groups have led to several conditions being underpowered. Despite the relatively high response rate, the absolute number of participants on which the effectiveness of the LDPs could be tested was small, due to the relatively small sample size for each of the LDP intervention groups at the start of the ESF call LEO. To see whether such significant effects would have popped up if we would have had more participants, it is interesting to visually inspect the data and to look at the mean values for the participants per organisation. However, visual inspection of the mean values per organisation showed no variations in the evolutions of the variables. Yet, these variations were not such that they could indicate the success of LDPs when we compare pre/post measures.

However, the retrospective and qualitative results allowed to shed further light⁹. These will be explained below in more detail per LDP.

6.2.1 | Situational LDP

Despite the non-significant results in the pre-post comparison, the *retrospective results* suggest that the **situational LDP** did cause a shift towards more humanistic mindsets amongst the leaders (particularly in terms of Theory X/Y, diversity mindset and adaptability mindset). This provides support for research question 1a. This LDP also impacted leaders' behaviours in terms of clarifying, supporting, empowering and protecting, supporting research question 2a. Given that these changes were reported by the employees, they provide notable evidence that the leader engaged in different behaviours at Time 5 compared to at the beginning of the intervention. The employees whose leader participated in the situational LDP subsequently also reported being more satisfied in their needs for autonomy, competence and relatedness as well as security, supporting research question 3a. No differences were reported in terms of followers' motivation or well-being. Hence, research questions 4a and 5a could not be supported for the situational LDP.

The *qualitative results* further add to these findings: the leaders of the situational LDP assumed the training could help them to become more effective and were appreciative of the trainers. At the same time, they also mention that they are likely to develop further simply by engaging further in their role as a leader. They reported they had improved in all four studied leader behaviours and followers particularly noticed that the leaders became better at clarifying. This partially supports research question 2a.

6.2.2 | Motivational LDP

For the **motivational LDP**, the leaders themselves, nor their followers reported significant differences when *retrospectively* comparing their situation before versus after the training. The only exception is follower burnout, which – unexpectedly – was higher after the training than before. Further research should investigate this result.

⁹ For the situational and motivational LDP.

However, the qualitative results reflect that the participants of the motivational LDP did nonetheless assume that attending an LDP could help them become more effective as a leader and these leaders seemed to like the tools and scientific base of the LDP. They did, however, regret that much of the training needed to happen online due to Corona and would have valued more practical guidelines. Leaders attending the motivational LDP, explicitly mentioned they had grown as a person and – throughout the different qualitative responses – the leaders gave examples of how they improved in all four studied leader behaviours and followers explicitly recognised the growth trajectories of the leaders.

6.2.3 | Shared LDP

The participants of the **shared LDP** reported *retrospectively* that leaders changed towards a more humanistic mindset only in terms of an adaptability mindset. Followers reported only a change in leaders' behaviour in terms of their protecting behaviour and an increase in their competence need satisfaction. No changes in the other follower outcomes were reported.

Note that – due to the length of the survey – no qualitative questions were asked of the people in the shared leadership LDP.

6.2 | Factors limiting the impact of the LDPs

Above, we note that there were challenges related to power that may have prevented us from finding statistically significant differences in pre/post scores. Additionally, strong contextual factors have also been mentioned that may have impacted the potential impact of the LDPs. These were partially reflected in the qualitative feedback of the participants but also surfaced in the feedback from company representatives, and LDP facilitators during the ESF call LEO.

The ESF call LEO ran during the COVID-19 pandemic. On the one hand, this interrupted the timing and way in which the LDPs were delivered (i.e., some parts were moved online). On the other hand, it also impacted the degree to which leaders could pay attention to their learnings and put things into practice (e.g., due to being busy with solving covid-related issues, understaffed teams, and working online).

6.3 | Overview of the results of the general model

In this section, we consider the research questions that belong under the second aim (i.e., b part of research questions 1-4) about our general model. The analysis examining the relationship between the leader mindset, leader behaviours and follower outcomes revealed few systematic relations between leader mindset and behaviours. Of the mindsets measured, adaptive mindset (thinking that followers may develop), trust mindset (holding trust in the followers), and Pygmalion mindset (assuming that followers are talented and can further develop) were associated (though not strongly or consistently) with the behaviours of being protective, supportive, and empowering as a leader. Hence, only limited evidence could be found for research question 1b. Most notably, however, this did not lead to more need satisfaction or other outcomes over time. This suggests that, although changes in mindset could relate to changes in behaviour, they would not necessarily translate into more employee motivation or well-being over time.

The analysis examining the relationship between leader behaviour and follower outcomes was more promising. In addition to the simple correlations, the results of latent growth modelling indicated that leader behaviour of clarifying, supporting, and empowering correlated with the satisfaction of the basic psychological needs for competence, relatedness and autonomy, respectively, which is in line with research question 2b. In turn, the satisfaction of followers' basic psychological needs could be linked to increased engagement (answering research question 3b).

This indicates that leaders indeed can make a change in employee need satisfaction by displaying the right behaviours. Making positive findings of relations within the research model could allow us to prescribe certain behaviour targeting LDPs for identified need satisfaction among followers. That is, if LDPs would be successful in helping leaders to engage more in clarifying, supporting and empowering, we can expect that their followers would experience more satisfaction of their basic needs and feel more engaged at work.

We were encouraged by these results as they largely (aside from the mindsets) confirm the evaluation frame we used in setting up this study. This Big X of leadership shows how different leader behaviours related to the satisfaction of basic psychological needs and thus employee motivation and well-being. This is important as this suggests that this evaluative frame can be used for future studies that aim to evaluate the impact of LDPs. In other words, the generic evaluative framework we have used fits the data. While more specific frameworks could be developed tailored to each training, this generic framework could be used regardless of the training content as it aims to capture a wide range of leader behaviours as well as follower needs that ultimately serve follower motivation and well-being.

7 | Recommendations

This project holds several recommendations for organizations, intermediaries such as Agoria, as well as policy-oriented research and policy. We believe this project also has value for the scientific literature, as requested at the onset of LEO. Appendix 9.14, mentions research papers that flow from the ESF call LEO. The recommendations for the other stakeholders are mentioned below.

7.1 | Selecting the best LDP

The ESF call LEO set off with the aim to assess the contextual variables influencing the impact of LDPs on employee autonomous work motivation and well-being. That is, one of the envisioned outcomes was to detect in which circumstances (e.g., which sector, organisational culture, specific problem among the employees) a particular LDP would be more successful such that organizations could be guided in their selection of LDPs.

The current set-up of the ESF call LEO did not allow testing whether and how organisational-level variables (e.g., culture, strategy) may play an important role in the effectiveness of particular LDPs (Ready & Conger, 2003). Nonetheless, the project provided some information that this indeed matters. Foremost, organizations wanted to select rather than be assigned to an LDP. This is not without reason. As a most extreme example, engaging in a shared leadership LDP would make less sense when organizations would not want to empower their teams and/or have a structure that would allow multiple people to take a leadership role within a team.

LDPs are often selected based on intuition, based on personal beliefs about what is good leadership, the charisma of the salesperson, and/or the LDP's track record of delivering on their promise. For a better selection, significant work must be done towards an accurate problem analysis and the subsequent match of that problem with the LDP's proposed solution. This moves leadership development from being an end in itself to being the solution to a specific challenge that the organisation is facing i.e., it is a strategic decision. Against this background, in the realm of the ESF call LEO, we developed a booklet entitled '**Strategic Swiping**' that helps choose the right LDP (more information can be found in Appendix 9.8.1). Built around a framework of vision, methodology, and impact, the booklet provides the reader with a range of questions that allows them to consider the match of a prospective LDP with their organisation. This booklet would apply to a wide range of stakeholders:

For organizations: Thinking of these questions as mapped out in the strategic swiping booklet may help to select the right LDP for their organization.

For consultants and intermediaries: Thinking about the strategic alignment of the LDP and the potential client organizations may help to further improve the LDPs by being specific about their purpose and directing their efforts to organizations that would be a good match to their approach and – hence – their success.

For policy-oriented research: To test the LDP-context match effectively, ideally, there would be a sample of leaders broad enough across different organizations with different characteristics. This not only requires a considerable budget but also cooperation from organizations to take part in a leadership program that may be assigned rather than chosen. Rather than having organizations sign up for the LDPs with multiple leaders, one could open up LDPs to various organizations in which only a few leaders per organization can participate. One can then assess both organizational characteristics and leader characteristics and examine whether they cause variations in the experiences during the LDPs. The initial sample should be of considerable size to evaluate the effectiveness of 1 LDP and adjusted if multiple LDPs would be involved. Given the resource constraints that the ESF call LEO and

any potential further research project will likely face, we would recommend setting up a system where companies and/or providers are co-sponsors of having these evaluations happen in such a way that a database of evaluation information automatically gets collected and expended over time. This would require government efforts towards accreditation or certification such that there is a common incentive to keep collecting high-quality data.

7.2 | Testing the effectiveness of an LDP

7.2.1 | Engagement of participants and sample size

The sample for LEO was rather modest vis-a-vis the aims of the project. To make the most of the data, we tried to have a good response rate, which turned out to be great compared to standards in the scientific literature (Anseel et al., 2010). Engaging in an LDP RCT is challenging and time-consuming – despite our best efforts communicating this, it is now clear to us that all parties (companies and researchers alike) overestimated the willingness/commitment. For future projects, the commitment involved should be clear for associated managers and should be accounted for in terms of necessary time availability and equipment (e.g., laptops or tablets). It proved especially difficult to keep participants engaged long-term. Rather than the survey involvement becoming a habit, it seemed to become more draining.

For organizations: In applying to take part in future evaluations, organizations should calculate whether their investments (e.g., in providing time and accommodations) in participating would be a burden they can bare. For example, they can make their engagement clear and stipulate how they would facilitate participants to take part in the research in their application (e.g. a) whether or not they allow participants to take part in the research during office hours and b) if so, how much time they allow them to take part in the study and how do they facilitate that this doesn't increase the workload of the participants, c) which means they provide (e.g. work laptops, tablets, group sessions in the cafeteria, etc.)

For consultants/intermediaries and researchers involved in the evaluation:

- We believe that the full scope of the research project was not well communicated among the actual participants. Clearer, direct communication with participants about what is expected of them and an active engagement of the organizations that they commit to these expectations (e.g. when signing up to take part) would help catch limitations early. Ideally, the amount of time that participants will need to invest needs to be stipulated before organizations apply. This implies that the research program is clear when organisations sign up.
- Organisations can be guided in how to navigate the research across time. Consultants and intermediaries can help organisations in this by sharing their learnings from previous experiences and/or setting up learning groups so organizations can learn from each other.
- Consultants and researchers can more closely collaborate such that the information that is collected with the surveys can serve both research and training purposes.
- In case leaders supervise large teams (e.g. N = 30), a selection of followers can be made to participate to keep the time and energy invested in the research manageable. This was done during the ESF call LEO but only implemented during or after the first survey.

For policy-oriented research:

- The power of the analyses can be improved if one can start with enough organizations to back up for natural fall-out (e.g., a company which can not participate due to circumstances such as Covid or organisational crises). This implies that future research would require a larger set of organisations where LDPs are implemented. The underlying constraint to achieving this are budgetary restraints and the coordination of more stakeholders (we also discuss this in point 7.1.).
- Having an industry partner (Agoria), which is in close contact with the organizations to encourage participation proved to be successful. Given the scope of the project in terms of stakeholders and moving parts, sharing the responsibility of coordination was essential. In addition, Agoria had a richer understanding of the involved organisations, often providing important perspectives for both pragmatic as well as research decisions. Given how fruitful this was, we think future collaborations could involve a closer collaboration earlier in the project. This would have been conducive to 1) helping steer each other's role (the research team providing the research perspective and the partner representing companies) and 2) a clearer role allocation going forward.
- Within this project it proved to be helpful to have the participation officially included in the contract with the organizations, stipulating clear consequences (e.g., paying for the participation in the LDP) when participation is low. This encouraged organizations to enable leaders and followers to fill out the surveys (e.g., free up time, provide laptops or tablets to fill out the surveys such that the participants do not have to use their personal time or means to engage in the study).
- In the ESF call LEO, response rates were only achieved through persistent, direct communication with the participants, as well as through close collaboration with organizational representatives and participating leaders. This was highly taxing for the research team, given their distance from the teams and lack of understanding of their context (e.g., not knowing certain team members didn't have computers, sick leave, changing team members, etc.). In the current setup, the research team had multiple touchpoints with the company representatives. To improve on this, we foresee the need for earlier, clearer communication of roles. For example, in the contract agreement, ownership of achieving minimum response rates (be that surveys, interviews, or other data sources) should be communicated already with an outline of what this process entails (making it tangible and explicit). Along with making the collection process more efficient, it should also help with setting clear, mutually-understood expectations during the contract signing.
- The surveys should be designed such that they are engaging, as we tried to do here. A good practice was to use pre-validated questionnaires yet adapt them to a comprehensive language; use longer and shorter surveys to enable rich data collection and analysis, without overburdening people; make surveys part of the interventions: the questions asked can be valuable reflection exercises. This can be assured through solid pre-testing surveys, being critical about what is necessary to incorporate into the survey, and striving for maximum overlap in what serves the LDPs as well as the research.
- Note that participation needs to be voluntary (GDPR-conform) and subject to natural attrition in teams and organizations (e.g., turnover, sickness absence), so no 100% response rate can be guaranteed. Dropout should hence be factored in in the expected attrition (e.g., in pursuit of retaining six follower respondees by the end of the time frame, 8-10 respondees were part of the original cluster). This was effective. In terms of the voluntary nature of participation, respondents (both leaders and followers) can be asked whether or not they can commit to

taking part before the research starts to ensure all included participants are willing to provide the data. Having these things clarified beforehand ensures the smooth collection within the timebound frames of each survey round.

7.2.2 | Using the right measures

No systematic differences could be found in the intervention vs. the control groups when comparing the pre-post scores regarding mindsets, behaviours and follower outcomes, despite our retrospective and qualitative data indicating that there could have been changes. Currently, we focused on leader mindsets, which were rated by the leader and aimed to associate these mindsets with leader behaviour and associated follower outcomes as rated by the followers. Associating the leaders' mindsets and behaviours as observed by the followers is the most strong test that the LDP would have observable effects on the followers. After all: improving the situation and experiences of the followers was the explicit goal of the ESF call LEO. However, several conditions need to be met for the association between leader mindset and followers' perceptions of their behaviour to emerge: 1) the LDPs need to have changed the mindsets of the leaders; 2) there needs to be a connection between leader mindset and leaders intention to act; 3) leaders need to be able to display their changed behaviour and 4) the followers need to notice the change in leader behaviour. If one of these conditions is not (optimally) met, no significant relations will appear, even if the LDPs were successful in changing the mindset of the leaders. Our qualitative results for example already hint at Covid and workload as barriers for leaders to display the learned behaviour and for followers to notice any differences. To enable future research to shed more light on this, we would advise:

For organisations:

- Organisations should move away from seeing an LDP as an end in itself but rather as a means to an end. It is important to be clear on the strategic goals or reasons behind pursuing an LDP, i.e., clarify what they want the LDP to contribute towards. Examples of objectives could be increasing employee well-being of leaders and/or followers, promoting an organisational change, or increasing team effectiveness. To do so, organisations should spend time doing a strategically embedded problem analysis so that they can enter conversations with LDP providers with a definitive point of view on what they need. Furthermore, a quality provider will likely want to continue this conversation to ensure they can develop a programme that solves the real problem at hand through customisation or product selection (i.e., selecting appropriate LDP content). The Strategic Swiping booklet can be used for guidance and inspiration.
- Organisations should provide enough time and opportunities for leaders to put their learnings into practice and for followers to become aware of the differences in leader behaviour. Ideally, while the LDP provider should structurally design their programmes to address challenges of transfer of training, the organisation must also do their part to allow for LDP participants to digest and experiment with their learnings. Leaders' learning and development process is not restricted to the intervention itself but also happens before and after the sessions. If this is not accounted for, the full value of an LDP may not be possible to realise.

For policy-oriented research:

- To further unpack the potential impact of the LDPs, for example, using simulation tasks/role play to assess whether the leaders learned different behaviours after compared to before taking part in the LDP (making abstraction of the context).
- To assess the leader behaviours not only through follower reports but also by asking the leaders themselves whether they engage in them and/or engage in them differently compared to before.
- Continue using retrospective questions and qualitative, open questions as well.
- A final recommendation is to design the study more as a controlled experiment that carefully manipulates the key ingredient that the training envisions. As is often the case for organizational research, a multitude of confounding factors may hinder the effectiveness of the research. Researchers and experts could work together to more carefully design and test a controlled experiment – especially when working with academic experts this would be a good idea as it leverages the expertise of the experts not just as trainers but as academics.

7.2.3 | Taking time

No changes in motivation and well-being were reported, not when taking the objective measures into account, nor when focusing on the more subjective retrospective data. This may indicate that it takes time for LDPs and subsequent leader behaviour to influence the well-being and motivation of followers. Future research could therefore expand the timeframe to test this further.

7.2.4 | Going beyond RCTs

The aim was to run an RCT to evaluate the effectiveness of the LDPs against a control condition. As mentioned, randomization across the LDPs was not possible due to the preferences of the organization and randomizing the intervention and control conditions within organizations did not prove to be successful using the classical approach of comparing pre and post-measures.

Future projects could try to open the black box of the intervention and examine the process through which LDPs are (not) effective. Our open qualitative questions in the questionnaires could already reveal some more information (e.g., on the boundary conditions for leaders to be effective), but more in-depth research (e.g., using interviews¹⁰) could further deepen our understanding of the process of the LDPs and their effectiveness.

The mandate of the ESF call LEO was to compare the LDPs in their relative effectiveness. This resulted in the project being built around a generic framework built on the commonalities that allowed us to contrast and compare them. More specific analysis of the LDPs, going into more depth could shed light on the importance of the differences between the LDPs. Indeed, the LDPs did not only differ in terms of focus and content (i.e., situational, motivational or shared leadership) but also in approach (e.g. length and duration) and trainer (academic vs. non-academic), which could have influenced the results. The current design, however, does not allow us to tease all these differences apart.

¹⁰ Note that in our future research we develop a study on qualitative interviews of the leaders. Yet, these focus on the learnings leaders develop during the LDPs, which is just one important aspect in the full model.

7.3 | Focus on leader behaviour

Apart from testing the effectiveness of the LDP in making changes to leaders' mindsets and behaviours and followers' outcomes, the current project also engaged in testing a research model linking these different constructs. The results of this test provided strong support for the relations between leader behaviours, follower basic need satisfaction and other outcomes. This indicates that a focus on leader behaviours is warranted and hence a stronger focus can be put on leadership training rather than leadership development (in which the focus is more on mindset). To help leaders, organizations, consultants and policy understand these relations better, we have developed a guideline "**The big X of leadership**" expressing the link between different leadership behaviours and employee basic needs as focal outcomes further impacting their well-being, attitudes and behaviours. Pragmatically speaking, organisations should formulate their requests of LDP providers in terms of the specific behaviours they would like to see out of the training. The Big X of Leadership is a framework that can be used to holistically consider leader behaviours and communicate that.

Leadership literature often refers to changing mindsets as a key determinant of leadership development (Dweck, 2017). In contrast to this, our results show that if they would be able to change leader behaviour, they would have a strong impact on follower outcomes. Our findings also question whether changing mindsets is the most effective route for these developmental programs to go to.

7.4 | Work towards leader (development program) accreditation

The broader aim of the ESF call LEO was to understand how leadership development can be implemented and managed to promote employee motivation and well-being. In the aforementioned recommendations, we have focused on practitioner and research-oriented approaches to increasing the impact of LDPs. However, the quality and impact of LDPs can also be promoted on a policy basis. The ESF call LEO revealed the challenges of comparing LDPs given their diversity. While the experts of the ESF call LEO took great efforts towards assuring the quality of their work, our broader experience has shown that quality assurance and communication of practices are not always so readily available. To this end, we believe that there is a need to accredit leadership development programs and more broadly the profession of leadership. Accreditation can happen through a coordinated effort across Belgian universities with the help of governmental support to launch this initiative. Structural support – financially but perhaps more importantly in terms of mandate to do this, would make an important difference.

7.5 | Stakeholder management

Several different stakeholders were involved in LEO, with all their own goals. It could be advised to engage in evaluating the effectiveness of interventions blindly, which means that the evaluators are not aware of who engaged in the intervention. However, in this project, we opted for close collaboration with the experts, engaging in frequent conversations to understand their interventions, inform them about the research and feed the results back to them. The ESF call LEO has been intensive, for all parties involved, and led to valuable insights for organizations, policy and research. We would like to thank all stakeholders involved and hope the recommendations may spur good leadership development in the future.

8 | Citations

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9 | Appendix

All appendices can be found in the attached document called “LEO final report appendix” so as to create better oversight.

9.1 | Survey overview

9.2 | Data management plan

9.3 | Informed consent form for survey participants

9.4 | Communication content

9.5 | Interview protocol

9.6 | Timeline

9.7 | Additional information on leadership development programmes

9.8 | Organisational engagement

9.9 | Full correlation table

9.10 | Overview of participating companies

9.11 | Interaction effects

9.12 | SPSS syntax of analyses

9.13 | Power analysis additions

9.14 | Additional (future) research