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Lean Team Leadership for Better Team Processes, Performance and Well-being: A Mixed-Methods Field Study

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Abstract

Lean management is a managerial philosophy focused on enhancing customer value through the elimination of non-value adding steps from work processes. Lean management is also enjoying extra attention because it aimed at achieving competitive advantage. However, often leadership as part of the philosophy and part of a completer Lean implementation gets neglected. Lean management, in particular research on Lean leadership, remains limited. In this study, we identify behaviours of Lean team leaders and study the effects of this behaviour on team functioning and well-being. This paper reports on exploratory research, using mixed-methods, that aims to identify if behaviours of Lean team leaders moderates the relation between Lean practices adoption and certain team processes. We expect that leaders' behaviour has a great impact on the effectiveness and sustainability of the Lean implementation and execution of Lean. In the theoretical framework, we produce a list of behaviours derived from Lean and leadership literature. We visited ten teams during two days, to collect data using three methods. Our first method provided insight into the different teams and their completion of Lean practices and observed the behaviour of team leaders via a regular Lean meeting (N_1=7). With the second method, we gained an understanding of the team processes and well-being of the teams (N_2=10). The Critical Incident Interviews gave us a qualitative insight into the various organisational challenges the organisations working with Lean practices face (N_3=26). We found relations among relations-orientated behaviour, change-orientated behaviour, several team processes, and well-being aspects. However, we also found that teams with a strongly report task-oriented team leader reported higher scores on team-functioning, compared to other teams. We also discovered positive relations between Lean practices adoption and top-management support for Lean. Besides, participants stated that without top-management-support they could not implement Lean practices. Also, a strong increase in team-level performance during the Lean implementation was reported. What is more, the researchers found a wide range of Lean practices that were adopted amongst the teams. To conclude we put forward a variety of propositions intended to guide future cross-national research and propose practical implications for practitioners for a more successful practice of Lean Leadership.

Keywords: *Lean management/Lean practices/Team well-being/Team performance/ Leadership behaviour/Team processes/Top management support*

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1 Introduction

In today's world, competition between companies has reached a new level. With more pressure from upcoming markets from countries such as China, companies in the Western part of the world struggle to meet new higher production standards. Hence, companies face problems since the cut-throat competition is mostly related to low production, lower shipping costs, and low wages in comparison to Western standards. While striving to keep up with these low-cost production markets, companies try their hardest to think of the optimal way of working, in order to decrease the production cost, eliminate waste and find the optimal solution for various competitional problems. However, with these new ways of doing business, essential and crucial processes are often lost out of sight. Herewith, the focus is regularly on profit-making and not searching for solutions for the long term. Besides, this includes facing regular problems such as a loss of quality due to the continuous focus on turnaround times instead. Another solution that companies execute in order to meet these high standards is to implement Operational Excellence. This strategy is one of the three strategies in the model of Treacy and Wiersema (1995) that companies can focus on. Operational Excellence is a strategy that assists companies in producing the product as inexpensive as possible and delivers it directly to the customer. Still for many companies, here the strategy stops. More regularly, a prolonged understanding of Operational Excellence is used, namely Lean. According to Bicheno & Holweg (2016), Lean is about moving ever closer to uninterrupted flow in the series of operations that deliver perfect quality, as becoming more of a time-based competitor. Moreover, Lean philosophy consists of a Lean-House with multiple pillars in order to visualise how the organisation is built and supported. These pillars are: 1) a continuous improvement pillar, 2) Just-in-Time pillar and later added 3) respect for people pillar (Bicheno & Holweg, 2016). However, Lean is often misused compared to the original Toyota Lean philosophy of organizing (Soni & Kodali, 2016). Furthermore, Lean is often solely used as a crash diet to achieve very rapid results also referred to as ''corporate anorexia'' (Radnor, 2004). The idea is to eliminate as many non-value-adding activities as possible in order to pursue the Operational Excellence strategy (Bicheno & Howleg, 2009). This, however, is not the basis of Lean nor Operational Excellence.

Instead, Lean practices are involved with several principles for instance: Kanban, Value Stream Mapping, Eliminating Wastes, Just-In-Time and many more (Bicheno & Holweg, 2016). However, managers frequently forget while implementing Lean, the key of a sustainable Lean implementation and a crucial aspect for the desired outcome namely that lies in their leadership

(Mann, 2009). Lean leadership is a powerful managerial approach widely recognised as is said to improve the overall operational performance of a company while implementing Lean (Liker, 2004). Bhasin and Burcher (2006) point out that only 10 percent or fewer companies succeed in implementing Lean. The consequence for companies that fail to implement Lean leadership is that regularly the Lean implementation does not succeed in the long term (Mann, 2009). Hence, companies fail in keeping up with competitors when not achieving a low-cost production model, such as Operational Excellence. Another important factor that is often forgotten while implementing Lean, is the well-being of teams and members. The focus often lies with the implementation of hard tools that reach faster an increased performance. However, the focus should also be on well-being since aspects can ensure healthy team performance. A healthy team performance meets the performance standard but also takes into account the combination with the individual well-being function which is related to the satisfaction, learning and the degree to which the attractiveness and vitality of a team are strengthened (Andriessen, & Vartiainen, 2006). Saad, Achanga, Shebab, and Nelder, (2005) discussed several causes of the lack of success of Lean implementations. The main reason for the lack of success is that companies are mainly focusing on tools that can be implemented (Womack and Jones 1996). Hereby, not enough attention is being paid on changing the organisational culture and the adoption of soft practices (Bortolotti, Boscari & Danese, 2015). Hereby, leadership is one of the most important soft practices to focus on (Mann, 2009; Achanga et al., 2004). Indeed, research on leaders' behaviour in teams has started to receive more attention (Morgesion, et al., 2010). Hence, in this research, the focus will be on which type of team leader behaviour will lead to Lean supportive behaviours among work floor level teams when those teams are adopting Lean practices.

What is more, in the research of Anderson and Sun (2017) nine different individual leadership styles are reviewed (charismatic, transformational, transactional, ideological, pragmatic, servant, authentic, ethical, spiritual, integrative public, shared or disturbed leadership). In this research, different leadership styles are investigated. For example, transformational leadership will be researched since several studies have reported a strong association between transformational leadership style and organisational health (Nielsen et al., 2009; Corrigan, Diwan, Campion, Rashid, 2002, Wang et al. 2011). Furthermore, the behaviour of leaders, combined with the leadership styles are reviewed; if the behaviour that a leader shows in alignment with his leadership style can be of great value to investigate which affect the behaviour can have on a team.

This research, will also investigate the behaviour of different leadership behaviours since leadership behaviour has a significant impact on team behaviour, performance, and well-being. Previous research on leadership behaviour focused mainly on employee performance and managing of employees instead of handling behaviour as an important outcome in itself (Inceoglu, Thomas, Chu, Plans, & Gerbasi, 2018). Furthermore, in this research the link between leadership style and which style and behaviour according to Yukl's (2012) taxonomy of leadership behaviour will generate 1) task-oriented behaviour, 2) relations-oriented behaviour or 3) change-oriented behaviour in order to effectively implement Lean or Operational Excellence. For a healthy team performance, a leaders' behaviour should essentially consist of tasks and relationships (Behendt, Matz & Göritz, 2017)**.** Team leaders are generally considered key actors in any team's effort to accomplish performance (Zaccaro, Rittman, & Marks, 2001). Therefore this research will investigate which leadership behaviour will lead to the well-being of teams and, thus to a healthy team performance. In this research, a healthy team performance is present when a team produces optimal output for a company and in turn, a team has individual enough well-being. It is assumed that such a healthy team performance, stimulate a successful adoption of Lean/operational excellence. Also, the extent to which Lean practices are adopted and which influence this adoption has on team processes and performance will be investigated. Another factor that is taken into account is the support that a team leader receives from the top management. Higher management can have a strong influence on the behaviour and values of the team leader (Van Dun et al., 2017). Therefore, we seek to answer the following question:

How do the support of top management and team leaders' behaviours affect the relation between Lean practices adoption and team processes and in turn, team well-being and team performance?

This paper aims to contribute to the existing body of knowledge in several ways by verifying the importance of leadership in Lean implementations; in particular on the importance of the behaviour of leaders on team functioning. We also provide insight into how the adopted degree of Lean practices affects team well-being. As well as the moderating role of top management and team leaders behaviour on the relation between Lean practices adoption and team processes. This research examines those relations through a mixed-method approach. This paper starts with a literature review, after which we report three studies. Finally, a conclusion, discussion, limitations and practical implications can be found.

2 Literature Review

2.1 Context: Lean

2.1.1 Lean History and explanation

As organisations are struggling to meet increasing competitive pressure, many of them are embracing Lean as an approach to improve their position in the competitive world. Lean is used more-and-more in a wide range of organisations; not only in manufacturing companies but also in healthcare, banking and many other sectors (Danese, Manfè & Romano, 2018). Liker (1996) describes Lean as follows. Lean is a philosophy which when implemented, reduces the time from customer order to delivery by eliminating sources of waste in the production flow. Even more, Lean production is focused on identifying and eliminating non-value activities in production as well as in services in order to create value for customers. Lean is considered to be a set of management principles for production with the aim of reducing waste. Lean entails various techniques for the designing of business. These are, for example, leadership, teamwork and continuous development of processes (Womack et al., 1990). The roots of Lean lie in the Japanese Toyota Production System (TPS) which is emphasized on producing cars and trucks in small volume with low investment, as well as minimising the cost with Just-in-Time (JIT) and even shortening the lead time. This approach helped Toyota to minimise cost, maintain the quality and provide multiple vehicle models in order to satisfy various customer requirements (Melton, 2005). Lean consists of multiple tools in order to create value for the customer (Womack & Jones, 1996). Furthermore, Lean involves five principles which are described by Womack and Jones (1996). These are: 1) specifying the value for the customer; 2) identifying values streams; 3) creating flow in the process; 4) leverage pull, and 5) seeking perfection by continuous improvement. However, the focus of companies is often only on implementing a few Lean tools and forget to implement the whole philosophy (Bhasin & Burcher, 2006). What is more, the philosophy consists of multiple technical requirements as continuous improvement. These are: Kanban, single-piece flow, supplier development, value and the elimination of seven wastes. But the philosophy is also focused on cultural requirements (Bhasin & Burcher, 2006). These involve, creating a clear vision (Hines et al., 1998), ensure a strategy of change, develop supplier commitment, nurture a learning environment, promote Lean leadership at all levels and a long term commitment (Liker, 2004).

Lean has been researched since the early 1990s. Krafcik (1988) mentioned the term for the first time. After that Womack, Jones et al. (1990) introduced the term ‘Lean production’ to the wider

public in one of the most well-known books: *The Machine that Changed the World*. Due to their contribution, Lean became more popular as a new manufacturing paradigm (Danese et al., 2018). Companies can benefit from the successful implementation of Lean practices. For example, a Lean system can help maintain long term customer satisfaction (Maleyeff, 2006). Moreover, companies may improve processing times, set-up times and quality but also improve employee satisfaction, commitments and increase a safe work environment (Danese et al., 2018). To summarise, Lean production is a strategy to increase maximum value for the customer and have as little possible waste in order to decrease operational costs (Krafcik 1988). Hence, Lean can help companies to gain competitive advantage.

2.1.2 Lean working practices

In this research emphasise will be on Lean working practices. Lean working practices consists of several tools. including Just In Time, Kanban, 5S, Fishbone Diagram, Value Stream Mapping, Process mapping, and Visual management. These Lean practices can also be described as the ‘hard’ tools of Lean. However, the focus of Lean practices that are used by companies, changing swiftly from only focusing on implementing of the ‘‘hard tools’’ to also incorporating the ‘‘soft practices’’ of Lean where a human-centric system is implemented (Danese et al., 2018). In this sort of practice, there is more focus on team-work, human resource, and training (Shah & Ward. 2007).

Within this research, we look into the amount of influence the adoption of the Lean practice may have on the team processes. We also research which influence this adoption has on the team's well-being and team performance. This means that, for example, many Lean practices can be implemented or just a few. Companies that implement many Lean practices might be viewed as more mature in their adoption of Lean. Also assumed is that companies with a higher amount of Lean adoption may have a higher performance. Therefore, it is to be expected that the level of completeness of Lean practices, also called maturity, affects the team's work processes and also the performance.

2.3 Leadership Behaviour

Leaders engage in complex behaviours and can exercise a range of distinct leadership behaviours, depending on the context. For example, the path–goal theory of leadership suggests that leaders choose behaviours that best suit their followers (Northouse, 2010). This research focuses on multi-level leadership within organisations and takes into account the three behaviours of Yukl (2012). Yukl's taxonomy of leadership behaviour contains three meta-

categories and fifteen associated component behaviours. Here Yukl (2012) defines the essence of Leadership as ‘‘influencing and facilitating individual and collective efforts to accomplish shared objectives’’. This research makes use of three applicable meta-categories namely: 1) task-oriented behaviour which is clarifying planning, monitoring operations and problem-solving. 2) relations-oriented behaviour is supporting, developing, recognising and empowering. it is about to what extent a leader supports employees to interact with stakeholders. 3) change-oriented behaviour consists of envisioning change, encouraging, innovation and facilitating collective learning. An overview can be found in Table 1.

Table 1. *The three applicable meta-categories comprised of 12 component behaviours*

Meta-category	Behaviour
Task-oriented	Clarifying
	Planning
	Monitoring operations
	Problem-solving
Relations-oriented	Supporting
	Developing
	Recognising
	Empowering
Change-oriented	Advocating change
	Envisioning change
	Encouraging innovation
	Facilitating collective learning

In previous research of Van Dun et al. (2017) is mentioned that Lean middle managers compared to other middle manager show more relations-oriented behaviour. This resulted in a higher output of teams and better well-being. Besides, managers with certain behavioural characteristics, create a more productive environment (Van Dun et al. 2017). Therefore, it can be suggested that team leaders scoring higher on these relations-oriented behaviours produce higher output and well-being (Van Dun et al. 2017). A leader's behaviour can be of influence on their teams. Since their behaviour can affect the team, it is important to further investigate what behaviour of leaders leads to healthier team outcomes. What is more, we expect that the behaviour of a leader can moderate the relation between Lean practices adoption and team processes; as a team leader might be of influence on team processes and team behaviour. For instance, when a leader is providing more information to the team, which might also affect the knowledge sharing process within the team. Hence, expected is that when a team leader shares more information with their team, the team will also share more information and will, in turn, have a positive effect on the teams’ well-being and performance.

2.3.2 Lean leadership behaviour

What is more, Lean Leadership is a concept that has starting to receive attention. In order to be complete, Lean leadership is taken into account in this research. One of the first studies on the role of the leader in Lean was provided by Mann. He structured the role of leadership as a process, proposing the dimensions of Lean leadership. A number of attributes (for example personal involvement, visibly observable discipline and accountability, supporting, change-oriented) were identified for a leader to be able to guide the organisation through the Lean journey. Lean Leadership raised from the roots where Toyota invested in developing leaders for Lean (Mudhafar Alefari et al., 2017). Toyota invented five values that Lean leaders need to have, which are: continues challenging of traditional approaches; the strive to constantly improve performance, the knowledge-based operations, enabling and promoting teamwork and promoting mutual respect (Liker & Convis, 2012). Also, Dumbrowski and Mielke (2013) made a list of principles for Lean leadership: ‘‘improvement culture’’, ‘‘self-development, ‘‘qualification’’, ‘‘gemba’’, and ‘‘policy deployment’’.

In addition, according to the research of Van Dun (2017) effective Lean middle managers show more relations-oriented behaviour than middle managers. This includes more active listening, building trust with employees, supporting, facilitating team learning and leading by example. In Table 2, the different behaviours which can be linked to a Lean manager according to the research of Van Dun (2017) can be found.

As displayed, Lean leaders are listening more often active to people and stimulate them by reacting positively to their ideas. Also, Lean leaders are checking less on their employees and if doing so, they will not take over the responsibility of the employees. Moreover, they provide less negative feedback and defend their position less often. According to Van Dun’s research, Lean leaders will support a culture of continuous improvement and hence a more productive team culture. What is more, Camuffo and Gerli (2018) came up in their literature review with 14 Lean management behaviours, which include: Organisational focus, managerial responsibility, decision making, problem-solving, supportiveness and challenge. Also by Tortorella, Vergara and Ferreira (2017), Lean leaders’ behaviours include practices as anticipating and reducing risk of incidents, clear strategies, meetings for communication of projects, teamwork and coaching.

Table 2. *Lean leadership behaviour*

Behaviour	Expression
Active listening	Making eye-contact, showing understanding, nodding, summarise, ask further questions
Building trust with employees	Showing something of themselves
Support and encourage	Responding positively to employees, give suggestions, give compliments, arrange resources for (process) improvement, providing clarity about the strategic course, celebrating success
Facilitating team learning	Putting feedback on the agenda, ask their team questions based on facts and grades about team performance learning , discusses points with the team, regularly ask the ‘‘why’’ question
Lead by example	Making clear agreements, following up on actions, minimising waste, allow your own work, be vulnerable, be aware of their your influence

What is more, team leaders' behaviour may influence the team. Therefore it is also expected that the leaders' behaviour may moderate the relation between Lean practices adoption and team processes. When a team leader shows via his behaviour the commitment towards Lean, it is expected that a team may copy the behaviour and can in turn, influence the team processes. For example, when a team leader encourages employees to work with Lean practices, the team will, therefore, feel more motivated to implement Lean practices and the Lean practices will, in turn, influence the team processes and performance. Therefore we expect that the behaviour of team leaders moderates the relation between Lean practice adoption and team processes.

2.4 Higher-level leader support as enabler of Lean teams

Higher managers, like top- and middle managers can play an influence on team leaders and team, by for example setting teams goals that are out of reach. Also, top managements' vision on Lean practices can influence the adoption of Lean by teams. When top management is not carrying out the support for Lean, many implementations can thereby come to a failure. Top management, therefore, plays a particular role in initiating and sustaining Lean on the work floors (Netland & Ferdows, 2014). By visiting the workplace frequently, managers can show their true commitment. Also, Ooi et al. (2008) found that top-management commitment to Lean was an infrastructural necessity for Lean to be effective. Also, higher level managers can have put pressure on team leaders. Daniels and Burns (1997) found that managers' miscommunication about the importance of certain performance indicators led to less-productive team leader behaviours. Also, Delbridge (1995) showed how top managers undermining Lean by putting enormous pressure on team leaders to reach targets no matter

what. In this example, the top management even controlled usage of a cord when production workers could listen to the radio. The literature suggests that top- and middle management may have an influence on the behaviour and values of team leaders by the amount of support they have for Lean practices. Hence, we expect that the support of top management is related to the team leaders support to the team. Likewise, top management can have an influence on the behaviour of the team leader. Expected is that when a team leader receives more support from his (top)management on the Lean adoption, this will have a positive influence on the behaviour of the team leader and in turn on the team processes. Since team leaders which not receive support from their management for the adoption and implementation of Lean can also display this on the team. Hence, we expect those team leaders who receive high support from the top management, have higher adoption of Lean.

2.5 Leadership styles

Companies frequently forget while implementing Lean, the key of a sustainable Lean implementation and crucial aspect for the desired outcomes, namely leadership (Mann, 2009). Generally, leadership can be defined as the interrelationship between leaders and followers and how leaders influence their followers to work towards achieving set goals (Bennis & Nanus, 1985; Burns, 1978). In addition, many companies struggle to implement Lean on longer terms. Also, recent research of van Dun and Wilderom (2017) pointed out the importance of the focus on the behavioural development of teams and leaders, where leadership is also a crucial factor. Leadership has been often researched in the past where many authors conduct studies on different leadership styles. Research since 2000 has examined a bewildering number of leadership styles. In this section, nine different leadership styles are explained based on Anderson and Sun's (2017) review. What is more, the behaviour, according to Yukl's (2012) description of behaviours a leader shows according to the different styles is investigated. Anderson and Sun (2017) reviewed the most frequently studied and recent newer leadership styles: transformational, charismatic, transactional, ideological, pragmatic, servant, authentic, ethical, spiritual, integrative public and shared/distributed. In appendix A, a full summarisation of each leadership style can be found.

In the next summarising table (3), the different leadership styles and their behaviours can be found. In addition, we investigated whether the behaviour is task/relations- or change-oriented according to Yukl (2012) description of behaviours in order to investigate which leadership is most related to Lean leadership.

Table 3. *Different leadership style and behaviours*

Leadership style	Behaviour	Task/Relation/Change	Source
Transfor-mational	Get followers to perform above and beyond expectations by expressing a clear vision, providing an role model, promote the acceptance of group goals, providing individualised support and intellectual stimulation, and expressing high performance expectations.	Task-oriented, relations-Oriented and change-oriented	Podsakoff, et al. (1990)
Charismatic	Sensitive to constraints, threats and opportunities in the external environment, articulating an appealing strategic vision, taking personal risks, exhibiting unconventional behaviour, and being sensitive to follower needs Articulation of vision,	Relations-oriented	Mumford, et al. (2002)
Transactional	monitor follower behaviour, anticipate problems, and take corrective actions before the behaviour creates serious difficulties. Passive leaders wait until the behaviour has caused problems before taking action	Task-oriented	Judge & Piccolo (2004)
Ideological	emphasises 'personal values, standards to be maintained, and the derivation of meaning through adherence to these standards	Task-oriented	Mumford et al. (2002)
Pragmatic	Motivating others through addressing their self-interest and by showing how proposed solutions will effectively realise shared goals, logical behaviour instead of emotional	Relations-oriented. Change-oriented	Mumford et al. (2008)
Servant	Focuses on the growth of those who are being led simultaneously and who are being served the natural	Relations-oriented	Stone et al. (2004) & Greenleaf (1970)
Authentic	Self-awareness, unbiased processing, relational authenticity, and authentic behaviour/action.	Relations-oriented	Kernis (2003)
Ethical	Fair, honest, trustworthy and a principled decision-maker a role model, one who practices what he or she preaches, and is seen to be an attractive role model, a moral manager – one who makes ethics an explicit part of his or her leadership agenda and uses rewards to hold followers accountable for ethical behaviour.	Relations-oriented and Task-oriented	Brown et al. (2005) Mayer et al. (2009)

Spiritual	Create a warm and caring environment	Relations-oriented	Fry et al. (2005)
Integrative	Creating Win/win mindset by the team and full synergy	Relations-oriented and Change-oriented	Morse (2010)
Shared or distributed	supportive coaching by an external leader (or team manager). related to direction, motivation, and support	Relations-oriented and Change-oriented	Carson et al. (2007)

Note: The behaviours of this table are based on the guidewords of behaviours described by Yukl (2012) on page 11.

Investigating the leadership behaviour of a Lean leader, and the research of the leadership styles, the researchers see Lean leadership most corresponding with transformational leadership. Here both styles have common grounds on being a role model as a leader, providing positive feedback and support. Also, a Lean leader tells the team every day what they can expect, which is also in alignment with a transformational leader. What we also found is that transactional leadership style is less closely related to Lean leadership since Lean leadership does explicitly not involve providing negative feedback, punishment and passive reaction (Van Dun, 2017). Here, Ooi, Arumugam, Teh, and Chong (2008) concluded that instead of pressuring team members, it is a Lean leader's task to stimulate his or her direct reports to express their ideas. Therefore we expect those team leaders who have a transactional leadership style and show thereby more task-oriented behaviour are negatively related to team processes. And in turn, a team leader who have a transformational leadership style and show thereby more relations-oriented behaviour, are positively related to team processes.

2.6 Lean team processes, team performance and team well-being

Team processes have played a central role in most team effectiveness models (Mathieu et al., 2017) including Lean team effectiveness (Van Dun & Wilderom, 2012). Also, a team leader plays a crucial role in team processes. Therefore, literature has been investigated about the influence of team leaders and team processes.

2.6.1. Team leader and team behaviour

In this research, team leaders are being investigated and observed since team leaders can have an expressive effect on a team (Van Dun & Wilderom, 2012). In the past, within Delbridge's (1995) participant observation study, team leaders monitored the team performance in order to find opportunities for improvement. In this study, one team leader was pro-active and tried to

create work pressure by speeding up the line or controlling the radio switch: “when workers had time to chat”. This was counterproductive as workers felt exploited and team performance levels went down. In this case, the team leader had felt increased pressure from higher-level managers to improve productivity. Team leaders must guide and facilitate the continuous improvement processes, assist workers when problems occur (Shook, 2010), and also foster a psychologically safe and cohesively performing team climate. Van Dun and Wilderom (2012) found that team leader support is a key dynamic of an effective Lean team. If Lean team leaders support mainly self-transcendence type of values, their team members adopted more information sharing behaviour, resulting in a higher level of Lean team effectiveness (Van Dun & Wilderom, 2014).

Processes describe how teams’ inputs are transformed into outcomes that are the by-products of teamwork (Mathieu, et al., 2019). In this research the following team processes will be investigated: psychological safety, innovative work behaviour, monitoring and back up, information sharing, conflict management, and team cohesion. Team processes can be present in several ways and can eventually affect team performance (Zaccaro et al., 2001). Team performance has become a high criterion variable for organisation since a team is something very useful to an organisation (Argote & McGrath, 1993; Goodman et al., 1988). Beal (2003) distinguished performance as performance behaviours and performance outcomes. He stated that behaviours are actions that are relevant to achieving goals, whereas outcomes are the consequences or results of performance behaviours. This includes team process improvement, learning behaviours, and cognitive task performance. Kirkman, Rosen, Tesluk, and Gibson (2004) assessed team process improvements by measuring feedback-seeking, error discussion, and experimentation, which they argued should lead to the ability to adapt and improve. Likewise, LePine, Piccolo, Jackson, Mathieu, and Saul (2008) found that team processes are positively related to team performance, cohesion, and members’ satisfaction.

What is also important for a company to ensure on one hand a sustainable Lean implementation, but to also including other aspects than performance measurements. Essential is to also take into account the well-being of teams. Researchers state that working can have both a positive as a negative influence on the health and well-being of workers (Warr, 1999). Well-being consists of engagement, positive emotion, relationships, meaning and achievement (Seligman, 2011) When work gets demanding and people experience stress, the research found that organisations cope with longer-term sickness (Vingard et al., 2005). However, other researchers found that individual who work in team reported lower levels of psychological stress and higher

job satisfaction compared to an individual that did not work in teams (Carter & West, 1999). Well-being has often measured as burn-out, sick leave, and levels of strain (Warr, 2007). However, Warr (2007) described effective well-being as two dimensions. The first one is anxiety-contentment and the second is depression-enthusiasm. Anxiety is experienced when excitement is high and pleasure low. Contentment is an experienced opposite. Depression is experienced when excitement and pleasure are both low and enthusiasm is experienced when both are high. War (2007) found that effective well-being is associated with the ability to cope with demands, psychological growth, and self-actualisations. That is why, in this research, investigated is if team processes can have an influence on the team's well-being. In what follows, we describe a set of team processes that are expected to positively affect both team-level well-being and team performance. Therefore, in the next section, the team processes which are taken into account in this research will be further explained.

2.6.2 Psychological safety

Team member's psychological safety is very important for every team. Without such safety, members will restrain in sharing their criticisms, suggestions, and ideas. This results in fewer process improvements and lower team performance. In addition, when those ideas are transformed into successful processes, the level of team psychosocial safety is likely to go up (Salas et al., 2015). Also, Rothenberg (2003) stressed that without trust, employee's will not contribute towards the improvement of work practices. In addition, Van Dun & Wilderom (2012) write that teams who feel more psychologically safe will have higher well-being. What is more, Edmondson (1999) states that that psychological safety is also related to learning behaviour and is seen as a mediating factor between psychological safety and team performance.

2.6.3 Innovative work behaviour

Another behavioural dynamic within effective Lean teams refers to their so-called innovating efforts. It is important for Lean teams to create new ideas for difficult issues, search new working methods, generate original solutions for problems, mobilise support for innovative ideas and get approval for these innovative ideas. But not only idea promotion is important; the realisation of ideas by transforming innovative ideas into useful applications and introducing the ideas into the work environment is important as well. When a team is effectively engaging in Lean, team members show a high level of change orientation in terms of both continuously improving and innovating work practices (Van Dun et al., 2017). What is more, based on a

survey of workers, Zeitz, Johannesson, and Ritchie (1997) stated that “innovation” improved significantly over the course of a Total quality management program.

2.6.4 Monitoring progress towards goals

Bessant, Caffyn, and Gallagher (2001) noted, in three of their six cases, that in advanced Lean organisations, employees show a high level of awareness of both company goals and strategic performance measures. What is more, when Lean team members show high organisational commitment towards the company’s strategic Lean goals, high Lean team performance is likely to follow (Van Dun et al., 2017). Here Lean tools such as visual management, performance dashboards, and daily start-up meetings are used by teams to ensure and learn from such monitoring to enhance their team’s progress. Effective Lean teams monitor how well they are meeting their team goals, seeking timely feedback from stakeholders about their goals and let team members know when they have accomplished a goal.

2.6.5 Knowledge sharing

Previous research on highly effective teams has shown that members share a relatively large amount of information (Salas, Sims, & Burke, 2005). Additionally, Scholars found that information shared by a leader can increase a healthy team performance (Aviolo & Bass, 1999). Bunderson and Boumgarden (2010) showed that more structured teams tend to share more information, which in turn affected a team’s learning orientation. What is more, Van Dun and Wilderom (2017) found that Lean teams are significantly more effective when all team members engage in sharing improvement-oriented work-related information. The researcher state that effective Lean teams will have developed one or more simple structures and/or daily routines of optimal information sharing so that all team members are able to continuously work to full capacity. In addition, in Lean practices often a certain structure can be found by using several Lean tools. Bunderson and Boumgarden (2010) showed that more structured teams tend to share more information, which in turn affected a team’s learning orientation.

2.6.6 Team back-up behaviour

Team members must be willing and able to support colleagues or provide backup when needed. For example in a Lean context, after a worker pulls the Andon cord. When such help is presented in a team’s performance figures or is appraised by management, it will help members to stand in for their colleagues, up to a point where helping in the team is normal (Raver et al., 2012). Herewith, an effective team develops standards for acceptable team member performance, balance workload, assist each other when needed, seek to understand each other’s

strengths and weaknesses (Raver et al., 2012). What is more, according to Van Dun et al. (2017), Lean teams are expected to know, discuss, and improve their individual selves as well as their team's performance by solving problems together.

2.6.7 Team cohesion

Team cohesion is another important team process. Effective teams are known to have higher interpersonal cohesion as a greater sense of working on a collective task (Van Dun & Wilderom, 2012). Team cohesion is important for Lean teams since it will help to establish a safe climate for effective improvements. In addition, when a good team cohesion is present, it will increase the level of team bonding and increase team performance (Mathieu et al., 2015). According to Zellmer-Bruhn and Gibson (2006), an effective team is a team that produces new ideas of doing work, has a high interpersonal-oriented cohesion where a feeling of unity and belongingness is present. A shared focus with high concentration is present in order to accomplish work.

2.6.8 Conflict management

In past research, conflict management amongst teams has been researched. Zeitz, Johannesson, and Ritchie (1997) showed that good communication, including solid conflict resolution, was significantly enhanced during TQM implementation. Edmondson (1999) suggested that continuous team learning behaviour is centred on potentially conflicting activities such as seeking team feedback, discussing errors and seeking feedback from customers (Bartezzaghi, Corso, & Verganti, 1997). According to van Dun et al. (2017), team members must argue with each other constructively and manage conflicts, otherwise, it may damage team members psychological safety and the level of team cohesion, and the level of overall team performance. In turn, according to Peterson and Behfar (2003), the lower a team's performance, the more it is likely that a conflict will occur within the team. The researcher state that effective teams deal with personal conflicts fairly, show respect for the members, maintaining group harmony, work hard to minimise conflict amongst members and encourage a healthy debate about ideas.

2.7 Hypothetical Framework

Taken into account the literature, This study will investigate the following hypothetical framework:

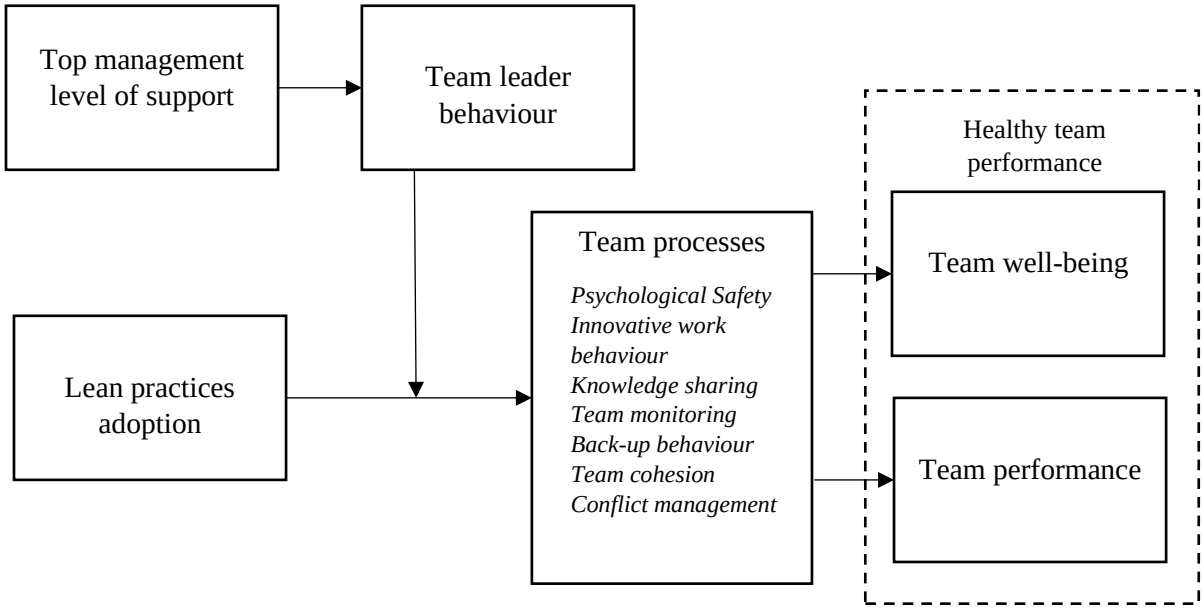

Figure 1. *Hypothetical Framework*

3 Research Design

This cross-sectional field study used a mixed-methods approach to study members of teams that adopted Lean practices. In order to bring structure and clarity to the different approaches, the methodology is divided into three methods:

- Method 1) multiple observations of a scheduled Lean event, weekly occurring meetings or operational meetings in order to investigate the team leaders behavioural patterns during such a meeting;
- Method 2) involves team leader and team member surveys which will measure the Lean practices adoption, support of top management, leaders behaviour, team processes, team well-being, and team performance;
- Method 3) critical incidence interview method is used in order to measure the employee and team leaders' experience with Lean (continuous improvement) events in the past year(s).

Furthermore, a mixed-method approach has been used at the state of prior theory and research. The methodological fits from Edmondsun and Mcmanus (2007) as quantitative and qualitative data have been used. As well, the study has been ethically approved by the University of Twente ethics committee.

3.1 Sampling

For this study, multiple sampling strategies have been used. First, a list of potential organisations has been constructed in collaboration with dr. Van Dun. We investigated which organisations have shown interest in her previous studies. Likewise, we set criteria that entailed that the participants should have adopted Lean practices for at least a year, that they worked with continuous improvement and that teams should be on operating level. The first e-mail invitation consisted of 185 companies. We got 100 companies which not responded, 50 were not able to meet our criteria, and two rejected. 33 companies responded positively and we had a following-up intake via telephone with the companies. After this, twenty-three companies were unable to meet the exclusion criteria. Ten companies were included for this research and where paid a two day visited. In Appendix B can an overview be found of onsite visitation planning. The entire sample consisted of 10 companies, yielding 10 teams, 14 team leaders (some teams included two team leaders per team) and a total of 96 participants. The total description of the teams, including team size and response rate on the different studies, can be

found in figure 2. In Table 4, a schematic representation of the teams and response rate per team can be found.

Figure 2. *Schematic representation of the sampling strategy*

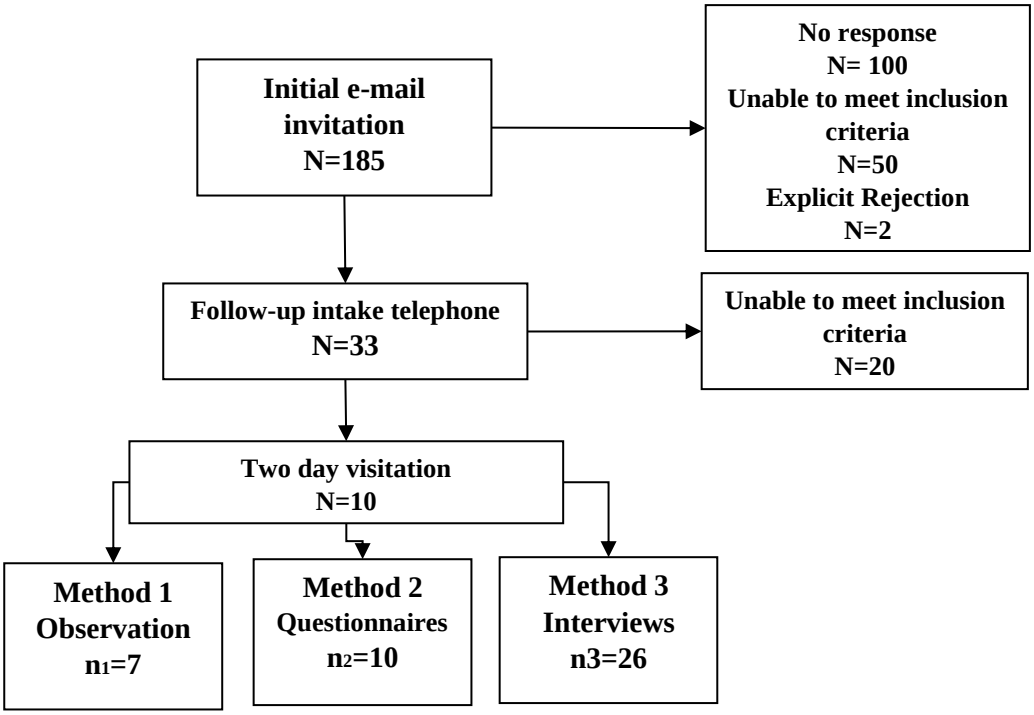

Table 4. *Schematic representation of the teams and response rate divided per team*

Team	Sector	No.team leaders	Team size	Lean maturity	Response rate video obs.	Response rate questionnaire	Response rate CIT
1	Healthcare	2	80	Low	1	16	3
2	Services	1	8	High	1	4	4
3	Services	1	14	High	1	9	3
4	Production	2	5	Low	1	5	4
5	Production	2	10	High	1	7	4
6	Retirement	2	10	Low	1	8	4
7	Human Resource	1	6	Low	1	4	4
8	Production	1	10	High	0	8	3
9	Healthcare	1	8	Low	0	8	4
10	Ministry of Justice and Security	1	39	High	0	12	3
Total		14	190	-	7	82	36

4 Method 1: Video Observation of Regular Lean Meetings

During the two-day visit at the companies, the researchers observed several Lean events and taped these via video cameras. The aim of these observations was to investigate the behavioural patterns of team leaders while in action. The researchers observed the amount of shown behaviour of team leaders and related this whether it was task/relations- or change-oriented leadership behaviour. After each meeting, the team-members filled out a three-item post-video questionnaire about the representability of the taped meeting. The results of the observations are compared to the self-reported scores on the questionnaires from method 2. The method aimed to analyse the behavioural patrons of team leaders in action. The outcomes of this method will be compared to the scores from method 2: the survey. Here comparison will be with the amount of shown behaviour and team processes and outcomes.

4.1 Sampling

The researchers only taped meetings which were regularly scheduled, so no Kaizen, project meetings or multidisciplinary meetings were included. 7 teams have been recorded on video. These teams consisted ranging from four team members to 10. The taped events are reported to be Lean events, which consisted of five daily meetings and two weekly improvement meetings.

4.2 Procedure

At the beginning of each visit, the researchers were introduced to the team leaders of the department. Which in turn introduced the researchers to the team members. Often the researchers received a tour throughout the company. At day one of the observations, the researchers were collaborating with the team while doing the daily jobs. When the researchers got acquainted with the team members, they asked on the next day at each of them if they approved that the Lean event was recorded. Only Lean-events where recorded when every member agreed and gave permission. Here two mobile phones were used to record the Lean event. One angle pointed towards the team leaders and the other one towards the team members. Here the researchers explicitly did not use cameras or big video footage, because this could give the employees a sense of intervening. Directly after each recorded Lean event, the researchers gave the team members a printed three-item questionnaire in order to investigate if the meetings could be compared with other meetings they had when the researchers were not present in order to reflect the reliability of the method. The questionnaire can be found in Table 5. After each visit, the researchers filled in a diary to describe the day and what the first impressions are. An example of the diary can be found in Appendix F.

Table 5. *Three-item post-meeting questionnaire*

In comparison with similar meetings with your team how different was…	Completely different	Somewhat Different	Slightly Different	Neutral	Slightly the same	Somewhat the same	Completely the same
1. .. this meeting?	O	O	O	O	O	O	
2. .. your behaviour during this meeting?	O	O	O	O	O	O	
3. .. the behaviour of your colleagues?	O	O	O	O	O	O	

In order to prevent attribution bias, by for example, making explanations about behaviour of the team leader which is in fact not necessarily reflect reality and also in order to prevent a halo or horn effects (Wade & DiMaria, 2003), the events are coded by two researchers which have trained prior before coding the events. After both researchers coded separately the Lean events, the codes where compared. When no agreement was reached, the researchers discussed the event. What the researchers also took into account was ethical problems that can arise during the investigation. Some of these problems are described by Archer (1974) and which are raised by the possible effects of observation on the group members and trough observer-member contact. These problems can be mitigated by encouraging observers to recognise these problems, which can occur in direct contact. Therefore, the researcher will modify their behaviour out of ethical considerations. Also, Archer (1974) makes clear that other ethical dilemmas can arise, for example about the way the observers react to the people they observe. Therefore, the researchers need to be constantly aware of their own ethical behaviour.

4.3 Data analysis

This research was conducted by two researchers who are a Master students Psychology and Business Administration at the University of Twente. For the analysis of the data, the researchers used Observer XT 12.5 ™ software (REF) to analyse and code the video data. The researchers investigated the video footage in which the behavioural traits of the team leader were recorded. The duration of the video's variated from 10-45 minutes. During the coding, the team leader was scored on the amount of shown behavioural traits whether the team leader showed task-, relations or change-oriented leadership behaviour. The codebook that the researchers used was already established used by Dr. van Dun and can be found in Appendix E. What is more, in Table 6 an overview of the team leader analysis can be found.

Table 6. *Overview steps of "team leader" analysis*

Steps	Analysis
1	Training researchers
2	First "leader coding round" (separate)
3	Comparing results
4	Discussing results
5	Second "leader coding round"
6	Conduct a reliability analysis
7	Conclusion

Before starting with the coding of the original data, the researchers practiced the coding on dummy data in order to create more alignment when coding the collected data for this research. At the end of the training, the researchers scored ≥ 85% of interrater reliability (with, $\kappa>0.7$). In addition, after coding the data, the two logs of both researcher has been compared and the pre-discussion inter-rater reliability metrics scores have been calculated. Here the pre-discussing IRR was 72%. After this, the researchers discussed the results and looked at the list of disagreements. By discussing and agreeing, congruency was reached. In the second round of the coding proceeded until an agreement of ≥ 95% and the interrater reliability was $\kappa>0.8$ was reached. After that, the data was standardized using for the percentage duration, the total measured time and for the percentage frequency the total measured frequencies per team leader.

4.4 Results

Our results of the observations in Table 7, demonstrate that the most frequent behaviours observed are active listening (31.5%), sharing information (21.8%) and showing disinterest (20.9%). These findings are congruent with previous studies of Van Dun et al. (2017), showing that Lean middle managers exhibit significantly more positive relations-oriented, active listening and agreeing behaviours and significantly less task monitoring, and counterproductive work behaviours (such as, providing negative feedback and defending one's own position). However, in contrast to the research of Van Dun et al. (2017), we found that the team leaders score very high on showing disinterest. Four out of seven teams score higher than 20%, which is outstanding high.

In Table 8 examples of the observation of every team leader can be found. In this table, explicit attention is given to examples that where exceptional notable according to the researchers. We saw in team 5, that the team leader only listened to what his or her team members were saying and did not bring much into the meeting. However, during the meeting, the team members sorted out difficulties. Also we saw that in team 7 someone else was taking the lead in asking questions about for example the performance of the team.

Table 7. *Showed behaviours of team leaders in percentage and frequencies*

Behaviours	Percentage duration								Percentage frequency							
Teams:	1	2	3	4	5	6	7	Mean	1	2	3	4	5	6	7	Mean
Task-oriented behaviour																
1. Structuring the conversation	5.9%	3.2%	-	3.3%	-	6.5%	-	4,7%	3.7%	1.9%	-	4.9%	-	2.8%	-	3.3%
2. Informing	14.2%	15.7%	-	16.8%	-	9.3%	23.1%	15,8%	18.5%	25.3%	-	20.7%	-	27.6%	16.9%	21.8%
3. Directing/delegating	-	-	-	4.5%	-	-	-	4,5%	-	-	-	3.7%	-	-	-	3.7%
4. Directing/interrupting	4.9%	3.4%	5.3%	2.8%	11.5%	-	-	5,6%	3.7%	1.9%	5.0%	2.4%	2.3%	-	-	3.1%
5. Directing/correcting	8.2%	8.1%	-	-	11.8%	-	-	9,4%	7.4%	3.9%	-	-	6.8%	-	-	6.0%
6. Verifying	7.6%	-	16.7%	-	17%	1.3%	-	10,7%	14.8%	-	5.0%	-	15.9%	2.8%	-	9.6%
SUM TEAMS	**41%**	**30.4%**	**22%**	**27.4%**	**40.3%**	**17.7%**	**23.1%**	**28,8%**	**48.1%**	**33.1%**	**10.0%**	**31.7%**	**25.0%**	**33.1%**	**16.9%**	**28.3%**
Relations-oriented behaviour																
7. Active listening	11.1%	29.6%	62.9%	15%	21.7%	6.7%	14.4%	23,1%	14.8%	33.1%	45.1%	35.54%	34.1%	25.5%	32.4%	31.5%
8. Agreeing	-	-	2.1%	2.5%	0.8%	0.6%	11.4%	3,5%	-	-	5.0%	8.5%	4.6%	16.6%	2.8%	7.5%
9. Individualized consideration - positive rewarding	-	-	-	4.6%	4.2%	-	-	4,4%	-	-	-	4.9%	2.3%	-	-	3.6%
10. Individualized consideration - being friendly	3.3%	5.2%	-	-	-	10.3%	-	6,3%	3.7%	1.9%	-	-	-	2.8%	-	2.8%
11. Individualized consideration – encouraging	-	-	3.4%	-	-	-	-	3,4%	-	-	2.5%	-	-	-	-	2.5%
12. Individualized consideration - personal interest	-	-	-	18%	-	-	-	18,0%	-	-	-	1.2%	-	-	-	1.2%
SUM TEAMS	**14.4%**	**34.8%**	**68.4%**	**40.1%**	**26.8%**	**17.6%**	**25.8%**	**32,6%**	**18.5%**	**35%**	**52.5%**	**50.0%**	**40.9%**	**44.8%**	**35.2%**	**39.6%**
Change-oriented behaviour																
13. Visioning	-	8.4%	-	6.8%	5.1%	2.4%	9.5%	6,4%	-	3.9%	-	1.2%	6.8%	2.8%	1.4%	3.2%
14. Intellectual stimulation- asking for ideas	-	8.2%	-	21.8%	9%	8.6%	4.6%	10,4%	-	13.6%	-	4.9%	2.3%	11.0%	5.6%	7.5%
SUM TEAMS	**0%**	**17.6%**	**0%**	**28.6%**	**14.1%**	**11%**	**14.1%**	**12,2%**	**0%**	**18.2%**	**0%**	**6.1%**	**9.1%**	**13.8%**	**7.0%**	**10.8%**
Counterproductive behaviour																
15. Showing disinterest	9.2%	18.2%	9.5%	3.6%	14.9%	52.9%	19%	18,2%	22.2%	13.6%	37.5%	9.8%	22.8%	5.5%	35.2%	20.9%
16. Providing negative feedback	22.5%	-	-	0.4%	4%	-	-	9,0%	3.7%	-	-	2.4%	2.3%	-	-	2.8%
17. Disagreeing	5.8%	-	-	-	-	-	-	5,8%	3.7%	-	-	-	-	-	-	3.7%
18. Nett task behaviour	7.1%	-	-	-	-	0.9%	18%	8,7%	3.7%	-	-	-	-	2.8%	5.6%	4.0%
SUM TEAMS	**44.6%**	**18.2%**	**9.5%**	**4%**	**18.9%**	**53,8%**	**37%**	**26,6%**	**33.3%**	**13.6%**	**37.5%**	**12.2%**	**25.0%**	**8.3%**	**40.8%**	**24.4%**

Note: - means the absence of the behaviour in the observation.

Table 8. *Observation examples per team combined with team process*

Team	**Team leader behaviour category**	Observation example of team leader behaviour during meeting
Team 1	Task-oriented	Team leader: ‘‘The room is broken so cannot be used today’’. Team leader interrupts two employees and says ‘‘I am not finished yet’’. Also, she asked one person’’ How does your program look today?’’ the employee says: ‘‘Busy’’. Then she asked ‘‘And how busy at noon?’’ Also she asked an employee ‘‘How was your holiday’’, the employee says: ‘‘Good, I am well rested’’. The team leader then says: ‘‘ All right then you can do some extra work today’’ and she gives the women extra work. However, also jokes were made by the team leader and team members during the meeting
Team 2	Relations-oriented	A lot of joking took place between the team members and the team leader. During a discussion, an employee openly stated ‘‘It is also my fault that it happened’’. The employees had an open attitude and were talking very directly with each other.
Team 3	Task-oriented behaviour	The team members asked if they could turn on the air-conditioning because they felt very hot but the team leader refused, so the air-condition stayed off. Also, a lot of information was shared among the team members. Only during the whole meeting the team leader and members had their hands in their pockets or arms crossed. Only a few jokes were made.
Team 4	Relations-oriented	Many team members had an open attitude. Almost all team members and the team leader were listening attentive to each other, even though the room was noisy due to machinery. Also between the subjects, jokes where made and the whole team laughed about it.
Team 5	Task-oriented	When the team leader talked and informed the team members, he looked almost every time at his screen instead of looking at the team members. Also when team members talked to him, he often looked away. An employee talked about one thing he had done very well. The team leader looked from his screen and said: ‘‘Good’’, and looked at his screen again. The team member responded in that he talked again to his team leader but then stopped and looked away. The team leader just focused on the next item on his agenda. When the team members were talking they only looked at the team leader to make eye-contact instead of the whole team.
Team 6	Task-oriented	It seems that another person during the meeting was, in fact, the team leader since the team leader was only listening and another member was holding members accountable for process performance. The team leader double-checked and verified some facts on the performance-monitoring board: ‘‘What are you guys going to do to make this point on the board clear’’. The team responses and made solutions together. When a team member asked another team member for more clearance on a subject, the team member reacted very direct and hash. Almost all members, including the team leader, was standing with crossed arms. Then a team member checked on his team members if they already had done a task, and the team members reacted as if she felt assaulted ‘‘Well because yesterday we got only the invitation?’’. In the end, the team discussed a task that needs to be done and one team member makes a suggestion but the team leader overruled and stated: ‘‘ I think it has to be done now’’. The team responded as in that they understand and assure the team leader it will be done.

Team 7	Relations-oriented	The team members managed the meeting and the team leader listens attentive. The team leader did not say much, but the team members shared information on several points with each other. A team member asked another team member about how the projects are going.

A discussion can arise in how effective this team leader is. Yet, he says not much in the meeting, however, his team is almost self-steering, which is in some cases very effective and desirable. Also outstanding was team 3. During the recorded meeting, everyone behaved very professionally and no jokes where made. Also, the team leader overruled his team by not putting on the air-conditioning, even though it was 39 degrees outside and every one of the team wore obliged long sleeves and legs and were heavily sweating. However, during the meeting the next day, when the researchers attended and recorded a day start which was held by the team members themselves, the team members yoked a lot and got together very well, also the air-condition was on this time. A difference was that the team leader was not present. Also outstanding is the behaviour of the team leader of team 1 and 5. The team leader of team 1 interrupted the team members and also gave another person more work since the employee just came back from holiday, and hence was well-rested. Also the team leader of team 5 showed during the observation almost no behaviour as active listening and instead was more busy looking at his laptop. Looking at the observed behaviour, questions can arise if the team leaders that are investigated are indeed Lean leaders.

According to Table 7, only team 1 showed more task-oriented behaviour than relations-oriented behaviour. We found that effective team leaders, which show more relations-oriented behaviour, show more active listening and sometimes they agree more. The less effective team leaders we have investigated distinguish themselves from effective leaders since they correct and verify more. What is more, in team 1 and three no change-oriented behaviour was found. When observing the video of team one, the researchers found that in the team 1 less innovative working behaviour was present. Also, the overall results show that the team leaders who participated did not show a lot of change-oriented behaviours. Likewise, the researchers found that almost all team leaders showed fewer behaviours that include: positive rewarding, being friendly, encouraging and showing personal interest. In addition, the researchers noticed that most of the meetings are focused on sharing information to the whole team; often a standard format was used. In team 2/4/7 strong team cohesion was noticed by the team leader. Similarly, in these teams, a lot of information was shared among the team members and the team leader listened actively to his team members.

Comparing table 7 with table 8 we see alignments in results. For example, the task-oriented behaviour of team leader number one in table 7 is also resembled in table 8 were examples of the team leader clearly makes an task-oriented impression. In addition, the high scores in table 7 on relations-oriented behaviour by team 3/4/5/6 is also notable in the examples in table 8.

5 Method 2: Questionnaires

In the second method we used a questionnaire among team leaders and members. First, the questionnaires were established offline but for the sake of convenience, were made online so participants could fill in the questionnaires before the two-day visit of the researchers. The researchers also translated the English established questionnaire into Dutch, so team members could understand and relate to the questions more. 14 team leaders took the questionnaire where and 82 team members.

5.1 Sample

The sample consisted of team leaders and employees from companies that use Lean/continuous improvement practices or use continuous improvement at least one year. The final sample consisted of 82 employees and 14 team leaders (see Table 9). The sample consisted of 53% male and 47% female. Also the researchers asked what background the participants had. Approximately 46.6% of respondents were attached to the production department, 33% in research and development, 11.7% in planning, procurement and logistics, 5.8% from IT, finance and administrative, 1.9% from sales and marketing and 1% from other departments.

Table. 9 *Description of final sample*

Demographic Variables	**Categories**	**Team Members (N=82)**		**Team Leaders (N=14)**	
		Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Gender	Male	38	48.5	9	60
	Female	34	41.5	4	26.7
Age	40 and below	34	41.5	2	14.3
	41 and above	38	48.5	12	85.7
Employment	Full time	52	72.2	10	66.7
	Part time	20	27.8	3	20
Tenure 10	5 and less	17	23	-	-
	6 to 10 years	16	21.6	-	-
	11 to 25 years	19	25.7	-	-
	26 to 35 years	4	5.4	-	-
	36 to 50 years	3	4.1	-	-
Education	Secondary Education	3	4.1	-	-
	Lower Vocational	5	6.8	-	-
	Secondary Vocational Education	28	37.8	2	13.3
	Higher Vocational	19	25.7	8	53.3
	University	16	21.6	3	20
	Other	1	1.4	-	-

5.2 Procedure

After carefully selecting the constructs and establishing the questionnaire, the questionnaire was carried out in several ways. At first, an offline version was established and after that for the sake of convenience, the questionnaire was made online via the online survey distribution program Qualtrics ™ provided by the University of Twente's BMS facility. In order to inform participants about anonymous participating, a letter of consent was made and had to be signed by the participant digitally (Appendix D). During and after data collection, the data was immediately stored on the secured encrypted servers of the University of Twente. What is more, When the researchers arrived at the organisation sites, the employees and team leaders have been asked whether they had fully completed the questionnaires. However, during the two-day visit researchers found that often the questionnaires were not filleted in yet. In addition, often the team members did not have a company e-mail account so they only could fill in the questionnaire when they were at home. In order to increase response rate, the researchers printed the offline questionnaire and gave these to the team members when they were on site when participants had not filled in the questionnaire yet. In Table 10. The questionnaire can be found. Appendix G is shows the questionnaire for team members and Appendix H the one for the team leaders. In Table 11 an overview of the different construct can be found. Compared if the construct was asked to the team leader and/or team members.

Table 10. *Questionnaires team leaders and team members*

Construct	No. Items	Example item	Scale	Source
Perceived level adoption Lean practices*	22	"The root cause and countermeasures of all problems are identified through an established problem-solving methodology."	1-5	Camuffo & Gerli, 2018
Top management support	8	Top management has assumed the responsibility for indication and maintaining Lean goals and culture	1-7	Ugboro & Obeng, 2000
Team leader support	8	Senses what needs to be changed in our organisation	1-5	Antonakis & House, 2014
Team leader behaviour			1-5	
Task-oriented behaviour	4	"Supports me in exchange for my efforts."	1-5	Bass & Avolio, 2003
Relations-oriented behaviour	5	"Suggests new options for looking at task performance."	1-5	Bass & Avolio, 2003
Change-oriented behaviour	4	"Expresses confidence that the goals will be achieved."	1-5	Bass & Avolio, 2003
Team processes				
Psychological safety	4	Members of this unit are able to bring up problems and tough issues.	1-7	Nembhard & Edmonson, 2006
Innovative work behaviour	9	Creating new ideas for difficult issues	1-7	Janssen, 2000
Knowledge sharing	4	Information is freely shared among members of this team	1-7	Bunderson & Boumgarden, 2010
Team monitoring	5	Regularly monitor how well we are meeting our team goals	1-7	Mathieu et al., 2019
Back-up behaviour		Assist each other when help is needed		
Team cohesion	6	Members of my team feel close to each other	1-7	Mathieu et al., 2019
Conflict management	4	Conflict is dealt with openly on this team	1-5	Tekleab et al., 2009
Team performance*	4	I am consistently high performing	1-7	Gibson etal., 2009
Team well-being				
Work engagement	9	When I get up in the morning, I feel like going to work	1-6	Schaufeli, Bakker, & Salanova, 2006
Job satisfaction	3	I find real enjoyment in my job	1-5	Thompson & Phua, 2012
Work pressure	10	Do you work under time pressure?	1-7	Veldhoven & Meijman, 1994
Job performance	4	"I am consistently high performing."	1-7	Gibson et al., 2009
Control variables				
Age	1	What is your age?	1-100	n.a.
Gender	1	To which gender do you most identify with?	Male/Female/Other	n.a.
Organisational tenure	1	How long have you been employed at this organisation?	Years & months	n.a.
Team meetings	1	How often does your team meet in an average week?	Average count	Hill et al., 2019
Team tenure	1	How long have you been part of this team?	Years & months	n.a.
Lean practices	2	How long have you been working with Lean practices?	Years & months	n.a.
Educational level	1	What is your highest level of education?	Categorical	n.a.

*Applicable only to team leader

Table 11. *Constructs asked to the team leader and team members*

Construct	Team leader	Team members
Lean practices adoption	X	
Top management support	X	X
Team leader support		X
Task-oriented behaviour		X
Relations-oriented behaviour		X
Change-oriented behaviour		X
Psychological safety		X
Innovative work behaviour		X
Knowledge sharing		X
Team monitoring		X
Back-up behaviour		X
Team cohesion		X
Conflict management		X
Team performance	X	
Work engagement	X	X
Job satisfaction	X	X
Work pressure	X	X
Job performance		X

5.2.1 Measures

5.2.1 Level of adoption of Lean operation practices

This construct makes use of Shah and Ward's (2007) definition of Lean production is an integrated socio-technical system whose main objective is to eliminate waste by concurrently reducing or minimising supplier, customer, and internal variability in supply, processing time, and demand. With this variable, the researchers want to investigate the ratings the team leader perceived about the degree of maturity of the Lean practices of the company. The researchers made use of the 22 items of Camuffo and Gerli (2018) to access several dimensions of Lean systems. Example items are on a scale of one to five: '' Formal 5S improvement activities are in place according to plant improvement plans and targets'' and ''The root cause and countermeasures of all problems are identified through an established problem-solving methodology''. The team leader answer on a scale ranging from one to five.

5.2.2 Top management support (for Lean)

In order to measure the perceived of top management is Lean support, the construct of Ugboro & Obeng (2000) was used. The nine-item scale included a five-point Likert scale ranging from 1, very dissatisfied to 7, very satisfied. The researchers made a change on this scale to replace the concept TQM for the word Lean. In practice, companies give ''Lean'' different words. Hence, we changed the word Lean by the word the company used in order to give clarity to the team members. Example items are: ''Top management has assumed the responsibility for

indication and maintain Lean goals and culture'' and ''Top management is involved in reviewing progress towards Lean''. This construct was both asked to team leaders as the team members

5.2.3 Team leader support

The perceived support of team leader support was questioned to team members. The researchers used Antonakis, & House (2014) eight-item scale. In addition, a five-point Likert was used ranging from 0 ''not at all'' to 5 ''frequently not always''. Example items include: ''Removes obstacles to my goal attainment'' and ''Ensures that I have sufficient resources to reach my goals''.

5.2.4 Team leader behaviour

In addition to observational results of method 1, the researchers wanted to measure additional team leaders' behaviour, questioned to the team members. The researchers made use of a short version of Bass & Avolio Multi-factor Leadership Questionnaire (MLQ) with three sub-dimensions namely 1) Management by Exception, 2) Consideration and 3) Intellectual Consideration. The construct contains a 13-item scale, on the questionnaire comprises of three scales: task, relation and change-oriented leadership. Sample items included ''Supports me in exchange for my efforts'', and ''Suggests new possibilities to look at the task performance'' and ''Asks questions in relation to important assumptions''.

5.2.5 Team processes

Several team processes were studied. All team process questionnaires were only asked at the team members.

Psychological safety. The researchers used Nembhard and Edmondson's (2006) four-item scale was used to measure the perceived psychological safety among team members within the team. Example questions started with ''In our team…'' which the members gave a rating on the next example questions. ''If you make a mistake in this unit, it tends to be held against you'' and ''the people in our unit value others' unique skills and talents. The word 'unit' was replaced with the word team and the questionnaire made use of a 7-point Likert scale. Starting with 1; strongly disagree to 7; strongly agree.

Innovative work behaviour. The researcher used the nine-item consisting questionnaire of Janssen (2000). Also, this questionnaire was translated to Dutch. The questionnaire contained items on idea generation, idea promotion and idea realisation. Example questions are:

‘‘Creating new ideas for difficult issues’’ and ‘‘transforming innovative ideas into useful applications’’. A 7-point Likert scale was used, ranging from 1 ‘never’ to 7 ‘always’,

Knowledge sharing. The questionnaire was established by Bunderson and Boumgarden (2010) four-item questionnaire. This questionnaire consist of a 7-point Likert scale, ranging from 1; strongly disagree to 7; strongly agree. An example item is: ‘‘ Information is freely shared among members of this team’’.

Team monitoring. The researchers made use of Mathieu et al. (2019) five-item questionnaire, with a 5-point Likert scale ranging from 1; not at all, and to 5; to a very great extent. Example item includes: ‘‘Our team ‘‘Regularly monitor how well we are meeting our team goals’’.

Back-up behaviour. In addition, another questionnaire from Mathieu et al. (2019) was used to measure back up behaviour, with the same Likert Scale. A sample item is: ‘‘Our team.. Assists each other when help is needed’’.

Conflict management. The team members rated their team on how conflict is managed within the team. The researchers made use of Tekleab et al. (2009) questionnaire with four items. The scale of this construct is a 5 point Likert and started each item with the question: ‘‘To what extent do you agree with the following statement’’. Here an example item is ‘‘Conflict is dealt with openly on this team’’.

Team Cohesion was measured according to Mathieu et al. (2019) six-item scale with a 1 to 7 Likert type scale. Ranging from 1; strongly agree to 7; strongly disagree. This questionnaire includes interpersonal-oriented and task-oriented items. Example items included: ‘‘There is a feeling of unity and cohesion in my team’’ and ‘‘Members of my team share a focus on our work’’.

5.2.6 Team performance

In order to measure team performance, each team leader was asked to fill in a four-item questionnaire established by Gibson and Cooper (2009), on a 7-point Liker scale ranging from 1; very inaccurate to 7; very accurate. The four questions where ’’ This team is consistently a high performing team’’, ‘‘This team is effective’’, ‘‘This team makes few mistakes’’ and ‘‘This team does high-quality work’’.

5.2.7 Team well-being

Team well-being has been measured by work engagement, job satisfaction, and work pressure. We combined these subjects by calculating the mean scores to measure the construct team well-

being. All items were questioned individually at team members. Work engagement used the UWES (Utrecht Work Engagement Scale), developed by Schaufeli et al. (2002), contained 9 items. Job satisfaction, as described by Thompson (2012), contained 3 items. Work pressure used the QEEW/VBBA as used by Veldhoven and Meijman (1994) with a 5-point Likert scale with 1; strongly disagree to 5; strongly agree. Example items where: ‘‘At my work, I feel bursting with energy’’. And I find real enjoyment in my job’’.

5.2.8 Measuring control variables

The researchers also included control variables**.** The control variables added to the questionnaire gather descriptive data, such as ages, tenure, gender and educational level. As well asked was about the number of times the team meets face-to-face during an average workweek, which was established by Hill and Thomas (2019). The control variable were both completed by both team leaders and team members.

5.3 Data analysis

The data analysis started with the extraction of the individual completed questionnaires from Qualtrics ™ and the secured server of The University of Twente and converted the outcomes to IBM SPSS Statistics version 25. Since a few questions were asked in a negative way, this output needed to be recoded in order to be consistent with the output on the other questions from the related variable. Next, a Pearson correlation matrix was drawn upon the data at the individual level (N_2=82). The variables are on a continuous scale and no outliers where detected. The researcher investigated several leadership behaviours and team processes. The researchers computed the Cronbach’s alpha at the individual level which holds an average value of .856. The first question of the construct Physiological safety was deleted in order to increase the Cronbach’s alpha.

In addition, the researchers computed the RWG score on each construct. This score is within-group interrater reliability and is the most frequently applied index for the interrater agreement on Likert-type scales (Brown & Hauenstein, 2005). The score represents the agreement between certain participants and is used in this method to test if the data at the individual-level can be aggregated to the team level. James et al. (1984) argue for an acceptable RWG value of 0.7. However, Wagner et al. (2011) recommended an RWG score of 0.8 and above to indicate a strong agreement, values between 0.7 and 0.8 indicate moderate agreement and values between 0.6 and 0.7 show weak agreement. What is more, values below 0.6 represent unacceptable

levels of agreement. The researchers need to be aware of the fact that these values are only heuristics and are therefore to some extent unpredictable (LeBreton & Senter 2008). In this method, all RWG scores where above 0.8 so we were able to aggregate the individual-level data to the team level.

We also reported, for each team, the average scores on every construct. A team level Pearson correlation matrix was drawn and the minimum and maximum scores for the teams were reported. In addition, an independent t-test was conducted to investigate if a difference between the team which has a higher amount of Lean practices adoption and the teams which have a lower adoption can be found with N=10. The dependent variable is measured on a continuous scale, also the groups we selected are independent, no significant outliers where found. Also, equal variances are assumed amongst the teams. The ten teams were split into a higher and lower selection by the median (4.43) of Lean practices adoption (rated by the team leader) and divided the two groups. This was also done in the research of Tortella et al. (2017) on Lean leader behaviour in Brazilian hospitals. We wanted to examine if the teams with a higher amount of Lean practices (rated by the team leader) rapport higher scores on top management support, team leader support, leadership behaviour, and team processes. Moreover, the moderating effect of leadership behaviour was tested by using regression analysis and ANOVA analysis for the R_2 to examine the proportion of variance explained by the model. Since data did not satisfy to the assumptions of a regression analysis the data needed to be centralised. The independent variable and the moderator variable are centralised first. After that, a new predictor has been calculated using the centralised variables. When this was done, a regression with the centralised variables was conducted via IBM SPSS Statistics version 25. The instruction manual to conduct moderating analyses was used from the methodical shop of the University of Twente.

5.4 Results

As the Pearson correlation matrix in Table 11 shows, a high positive correlation ($p<0.01$) from the team level data can be found between team performance and the perceived Lean adoption ($R=.775$ $p<0.01$), top management support and on team performance ($R=.720$ $p<0.01$). What stands out is that the construct team leader support has significant positive correlations with knowledge sharing ($R=.884$ $p<0.01$) and back up behaviour ($R=.817$ $p<0.01$). Additional, team leader support correlated with relations-oriented behaviour ($R=.802$ $p<0.01$) and change oriented behaviour ($R=.793$ $p<0.01$)

What is more, relations-oriented leaders' behaviour correlates with the team processes: knowledge sharing (R=.879 p<0.01), team monitoring(R=.795 p<0.01), back up behaviour(R=.854 p<0.01) and team cohesion(R=.792 p<0.01). Also significant correlations amongst the several team processes were found.

More significant positive correlations where found on a 0.05 alpha level. The correlations are amongst top management support for Lean rated by the team leader and top management support for Lean rated by team members (R=.607 p<0.05). Also, for top management support for Lean rated by team member and change-oriented behaviour (R=.642 p<0.05). Additional, team leader support correlated with task-oriented behaviour (R=.721 p<0.05). Moreover, task-oriented behaviour correlates with back-up behaviour. (R=.653 p<0.05) Also, change-oriented behaviour, shown by the team leader correlates positive significant with the team processes: knowledge sharing (R=.682 p<0.05), back-up behaviour (R=.723 p<0.05), team cohesion (R=.727 p<0.05), and conflict management (R=.714 p<0.05). About the well-being items: Work engagement correlates with Job performance (R=.762 p<0.05) and Job satisfaction with work pressure (R=.776 p<0.05). In addition, Job satisfaction positively correlates with Team cohesion (R=.667 p<0.05).

Table 13 reports the scoring of each team on the different constructs. Team number 1 scored the highest on back-up behaviour and lowest on team monitoring and team performance. Team number 2 scored the highest on the most variables which are: team leader support, relations-oriented behaviour, knowledge sharing, team monitoring, team performance, work engagement, and job performance. However, the team leader of team two scored also highest on task-oriented behaviour. Team number 3 scored the highest on top management support for Lean rated by the team members, team cohesion and conflict management. Team 3 has no lowest scores which is the same for team four. Team number 4 scored highest on team performance and showed the team leader the less task-oriented behaviour of all team leaders, which are rated per team. Team 5 scored the highest on Lean practices adoption, team performance and top management support for Lean, however, they score the lowest on relations-oriented behaviour, knowledge sharing, and team cohesion. Team number 6 has only the lowest scores for team leader support and work pressure. Furthermore, team seven scores highest on innovative work behaviour and lowest on top management support for Lean rated by the team members, change-oriented behaviour, psychological safety conflict management, and job performance. In contrast Team 8 scored the lowest on innovative work behaviour and back-up

Table 12. *Descriptive statistics and Pearson correlations of the survey variables at individual and team level (method 2)*

	Range	M	SD	N	α	RWG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Perceived level adoption Lean practices	1-7	4.24	1.16	14	.946	-		.873**	-.172	.234	-.133	.392	-.079	-.056	-.035	.306	.039	.028	-.033	-.252	.775**	.228	-.092	-.353	-.177
2.Top management support by team leader	1-7	4.81	1.11	13	.888	-	.873**		.607*	-.007	-.401	.092	-.269	-..111	-.076	.028	-.179	-.228	-.169	-.456	.720**	.089	-.197	-.262	-.153
3.Top management support by team members	1-7	4.43	0.94	82	.898	.91	.275	.114		.569	.574	.517	.642*	-.252	.126	.465	.380	.563	.547	.800**	-.012	.412	.514	.223	.356
4.Team leader support	1-5	3.68	0.56	78	.861	.98	.-.310	-.141	.211		.721*	.802**	.793**	-.002	-.045	.884**	.564	.817**	.600	.480	.099	.066	.213	-.076	.078
Team leader behaviour																									
5.Task-oriented behaviour	1-5	3.13	0.62	79	.748	.97	-.076	.075	-.003	-.013		.644	.786**	-.057	-.075	.559	.525	.653*	.446	.609	-.399	.050	-.040	-.373	-.014
6.Relations-oriented behaviour	1-5	3.56	0.66	80	.791	.96	-.058	-.118	.139	.665**	.062		.725*	.345	.110	.879**	.795**	.854**	.792**	.599	-.042	.211	.424	-.143	-.057
7.Change-oriented behaviour	1-5	3.77	0.60	79	.824	.97	-.485	-.578*	.243*	.682**	..033	.719**		.-.007	-.023	.682*	.481	.723*	.727*	.714*	-.240	.159	.343	-.008	.190
Team processes																									
8.Psychological safety	1-7	5.07	0.89	76	.861	.90	-.65	-.11	.062	.398**	-.062	.292*	.388**		.442	.297	.736*	.371	.326	.004	-.088	-.195	.222	.028	-.185
9.Innovative work behaviour	1-7	4	1.15	72	.954	.90	-.253	.011	.180	.057	.015	.179	.154	-.087		.018	.352	.056	-.065	-.045	.490	.199	.467	.337	.257
10.Knowledge sharing	1-7	5.34	1.12	78	.903	.90	.486	.564*	.132	.281*	-.060	.141	.224	.517**	-.015		.788**	.935**	.740*	.387	.010	-.097	.362	.004	-.112
11.Team monitoring	1-7	3.36	0.65	77	.865	.97	.180	.314	.209	.320**	-.027	.278*	.370**	.237**	.221	.506**		.846**	.680*	.426	-.194	-.043	.410	-.023	-.075
12.Back-up behaviour	1-7	3.46	0.69	75	.832	.97	.324	.328	.341**	.469**	-.124	.277*	.384**	.574**	-.007	.702**	602**		.834**	.539	-.146	-.178	.490	.137	-.191
13.Team cohesion	1-7	5.13	1.07	73	.904	.92	.159	.195	.163	.316**	.119	.263*	.296*	.699**	-.066	658**	.433**	.670**		.755*	-.281	.087	.667*	.231	-.014
14.Conflict management	1-5	4.44	1.24	76	.892	.88	-.265	-.364	.159	.400**	-.177	.379**	.448**	.764**	-.056	.416**	.329**	.533**	.578**		-.346	.517	.484	.045	.364
15.Team performance	1-7	5.13	1.14	14	.815	-	.775**	.720**	.148	-.053	.020	-.153	-.463	-.088	-.280	.650*	.532*	.650*	.309	-.292		..173	.279	-414	.129
Team well-being																									
16.Work engagement	1-7	5.27	0.77	72	.795	.95	.188	.031	.186	.162	-.132	.141	.044	.020	.180	.014	.114	.114	.026	.233*	-.195		.143	-.203	.762*
17.Job satisfaction	1-5	3.92	0.63	72	.833	.97	-.068	-.134	.062	.195	-.089	.156	.123	.457**	..122	.238*	0.100	.250*	.287*	.366**	-.173	.438**		.776*	.068
18.Work pressure	1-7	2.20	0.44	71	.849	.99	-.106	-.195	-.126	-.086	.074	-.052	.018	.137	.149	-.001	-.127	-.067	.023	-.093	-.024	-.524**	.058		.012
19.Job performance	1-7	5.21	0.81	71	.809	.95	.030	-.080	-.014	.064	.046	.075	.058	-..009	.363**	.004	.023	-.099	.060	.045	.087	.206	.149	-.029	

* Correlation is significant at the 0.05 alpha level (two-tailed)

**Correlation is significant at the 0.01 alpha level (two-tailed)

Note: Bottom correlations are at individual level and upper correlations are at team level

Table 13. *Scoring of teams*

Team				**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Scale	M	SD	(N=16)	(N=4)	(N=9)	(N=5)	(N=7)	(N=8)	(N=4)	(N=8)	(N=8)	(N=12)
Perceived level adoption Lean practices	1-7	4.24	1.16	4.02	3.95	4.55	4.20	5.52	4.50	2.91	5.32	1.09	5.09
Top management support for Lean by team Leader	1-7	4.81	1.11	5.28	4.11	5.22	5.00	5.90	5.11	4.22	5.78	1.67	4.78
Top management support for Lean by team member	1-7	4.43	0.94	4.57	4.78	4.92	4.78	4.21	4.32	3.96	4.15	4.19	4.36
Team leader support	1-5	3.68	0.56	3.63	4.16	3.81	4.05	3.33	3.22	3.47	3.52	4.05	3.80
Team leader behaviour													
Task-oriented behaviour	1-5	3.13	0.62	3.33	4.13	3.86	3.13	2.89	3.38	3.31	3.96	3.88	3.83
Relations-oriented behaviour	1-5	3.56	0.66	3.61	4.00	3.90	3.44	3.09	3.10	3.45	3.40	3.75	3.82
Change-oriented behaviour	1-5	3.77	0.60	3.58	4.00	4.13	4.00	3.54	3.47	3.44	3.59	4.06	4.11
Team processes													
Psychological safety	1-7	5.07	0.89	5.75	5.38	5.61	5.25	4.39	4.72	3.94	4.25	5.88	5.00
Innovative work behaviour	1-7	4.00	1.15	3.44	4.56	4.33	3.89	4.26	4.35	4.78	2.76	3.39	4.56
Knowledge sharing	1-7	5.34	1.12	5.42	6.06	5.67	5.65	4.11	4.81	5.25	4.97	6.06	5.69
Team monitoring	1-7	3.36	0.65	3.13	4.05	3.80	3.16	2.60	3.40	3.50	3.18	3.55	3.58
Back-up behaviour	1-7	3.46	0.69	5.47	3.95	3.98	3.56	2.69	3.25	3.30	3.17	3.98	3.49
Team cohesion	1-7	5.13	1.07	4.65	5.71	5.91	4.51	4.09	4.91	4.11	4.52	5.89	5.30
Conflict management	1-5	4.44	1.24	5.43	5.50	5.56	4.10	4.18	4.13	2.75	4.19	4.28	4.40
Team performance	1-7	5.13	1.14	2.75	4.75	4.50	4.75	4.75	4.25	4.50	4.25	5.00	4.50
Team well-being													
Work engagement	1-7	5.27	0.77	5.43	5.50	5.25	5.22	5.41	5.18	5.11	5.25	5.01	5.42
Job satisfaction	1-5	3.92	0.63	4.21	4.06	4.33	3.75	3.83	4.06	3.81	3.22	4.03	3.96
Work pressure	1-7	2.20	0.44	2.34	2.13	2.31	2.26	2.28	2.46	2.20	1.74	2.34	2.08
Job performance	1-7	5.21	0.81	5.29	5.67	4.94	5.40	5.46	5.44	4.81	5.09	4.88	5.52

Lean practices adoption		Low	Low	High	Low	High	High	Low	High	Low	High
Control variables											
Age		40.5	36.5	45.6	51.8	40.8	36.5	39.5	50.4	31.9	40.8
Male		1	4	9	3	7	3	1	7	0	4
Female		12	0	0	2	0	5	3	1	8	8
Organisational tenure (in years)		17	8.4	8.5	11	15.6	9.7	1.56	24.3	4.98	15.6
Team meetings per week		5	3	5	5	2	5	3	0.33	1	2
Team tenure (in years)		11.6	3.5	8.5	5.2	4.9	2.4	0.98	17.03	2.91	4.99
Lean practices opinion	1-5	3.43	4	4.22	4	3.61	3.33	3.16	3.04	3.81	3.61
Educational level		hbo	mbo	mbo	lbo	mbo	hbo	hbo	mbo	uni	mbo

Table 14. *Aggregated data team level. Minimum maximum, mean and standard deviation*

	N	Range	Minimum	Maximum	Mean	Std.dev		N	Range	Minimum	Maximum	Mean	Std.dev
1. Perceived level adoption Lean practices	10	1-7	1.09	5.55	4.24	1.16	**15.Team performance**	10	1-7	2.25	6.50	5.13	1.14
2.Top management support by team leader	10	1-7	1.67	6.00	4.81	1.11	**Team well-being**						
3.Top management support by team members	10	1-7	3.96	4.92	4.42	.32	16.Work engagement	10	1-7	5.01	5.50	5.28	.16
4.Team leader support	10	1-5	3.22	4.16	3.70	.32	17.Job satisfaction	10	1-5	3.22	4.33	3.93	.31
Team leader behaviour							18.Work pressure	10	1-7	1.74	2.46	2.21	.20
5.Task-oriented behaviour	10	1-5	3.33	4.25	3.77	.32	19.Job performance	10	1-7	4.81	5.67	5.25	.30
6.Relations-oriented behaviour	10	1-5	3.09	4.00	3.56	.32							
7.Change-oriented behaviour	10	1-5	3.19	4.13	3.76	.33							
Team processes													
8.Psychological safety	10	1-7	3.94	5.88	5.02	1.24							
9.Innovative work behaviour	10	1-7	2.76	4.78	4.03	.65							
10.Knowledge sharing	10	1-7	4.11	6.06	5.37	.61							
11.Team monitoring	10	1-7	2.60	4.05	3.40	.40							
12.Back-up behaviour	10	1-7	2.69	3.98	3.48	.41							
13.Team cohesion	10	1-7	4.09	5.91	5.04	.71							
14.Conflict management	10	1-5	2.75	5.56	4.37	.79							

Table 15. *Independent sample t-test, comparison of high and low Lean practices adoption of teams*

	High Lean practices adoption (Team 3,5,6,8,10)				**Low Lean practices adoption (Team 1,2,4,7,9)**								
	N	**M**	**SD**	**SE**	**N**	**M**	**SD**	**SE**	**F**	**Sig**	**t**	**df**	**Sig two tailed**
Top management support for Lean	5	4.39	.31	.14	5	4.46	.37	.16	.766	.407	.299	8	.773
Team leader support	5	3.54	.27	.12	5	3.87	.30	.14	.397	.546	1.858	8	.100
Team leader task-oriented behaviour	5	3.80	.34	.15	5	3.76	.35	.16	.111	.748	-.164	8	.874
Team leader Relations-oriented behaviour	5	3.46	.39	.17	5	3.65	.23	.10	2.687	.140	.933	8	.378
Team leader Change-oriented behaviour	5	3.77	.32	.15	5	3.76	.37	.15	.037	.852	-.055	8	.958
Psychological Safety	5	4.79	.54	.24	5	5.24	.77	.35	.181	.682	1.058	8	.321
Innovative Work behaviour	5	4.05	.73	.33	5	4.01	.64	.28	.002	.967	-.092	8	.929
Knowledge Sharing	5	5.05	.66	.30	5	5.69	.37	.16	1.493	.256	1.888	8	.096
Team Monitoring	5	3.31	.459	.21	5	3.49	.38	.17	.215	.656	.628	8	.547
Back-up behaviour	5	3.32	.47	.21	5	3.63	.32	.14	.263	.622	1.252	8	.246
Team-Cohesion	5	4.95	.70	.31	5	5.14	.78	.35	.435	.528	.408	8	.694
Conflict Management	5	4.49	.61	.27	5	4.23	.99	.47	.482	.507	-.451	8	.664

Table 16. *Moderating test of leadership behaviour and the relation of Lean practices adoption and team processes*

	Task-oriented behaviour					Relations-oriented behaviour					Change-oriented behaviour				
Team processes	R^2	B	SE	t	Sig.	R^2	B	SE	t	Sig.	R^2	B	SE	T	Sig.
Psychological safety	.082	2.017	2.84	.711	.504	.262	2.106	2.403	.877	.414	.549	-.377	.842	-.448	.670
Innovative work behaviour	.022	.446	1.483	-.238	.820	.097	.965	1.346	.717	.500	.003	-.090	1.206	-.075	.943
Knowledge sharing	.461	.097	1.032	.094	.928	.777	.150	.626	.239	.819	.652	-.658	.667	-.987	.362
Team monitoring	.296	.215	.786	.274	.793	.744	.338	.448	.755	.479	.299	-.458	.632	-.725	.496
Back-up behaviour	.461	-.343	.706	-.486	.644	.846	-.157	.356	-.442	.674	.691	-.763	.430	-.1774	.126
Team cohesion	.222	-.600	1.451	-.413	.694	.808	.768	.681	1.128	.302	.539	-.314	.899	-.346	.739
Conflict management	.435	-.823	1.377	-.598	.572	.642	.187	1.035	.181	.862	.551	-.157	.988	-.157	.879

behaviour and job satisfaction but the team has rated work pressure the lowest of all teams. Team 9 scored highest on psychological safety and knowledge sharing. The team scored lowest on Lean practice adoption, work engagement and top management support rated by the team leader. Outstanding is that the score on top management support for Lean was rated by the team leader with an average of 1.07 while the other team members gave a rating of 4.19. At last, team 10 scored highest on change-oriented behaviour showed by the team leader. We found not great differences amongst team with a high Lean practice adoption or high Lean practices adoption. However, scores of teams with lower Lean practices adoption, seam higher than the teams with high Lean practice adoption.

The next Table 14 shows the minimum, maximum and standard deviation of every measured construct of the aggregated data. What stands out is that all teams scored highly on top management support for Lean (M=4.81), psychological safety (M=5.02), team cohesion (M=5.04), and team performance (M=5.13). Amongst the leadership behaviours, the mean for task-related behaviour was scored highest (M=3.77) by the teams and relations-oriented behaviour lowest (M=3.56). Work pressure was found to be very low amongst the teams (M=2.21). However, low mean scores were found for team monitoring (M=3.40), and back-up behaviour (M=3.48).

An independent samples t-test was conducted to compare the means of the team processes from the teams with a high and low Lean adoption (rated by the team leader). As Table 15 demonstrates, no significant evidence was found that the two means of the groups are different for the various variables and constructs. Only two marginally significant differences were found for team leader support ($p<.100$) and knowledge sharing ($p<.096$). However, when investigating the different means for the constructs, it stands out that the teams with lower Lean practices adoption have higher means comparing to the teams with higher adoption of Lean practices on almost every leadership behaviour and team process.

Table 16, reports the results of the moderating test. No significant evidence was found for the moderating effect of leadership behaviour on the relation between lean practices adoption and team processes. What we did found was a significant positive regression for relations-oriented behaviour and several team processes, namely: knowledge sharing (B= 1.734, t= 4.27, p= .005), team monitoring (B= 1.209, t= 4.166, p=.006), team cohesion (B = 2.208, t= 5,004, p= .002) and conflict management (B=2,077, t=3.096, p=021). Also for the change-oriented behaviour of the team leader we found a positive regression for several team processes: back-up behaviour

(B= 1.259, t = 3.655, p= .011), knowledge sharing (B= 1.606, t= 3.003. p= .024) and psychological safety = (B= 1.60, t = 2.476, p= .048). We found that a leader who shows more relations-oriented behaviour, have likely higher scores on the team processes: knowledge sharing, team monitoring, team cohesion, and conflict management. In addition, the teams of team leaders who show more change-oriented behaviour score higher on the following team processes: psychological safety, knowledge sharing, and back-up behaviour.

6 Method 3: Critical incidents technique interviews

6.1 Method

Finally, both researchers conducted semi-structured interviews drawn upon the critical incident interview technique (Flanagan, 1954). The critical incident technique is used as a direct observation of human behaviour that are related to the defined criteria. We chose this method since it provides us a flexible method that gives the researchers several tools to investigate different incidents within the context of Lean.

The aim of the interviews was to investigate whether (top) management supports the employees in Lean practices adoption or continuous improvement or not (N_3=64). In addition, we wanted to find out if of this affects the team' well-being and team performance. We were focused on gathering data about specific and real cases. Attention was paid to the experience of the interviewee. The researchers chose to investigate several employees per team, the team leader and someone who was standing close to the team in order to receive a full picture of the team and their function through time.

6.2 Sample

The interviews have been executed among the participating Lean working operational teams. The selection of the employees was done randomly. The researchers often worked alongside the participants when asking questions since the employees worked often in a setting at which they could not walk away from.

6.3 Procedure

The researchers' aim was to investigate the perceptions of the individuals on their engagement in performing or growing towards a continuous improving (Lean) culture. Here explicated attention was paid to a Lean activity in the past year. Questions were asked on how Lean or continuous improvement was implemented and how the interviewee felt at the beginning of the implementation and more recently. Moreover, members were asked to describe the team ambiance from the beginning and comparing to more recently. As recording devise the researchers made use of a mobile device, to provide a richer amount of data and to allow the researcher to check the conversations and to prevent bias since the researcher could again listen to the recorded tapes. To ensure validity, the researchers asked the same question sometimes

to the interviewee but slightly different, so the researchers could find out if the interviewee was indeed talking about the subject. In order to increase reliability, the researchers asked for a verifying answer after some questions or the researchers repeated the question. The interview duration differed strongly. Sometimes the interview took a few minutes, some more than an hour. All the interviews have been transcribed. Here the researchers made use of the online transcribing tool Amberscript, which allowed the researchers to transcribe with a greater amount of data in German and Dutch. Besides, checked was or the produced transcripts by Amberscript were consistent with the real recording, and if necessary, corrected.

6.4 Data analysis

For the data analysis, the researchers both selected 26 interviews from the data set and looked into the transcripts and carefully selected citations of the interviews and linked these to each team. The researchers analysed mindfully every word and marked what they found interesting considering the subjects of this research. Via this way, the researcher got more insight into the team processes and the way how management and the team leader deal with Lean in the past.

6.5 Results

In Table 12 the results can be found. In team 1, the opinion about Lean amongst the team members is divided. Three of the four teams are happy that they work with Lean. What stands out is the shifts in opinions about Lean. At first, the team members did not like Lean very much. And later on, when tools got implemented they started to see the results that Lean can bring and hence liked Lean more. The members of team 1 state that they do not feel more involved with new plans for continuous improvement. Besides, they do not have the feeling that other team members are busy working with Lean.

Table 17. *Quotes of team members statements during Critical Incident Interviews*

Team	No. interviews	Answers	Subject
Team 1	4	Team member stated that management does not provide enough time to implement new ideas. The team member has to make time for meetings about Lean during her coffee break. Also the team member stated that Lean also has negative side effects because ‘‘all those invented Lean meetings taking a lot of time’’. Also another team member gives an example of an improvement that was made by the management but in practice, it does not work because the department received more work by using the change. Also the team members stated that: ‘‘I don’t have the idea that we work faster or	Top management

		more efficient while we work with Lean'' and ''I am not really positive about Lean but I am also not against it, but I don't see the extra value of it''.	
		Team members stated that: '' Behind the scenes, they (management) invent new ideas but they implement these ideas without sufficient consultation of the employees. For example last week I had a totally new arranged workplace but when I got my first patient, which was an emergency case, I could not find my tools and critical time got lost''. Another team member stated ''Since we work with Lean I got the feeling that we use more programs to get the same output, everything got more complex, so when you need to work with Lean, things need to get more simple''. In addition, they stated: ''I don't have the impression that my team members are busy with Lean, that they feel driven to work with it''	Top Management
Team 2	3	Team leader states: ''during the implementation, my employees first thought: ''oh there we go again, something new'', it took one year to get used to the new way of working and they started to see the value of it. At first, they were not happy when they heard they needed to start working differently''. ''We managed this by just keep working with Lean, even though they did not like it, and we worked together on it, they started to initiate new projects also they started communicating more''. Team member: ''In the beginning, I really did not like Lean, I thought that it was wild nonsense. It will only that more time, but now I can see the results and the advantages. Also, I think that we as a team, communicate more and are more open towards each other''. Another team member states that: ''We are working more structured now, however during the implementation, it was chaotic. Also, the good results we are accomplishing through Lean, increases our ambiance in the team''.	Implementation Knowledge sharing Implementation
Team 3	4	Team leader states: ''When I started working here, nobody laughed, but now people are enjoying their work more and I think when someone is enjoying his work, this will count for 80% of his performance. I think this is accomplished now because back in the days, people were not allowed to think about solutions, however, now it is expected from them since we work with Lean''. And he stated that ''it is important to get structured solutions for problems, however sometimes this means that the company needs to invest more, but it will increase the benefits''. ''Also here, it is important that employees carry on solutions for problems''. On the implementation of Lean, he states: ''In the beginning, it was really hard because we needed to adapt and change a lot, also I am not a structured person so that was even harder''. ''Also you need very critical people in a team when you start working with Lean because they will help that you will get a better method in the end. They will ask questions like: why are we doing this? And why like this? Because a Lean implementation takes time and of course you will lose time but I would rather have it in the beginning than at the end''. Team member: ''When we do things together the work is getting more lighter'' and ''the men on the work floor are the most valuable part, without them we don't have an end product''. Another member stated on the	Team cohesion Implementation

		implementation that: ‘‘In the beginning, I found it very hard to work with Lean. I thought it was nonsense, it did not match with how I liked to work. I thought it is only for people that work in the office, but now I see how Lean helps accomplish our goals, and now we are more consequent and you can see on the board how the process is doing’’. ‘‘In the beginning it took lots of time but now it is getting more time sufficient’’. ‘‘I am very happy now working with Lean, and it is also good for the company’’.	Implementation
Team 4	2	Team leader states: ‘‘I am open for changes initiated by the team members’’. A team member states: ‘’I sometimes feel stressed to make sure the job gets done’’. and ‘‘We work with 5S when we have time, however, often we don’t have time to continues improve the processes’’. Also, he states: ‘‘The management can do more to stimulate us for making changes, especially beside the day-start, I would like to get more time for working with Lean’’.	Well-being Top management
Team 5	3	Team member: ‘‘Since we work with Lean we got major improvements, not only at our stations but we got also new clothing. It is working amazingly. I work well with my colleagues, we have all positive expectations of Lean’’. And: ‘‘The implementation of Lean was initiated by the work floor, we explained what we needed at our stations. My team leader stimulates me to continuous improvement, however the team leader can sometimes by a little sceptical about new improvements’’.	Lean implementation Leaders’ behaviour
Team 6	2	The team leader stated: ‘‘ I am very happy when people are conscious about what they are doing. I feel happy when the see when things are done in not the optimal way and then starting to propose solutions for the problems’’. Team member: ‘‘We are a team that is working separately but when we have time, we look for each other’’.	Team cohesion
Team 7	2	Team leader: ‘‘I enjoy when the team is making plans for continuous improvements. I think to improve the communication within the team is to make sure that ambiguities are prevented, that team members do not make assumptions often. Also, it contains to give feedback about things you don’t like. My leadership involves a coaching style, asking questions and sometimes steering ’’. Team member: ‘‘ I am aware that we are working with continuous improvement. The implementation was initiated from the management, however, the team members did not saw what Lean could deliver results so they stopped to go to meetings and resistance arose. I think that arose due to unclarity from top management, we needed more frameworks’’.	Leaders’ behaviour Lean implementation Top management
Team 8	3	Team leader: ‘‘I started to lead differently when we started to work with Lean, I especially got very lazy. Lean is for lazy people. Also, I started to listen more because irritation from the employees started when they need to repeat a lot. Now they talk openly and honestly about issues’’. Team member: ‘‘The implementation did not happen without a fight, people are hard to change. A lot of old employees work at this company. In the beginning, we needed to do more work but we got the same pay at the end of the month, that was something that did not work. However, during the years it dragged in and employees got used to Lean. Also, my team leader is very open and a people person. You can see the difference with another	Implementation Knowledge sharing Implementation

		team leader, he was very good at working but did not know how to treat people. What you saw in the output during his shift, stagnated and decreased. When my team leader started with his team, the output increased again and was very high. So it is very important that team leaders also change when they start working with Lean, and not only the employees on the work floor''.	Team leader behaviour
Team 9	2	Team leader: '' I initiate continuous improvements ideas often. But when team members come with improving ideas, I always say yes on those ideas. In doing so, I will help optimise the ideas with the team member''. Team member: '' I think our team can be more efficient, we all talk too much but we need to be more pragmatic''.	Leaders' behaviour Team performance
Team 10	2	Team leader: ''The initiation of Lean came from the work floor. When an initiating idea comes about new improvements, I will facilitate the idea. Since we work digitally, it is for the teams hard to work with Lean since it is hard to visualise everything. Back in the days, we used day-start boards to visualise, now that is not possible anymore''. Team member: ''We work with continuous improvement to the annoying. Not everyone wants to work with Lean. The people that work here for many years, are holding on to their normal habits. They want to get paid when doing extra effort like changing. Also, management does not see what I put into the effort for working with Lean and initiating improvements''.	Lean implementation Leaders' behaviour Management

In team 2 it is clear that at first the team did not like to start to work with Lean in the beginning, however, during the implementation, they changed their minds because they saw that Lean can visualise results. Team 3 agrees with team number two on the first impression of Lean. In line with team 2, they state that in the beginning, they did not like to work with Lean and that it takes lots of time. But now they changed their opinions into what they like to work with Lean. The team leader of team three states that for a successful Lean implementation, critical people are necessary in order to have a successful Lean implementation. Team 8 stated that the Lean implementation did not go easy. However, it started to work since people got used to working with Lean. What also of value is the statement about the two different leaders, one leader that was not good in leading people and the other team leader that is very open and a people person. He stated that the difference between these two types of leaders resulted in a change in production. A low production was found when the team leader, which is not a people person, was present with his team, and it changed when the more open towards people team leader came in. This suggests that it is important that also team leaders need to change when a company starts to work with Lean and not only to focus on changes in ways of working and tools.

Wat we see when analyzing our results is that the subjects: top management support, Lean implementation and leaders' behaviour pops out. Comparing teams with a low Lean adoption

and a high Lean adoption is that teams with a low Lean adoption frequently tell on the subject top management support. More often they state that top management is not fully supporting Lean or that top management can do more to support Lean.

7 Cross-Method Analysis of Results

In this part of the paper, the results of our three methods will be compared in terms of how the team leaders behaviour' and the outcomes on the team processes, team performance, and team well-being match. In the next section, the cross- method analysis results for teams with low Lean adoption and High lean adoption can be found. Also described will be what we can learn of the different investigated constructs.

7.1 Cross-Method analysis of results amongst teams with low and high lean adoption

Teams with low Lean adoption

The team leader of team 1 and 9 showed the most task-oriented behaviour according to the video-observation and questionnaire. However, looking at the results of the survey, the team leader of team 1 showed an average amount of task-oriented behaviour, less relations-oriented behaviour and no change-oriented behaviour. The team scored the lowest of all teams on the team monitoring and team performance. However, the team scored high on back-up behaviour and scored above average on well-being. The task-oriented behaviour of the team leader and the team process back-up behaviour were significantly. In the interviews, the team members stated that they are not satisfied with how the management is carrying out and implement Lean practices. However, they gave high scores for top management support in the survey.

In contrast, The team leaders of team 2, 4, and 7 showed more relations-oriented behaviour than task-oriented behaviour in the video-observation. However, the results of the questionnaire demonstrate that the team leader of team 2 scores the highest on task-oriented behaviour. If we look at the team processes and the results of the variables of the questionnaire, team 2 scored the highest on most team processes and well-being variables compared to all teams and also to the teams with a high adoption of Lean practices. In addition, they scored the highest on team performance and had a very low score on work pressure. In the interviews, the team members of team 2 stated that by working with Lean, they increased the knowledge sharing and team cohesion among the team. This point can also be supported by the results of the questionnaire that showcase that the team has the highest score on knowledge sharing and also a high score on team cohesion. Except for team 1, all low Lean adoption teams scored average on change-oriented behaviour.

Moreover, in team number 7 the questionnaire found a high score on innovative work behaviour but very low scores on conflict management and psychological safety. In team 9 the lowest score for Lean adoption was measured, and also the lowest score was reported by the team leader for support for Lean by top management. A highly significant correlation was found amongst these two variables in the questionnaire. So, low Lean adopting teams typically score high on several leadership behaviours, team processes, team performance and well-being.

Teams with high Lean adoption

In teams 3 and 6, we found a high score on team leader's relations-oriented behaviour and less task-oriented behaviour. However, in team 3, no change-oriented behaviour was reported in the video-observation. Moreover, in team 6, the highest score on work pressure was found. The leaders of team 5 and 8 showed a high amount of task-oriented behaviour. In the interviews, the members of team 8 reported that they experience their team leader as very open and a people person. However, the team reported, in the questionnaire, a high score on task-oriented behaviour for their team leader. Team 5 reported a high score for support for Lean by top management, team cohesion, and conflict management. As we see in the results of method two, relations-oriented behaviour was strongly related to team cohesion and top management support correlates significantly with conflict management. Team 5 scored high on Lean practices adoption, top management support and reported a high performance. Our results of the interviews also indicate that a strong significant correlation between perceived level adoption of Lean practices and support of top management can be found. Also, a strong correlation was found between perceived level adoption of Lean practices and team performance and between top management support for Lean and team performance. In contrast to team 6, in team 8 the lowest score on work pressure was reported.

The leader of team 10 scored high on change-oriented behaviour according to the questionnaire. What is more, this team scored overall very well on all team processes and well-being. Also an average amount was found on task-oriented behaviour and change-oriented behaviour according to the video-observation. In multiple interviews, team members stated that the team cohesion increased when they started to work with Lean. This is in alignment with the results the questionnaire which report a high score on team cohesion.

High lean-adopting teams typically score high on top management support, leadership behaviours, several team processes and well-being. We expected that teams with a high amount of Lean practices adoption, scored overall better than teams with low Lean adoption. However, our results demonstrate that both categories score high on several team processes. Only teams with low Lean adoption, scored overall higher on team performance compared to teams with a high Lean adoption. In addition, teams with a high Lean adoption scored higher on support for Lean by top management than teams with a low amount of Lean practices adoption. Overall, not many differences amongst these groups where found.

7.2 Cross-method of analysis amongst constructs

Lean practices adoption

We see across the entire sample a wide variety of approaches to adopt Lean practices and implement it to their own practices. Our observations and the self-rated questionnaires show a general insufficiency in terms of the following Lean practices. During the observations of a regular day-start or meeting we noticed practices in different ranges and forms. Some teams used visual screens in order to show results or updating a number of performance indicators. Moreover, differences were found in the amount of visualisation throughout the company. Most teams had indeed one board where accomplishments were shown and reported. However, for some teams, that was it. Our observations are consistent with team leaders' answers to the questionnaire about the adoption of Lean practices by the company. We found that the companies lack in visual management, evidence-based measures and solutions but also in inadequate system monitoring. The questionnaire showed also for almost every team a low score on team monitoring. Furthermore, almost no company uses Lean partnerships, hence little synergetic relationships with suppliers are made. The critical incident interviews, showed a variety on how Lean practices were implemented. Another overarching subject was support of top management. The teams reported that it is critical for a successful Lean implementation that top management supports Lean implementation. The teams stated that Lean was implemented top-down. Likewise, we could not find evidence about when a team has a higher amount of Lean practice adoption, this results in higher team performance, or more team-level employee well-being.

Leadership behaviour

Our video-based observations of the team leaders' behaviour was not always consistent with the reported scores of the team member through the questionnaire. Also, we did not find that every team leader was showing more relations-oriented or change-oriented behaviour. In contrast, we found that teams with higher scores on task-oriented behaviour of the team leader often scored higher on several team processes and well-being. Task-oriented behaviour significant correlates with back-up behaviour and team leader support. Furthermore, relations-oriented behaviour correlates with a team's knowledge sharing, team monitoring, back-up behaviour, and team cohesion. Also, relations-oriented behaviour strongly correlates with team leader support. Change-oriented behaviour significantly correlated with knowledge sharing, back-up behaviour, team cohesion, and conflict management. But also with top management support for Lean and team leader support.

The interviews, showed that practically everyone reported their team leader to be a positive influence or an agent supportive of continuous improvement within the organisation. We also discovered significant relations between the three behaviours, which can be explained as they are part of the same team leader behaviour construct. The regression analysis, showed that those team leaders who show more relations-oriented behaviour, typically score higher on team processes such as: knowledge sharing, team monitoring, team cohesion, and conflict management are higher. In addition, we found those team leaders who show more change-oriented behaviour score higher on the team processes psychological safety, knowledge sharing, and back-up behaviour. However, no significant evidence was found for the moderating effect of leadership behaviour on the relation between Lean practice adoption and team processes.

Team processes

We observed a strong team cohesion amongst almost all of the teams, similar to what was found in the questionnaire. The same goes for knowledge sharing. In the video-observation a lot of knowledge sharing was reported amongst the team members. In the questionnaire a high score for knowledge sharing amongst the teams was found. Moreover, reported in the video-observation high psychological safety that was notable by the researchers. All the teams rated there team monitoring very low. As the results of the questionnaire showcase, the team processes correlated strongly with several team leader behaviours. Besides, team cohesion also was strongly correlated with team satisfaction. In addition, some team processes correlated with other team processes, which also can be explained as they are part of the same team process

construct. Moreover, team leader support correlated significantly with knowledge sharing and back-up behaviour. During the interviews, it became clear that teams change the way they shared information during the Lean implementation. Moreover, a marginal significant difference in the mean for knowledge sharing was found between teams with low Lean practice adoption and high practices adoption.

Team performance

Except for one team, we found that each team leader gave their team a high score on team performance. Also, in the questionnaire were high positive significant correlations with Lean practices adoption and top management support. We also found that teams that have a high reported team performance also have a high score on Lean practice adoption and support for Lean by top management.

Team well-being

Every team rated the work pressure as very low. Scores on work engagement, job satisfaction and job performance were found very high amongst all the teams. We found only a significant correlation between team cohesion and job satisfaction. Moreover, we found work engagement and job performance positively correlating. This can be explained as they are part of the same team well-being construct. During the interviews, some team members stated that at the beginning of the Lean implementation they got stressed while working with Lean because making changes is not always something that they like to do. However, almost every team member stated that now they are very happy since they work with Lean.

8 Conclusion, Discussion and Limitations

This study helps us understand more about the relationships between Lean practices, team leadership behaviour, team processes, team performance, and well-being. The mixed-method approach provided us with a rich data sample that is of great use far beyond the reach of this current study. This paper aims to contribute to the existing body of knowledge in several ways by verifying the importance of leadership in Lean implementations (Dombrowski & Mielke, 2014); in particular on the importance of the behaviour of (team) leaders on team functioning (Van Dun & Wilderom, 2012), performance, and well-being (Schwarz, Nielsen, Stenfors, Hasson, 2016). Our video-observation provided insight into the different teams and their completion of Lean practices using the 'meta-categories' of leadership behaviours (Yukl, 2002). In addition, we observed the behaviour of team leaders via a regular Lean meeting. Via the questionnaire, we gained an understanding of the team processes and well-being of the participating teams. The interviews gave us a unique insight into the different organisational challenges that organisations working with Lean practices face.

Lean team leaders, at multiple hierarchical levels, have currently not been studied often as motivation of high lean team performance (Bortolotti et al., 2015; Shah & Ward, 2003; Taylor et al., 2013). Our research adds to the existing theory as more video-based studies of leaders and behaviours are advised (Van Dun & Wilderom, 2019). Also our study contributes to the view on how teams can have higher team performance considering influences as leadership behaviour and Lean practices. Also it explorers cross-level leadership dynamics, typically examining the influence of leadership on both team level processes and outcomes, such as performance and well-being of team members (Chen & Bliese, 2002) and effects of leadership behaviour on team processes. The literature only introduced recently leaders' behaviour as drivers of organizational-level dynamic capabilities (Schilke, Hu, & Helfat, 2018; Teece, 2016), with a unbalanced focus on top management (Fainshmidt & Frazier, 2017) and without any team-level analyses (Lord, 2017). Team leadership has seen a significant increase in the quantity of recent research. However, especially research on team level, and overall effects of leadership on multi-hierarchical level is still lacking (Dinh et al. 2014). Our research adds to the extended literature, as it is based on a mixed-method approach using both a quantitative approach as well as qualitative. In trying to investigate the relation between leadership behaviour on team level and higher management level on Lean practices, team functioning, team performance and team well-being.

In our initial, we expected that the team's work processes were positively affected by the number of Lean practices and in turn that the that teams should have better performance and higher well-being. The theory on this subject stated that Lean can increase the performance of a company (Danese et al., 2018). Our contribution adds that a relation between Lean practices adoption and team performance was found but not in directly through team processes. An explanation can be that the teams we investigated, had all different amounts of Lean practices adopted in the company. Discussion can arise when a company is indeed a Lean working company or not, taking into account the observed differences in Lean practices adoption. The diversity brings about a cherry-picking of Lean practices, that leaves behind every organisation with its own unique interpretation of the Lean concept. For example, some teams did perform a day start every day and some teams planned a meeting only once in three weeks. So in the investigated teams, Lean was not fully implemented throughout the company as it is suggested by theory in order to measure an optimal company performance (Womack & Jones, 1996; Danese et al., 2018). What is more, This contradiction might be determined by the difficulty by which the Lean practices can be operationalised. Contextual variables such as the ways of implementation of the changing organisational culture are also variables that are crucial to take into account. It is therefore important to first understand the culture and organisational context upon implementation (Eldredge et al., 2016).

Theory state that effective lean leaders aim to display both relations- and task-oriented behaviours to their teams (Behrendt et al., 2017; Pratoom, 2018; Tortorella & Fogliatto, 2017). Moreover, effective lean leaders may show more frequent relations-oriented types of behaviours, such as actively listening (Van Dun et al., 2017). Tortorella and Fogliatto (2017) even showed that managers who adopt Lean, prefer to display supporting types of behaviours. Therefore, we expected that a leader which shows more task-oriented behaviour influences the team processes negatively, and a leader who shows more relations-oriented behaviour has a positive influence on the team processes (Van Dun et al. 2017). In addition, we expected also an increase in team well-being and performance, when showing more relations-oriented behaviour. Thus, we expected that those team leaders are more effective (Van Dun et al. 2017). However, the researchers found the opposite of their expectations. We found that teams where a team leader showed more task-oriented behaviour, scored higher on team processes and team performance and well-being. We even found a team at which the team leader scored highest on task-oriented behaviour (questionnaires) but the team had, in fact, the highest scores on the most team processes and well-being items. Indeed, the theory states that soft tools are necessary

for successful Lean implementation and maintain Lean into the cooperate processes (Botrolotti, Boscari & Danese, 2015; Van Dun & Wilderom, 2012). However, we did not find any evidence to support this claim. An explanation can be that the team leaders self-rated the performance of the team or the teams as earlier mentioned, do not have adopted enough sufficient Lean practices. However, our research indicates that an combination and balancing of the shown leaders' behaviours: task-oriented behaviour, relations-oriented behaviour and change-oriented behaviour is key in order to have higher team processes, performance and well-being.

What is more, according to the literature we expected that the behaviour of team leaders moderates the relation between Lean practice adoption and team processes. However, the researchers did not find evidence to support our expectations. Although, during the moderator analysis, the researchers did find that if a leader shows more relations-oriented behaviour, the following team processes score higher: knowledge sharing, team monitoring, team cohesion, and conflict management. In addition, team leaders which show more change-oriented behaviour have higher ratings on: psychological safety, knowledge sharing, and back-up behaviour.

Earlier research suggests that top- and middle management may have an influence on the behaviour and values of (team) leaders by the amount of support they show for Lean practices. Also, theory claims that Lean often fails in organisations that lack communication, training and education (Albliwi, Antony, Lim & Van der Wiele, 2014). Which is mostly because of top management that lacks commitment to, and involvement with Lean management (Ooi et al., 2008). Hence, we expected that the support of top management is related to the team leaders' behaviour and thus support for Lean. The researchers did find a relation with Lean practices adoption and top management support for Lean. We also found teams that reported a high score on top management support as well on Lean practice. In addition, one team which reported a low score on top management support, had also a low score on Lean practices adoption. However, we could not find strong evidence to support this expectation since two observations are not supportive enough.

Beyond the scope of the theoretical framework, we found low rated scores on team monitoring (compared to scores of other team processes). Even though, we saw in our video-observation that team member share and regular monitor the performance of the team. By checking an discussing own and other's results (Van Dun & Wilderom, 2019). Besides, when investigating the basic principles of Lean practices, Lean practices are based on monitoring and visualising

processes (Womack & Jones, 1990). Here, Lean tools such as visual management, performance dashboards, and daily start-up meetings are used by teams to ensure and learn from such monitoring to enhance their team's progress (Womack & Jones, 1996). Hence, we expected that the investigated Lean teams scored high on team monitoring.

Moreover, we did find a high score amongst all teams on psychological safety. Previous studies stated that psychological safety is very important for every team: without such safety, team performance and teams that feel psychological safe have often higher well-being (van Dun & Wilderom, 2012) and team performance (Salas et al., 2015). Every team rated the work pressure as very low. Even though team members stated that since they started to work with Lean, the production or delivering of services increased tremendously. Although, Lean is often seen as a manner to produce more, the team members did not feel more pressured.

Our study focused on how leaders can influence their team's processes, performance and well-being. Our study suggests that by facilitating the need of more positive team motivational states such as team cohesion and psychological safety, can positively influence team performance (Schaubroeck, Lam & Peng, 2011). Leaders do have indeed an important role in implementing Lean practices, especially we found leaders' support to the team to be key (Lord et al., 2017). Also we found that not only a team leader can influence the team processes but also team members tend to have an effect. We saw in our video-observations that it is not only the team leader but also members who monitor and synchronize their activities to prevent the team performance to decline (Van Dun & Wilderom, 2019).

Although our findings are soundly based on a theoretical frame work, they indicate that we not fully can confirm our theoretical framework as suggested. We did find relations between Lean practices adoption, team processes, and well-being. However, we cannot confirm statistical significantly that leadership behaviour moderates the relationship between Lean practices adoption and team processes.

Limitations and future research

As mentioned, the maturity of Lean practices adoption per company was different. Hence, the comparison of all teams needs to be toned down a little. Since every team used Lean differently, it is not correct to use the term Lean practices for teams as if they use the same method. In addition, the scoring of the amount of Lean practices adoption has only be rated by the team leader and will not give us a full picture of the amount of Lean practices that are implemented in the company. It is important to include an extra measure of "Lean management" to ensure the complete validity of the construct as it has been measured in this current method by the team leaders. Future research can include a countermeasure to investigate if the teams are indeed on the same level on the maturity of Lean practices.

Also, we must take into account that the job performance is a self-perceived measure and can, therefore, be subject to a self-observational bias. This is being countered by the anonymity of the study, yet this countermeasure does not fully ensure validity. For future research, it is recommended to enlarge not only the sample size of the quantitative study but also the qualitative one.

As earlier mentioned, our video-observations were not always consistent with the reported scores of the team member in the survey on the team leaders' behaviour. An explanation can be is that the researchers only observed one meeting per team. Hence, the behaviour of the team leader can be recorded differently as in daily work meetings with the team or collaboration on the work floor. Additionally, analysing one meeting per team leader is insufficient when interest in uncovering their more complete behavioural patterns, include those of the team members (Van Dun et al., 2017). It is recommended, therefore, to analyse video-shadowing data of Lean managers 'behaviour at the coffee machines', in unscheduled meetings and other less formal work settings (Czarniawska, 2007; Mcdonald, 2005; Vie, 2010; Van Dun et al., 2017).

What is more, the investigated teams operating in different sectors. Especially, we investigated teams in a production setting which only requires standardised job task as watching a machine. Discussion can arise about if in these teams enough room for innovative work behaviour is present, and therefore can be measured and compared amongst these teams. Future research should therefore take more into account the different sectors, contexts and work proceedings of lean teams and non-lean teams. In particular, to investigate if the same amount of innovative work behaviour is present amongst teams that are operating in the same sector.

Further limitations include that the researchers went separate to companies and could have therefore created potential single interviewer and observer bias**.** This is being countered by checking the data by both researchers and reflect on the data if the researchers indeed had created observer bias. Even though the studies where restricted in range due to its narrowed focus on teams that were 1) on work floor level, 2) focused on Lean practices and 3) effective and did not find a significant difference in leadership behaviours, we suggest for future research to include different ranks of management to be investigated. In addition, to include the middle-management into an investigation with team leaders and top management can uncover patterns of behaviour links for teams and their team leader.

Practical implications

Lean management is often interpreted a set as various tools that are used in order to create value for the customer by reducing waste and implementing tools by doing so. However, companies forget often an important factor while implementing Lean, and an important pillar of the Lean house namely the people pillar which takes into account the soft practices of Lean. In doing so, also leadership is another factor that companies forget regularly. But team leaders have a critical role in carrying out Lean practices towards the team. As a team leader, being close to the workers, it is advised to show more relations-oriented behaviour as: active listening, agreeing, positive rewarding, being friendly, encouraging and show personal interest in team members. And change-oriented behaviours as: encouraging and asking for ideas. What we find is maybe logical behaviour to a good (Lean) leader, however our video-observations show that still many leaders do not demonstrate these behaviours. Coaches or HR managers can work along with team leaders to help adopt or enlarge these behaviours in order to increase the level of team processes, team performance, and well-being. This is especially of great value for team leaders that showcase high amounts of task-oriented behaviour. It is important that they shift focus to be more concentrated on the team members instead only rather on the implementation of Lean practices tools and on outcomes as performance.

Also we found that team leader support is more crucial for certain team processes than we thought on forehand. Important is that team leaders adopt more behaviours and proceedings as providing constructive feedback, remove obstacles for goal attainment and translates the mission into specific goals for and to members. Besides, not only team leader support is key, top management support seems to be crucial to the success of a Lean implementation. Top management can increase the support for Lean by regularly visiting the workplace. While

visiting the workplace, the top management can see the benefits of the improvements made and see what step they should take next. Hence, not only team leaders must support their team but also top management.

Our video-observation displayed that the investigated leaders showed almost no change-oriented behaviours. However, for managers of great value is to involve employees when a change is being made. Employees can hold valuable and often crucial information about work processes and can, therefore, be of great value when designing new changes. At the same time, the employee will feel more involved in the change process and will likely support the change rather more when not being involved. Besides, as noted by member: ‘‘when we do things together the work is getting more lighter’’.

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10 Appendix

Appendix A Summary of selected leadership styles

Transformational Leadership

The first reviewed leadership style is transformational Leadership. This leadership style has often been researched in the past. First, Bass (1985) built on Burns' (1978) description of 'transforming leadership' and developed a model of transformational leadership that includes four dimensions: 1) Charisma, 2) Inspirational, 3) Intellectual stimulation, and 4) Individualized consideration. Furthermore, the meta-analysis by Wang et al. (2011) displays the importance of transformational leadership. The researchers found transformational leadership strongly related to followers' job satisfaction, satisfaction with the leader, motivation, organisational commitment and effort, three types of job performance (task, contextual and creative), as well as team and organisational performance. In addition, Ohio State studies in the 1950s and 1960s stated that transformational leadership captures behaviours surrounding the way leaders organize their roles and the roles of their followers. These behaviours focus on goal attainment through management of tasks. Also thoughts are with people, and involves developing relationships and mutual trust with followers. It seeks to enhance the self-efficacy of followers in their ability to complete assignments and tasks effectively. Robbins (2003) states transformational leaders have a better track record of retaining followers compared to transactional leaders. What is more, transformational leadership is also positively related to working towards work condition improvements, needs satisfaction and performance improvements of followers (Liu et al., 2003). Theories of transformational leadership posit that most leaders engage in transactional forms of leader behaviour by providing feedback contingent on performance, but exceptional leaders go beyond this and also engage in transformational forms of leader behaviour (MacKenzie et al. 2001). What is more, Podsakoff, MacKenzie, Moorman, and Fetter (1990) indicated that transformational leaders' behaviour get followers to perform above and beyond expectations by expressing a clear vision, providing an role model, promote the acceptance of group goals, providing individualized support and intellectual stimulation, and expressing high performance expectations.

Charismatic Leadership

Charismatic leadership is characterised by leaders who articulate an inspirational vision of a desirable future that motivates followers to offer their self-interests and considerate exceptional

effort to the causes defended by the leader (Anderson and Sun, 2017). Research by Conger and Kanungo (1994) support a five-factor model consisting of behaviour which includes being sensitive to constraints, threats and opportunities in the external environment, articulating an appealing strategic vision, taking personal risks, exhibiting unconventional behaviour, and being sensitive to follower needs. Furthermore, House (1977) and House and Podsakoff (1994) argue that charismatic leaders show behaviour as passion and self-confidence, engage in self sacrificial behaviour and promote a collective identity, role model desirable behaviour, establish high expectations for followers and express confidence that followers can achieve them. These behaviours help explain the inspirational influence on followers that charismatic leaders have. They are seen by their followers as having extraordinary abilities and qualities. Their personal magnetism and visionary appeals followers to identify personally with their leaders, and make their leaders' goals, values and beliefs, their own. Hence, resulting in followers desire to pursue their leaders (House 1977).

Transactional Leadership

Bass's (1985) model of leadership conceptualized transactional leadership as consisting of three dimensions: contingent reward and two forms of management by exception. Contingent reward is 'the degree to which the leader sets up constructive transactions or exchanges with followers: the leader explains expectations and determines the rewards for meeting these expectations' (Judge and Piccolo 2004, p. 755). Management by exception 'is the degree to which the leader takes corrective action on the basis of results of leader–follower transactions (Judge and Piccolo 2004, p. 755), and it takes two forms (active and passive). 'Active leaders monitor followers' behaviour, anticipate problems, and take corrective actions before the behaviour creates serious difficulties. Passive leaders wait until the behaviour has caused problems before taking action (Judge and Piccolo 2004, p. 756). Transactional leadership behaviour involves an exchange between the leader and the follower. Leaders provide rewards in return for the effort made by the follower (Burns, 1978). These forms of behaviour are dependent reward and punishment behaviour, which is typically associated with transactional leadership. This behaviour consists of various forms of negative feedback (e.g., correction, criticism, and/or other forms of punishment), administrated by the manager dependent on poor performance. Kohli (1985) called this behaviour ''Arbitrary and punitive''. However, also studies demonstrated that transactional leadership is related to team performance (Bass et al. 2003), the ethics of justice (Simola et al. 2010) and employee creativity (Herrmann and Felfe 2014).

Ideological Leadership

Researchers have found that only charisma is not essential to successful leadership (Pasternack and O'Toole 2002; Yukl 1999), and that other qualities may be more crucial (Khurana 2002). Ideological and pragmatic leadership styles are alternatives to charismatic/transformational leadership. Ideological leadership was developed as a diverse leadership style in Strange and Mumford's (2002) historiometric analysis of 60 historic leaders. Their research claims that, the ideological leader's vision and behaviour emphasizes on 'personal values, standards to be maintained, and the derivation of meaning through adherence to these standards' (p. 346). Ideological leaders seek followers who intrinsically believe in the goals and values that provide a basis. As a result, ideological leaders like to attract like-minded followers rather than masses of followers (Mumford, 2006).

Pragmatic leadership

In contrast to the models used by ideological and charismatic leaders, the prescriptive mental models underlying the actions of pragmatic leaders do not stress goals (Mumford et al, 2008). For pragmatic leaders, goals are given, which are created by objective threats and opportunities. As a consequence, the prescriptive mental models formulated by pragmatic leaders motivates these threats and opportunities within the local situation (Mumford & Van Doorn, 2001). Pragmatic leadership is recommended by the leaders' knowledge of practical, day-to-day problems that people and organisations face and has a focus on identifying cost-effective solutions (Anderson & Sun, 2017). It involves motivating others through addressing their self-interest and by showing how proposed solutions will effectively realise shared goals. This pragmatic leadership style requires a deep knowledge of the organisation, shared goals and other relevant parties who have a stake in the problems and the economic and technical issues associated with problems and their solutions. Pragmatic leaders, moreover, see causes as involving both people and situational factors, and with various degrees of control (Mumford 2008). Pragmatic leaders behaviour tries to show more logical behaviour rather than emotional. This result in commitment of followers based on mutual trust rather than on personal commitment to the leader.

Servant Leadership

Servant leadership is a style that focuses on the growth of followers who are being at the same time led and served (Stone et al. 2004). Servant leaders begin with the natural feeling of serving first, to ensure that others' 'highest priority needs are served first' (Greenleaf 1970, p. 4).

Authentic Leadership

As servant leaderships takes into account the serving of other first, authentic leadership is based on an deeper connection of followers. Authentic leadership is 'a pattern of leader behaviour that draws on and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-development' (Walumbwa et al. 2008, p. 94). Kernis (2003) identified four core elements of authenticity behaviour: self-awareness, unbiased processing, relational authenticity, and authentic behaviour/action. What is more, authentic leaders are described as leading by example. This includes demonstrating transparent decision making, confidence, optimism, hope and resilience, and consistency between their words and deeds (Avolio, Gardner, 2005). Ilies et al. (2005) found that authentic leaders establish positive social exchanges with followers. They argue that when leaders display personal integrity, and an authentic relational orientation, the relationships with followers will be characterised by high levels of respect, positive affect, and trust. High quality and close relationships will in turn create greater value aligning in the form of behaviour that is consistent with the leader's values. This will result in greater authenticity, and wellbeing, among followers.

Ethical Leadership

Where authentic leadership focused more on creating a positive climate, Ethical leadership takes into account acting correctly towards followers. Research by Brown et al. (2005) theorized ethical leadership as a distinct style by drawing on social learning theory. What is more, Ethical leadership is defined as 'the demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and the promotion of such conduct to followers through two way communication, reinforcement, and decision making' (Brown and Trevino 2006, p. 595). An ethical leader is: 1) a moral person, which output of behaviour can be found as someone that is fair, honest, trustworthy and a principled decision-maker, 2) a moral role model, a leader who practices what he or she preaches, and is seen to be an attractive role model (Brown et al. 2005; Mayer et al. 2009), and 3) a moral manager. This is a leader who makes ethics an explicit part of his or her leadership agenda and uses rewards to hold followers accountable for ethical behaviour. Also Brown et al. (2005) found that ethical leadership is positively related to followers willingness to report problems to management, and to put in extra effort (Brown et al. 2005).

Spiritual Leadership

Spiritual leadership is defined by Fry (2003) as 'comprising the values, attitudes, and behaviours that are necessary to intrinsically motivate one's self and others so that they have a sense of spiritual survival through calling and membership' (pp. 694–695). Focus is on doing meaningful work that fulfils life purposes and has a sense of belonging and called to the organisation. By being ''called'' and include as a ''member'', a follower can live spiritually trough an organisation and increases a followers spiritual well-being (Fry, 2003). Spiritual leadership theory suggests that leaders' values, attitudes and behaviours create a spiritual environment that helps followers to live (Fry 2003; Reave 2005). Here, a loving spiritually created by the leader is key (Ferguson and Milliman, 2008). This environment will increase the intrinsic motivation of followers and can increase faith in organisation's leadership (Fry et al. 2005). The outcome of this environment is that followers trust that leaders have their best interest at heart and therefore being intrinsically motivated to expend effort.

Integrative public Leadership

Integrative public leadership is defined as leadership necessary to bring 'diverse groups and organisations together in semi-permanent ways, and typically across sector boundaries, to remedy complex public problems and achieve the common good' (Crosby and Bryson 2010, p. 211). It operates in contexts where there are no hierarchical relationships between the partners. Actors in such collaborations partner for diverse reasons with different objectives that do not always match. These differences have led researchers to argue that integrative public leadership is a new theory of leadership that differs from other leadership styles such as charismatic/transformational or ethical (Ospina and Foldy 2010). "Integrative" represents a whole that is greater than the sum of its parts. Here ''win/win'' and ''synergy'' is important (Morse, 2010).

Shared or distributed leadership

The final leadership style that is reviewed, is shared or distributed leadership, which is defined as the 'distribution of leadership influence across multiple team members' (Carson et al. 2007, p. 1218). Furthermore, DeRue (2011) suggested that shared leadership is a complex, adaptive process that involves a series of leading and following interactions. Distributed leadership is often more relevant for teams, where individual members practice leadership based on their expertise to meet shared goals and objectives (Anderson and Sun, 2017). The influence on the team can differ in which one or a few members influence the team or the whole team is

influencing each other (Carson et al. 2007) Distributed leadership is seen as a group or shared responsibility where members rely on the skills of one another to enact a range of tasks (Thorpe et al. 2011). Leadership has often been conceptualized as a top-down process where researchers isolate a single leader. However, Carson and colleagues (2007) argued that "shared leadership originates with individual members of a team engaging in activities that influence the team and other team members in areas related to direction, motivation, and support" (pp. 1218-1219). Distributed leadership is important for today's environment where complexity pressures team members to take leadership roles, instead of relying solely on a single external leader to make all decisions (Carson et al. 2007). The use of self-managed teams in organisations also necessitates teams to self-lead. Empirical evidence points to a link between distributed leadership and team performance (Carson et al. 2007;). Carson et al. (2007) found that important antecedents for distributed leadership are an overall supportive internal team environment (consisting of shared purpose, social support and voice) and supportive coaching by an external leader or manager. Stewart et al. (2011) point out that there is still a need to develop an accepted measure for distributed leadership at the team level.

Appendix B Field visit protocol

Segment	Day 1	Day 2
Morning	• Meet the team leader & team • Check whether all questionnaires have been completed • Introduction to work by employee 1	• Attendance and filming Day start or other weekly team meetings • Walk along with a team member / team leader • Interviews
Afternoon	• Introduction to work by employee 2 • Work with the team or walk with a team member / team leader • Interviews	• Working with the team • Walk along with a team member / team leader • Feedback first impressions to team leader

Appendix C Overview of team member analysis

Overview steps of "team member" analysis

Steps	Analysis
1	First round "Team member" open round.
2	Second "team member" axial coding round
3	Third "team member" selective coding round.

Appendix D Request of consent of participants

INDIVIDUELE TOESTEMMING VOOR DEELNAME AAN ONS TEAM ONDERZOEK

Overeenkomstig met de richtlijnen van de Ethische Commissie van de faculteit Behavioural, Management and Social Sciences van de Universiteit Twente, vragen wij u om akkoord te gaan met de volgende voorwaarden voordat u deelneemt aan het onderzoek:

1. Ik heb bovenstaande informatie over deze studie gelezen en begrepen, en heb de kans gehad om vragen te stellen aan de onderzoekers.
2. Ik begrijp dat deelname aan deze studie betekent dat ik: (1) zal worden gefilmd tijdens een regulier werkoverleg van mijn team, (2) een vragenlijst invul en (3) eventueel wordt uitgenodigd voor een kort interview met de onderzoeker.
3. Ik neem op vrijwillige basis deel aan deze studie en begrijp dat ik mij te allen tijde kan terugtrekken uit de studie zonder daarvoor een reden te geven.
4. Ik begrijp dat de verzamelde video-, vragenlijst- en interviewdata anoniem wordt verwerkt door de Universiteit Twente (niet herleidbaar naar mij of mijn team) en wordt gebruikt voor wetenschappelijke publicaties en geanonimiseerde feedbackrapportages.
5. Ik geef de Universiteit Twente toestemming om mijn gegevens op te slaan op beveiligde servers voor een periode van 10 jaar na publicatie, welke overeenkomt met de strikte regels van de Universiteit Twente voor het uitvoeren van wetenschappelijk onderzoek.

Mocht u vragen of bedenkingen hebben omtrent het onderzoek, neem dan contact op met onderzoekers David Charles van der Griend of Tanja van Dooren van de Universiteit Twente via d.c.vandergriend@student.utwente.nl of a.vandooren@student.utwente.nl

Het onderzoek wordt begeleid door dr. Desirée van Dun, van de vakgroep Change Management & Organisational Behaviour van de Universiteit Twente (www.utwente.nl/cmob).

Appendix E Video code book of behaviours team leader

Video-coded Microbehaviour Descriptions and Examples

Microbehavioural Codes	Description	Example Situation[a]
1. Correcting	Calling someone to order; telling someone not to do something	"No, you should not do it like that"
2. Delegating	Distributing obligatory tasks	"I want you to handle this improvement idea"
3. Task Monitoring	Checking the status or asking for clarification on the status; referring to visual dashboards	"How are we doing in terms of productivity?"
4. Informing	Sharing factual information with team members	"I have called our customer to discuss her complaint"
5. Visioning	Sharing own opinion or determining a strategy	"In my opinion…" or "I foresee…"
6. Structuring the Meeting	Enabling an efficient and effective meeting	"Let me summarise our decision"
7. Executing Individual Tasks	Performing operational work tasks	During a meeting: Continuing daily work while the meeting already started; during daily work: Working behind his/her work station/computer
8. Agreeing	Showing that he/she shares the same opinion	"I agree with you"
9. Individual Consideration	Showing a personal interest or giving individual attention	"So you are going on a holiday to Turkey, right?"
10. Intellectual Stimulation	Asking for root causes, ideas; inviting people to share views	"Why do you think this problem keeps nagging us?"
11. Active Listening	Showing that he/she is paying attention and hears you	Nodding, making eye contact while being in a conversation
12. Showing Disinterest	Responding impersonal, distant, or inaccessible	During a meeting: Turning his back to the team leader; during

		daily work: Watching away or not paying attention while a colleague is talking to him/her
13. Defending One's Own Position	Safeguarding his/her own interests and showing his/her own value	"Let me handle this. I know this person for quite some time and I know exactly how to handle this situation"
14. Providing Negative Feedback	Responding unfavorably to someone or judging someone	"You are too late: you should be here around 10:00 PM"
15. Disagreeing	Showing that he/she does not share the same opinion	"I don't think that is a good idea"

[a] All example situations were taken from this study's video-based dataset.

Appendix F Diary of researchers

Dagboek Onderzoekers

<table>
<tr><td>Naam onderzoeker:</td><td></td></tr>
<tr><td>Datum:</td><td></td></tr>
<tr><td>Organisatie:</td><td></td></tr>
<tr><td colspan="2">1. Hoe reageerden de teamleden vandaag op jouw aanwezigheid? Kun je daar een voorbeeld van geven?</td></tr>
<tr><td colspan="2">2. Wat is jou vandaag opgevallen in de vergaderingen die je hebt bijgewoond?</td></tr>
<tr><td>Vergadersetting (1):</td><td>Omschrijving:</td></tr>
<tr><td>Vergadersetting (2):</td><td>Omschrijving:</td></tr>
<tr><td colspan="2">3. Wat is jou vandaag opgevallen in de meeloopsessies die je hebt gedaan?</td></tr>
</table>

Meegelopen met (1):	Omschrijving:
Meegelopen met (2):	Omschrijving:
4. Welke opvallende momenten heb je nog meer gezien?	

Appendix G Questionnaire team members

Q1 De vragenlijst begint met vragen over het topmanagement. Geef aan in hoeverre u het met de volgende stellingen eens of oneens bent:

#	Field
1	Het topmanagement heeft de verantwoordelijkheid op zich genomen voor het opstellen en in stand houden van Lean-doelen en een Lean-cultuur
2	De topmanagement visie en toewijding aan Lean worden continu gecommuniceerd aan alle medewerkers
3	Het beleid en de strategie van de organisatie zijn gebaseerd op het concept van Lean
4	Het topmanagement heeft goede beloningssystemen bedacht die werknemers en leidinggevenden erkennen voor hun Lean gerelateerde prestaties
5	Noodzakelijke beleidswijzigingen zijn doorgevoerd om deelname en betrokkenheid van medewerkers bij het Lean-proces te stimuleren
6	Het topmanagement is betrokken bij het evalueren van de voortgang van Lean
7	Topmanagement besteedt een aanzienlijk deel van de tijd aan Lean-kwesties
8	Topmanagement biedt de benodigde financiële middelen voor Lean
9	Het topmanagement biedt de benodigde financiële middelen om werknemers te trainen in de essentiële Lean-technieken

Q2 - Ondersteuning van uw teamleider Mijn leidinggevende..

#	Field
1	… begrijpt de beperkingen van de organisatie
2	… ziet wat moet worden veranderd in de organisatie
3	… verwijdert belemmeringen zodat ik mijn doelen kan behalen
4	…zorgt dat ik voldoende middelen heb om mijn doelen te behalen
5	… helpt mij om te leren van mijn fouten
6	… geeft mij constructieve feedback over fouten
7	… zorgt ervoor dat zijn/haar visie specifiek genoeg is
8	… vertaalt de missie in specifieke doelen

Q3 - Vragen over het gedrag van uw teamleider Mijn leidinggevende...

#	Field
1	… ondersteunt mij in ruil voor mijn inspanningen
2	… vestigt de aandacht op onregelmatigheden en fouten
3	… houdt fouten goed in de gaten
4	… is waakzaam ten aanzien van het niet behalen van doelstellingen
5	… suggereert nieuwe mogelijkheden om naar de taakuitvoering te kijken
6	… besteedt tijd aan begeleiding en coaching
7	… behandelt mij meer als individu dan slechts als lid van het team
8	… heeft oog voor het feit dat ik verschillende behoeften, mogelijkheden en aspiraties heb in vergelijking tot anderen
9	… helpt mij om mijn sterke kanten te ontwikkelen
10	… straalt vertrouwen uit dat de doelen behaald zullen worden
11	… stelt vragen met betrekking tot belangrijke veronderstellingen
12	… zoekt verschillende invalshoeken bij het oplossen van problemen
13	…laat mij problemen bekijken vanuit verschillende invalshoeken

Q4 - Vragen over uw team Geef aan in hoeverre uw team actief werkt om:

#	Field
1	Regelmatig te meten hoe goed we onze team doelen behalen
2	Duidelijk gedefinieerde meetinstrumenten te gebruiken om de voortgang te meten
3	Tijdige terugkoppeling van anderen buiten het team te zoeken over hoe goed we onze doelen halen
4	Te weten of we op schema liggen om onze doelen te bereiken
5	Teamleden te laten weten wanneer we onze doelen bereikt hebben
6	Standaarden te ontwikkelen om te komen tot acceptabele prestaties van teamleden
7	De werkdruk tussen teamleden te balanceren
8	Elkaar te assisteren wanneer hulp nodig is
9	Teamleden het te laten weten wanneer hun werk niet voldoet aan de normen
10	Elkaars sterke en zwakke punten proberen te begrijpen

Q5 - In ons team....

#	Field
1	…wordt informatie vrijelijk gedeeld onder de leden van ons team
2	…wordt informatie die ontvangen wordt door een teamlid, snel gedeeld wanneer het hele team het aangaat
3	….werken leden van dit team hard om elkaar op de hoogte te houden van hun werkzaamheden
4	….worden alle teamleden op de hoogte gehouden over belangrijke zaken die het team aangaan

Q6 - In ons team....

#	Field
1	Heerst een gevoel van eenheid en samenhang
2	Heerst een sterk gevoel van verbondenheid tussen teamleden
3	Voelen teamleden zich erg aan elkaar gehecht
4	Delen teamleden de focus op ons werk
5	Concentreren teamleden zich erop om het werk af te krijgen
6	Spannen we ons samen in
7	Weten we wat moeten doen als zich een conflict voordoet tussen teamleden om het werk af te maken

Q7 - Vragen over de sfeer in uw team In hoeverre bent u het eens met de volgende stellingen:

#	Field
1	Als je in dit team een fout maakt, dan wordt je dat doorgaans kwalijk genomen
2	De leden van dit team voelen zich vrij om bij elkaar na te gaan of er nog vragen zijn over de beste manier om iets te doen
3	De leden van dit team hechten waarde aan elkaars unieke vaardigheden en talenten
4	De leden van dit team zijn in staat om problemen en moeilijke kwesties bespreekbaar te maken
5	Conflicten worden openlijk afgehandeld in ons team
6	Als een conflict zich voordoet in ons team, dan nemen de betrokkenen in het conflict onmiddellijk stappen om het op te lossen
7	Ons team weet wat het moet doen als zich een conflict voordoet tussen teamleden
8	Ons team is in staat om de negatieve gevolgen van conflicten te voorkomen voordat ze plaatsvinden

Q8 - De volgende vragen gaan over de onderlinge relatie en communicatie in uw team Geen aan of de volgende voorbeelden op u van toepassing zijn

#	Field
1	Teamleden delen uw doelen met betrekking tot de teamtaken
2	Teamleden weten over het werk dat u doet binnen het team
3	Teamleden respecteren uw werk binnen het team
4	Teamleden delen uw persoonlijke waarden met betrekking tot de teamtaken
5	Uw teamleider deelt uw doelen met betrekking tot de teamtaken
6	Uw teamleider weet over het werk dat u doet binnen het team
7	Uw teamleider respecteert uw werk binnen het team
8	Uw teamleider deelt uw persoonlijke waarden met betrekking tot de teamtaken

Q9 - Geef aan of de volgende voorbeelden op u van toepassing zijn

#	Field
1	Teamleden communiceren frequent met u over de teamtaken
2	Teamleden communiceren op tijd met u over de teamtaken
3	Teamleden communiceren nauwkeurig met u over de teamtaken
4	Teamleden communiceren face-to-face met u over de teamtaken
5	Wanneer een probleem optreedt met de teamtaken, werken teamleden met u samen om het op te lossen
6	Wanneer een probleem optreedt de teamtaken, geven teamleden anderen de schuld.
7	Uw teamleider communiceert frequent met u over de teamtaken
8	Uw teamleider communiceert op tijd met u over de teamtaken
9	Uw teamleider communiceert nauwkeurig met u over de teamtaken
10	Uw teamleider communiceert face-to-face met u over de teamtaken
11	Wanneer een probleem optreedt met de teamtaken, werkt uw teamleider met u samen om het op te lossen
12	Wanneer een probleem optreedt de teamtaken, geeft uw teamleider anderen de schuld.

Q10 - Vragen over uw mening en werk waarden Bij de volgende vraag kunt uw mening over Lean aangeven. Geeft u bij de volgende stellingen aan of u er wel of niet mee eens bent

#	Field
1	Ik geloof in de toegevoegde waarde van Lean
2	Ik denk dat het management een fout maakt door Lean te introduceren

Q11 - Uw mening over uw baan Geeft u bij de volgende stellingen aan of u er wel of niet mee eens bent

#	Field
1	Ik beleef veel plezier aan mijn baan
2	Ik vind mijn baan leuker dan de gemiddelde persoon
3	Op de meeste dagen ben ik enthousiast over mijn baan
4	Ik ben redelijk tevreden over mijn baan

Q12 - Vragen over uw individuele werk waarden Geef per waarde aan in hoeverre u deze belangrijk vindt. De antwoordmogelijkheden lopen van 'zeer onbelangrijk' tot 'uiterst belangrijk'. De antwoordmogelijkheden lopen van 'tegenovergesteld aan mijn waarden' tot 'uiterst belangrijk'.

#	Field
1	Onbaatzuchtigheid (zorgzaamheid, anderen ondersteunen)
2	Rechtvaardigheid (anderen eerlijk behandelen)
3	Behulpzaamheid (werken voor het welzijn van anderen)
4	Teamwerk (samenwerking)
5	Gelijkheid (gelijke kansen voor iedereen)
6	Experimenteren (nieuwe dingen proberen)
7	Afwisseling (nieuwigheden en verandering verwelkomen)
8	Creativiteit (innoveren, denken buiten gebaande paden)
9	Nieuwsgierigheid (interesses najagen, leergierigheid)
10	Durf (avontuur zoeken, risico's nemen)
11	Gehoorzaamheid (verplichtingen nakomen, plichtsgetrouw)
12	Overeenstemming (de regels volgen, aanpassen)

13	Zelfdiscipline (uzelf kunnen bedwingen)
14	Traditie (gebruiken in stand houden)
15	Respect (respect voor oudere medewerkers)
16	Initiatief (ondernemendheid, vindingrijkheid)
17	Ambitie (veel ambitie hebben)
18	Succes (dingen bereiken of volbrengen)

Q13 - De volgende vragen gaan over innovatief werk gedrag, uw werktevredenheid en werkprestatie Geef aan in hoeverre u iemand bent die:

#	Field
1	… creatieve ideeën bedenkt voor lastige problemen
2	… nieuwe werkwijzen, technieken of instrumenten uitzoekt
3	… met originele oplossingen komt voor problemen
4	… steun mobiliseert voor vernieuwende ideeën
5	… bijval oogst voor vernieuwende ideeën
6	… sleutelfiguren enthousiast maakt voor vernieuwende ideeën
7	… vernieuwende ideeën uitwerkt tot werkbare toepassingen
8	… vernieuwende ideeën planmatig invoert
9	… de baten van vernieuwende ideeën evalueert

Q14 - Geeft u aan hoe vaak u de volgende punten ervaart:

#	Field
1	Wanneer ik op het werk ben, voel ik dat ik barst van de energie
2	Op mijn werk voel ik me sterk en krachtig
3	Als ik 's morgens opsta, heb ik zin om naar mijn werk te gaan
4	Ik ben enthousiast over mijn werk
5	Mijn werk inspireert me
6	Ik ben trots op het werk dat ik doe
7	Ik voel me vrolijk wanneer ik intensief aan het werk ben
8	Ik ben ondergedompeld in mijn werk

9	Ik laat mij meeslepen wanneer ik aan het werk ben

Q15 - Geeft u aan hoe vaak u de volgende punten ervaart:

#	Field
1	Moet u erg snel werken?
2	Heeft u veel extra werk te doen
3	Moet u extra hard werken om iets af te krijgen?
4	Werkt u onder tijdsdruk?
5	Moet u zich haasten?
6	Kunt u uw werk op uw gemak doen?
7	Heeft u te maken met een achterstand in uw werkzaamheden?
8	Heeft u te weinig werk?
9	Heeft u problemen met het werktempo?
10	Heeft u problemen met de werkdruk?

Q16 - Geef aan in hoeverre u het met de volgende stellingen eens of oneens bent:

#	Field
1	Ik presteer op een constant hoog niveau
2	Ik ben effectief
3	Ik maak zelden fouten
4	Mijn werk is van hoge kwaliteit

Q17 - Algemene vragen over uw team: Hoeveel FTE telt uw team?

Q18 - Hoeveel teamleden telt uw team?

Q19 - Hoe vaak komt uw team face-to-face bijeen gedurende een gemiddelde werkweek?

Q20 - Algemene vragen over uzelf:Wat is uw geslacht?

Q21 - Wat is uw leeftijd?

Q22 - Hoeveel jaren en maanden werkt u bij deze organisatie?

Q23 - Hoe lang werkt u al in dit team (in jaren en maanden)

Q24 - Wat is de hoogste opleiding die u heeft afgerond?

Q25 - Wat voor een dienstverband heeft u?

Appendix H Questionnaire team leaders

Q1 De vragenlijst begint met vragen over het topmanagement. Geef aan in hoeverre u het met de volgende stellingen eens of oneens bent:

#	Field
1	Het topmanagement heeft de verantwoordelijkheid op zich genomen voor het opstellen en in stand houden van Lean-doelen en een Lean-cultuur
2	De topmanagement visie en toewijding aan Lean worden continu gecommuniceerd aan alle medewerkers
3	Het beleid en de strategie van de organisatie zijn gebaseerd op het concept van Lean
4	Het topmanagement heeft goede beloningssystemen bedacht die werknemers en leidinggevenden erkennen voor hun Lean gerelateerde prestaties
5	Noodzakelijke beleidswijzigingen zijn doorgevoerd om deelname en betrokkenheid van medewerkers bij het Lean-proces te stimuleren
6	Het topmanagement is betrokken bij het evalueren van de voortgang van Lean
7	Topmanagement besteedt een aanzienlijk deel van de tijd aan Lean-kwesties
8	Topmanagement biedt de benodigde financiële middelen voor Lean
9	Het topmanagement biedt de benodigde financiële middelen om werknemers te trainen in de essentiële Lean-technieken

Q2 - Vragen over de resultaten van het team waar u leiding aan geeft Geef aan in hoeverre u het met de volgende stellingen eens of oneens bent:

#	Field
1	Dit team presteert altijd hoog
2	Dit team is effectief
3	Dit team maakt weinig fouten
4	Dit team doet werk op een hoge kwaliteit

Q3 - Vragen over de mate van Lean implementatie Geef aan in hoeverre u het met de volgende stellingen eens of oneens bent:

#	Field
1	De oorzaak en tegenmaatregelen van alle problemen worden geïdentificeerd aan de hand van een bewezen methode van probleemoplossing
2	Visuele schermen voor procesmonitoring en poka-yoka systemen om automatisch processen te stoppen, worden overal in de organisatie gebruikt

3	Een breed scala aan visuele managementmethoden wordt overal in de organisatie gebruikt
4	Er zijn duidelijke lijnstopprocedures aanwezig en medewerkers zijn gemachtigd om de lijn te stoppen zodra een afwijking optreedt
5	De besluitvorming binnen de organisatie wordt gedelegeerd naar de betreffende afdeling
6	Formele 5S verbeteringsactiviteiten zijn ingeregeld volgens de plannen en doelen voor continue procesverbetering
7	Elke afdeling van de organisatie werkt actief aan procesverbetering
8	Gevorderde kennistraining vindt plaats en is gekoppeld aan doorgroeimogelijkheden
9	Het werk wordt volledig aangedreven door de vraag ("Pull" signaal) vanuit opeenvolgende afdelingen
10	Het “first in first out” principe wordt toegepast
11	Ook leveranciers gebruiken “Pull” principes
12	Het werk is perfect afgestemd op de vraag van de klant en gebaseerd op de oplevertijd
13	Het werktempo wordt vastgesteld op basis van de optimale oplevertijd
14	Wij gebruiken communicatiesystemen die in de hele toeleveringsketen gebruikt worden, zodat planning en levering samen en realtime gebeurt
15	De vraag wordt voornamelijk aan externe partners doorgegeven op basis van de vraag van de klant
16	De werkstroom van leverancier naar klant wordt gemaximaliseerd
17	Wij helpen onze leveranciers bij het bereiken van een hoog niveau van excellentie
18	Wij brengen innovatieve nieuwe producten op de markt door het creëren van samenwerkingsrelaties met een strategische partner
19	Wij maken flink gebruik van technologie om met toeleveranciers samen te werken
20	Gecoördineerde “one-piece flow” vindt plaats voor alle bewerkingen en afdelingen
21	Benaderingen voor het verkorten van de tijd voor werkvoorbereiding zijn goed gedefinieerd en worden goed begrepen
22	Preventieve onderhoudsactiviteiten worden continu verbeterd door middel van kaizen-activiteiten.

Q4 - Vragen over uw individuele werk waarden Geef per waarde aan in hoeverre u deze belangrijk vindt. De antwoordmogelijkheden lopen van ‘tegenovergesteld aan mijn waarden’ tot ‘uiterst belangrijk’.

#	Field
1	Onbaatzuchtigheid (zorgzaamheid, anderen ondersteunen)
2	Rechtvaardigheid (anderen eerlijk behandelen)
3	Behulpzaamheid (werken voor het welzijn van anderen)
4	Teamwerk (samenwerking)
5	Gelijkheid (gelijke kansen voor iedereen)

6	Experimenteren (nieuwe dingen proberen)
7	Afwisseling (nieuwigheden en verandering verwelkomen)
8	Creativiteit (innoveren, denken buiten gebaande paden)
9	Nieuwsgierigheid (interesses najagen, leergierigheid)
10	Durf (avontuur zoeken, risico's nemen)
11	Gehoorzaamheid (verplichtingen nakomen, plichtsgetrouw)
12	Overeenstemming (de regels volgen, aanpassen)
13	Zelfdiscipline (uzelf kunnen bedwingen)
14	Traditie (gebruiken in stand houden)
15	Respect (respect voor oudere medewerkers)
16	Initiatief (ondernemendheid, vindingrijkheid)
17	Ambitie (veel ambitie hebben)
18	Succes (dingen bereiken of volbrengen)

Q5 - Vragen over uw werktevredenheid Geeft u bij de volgende stellingen aan of u er wel of niet mee eens bent

#	Field
1	Ik vind mijn werk erg leuk
2	Ik vind mijn werk leuker dan de gemiddelde persoon
3	Op de meeste dagen ben ik enthousiast over mijn werk
4	Ik ben redelijk tevreden over mijn baan

Q6 - Werkbetrokkenheid Geef aan hoe vaak u de volgende punten bij u van toepassing zijn:

#	Field
1	Wanneer ik op het werk ben, barst ik van de energie
2	Op mijn werk voel ik me sterk en krachtig
3	Als ik 's morgens opsta, heb ik zin om naar mijn werk te gaan
4	Ik ben enthousiast over mijn werk
5	Mijn werk inspireert me
6	Ik ben trots op het werk dat ik doe

7	Ik voel me goed wanneer ik intensief aan het werk ben
8	Ik voel me soms ondergedompeld in werk
9	Ik word meegesleept wanneer ik aan het werk ben

Q7 - Algemene vragen over uw team Geeft u bij de volgende stellingen aan of u er wel of niet mee eens bent

#	Field
1	Teamleden werken nauw met elkaar samen om hun werk uit te voeren
2	Teamleden zijn verantwoordelijk voor het bepalen van de methoden, procedures en planning van het werk
3	Het werk van teamleden is routinematig
4	Teamleden doen elke dag dezelfde taken
5	Het team, en niet ikzelf als teamleider, bepaalt wie wat doet binnen het team
6	Teamleden voeren herhalende activiteiten uit tijdens hun werk
7	De meeste werk-gerelateerde besluiten worden door de teamleden genomen in plaats van door mijzelf als teamleider
8	Het werk van individuele teamleden heeft een grote impact op het werk van andere teamleden
9	Teamleden moeten regelmatig hun taken met elkaar afstemmen

Q8 - Algemene vragen over uw team: Hoeveel FTE telt uw team?

Q9 - Hoeveel teamleden telt uw team?

Q10 - Hoe vaak komt uw team face-to-face bijeen gedurende een gemiddelde werkweek?

Q11 - Algemene vragen over uzelf:Wat is uw geslacht?

Q12 - Wat is uw leeftijd?

Q13 - Hoeveel jaren en maanden werkt u bij deze organisatie?

Q14 - Hoe lang werkt u al in dit team (in jaren en maanden)

Q15 - Wat is de hoogste opleiding die u heeft afgerond?

Q16 - Wat voor een dienstverband heeft u?

Appendix I method 2 Recoded Item list

DATASET ACTIVATE DataSet1.

RECODE Q38_2 (1=7) (7=1) (2=6) (6=2) (5=3) (3=5).

RECODE Q43_8 Q43_9 (1=7) (7=1) (2=6) (6=2) (5=3) (3=5).

TopManagement_Support=(Q60_1+Q60_2+Q60_3+Q60_4+Q60_5+Q60_6+Q60_7+Q60_8+Q60_9)/9.

COMPUTE TL_Support=(Q2_1+Q2_2+Q2_3+Q2_4+Q2_5+Q2_6+Q2_7+Q2_8)/8.

COMPUTE TL_Task_Related_Behaviour=(Q25_1+Q25_2+Q25_3+Q25_4)/4.

COMPUTE TL_Relation_Behaviour=(Q25_5+Q25_6+Q25_7+Q25_8+Q25_9)/5.

COMPUTE TL_Change_Behaviour=(Q25_10+Q25_11+Q25_12+Q25_13)/4.

Monitoring_Towards_Goals=(Q28_1+Q28_2+Q28_3+Q28_4+Q28_5+Q28_6+Q28_7+Q28_8+Q28_9+Q28_10)/10.

COMPUTE Knowledge_Sharing=(Q29_1+Q29_2+Q29_3+Q29_4)/4.

COMPUTE Team_Cohesion=(Q31_1+Q31_2+Q31_3+Q31_4+Q31_5+Q31_6+Q31_7)/7.

COMPUTE Conflict_Management=(Q32_5+Q32_6+Q32_7+Q32_8)/4.

COMPUTE TM_Opinion_Lean=(Q38_1+Q38_2)/2.

COMPUTE Job_Satisfaction=(Q39_1+Q39_2+Q39_3+Q39_4)/4.

Innovative_Work_Behaviour=(Q42_1+Q42_2+Q42_3+Q42_4+Q42_5+Q42_6+Q42_7+Q42_8+Q42_9)/9.

Work_Engagement=(Q43_1+Q43_2+Q43_3+Q43_4+Q43_5+Q43_6+Q43_7+Q43_8+Q43_9)/9.

Job_Pressure=(Q44_1+Q44_2+Q44_3+Q44_4+Q44_5+Q44_6+Q44_7+Q44_8+Q44_9+Q44_10)/10.

Job_Performance=(Q45_1+Q45_2+Q45_3+Q45_4)/4.

DATASET ACTIVATE DataSet2.

Top_Management_Support_TL=(Q8_1+Q8_2+Q8_3+Q8_4+Q8_5+Q8_6+Q8_7+Q8_8+Q8_9)/9.

Team_Performance=(Q9_1+Q9_2+Q9_3+Q9_4)/4.

Lean_Practices_Adoption=(Q11_1+Q11_2+Q11_3+Q11_4+Q11_5+Q11_6+Q11_7+Q11_8+Q11_9+Q11_10+11_11+Q11_12+Q11_13+Q11_14+Q11_15+Q11_16+Q11_17+Q11_18+Q11_19+Q11_20+Q11_21+Q11_22)/22.

DATASET ACTIVATE DataSet1.

Psycholocical_Safety=(Q32_1+Q32_2+Q32_3+Q32_4)/4.

Psycholocial_Safety_NEW=(Q32_2+Q32_3+Q32_4)/3

Appendix J Examples of SPSS output

Case Processing Summary

		N	%
Cases	Valid	73	71,6
	Excluded[a]	29	28,4
	Total	102	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
,904	7

T-Test

Group Statistics

	Group1	N	Mean	Std. Deviation	Std. Error Mean
M_Innovative_Work_Behaviour	,00	5	4,0120	,63622	,28452
	1,00	5	4,0520	,73087	,32685

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
M_Innovative_Work_Behaviour	Equal variances assumed	,002	,967	-,092	8	,929	-,04000	,43335	-1,03930	,95930
	Equal variances not assumed			-,092	7,851	,929	-,04000	,43335	-1,04261	,96261

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Mod_LeanXTask, Mod_Task_Beha, Mod_Leanpr[b]	.	Enter

a. Dependent Variable: M_Knowledge_Sharing

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,679[a]	,461	,191	,54472

a. Predictors: (Constant), Mod_LeanXTask, Mod_Task_Beha, Mod_Leanpr

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,521	3	,507	1,708	,264[b]
	Residual	1,780	6	,297		
	Total	3,301	9			

a. Dependent Variable: M_Knowledge_Sharing

b. Predictors: (Constant), Mod_LeanXTask, Mod_Task_Beha, Mod_Leanpr

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5,289	,188		28,086	,000
	Mod_Leanpr	,320	,382	,425	,838	,434
	Mod_Task_Beha	1,118	,563	,607	1,986	,094
	Mod_LeanXTask	,097	1,032	,048	,094	,928

a. Dependent Variable: M_Knowledge_Sharing