

Improving high lean team performance through aligned behaviour-value patterns and coactive vicarious learning-by-doing

Improving
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performance

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Desirée H. van Dun and Celeste P.M. Wilderom

Industrial Engineering and Business Information Systems, Faculty of Behavioural, Management and Social Sciences, University of Twente, Enschede, The Netherlands

Abstract

Purpose – Why are some lean workforce teams able to improve their already high performance, over time, and others not? By studying teams' and leaders' behaviour-value patterns, this abductive field study uncovers a dynamic capability at the team level.

Design/methodology/approach – Various methods were employed over three consecutive years to thoroughly examine five initially high-performing lean workforce teams, including their leaders. These methods encompassed micro-behavioural coding of 59 h of film footage, surveys, individual and group interviews, participant observation and archival data, involving objective and perceptual team-performance indicators. Two of the five teams continued to improve and perform highly.

Findings – Continuously improving high lean team performance is found to be associated with (1) team behaviours such as frequent performance monitoring, information sharing, peer support and process improvement; (2) team leaders who balance, over time, task- and relations-oriented behaviours; (3) higher-level leaders who keep offering the team face-to-face support, strategic clarity and tangible resources; (4) these three actors' endorsement of self-transcendence and openness-to-change work values and alignment, over time, with their behaviours; and (5) coactive vicarious learning-by-doing as a “stable collective activity pattern” among team, team leader, and higher-level leadership.

Originality/value – Since lean has been undertheorised, the authors invoked insights from organisational behaviour and management theories, in combination with various fine- and coarse-grained data, over time. The authors uncovered actors' behaviour-value patterns and a collective learning-by-doing pattern that may explain continuous lean team performance improvement. Four theory-enriching propositions were developed and visualised in a refined model which may already benefit lean practitioners.

Keywords Lean leadership, Improving high team performance, Dynamic capabilities, Middle-up-down-management, Social learning, Video-based micro-behavioural coding, Work values, Longitudinal, Abductive mixed-methods field study design

Paper type Research paper

1. Introduction

Many organisations around the globe engage in “lean” or “continuous improvement” (Balzer *et al.*, 2019; Danese *et al.*, 2018; Netland *et al.*, 2015). Lean stands for attaining more customer

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value by continuously improving work processes (Shah and Ward, 2007). Adopting lean requires workflow teams (hereafter: “lean teams”) to reduce own wasteful activities and variability in task-processing time through lean practices that support just-in-time process flows (Staats *et al.*, 2011). Lean enables teams to “routinely realize peak performance” over time (Edgeman, 2017, p. 261; Sadun *et al.*, 2017), not only via lean practices but also through leadership and workflow employees’ behaviours (Camuffo and Gerli, 2018; Netland *et al.*, 2019; Onofrei *et al.*, 2019; Tortorella *et al.*, 2017). Despite lean’s worldwide popularity, many high-performing lean teams revert back, over time, to a lower-performing non-lean state (Jasti and Kodali, 2015; Netland *et al.*, 2015; Taylor *et al.*, 2013), labelled in the team literature as “team performance decay” (Diazgranados *et al.*, 2013; Quigley *et al.*, 2018). To prevent such decay, it is important to know how initially high-performing lean teams can continue improving their operational performance over time.

“Top management” and “culture” are often implied when explaining continuous high lean team performance (Bortolotti *et al.*, 2015; Losonci *et al.*, 2017; Marshall *et al.*, 2016). Most studies, whilst aiming to explain the “soft” side of lean, take a cross-sectional survey approach, thereby disregarding its complex evolutionary nature (Danese *et al.*, 2018; Jasti and Kodali, 2014; Mathieu *et al.*, 2017). Team members’ and leaders’ behaviours and values, which are seldom studied concurrently, may vary over time (Balzer *et al.*, 2019; Bortolotti *et al.*, 2015; Dobrzykowski *et al.*, 2016; McClean *et al.*, 2019; Shah and Ward, 2003; Taylor *et al.*, 2013). Therefore, uncovering how high lean team performance can wax and wane requires longitudinal field studies (Negrão *et al.*, 2020; Netland and Ferdows, 2016), with a focus on multi-level actors’ behaviours and their anchors, such as work values (Deichmann and Stam, 2015; Schwartz *et al.*, 2012, 2017).

The present study contributes to a better understanding of behaviour-value patterns for continuously improving high lean team performance and taps into the dynamic capabilities theory (Danese *et al.*, 2018). A *dynamic capability* is defined as a “learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines” (Zollo and Winter, 2002, p. 340). Albeit originally pitched by economists, capabilities may exist at or across various organisational levels of analysis and can enable continuous operational improvement and high performance (Schilke *et al.*, 2018; Witcher *et al.*, 2008): A lean production system can be seen as a dynamic capability by itself (Secchi and Camuffo, 2016; Witcher *et al.*, 2008). Nested within it might be a *team-level* learning-type dynamic capability (Argote and Hora, 2017; Danese *et al.*, 2017; Dobrzykowski *et al.*, 2016; Secchi and Camuffo, 2016). Yet, to date, little is known about the (micro-level behavioural and value type of) “ingredients” of such a team- or “meso-level” capability, including the leaders’ roles therein (Kurtmollaiev *et al.*, 2018; Schilke *et al.*, 2018). Camuffo and Gerli (2018) stated that managerial and worker behaviours represent the microfoundations of lean production systems.

When taking stock of pertinent Organisation-Behavioural (OB) theorising on highly performing teams one also needs to consider Nonaka’s (1988) *middle-up-down management* theory which positions team leaders as linking pins between higher-level leaders and workflow teams. The present study uniquely zooms in on the micro-level behaviour-value patterns of these three actors who are assumed to co-produce a meso-level dynamic capability (Nonaka *et al.*, 2016) in order to contribute to further improving high lean team performance. In addition, the *social learning* theory posits that managerial and worker behaviours may be linked, given that people are inclined to learn from successful superiors (Bandura, 1977): i.e. employees may gradually start to mimic their leaders’ behaviours. Similar effects may occur in terms of their values (Deichmann and Stam, 2015, p. 1576). Hirzel *et al.* (2017) recommended studying the joint performance effects of lean leaders’ and employees’ values and their “changes in behaviour over time.” Also following Barreto’s (2010) call, our abductive field study focuses on specific behaviour-value patterns of various intra-organisational actors to

answer the following two-pronged research question: *What are the behaviour-value patterns of high-performing lean workflow teams, their team leaders, and higher-level leaders?* and *How may those patterns explain the teams' continuous improvement of operational performance?*

We tracked five initially high-performing lean teams over three years, using various methods and performance indicators. Despite their favourable starting positions, three lean teams did not improve on their initial high performance level over time. We uncovered the behaviour-value patterns of the teams, and their (higher-level) leaders, that continued improving their high team performance. Together, they formed a meso-level stable, collective activity pattern, labelled “coactive vicarious learning-by-doing”, in line with common academic parlance (Myers, 2018). Abductive studies, like this one, are phenomenon-driven, leading to proposals that may extend existing theories (Ketokivi and Choi, 2014; Mathieu, 2016). In the discussion we draw implications for three existing theories: dynamic capabilities, middle-up-down management and social learning theory, and offer a refined conceptual model of lean team performance improvement plus four propositions to further unravel, with more behavioural precision, the human dynamics of continuously improving high team performance.

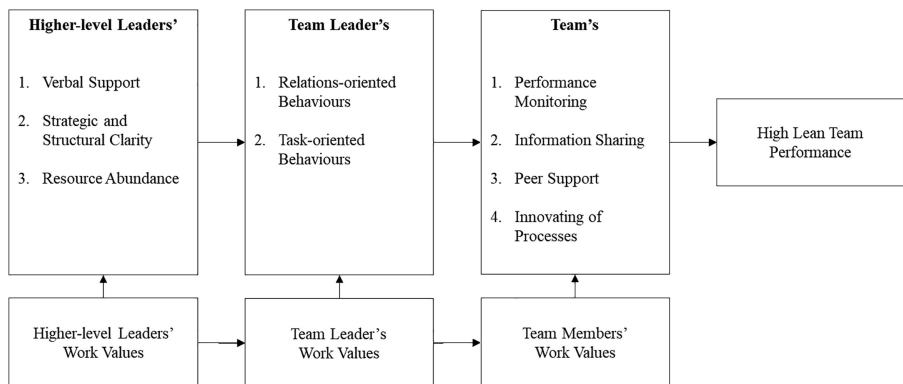
2. Literature review: behaviours and values in and around lean teams

The dynamic capabilities theory introduced top managerial behaviours as drivers of organisational-level dynamic capabilities that enable high operational performance and improvement (Ambrosini and Bowman, 2009; Fainshmidt and Frazier, 2017; Schilke *et al.*, 2018). At the meso-level of dynamic capabilities, Nonaka *et al.* (2016) added that team leaders, and the workflow teams themselves, must be taken into account. Similarly, Balogun (2003) and Huy (2001) argued that team leaders are change intermediaries who help make sense of top-down management mandates while coordinating bottom-up performance improvement initiatives. In the context of lean, McMackin and Flood (2019) suggested that lean team performance requires an interplay between higher-level leaders, team leader and team behaviours, anchored in their values (Schwartz *et al.*, 2017; Van Dun and Wilderom, 2016). We know that leaders co-shape their employees' behaviours and values (Brown and Treviño, 2009; Wang *et al.*, 2018b). Bandura's (1977) *social learning theory* assumes that people are more strongly influenced by proximal rather than distant others, such that effective higher-level leaders can affect front-line leaders who then affect team behaviours and values (Wang *et al.*, 2018b). Also, Soltani and Wilkinson (2010) observed that top leaders' lean-supportive behaviours influence subordinate leaders' behaviours. In turn, workflow employees may even learn to take over responsibilities from their leaders (De Treville and Antonakis, 2006). A recent survey in a non-lean context showed that the empowering leadership behaviour “of higher-level leaders promotes the empowering leadership of lower-level leaders, which indirectly improves the task performance of employees” (Byun *et al.*, 2020, p. 399). Similarly, Wu *et al.* (2021) demonstrated through a series of experiments that servant leadership behaviours may inspire followers' serving behaviours. Hence, a trickle-down idea of behaviours and values is the fundament of Figure 1 which synthesises pertinent (OB) literature on lean leadership behaviours and values across hierarchical levels which we used on starting our empirical work. The underlying premises in Figure 1 are that people's values help shape their own behaviours while lean leaders co-shape the work behaviours and values of their followers. Its assumed contents will be elaborated next.

2.1 Higher-level leader behaviours

Higher-level leader support may take various forms and has been found to affect lean team performance (Dobrzykowski *et al.*, 2016). Tortorella and Fogliatto (2017) showed that

Figure 1.
Initial model of lean
team performance
improvement



managers tend to offer “support”, especially in the later maturity stages of lean adoption. [Magnani et al. \(2019\)](#), [McMackin and Flood \(2019\)](#) and [Van Dun and Wilderom \(2012\)](#) reported the following supportive higher-level leader behaviours which may contribute to teams’ continued performance improvement:

- (1) *Verbally promoting lean*: Leaders’ frequent support for lean, and how often they are present on the floor or participate in kaizen events, is important ([Bortolotti et al., 2015](#); [Netland and Ferdows, 2014](#); [Worley and Doolen, 2006](#)). Higher-level leaders who strongly endorse lean values, such as “elimination of waste” or “process improvement”, induce better team communication and performance ([Dobrzykowski et al., 2016](#)).
- (2) *Providing clarity about the organisational strategy and structure*: Leaders must convey strategic goals and align rewards and HR policy ([Carton et al., 2014](#); [Diazgranados et al., 2013](#); [Netland et al., 2015](#)). Such communicative clarity, also about the reasons for the adoption of lean, must curb employee uncertainty ([Shim and Steers, 2012](#); [Worley and Doolen, 2006](#)).
- (3) *Investing in resources*: Leaders should invest in lean practices such as team performance dashboards (“huddle boards”); operator control systems; IT support; lean belt training; and lean coaching/consulting ([Anand et al., 2009](#); [Fullerton et al., 2014](#); [Maalouf and Gammelgaard, 2016](#); [Procter and Radnor, 2014](#); [Secchi and Camuffo, 2016](#)). A team’s access to lean resources and time to implement the resulting improvements enables learning and performance ([De Treville and Antonakis, 2006](#); [Negrão et al., 2020](#)).

In sum, higher-level leader’s verbal support for lean, strategic and structural clarity, and investing in lean resources, are assumed to inspire team leaders’ behaviours that, in turn, contribute to the performance improvement of lean workflow teams ([Figure 1](#)).

2.2 Lean team leader behaviours

Effective lean team leaders display both relations- and task-oriented type behaviours ([Camuffo and Micelli, 1997](#); [Tortorella et al., 2017, 2018, 2020](#); [Tortorella and Fogliatto, 2017](#)). This relations-oriented versus task-oriented categorisation of behaviours is well-established in the literature on effective leadership ([Behrendt et al., 2017](#); [Dinh et al., 2014](#); [Yukl, 2012](#)). Indeed, [Diazgranados et al. \(2013\)](#) proposed that, in order to avoid team performance decay, team leaders must model desired behaviours, e.g. by mentoring the members (relations-oriented), and coordinating the work (task-oriented).

According to the literature, lean-specific *relations-oriented team leader behaviours* are being considerate, showing respect and appreciation, rewarding self-management skills and demonstrating humility through active listening and admitting mistakes (De Treville and Antonakis, 2006; Lam *et al.*, 2015; Poksinska *et al.*, 2013; Van Dun *et al.*, 2017). Team leaders' push for employee engagement and learning from mistakes has also been associated with sustained high lean team performance (Camuffo and Micelli, 1997; Spear and Bowen, 1999; Staats *et al.*, 2011). Moreover, lean team leaders' habitual intellectual stimulation by asking "why" and soliciting employees' ideas (Baer and Frese, 2003; Robinson and Schroeder, 2009; Spear and Bowen, 1999) appears to be conducive to high team performance (Behrendt *et al.*, 2017).

Task-oriented lean team leader behaviours include initiating structure and sharing factual information with employees (Camuffo and Micelli, 1997; Poksinska *et al.*, 2013), and offering them timely problem-solving support (Spear and Bowen, 1999). A lean team leader's frequent correcting and task monitoring appears to be detrimental to lean team performance (Van Dun *et al.*, 2017): Instead of micromanaging, mature lean leaders are seen to nurture their team members' skills (Camuffo and Gerli, 2018).

The specific team-leader behaviours involved in continuously improving already high team performance will be detected in this field study (Figure 1), through novel video-based micro-behavioural observations. In addition, we will examine how they relate to their leaders' and team's behaviours as well as to improving already high operational team performance.

2.3 Lean team behaviours

Inspired by their leaders, lean teams may check and discuss their own results regularly (Van Dun and Wilderom, 2012). Such *performance monitoring* typically generates feelings of responsibility for their team's performance improvement, thereby taking on leader-like roles (De Treville and Antonakis, 2006; Fullerton *et al.*, 2014; Netland *et al.*, 2015; Staats *et al.*, 2011; Taylor *et al.*, 2013). Indeed, frequent factual work-related *information sharing* was shown to predict lean team performance (Van Dun and Wilderom, 2016). Open communication and information analysis results in members' problem understanding and to team learning, performance and productivity growth (Bunderson and Boumgarden, 2010). Both performance monitoring and information sharing are typically aided by lean practices such as start-of-shift meetings, an own meeting space and vertical information flows (Poksinska *et al.*, 2013; Siemsen *et al.*, 2009; Tucker *et al.*, 2002).

Peer support includes helping coworkers to solve or prevent work-related problems, out of collective responsibility (Staats *et al.*, 2011). Lean teams are also expected to *improve their work processes* (Spear and Bowen, 1999; Staats *et al.*, 2011), thereby enhancing team performance (Anand *et al.*, 2009; Baer, 2012). For this to happen, *both* team leaders and members have to frequently ask for ideas, share suggestions and possible innovations, and then react constructively (Robinson and Schroeder, 2009).

Thus, these four team behaviours are expected to show up in the empirical part of this study of continuous lean team performance improvement (Figure 1).

2.4 Lean work values

People's values are considered essential elements of a lean culture (Liker and Hoseus, 2008; Mann, 2015; Shook, 2010). Based on Schwartz's earlier work, Brown and Treviño (2009) developed a framework with four work values clusters: self-transcendence, self-enhancement, openness to change and conservation. Highly effective lean middle and team managers especially endorse self-transcendence and openness-to-change type values (Poksinska *et al.*, 2013; Van Dun *et al.*, 2017; Van Dun and Wilderom, 2016), often in response to higher-level leaders (Bardi and Schwartz, 2003; Schwartz *et al.*, 2017; Wang *et al.*, 2018a). Other studies

found that non-managerial employees can indeed enact the values endorsed by their higher-ups (Gruys *et al.*, 2008). Such values congruence has even been positively related to team innovation (Mitchell *et al.*, 2012). One may thus expect that work values impact lean team performance improvement through (team) leader and team behaviours (Figure 1). Yet, as to how organisational and individual values become congruent is still a “theoretical black box” (Edwards *et al.*, 2006, p. 822; Gehman *et al.*, 2013). The present longitudinal field study addresses how already high-performing lean teams can keep improving by focusing on both the work behaviours and values of the team and their leaders.

3. Methods

3.1 Research design

Eisenhardt’s “racing design” (Gehman *et al.*, 2018, p. 288) was used to track five carefully selected high-performing lean teams in the Netherlands over three years. Figure 2 depicts the chronology of the employed mixed methods (Behrendt *et al.*, 2017; LeBaron *et al.*, 2018). It includes a combination of novel video observation, participant observation (with field notes), surveys, archival documents (such as annual reports) and (retrospective group) interviews, plus objective and perceptual indicators of team performance (Bhasin, 2012; Bortolotti *et al.*, 2015; Fullerton and Wempe, 2009; Marodin and Saurin, 2013).

3.2 Sampling high-performing lean teams

A country-wide call for continuously high-performing lean team nominations led to 30 teams. This initial list contained six public-sector and 24 private-sector teams. Each team was embedded in a large organisation that engaged in lean adoption. Those organisations included a municipality, a university hospital, an international bank, insurance corporations, energy companies, logistics firms and multinational manufacturers. They were geographically spread across the Netherlands. Through telephone interviews, we selected teams that (1) provided evidence of both high current operational performance as well as performance improvement over the last two years; (2) had a stable team composition and leadership over the past year; (3) actively used lean practices as part of a lean programme in multiple departments (i.e. the organisations they were part of had moved from a “beginner stage” to the “in-transition stage” of lean adoption (Netland and Ferdows, 2016)) and (4) were seen by higher-level leaders as their “best-practice” teams. Selection interviews were held with the higher-level leaders of nine teams which seemed to tick all the boxes to check further whether the teams fit these criteria. We also requested detailed accounts of their teams’ objective operational performance indicators from the last two years. Five teams met all the

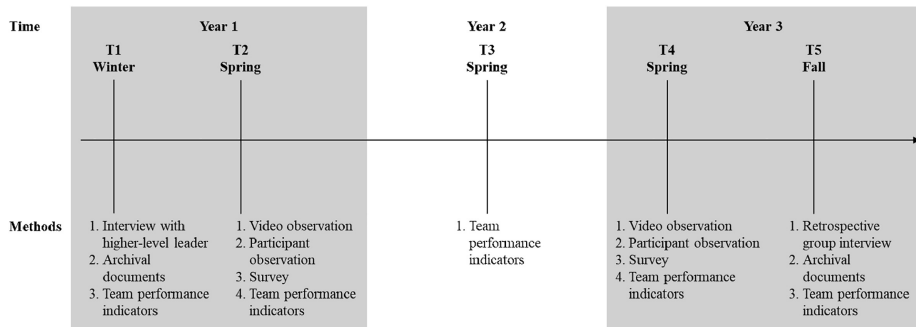


Figure 2.
Chronology of data collection in the longitudinal field study

selection criteria; in the following discussion, those clearly high-performing teams will be referred to via pseudonyms that represent their core business: Truck, Commodity, Government, Insurance and Mail. Most of their members were middle-aged, vocational school graduates who worked independently on low-complex tasks (Table 1). The teams varied not only in sector but also in size, gender diversity, full/part-time ratio and lean maturity.

The *Truck team* worked in a multinational's largest plant that began adopting lean production more than a decade ago and was known internationally as a lean "best practice". The ten team members assembled a part of a truck. At T4, the team was split into a morning and evening shift; we continued studying the evening shift as most of the initial participants worked this shift. The *Commodity team* was part of a manufacturing multinational; their fast-moving consumer goods plant had pioneered lean for seven years to prevent closure. Their parent company also adopted lean after Asian plant managers toured the Dutch facility for inspiration. The team members mainly monitored machines. The *Government team* was part of a large public agency whose 52 administrative teams had started adopting lean one year earlier. The focal team worked across two rooms, examining data records. Its nine team members typically had long tenure. The *Insurance team* was part of a major health insurance firm and handled claims from healthcare providers. The 34 team members had two part-time leaders; seven seniors handled the difficult claims. The team was introduced to lean 1.5 years earlier through a company-wide "customer focus" programme to beat the competition. Finally, the *Mail team* was part of a national distribution centre; its parent firm was recently listed on the stock exchange. The centre started adopting lean more than two years earlier; all the other centres adopted the company-wide "operational excellence" programme a year later. The 12 part-time workers had long team tenure and routinely sorted mail by hand; flexible workers were added to their shifts as extra capacity.

3.3 Data Collection

After piloting all the measures, they were employed at five points in time (Figure 2). At T1, a higher-level leader of each team was interviewed for one hour (46 single-spaced transcript pages); we also collected objective team performance data and potentially relevant documents. At both T2 and T4, one researcher spent one week with each team. During the first three days, the researcher co-executed the team's standard operating procedures (SOPs), asked informal questions in casual conversations (see Table 2), and was allowed to take photographs. This naked-eye type participant observation (Czarniawska, 2007) enabled familiarisation and led to a qualitative database consisting of 79 single-spaced field-note pages (McDonald, 2005; Vásquez et al., 2012). On day 3, a survey was administered, capturing responses from 5 team leaders and 55 members at T2 (77.46%) and 4 team leaders and 45 members at T4 (67.16%) [1]. On days 4 and 5, the team leaders and two selected members [2] were videotaped during two prototypical work situations: start-up meetings and regular daily work settings (McDonald, 2005). In total, 59 h of film footage was collected (T2: 27 h; T4: 32 h). To reduce reactivity and observer biases (Czarniawska, 2007), we explained our data-collection plan; pre-tested the video-taping; avoided any further intrusions; wore company clothing; and checked, with short post-observation interviews, the representativeness of the taped events.

At T5, a two-hour retrospective group interview took place with three seniors per team (the script is in Table 3). During this group interview, the team's past development was reconstructed by building a visual map of key chronological events using sticky notes (Grodal et al., 2021); focus group (Morgan, 1996) and life history interview techniques (Grotzinger, 2008) were used. The transcripts, which covered 142 single-spaced pages, were added to the qualitative database.

Table 1.
Team's characteristics
and lean practices from
T1/T2 (year 1) to T4/T5
(year 3)

Team pseudonym Time	Truck		Commodity		Government		Insurance		Mail	
	T1/T2	T4/T5	T1/T2	T4/T5	T1/T2	T4/T5	T1/T2	T4/T5	T1/T2	T4/T5
<i>Team characteristics</i>										
Sector	Manufacturing		Manufacturing		Service		Service		Service	
Team size, excluding team leader(s)	10	5	5	5	9	10	34	35	12	12
Male ratio	0.89	0.83	1.00	1.00	0.56	0.64	0.36	0.42	0.11	0.15
Full-time ratio	0.67	0.67	1.00	1.00	0.44	0.44	0.68	0.68	0.10	0.08
Mean age	48.70	36.67	43.33	45.33	47.33	48.70	45.41	45.42	50.36	53.77
Mean team tenure (in years)	3.00	3.40	1.40	3.50	4.60	8.10	4.30	6.50	5.80	11.30
Lean maturity (in years)	12.25	14.25	7.25	9.25	1.00	3.00	1.58	3.58	2.17	4.17
<i>Lean practices</i>										
Aligned performance measures	D	D	D	D	W	W	D	D	D	D
Andon cord	✓	✓								
Start-up meetings	D	D	B	W	D	W	D	D	D	D
Standardisation	✓	✓	✓	✓	✓		✓	✓	✓	✓
Leader standard work		✓								
Standardised process audit	D	D	R	R						
Reduced setup times	✓	✓	✓	✓						
Kanban system	✓	✓	✓	✓						
One-piece flow	✓	✓	✓	✓						
Reduced lot sizes	✓	✓	✓	✓						
Reduced buffer inventories	✓	✓	✓	✓						
5S	D	D	R	R						
Kaizen	R	W	R	R						
Just in time	✓	✓								
Spaghetti/Layout diagram	✓	✓								
Visual display of quality data	D	D	D	D	W	W			D	D
Visual display of defect rate data	D	D								
Visual display of productivity data	D	D	D	D	W	W	D	D	D	D

Note(s): The Ts correspond to [Figure 2](#). The lean practices follow [Fullerton et al. \(2014\)](#). A check mark indicates whether a lean practice was in place. For each meeting, audit- or event-type practice, we indicated how frequent these practices were applied: D = Daily; W = Weekly; B = Bi-weekly; R = Regularly; to O = Occasionally

- (1) How is your day?
- (2) What do you do mostly during the day?
- (3) What is your role within the team?
- (4) Can you explain what just happened?
- (5) What was the purpose of this meeting?
- (6) What do you think about lean?
- (7) What does . . . mean?
- (8) When do people raise points for improvement?
- (9) When do people get promoted?
- (10) Is this how things normally go in the team?
- (11) Does today represent the day-to-day happenings for this team?
- (12) Do you think people act normally now that I am here?

Note(s): During the various site visits, while observing team members and leaders on days 1–3 of each 5-day team visit, we occasionally asked these open (interview-type) questions when we were alone with the team leader or members

Table 2.
Informal interview
questions asked during
participant
observation at T2
and T4

3.4 Measures

3.4.1 Team performance. Following the categorisation by [Bhasin \(2012\)](#), [Fullerton and Wempe \(2009\)](#) and [Marodin and Saurin \(2013\)](#) on lean-specific operational performance indicators, we used the teams' own *objective operational performance indicators* at five points in time. The indicators differed per team. Examples are productivity, team members' sickness absence and customer satisfaction (e.g. delivery reliability, defect ratio). The management controllers who gave us access to the team-level company data vouched for its accuracy; these performance indicators were tracked and used in the daily and weekly performance review cycles of each team as well as in the departments in which they were embedded.

To add to the operational and people-related performance indicators, we also measured *perceived team performance* ([Bhasin, 2011, 2012](#); [Ketokivi and Schroeder, 2004](#)). Members' own perceptions of their team's outcomes and successes is known as an impetus for continuous improvement effort ([Keating et al., 1999](#)). Team members rated perceived team performance at T2 and T4 via a composite scale, based on [Van Den Bossche et al.'s \(2006\)](#) validated four-item "team effectiveness" scale that incorporates team performance, viability and learning; combined with two items from [Wageman et al.'s \(2005\)](#) "general satisfaction" scale ([Wageman et al.'s](#) third reverse-scored item was left out because such an item is typically less reliable). The six survey items were measured on a seven-point Likert scale. An example is "We are satisfied with the performance of our team". The items were translated into Dutch via the translation/back-translation method ([Brislin, 1970](#)). A principal axis exploratory factor analysis yielded one factor explaining 56.59% of the variance; the factor loadings ranged from 0.55 to 0.94 (T2: $\alpha = 0.79$; T4: $\alpha = 0.84$; $KMO = 0.84$; $X^2_{15df} = 252.93$, $p = 0.00$; see [Table 4](#)). The ICC1, ICC2, r_{WG} and a_{WG} scores ([LeBreton and Senter, 2008](#); [Wagner et al., 2010](#)) flagged strong team-member agreement at T2 and T4. The scores were at T2: ICC1 = 0.32; ICC2 = 0.88; $r_{WG} = 0.95$; $a_{WG} = 0.87$; and at T4: ICC1 = 0.17; ICC2 = 0.75; $r_{WG} = 0.92$; $a_{WG} = 0.82$.

3.4.2 Higher-level leader behaviours. The higher-level leaders included managers who supervised the team leaders (e.g. production, site or departmental managers). In all cases, this was the highest-responsible location leader. Their *verbal support for lean* was measured through selective coding of the qualitative data ([Ketokivi and Choi, 2014](#)). Specifically, we counted the frequency of lean words (i.e. continuous improvement, operational excellence, efficiency, process waste reduction and quality) in the president's letters and mission statements in the three annual reports ([Carton et al., 2014](#)). In addition, each instance of a higher-level leader's behavioural support (including their physical workflow presence) was coded in the following sources: the T1 interview transcripts; T2 and T4's field notes;

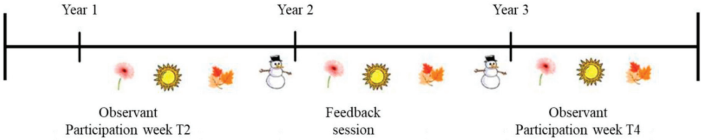
Section	Instructions
Introduction	<p>Welcome the group interview participants and explain:</p> <ul style="list-style-type: none"> ● Goal: In the past three years, we have seen each other during site visits. The goal of this team interview is to determine the key events in your team between the first year and now: year 3. With this information we can complete the final pieces of the puzzle in our research. ● Why we asked you for this interview: because you were there during the site visits in year 1 and 3, and we think that you can provide accurate data about this period. ● Procedure: On the wall you see a time-lined poster: visualizing the past three years. We will ask you to list all important events in and around your team during this period. The pictures symbolize the four season, meant to help you to recall the events on this timeline: 
Core	<ol style="list-style-type: none"> 1. Before we start, do you have any questions about the procedure? 2. In preparation of this interview, you already thought of some events. Who wrote down an event he/she would like to start talk about? 3. Can you explain a bit more about that event: what happened exactly? 4. How did this make the team feel at the time? 5. How did this event impact on the team? 6. Can you summarize the event, so that we can write the event on a sticky note? 7. When did this event happen exactly? 8. Who had listed another important event he/she would like to talk about? (<i>then: repeat question 2-8, until saturation occurs</i>) <p><i>Post each event on the poster. If team members find this difficult or the discussion dries up:</i></p> <ul style="list-style-type: none"> ● <i>Either refer to one of the symbols on the wall poster: e.g. "What happened around the time when researcher X visited your team in year 1?"</i> ● <i>Or mention a critical incident mentioned by one of the (other) team members in the T4 open-ended survey: "In the survey, someone/several team members noted X as an important event. Can you talk a bit more about that?"</i>
Conclusion	<ol style="list-style-type: none"> 9. We would like to draw a line on the wall poster visualizing your team performance. How would that line run? Can you explain why? 10. And how would the line visualizing your team climate run? Can you explain why? <p><i>Thank you very much for all your input.</i></p>

Table 3.
Retrospective group
interview script

open-ended responses to T4's survey (wherein team leaders and members were asked to list past team events); and T5's retrospective interview transcripts. To measure *strategic and structural clarity*, the same sources were coded with combinations of the search terms: manager, leader, strategy and structure. *Resources for lean* were assessed similarly with search terms such as manager, leader, resource and finance/financial; plus occurrences of lean practices per team (Table 1).

3.4.3 *Team leader behaviours.* Using a validated micro-behavioural video-coding scheme with 15 mutually exclusive codes (Hoogeboom and Wilderom, 2015; see Table 5) and The Observer software (Noldus et al., 2000), two MSc students rated the team leaders' footage. We then grouped each coded utterance into one of the following behaviours: *Relations-oriented behaviours* included active listening, agreeing, individual consideration and asking for ideas; and *task-oriented behaviours* included factually informing, correcting, delegating, task monitoring, visioning, structuring the conversation and executing individual tasks. The scheme also had four counterproductive behaviours (showing disinterest, defending one's own position, providing negative feedback and disagreeing). In addition, the field notes and retrospective interviews were content-analysed to identify observations and quotes related to the team leader's relations- and task-oriented behaviours.

3.4.4 *Team behaviours.* The same micro-behavioural coding scheme and procedure was used to measure four team behaviours by aggregating the mean team members' frequencies of: *performance monitoring* (consisting of the following micro-behavioural codes group: task monitoring, correcting, delegating and structuring the conversation); *information sharing* (i.e. factually informing); *peer support* (i.e. active listening and individual consideration); and *process improvement* (i.e. asking for ideas, visioning and agreeing). Also, the team members' counterproductive behaviours were coded (i.e. showing disinterest, defending one's own position, providing negative feedback and disagreeing), as well as their individual task execution behaviours. Table 5 provides short definitions and examples of each of those codes. After coding the individual team members' behaviours, we followed Hoogeboom et al. (2021) by grouping the number of specific behaviours displayed in each meeting and daily work setting by each team member. The next step was to combine the individual behaviours to form team behaviours, which the OB literature sees as "members' interdependent acts that convert inputs to outcomes" (Klonek et al., 2019, p. 246). This aggregation was justified because the r_{WG} scores, ranging between 0.96 and 1.00, identified strong similarity among the frequencies of individual team members' behaviours (see Wagner et al., 2010). The resulting team-level behavioural measure was then used in our subsequent analyses (see, also, Klonek et al., 2019). In addition to the quantitative systematic video-based coding, field notes and retrospective interviews were content-analysed using the four literature-based team behaviours as codes.

3.4.5 *Leader and member work values.* As it was not possible to survey the higher-level leaders, two different ways of measuring leader and member work values were used. To measure higher-level leaders' espoused work values, annual reports and organisational websites were content-analysed with selective coding (Daly et al., 2004), with a scheme derived from Brown and Treviño (2009) and Schwartz et al. (2012). Two independent raters coded the values found in those public sources in terms of self-transcending, self-enhancing,

Item	Factor loadings	h^2
Generally speaking, our team members are very satisfied with this team	0.94	0.70
We are satisfied with the performance of our team	0.71	0.46
Team members enjoy the kind of work we do in this team	0.68	0.46
Team members would like to work with this team in the future	0.65	0.43
We complete our tasks in a way we all agree upon	0.61	0.35
As a team, we learn a lot	0.55	0.28
Eigenvalue	3.40	
% of variance	56.59	

Note(s): Principal axis exploratory factor analysis with an exploratory sample, including both team members and team leaders at T1/T2 and T4/T5: $n = 109$. h^2 = initial communality coefficient. Kaiser-Meyer-Olkin measure is 0.84 and Bartlett's test of sphericity is significant ($X^2_{15df} = 252.93, p = 0.00$)

Table 4.
Exploratory factor
analysis of perceived
team performance:
Factor loadings

Codes	Definition	Examples ^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. Factually 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 conversation	Enabling an efficient and effective meeting	"Let me summarize our decision"
7. Executing individual tasks	Performing operational work tasks	Continuing daily work while the meeting already started; or, during daily work: Working behind a 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 positive individual feedback	"So you are going on a holiday to Turkey, right?" or "Well done!"
10. Asking for ideas	Asking for root causes, ideas; inviting people to share views with the team	"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/her back to the team leader; during daily work: Watching away 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 unfavourably 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 do not think that is a good idea"

Table 5.
Video-coded
behaviours and
examples

Note(s): The codes are derived from [Hooigeboom and Wilderom \(2015\)](#), with the only exception that individual consideration also includes providing positive feedback. Executing individual tasks was added to the scheme
^aAll examples were taken verbatim from this study's video-based dataset

open to change and conservation, with an initial inter-rater agreement of 70%, and then 95% after a discussion.

Team leaders and members were surveyed at T2 and T4 about their own work values. The validated scale included ([Brown and Treviño, 2009](#)): five self-transcendence items (e.g. "altruism") ($\alpha = 0.73$); three self-enhancement items (e.g. "taking initiative") ($\alpha = 0.68$); five openness to change items (e.g. "experimentation") ($\alpha = 0.84$); and five conservation items (e.g. "tradition") ($\alpha = 0.60$). The answering scale ranged from $-1 = \textit{opposed to my values}$ to $7 = \textit{of supreme importance}$. We also content-analysed the field notes and retrospective interviews with these four values clusters.

3.5 Data analyses

[Table 6](#) reports the descriptive statistics and repeated measures analyses of variances of the objective operational team performance indicators, plus the *t*-test comparisons of the perceived team performance at T1/T2 and T4/T5. Based on this data we determined whether

Performance indicators per team	T1/T2 (year 1)		T3 (year 2)		T4/T5 (year 3)		λ/t	Δ
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
<i>Truck</i>								
Weekly # line stops	16.18	12.13	14.95	10.49	9.79	11.88	0.84*	+
Defect rate (defects/trucks produced) ^a	2.12	2.10	0.59	0.59	0.75	0.67	0.28**	+
Sickness absence rate	17.32	0.00	19.69	0.00	3.82	0.00	NA	+
Perceived team performance	5.00	0.94	–	–	5.17	1.18	–0.21	≈
<i>Commodity</i>								
Productivity rate ^a	23.07	3.14	27.29	4.23	31.75	2.23	0.09**	+
Delivery reliability rate ^a	89.75	8.77	91.48	6.36	91.49	8.10	0.96	+
Service reliability rate ^a	92.97	6.99	93.21	7.00	96.28	3.95	0.78**	+
Sickness absence rate ^a	4.83	1.69	5.85	1.57	7.01	3.69	0.75**	–
Perceived team performance	5.88	0.76	–	–	5.53	1.15	0.58	≈
<i>Government</i>								
Productivity rate ^a (as a function of the norm)	157.00	409.82	201.42	186.98	131.13	27.19	0.87*	–
Weekly backlog	863.77	514.64	859.85	434.47	387.92	121.76	0.30**	+
Case lead time (# days)	26.73	17.14	40.33	19.91	22.80	11.28	0.60**	+
Quality rate ^a	96.66	4.55	97.65	4.17	98.23	3.22	0.87*	+
Perceived team performance	4.31	0.81	–	–	3.79	0.79	1.31	–
<i>Insurance</i>								
Productivity per hour	494.30	174.32	708.88	176.31	617.06	127.01	0.41**	+
Customer loyalty ^b	–13.00	0.00	–16.00	0.00	–16.00	0.00	NA	≈
Perceived team performance	5.58	0.55	–	–	5.00	0.68	3.12**	–
<i>Mail</i>								
Productivity per hour	1,208.05	190.41	1,253.52	227.37	884.26	324.87	0.51**	–
Planned productivity per hour	1,139.36	216.51	1,307.87	496.01	958.66	440.91	0.72**	–
Efficiency rate ^a (productivity/planned)	1.09	0.23	1.02	0.25	0.99	0.26	0.91 [†]	–
Sickness absence rate ^a	11.11	9.79	3.38	5.07	9.90	2.63	0.41**	+
Perceived team performance	5.73	0.39	–	–	4.83	0.92	2.70*	–

Note(s): *M* = Mean; *SD* = standard deviation. The *T*s correspond to Figure 2. For each objective performance indicator a one-way repeated measures analysis of variance was conducted: the Wilks' lambda coefficients are reported here. For the perceived team performance variable a *t*-test was performed, based on the surveys at T2 (*n* = 55) and T4 (*n* = 45). The coefficients are in the second column from the right: [†]*p* < 0.10; **p* < 0.05; ***p* < 0.01 (two-tailed). The last column reports our interpretation of the level of improvement (Δ) of each performance indicator: + = improved; ≈ = neutral; – = decreased

^aAll these rates are in percentages

^bWe used a firm-level measure on a scale from +100 (only loyal customers) to –100 (only disloyal customers)

Table 6.
Team's performance differences: T1/T2 (year 1) to T4/T5 (year 3)

each team's score on each separate indicator had either improved (in line with lean's adage of continuous improvement), decreased or stayed more-or-less the same over time. This led us to split the five teams into two groups: the teams that continued improving their high performance versus the three lower-performing ones.

In terms of the minutely coded team leader and member behavioural video-data, the inter-rater reliability was first checked through automatic flagging of more than two seconds of variance between the raters' assigned codes; their initial agreement was 80%: They then discussed the contested fragments. The final agreement rates were 97.9% for T2 and 100% for T4. The standardised frequencies of leader and member behaviours, categorised per work setting and per time, were analysed in various ways. First, the behavioural differences (comparing T2 with T4) were examined with two-tailed tests (Table 7). Paired samples *t*-tests

Table 7.
Observed team leader and team behaviours during filmed meetings and daily work, in % mean frequencies: T2 vs T4

Behaviours	Truck			Commodity			Government			Insurance			Mail							
	Meetings T2	Daily work T2	T4	Meetings T2	Daily work T2	T4	Meetings T2	Daily work T2	T4	Meetings T2	Daily work T2	T4	Meetings T2	Daily work T2	T4					
<i>Team Leader</i>																				
Relations	29.25	50.85	46.62	49.65	55.62	54.60	38.84	49.08*	52.89	55.21	55.70	71.45*	51.43	56.21	57.55	58.80	31.09	31.57	44.62	46.49
Task	69.94	45.37	52.91	47.87	43.79	45.40	60.63	48.58*	47.11	42.31	43.94	25.44*	48.33	40.47	41.26	40.44	66.89	68.43	54.72	51.19
Counterprod	0.81	3.78	0.45	2.48	0.59	0	0.53	2.34	0	2.48	0.36	3.11	0.24	3.32	1.19	0.76	2.02	0	0.66	2.32
<i>Team</i>																				
PerfMonitor	15.85	19.99	7.65	5.09	16.05	33.93	10.00	4.16	14.94	15.07	11.34	8.95	12.01	10.34	2.91	0.66*	15.19	0.86	8.52	1.90*
InfoSharing	24.67	10.80	10.16	10.13	31.48	39.29	8.33	11.79	30.51	23.52	12.73	10.44	37.37	39.26	12.22	23.31	19.58	8.74*	11.01	4.89 [†]
Peer support	28.60	37.72	42.30	52.47 [†]	9.88	4.17	42.03	38.83	26.91	15.14	48.30	48.56	12.94	5.29	51.90	45.70	17.13	11.26	46.44	54.14
Process Impr	2.94	9.90	2.34	2.04	37.65	11.31*	0	11.57	21.91	19.26	6.87	5.99	36.44	17.43*	13.03	6.97	10.05	8.36	6.28	4.11
Counterprod	27.94	21.59	0	1.59	4.94	11.31	0	2.82	5.65	27.01*	2.48	1.63	1.24	27.66	0	0.65	38.04	70.78 [†]	0.08	1.57 [†]
ExIndivTask	—	—	37.56	28.74*	—	—	39.64	30.83	—	—	18.28	24.42	—	—	19.96	22.72	—	—	27.68	33.44

Note(s): The Ts correspond to Figure 2. Relations = Relations-oriented; Task = Task-oriented; Counterprod = Counterproductive; PerfMonitor = Performance monitoring; InfoShar = Information sharing; Process Impr = Process improvement; ExIndivTask = Executing individual tasks. The percentages represent the mean relative frequency a behaviour was displayed by each team's leader or the teams during the filmed meetings and daily work settings. The observed behaviours for each meeting and daily work setting add up to 100%; rounding differences may have occurred. The Ts correspond to Figure 2. A t-test (2-tailed) showed significant differences between T2 and T4: [†]p < 0.10; *p < 0.05; **p < 0.01 (two-tailed)

were executed to determine how team leaders distributed their task and relations-oriented behaviours during the filmed meetings and daily work settings at T4. Another set of paired samples *t*-tests explored whether the team behaviours of the higher- and lower-performing teams had changed significantly between T2 and T4.

The qualitative data was analysed to deepen our insight into each team's context and the actors' behaviour-value patterns as well as to solve the puzzle "why" there were such apparent performance improvement differences between the teams (through the "focusing on puzzles" strategy; Grodal *et al.*, 2021, p. 4). The field notes, retrospective interview transcripts, and annual reports were carefully reviewed in multiple rounds by the first author and four Business Administration Master's students (through the "asking questions" strategy; Grodal *et al.*, 2021, p. 4). While categorising the data, initially using deductive analysis and forming team narratives (Gehman *et al.*, 2018), we started highlighting quotes and observations through thematic content analysis, and counting the search terms in the data. Qualitative accounts of each team's higher-level leader support for lean and team leader and member behaviours are in Table 8, including observations *and* direct quotes.

The higher-level leader values expressed in the annual reports and organisational websites were categorised into Schwartz *et al.*'s (2012) four values clusters and then compared with the team leaders' and members' self-reported scores in those same clusters: Averages of 5.60 (on the scale of -1 to 7) and higher were deemed *congruent* with their higher-level leaders' values; averages below this threshold were non-congruent (Table 9).

4. Results

After comparing the performance indicators (Table 6), it was clear that two of the five teams continued improving their *high* level of performance. The first, Truck team kept improving their costly number of "full line stops" and their defect and sickness absence rates. Despite an increase in sickness absence rate, the second team (Commodity) stepped up productivity, as well as delivery and service reliability. Despite their favourable starting positions as high-performing teams, the three other teams became *lower performers*: The Government team's productivity and perceived team performance decreased (even though their backlog and average case handling time had improved). Almost all of the Insurance and Mail teams' objective operational performance indicators had decreased as well as their perceived performance.

The two teams that consistently improved their already high performance level will now be compared with the three lower-performing teams, in terms of their (1) higher-level leader, (2) team leader and (3) own behaviours and (4) values.

4.1 Higher-level leader behaviours

The two consistently high-performing teams (Truck and Commodity) received continuously higher-level leader support for lean. These leaders stuck to their lean strategy, which was frequently emphasised in their annual reports and through wall posters (Table 8). One of them noted: "[our strategy] is ingrained in people's mindset". Moreover, these higher-level leaders were daily physically present and accessible for both teams: together with the team leaders they participated regularly in the teams' meetings and scheduled Gemba walks. They also offered abundant tangible resources for process improvement such as real-time team performance dashboards, training and lean excursions together with workflow employees (Table 8). A new middle manager who was appointed from within the Truck team at T3 continued the face-to-face support for lean. In addition, the higher-level leaders celebrated performance-improvement successes with cake, compliments (for instance when team members had initiated improvements to reduce lead time) and visits from global directors (Table 8).

The three other teams (Government, Insurance and Mail) received far less face-to-face higher-leadership support: Despite the fact that their higher-level leaders had embraced lean for quite a bit

	T1/T2 (year 1)	T3 (year 2)	T4/T5 (year 3)
<i>Truck</i>			
HLLs	Lean mentioned six times in annual report; daily Gemba walks and SOP examinations; “if everyone thinks about process optimisation, improvements will occur much faster, with better solutions”; cakes to celebrate high quality	Lean mentioned seven times in annual report; daily Gemba walks and SOP examinations; middle manager gets promoted: Replaced by a team leader; lower production targets leads to the lay-off of temporary staff	Lean mentioned eight times in annual report; daily Gemba walks and SOP examinations; team is split into a morning and evening shift; “[our strategy] is ingrained in people’s mindset”
TL	TL brings coffee, changes garbage bags and helps to solve production problems: He tries out solutions himself	“We started to pilot-test SOPs for the TL. He came to visit us every two hours”	When a TM forgets to execute a part of the SOP, the TL rectifies this; TL thanks a TM for noticing an error
TMs	Performance figures and mistakes are discussed during the daily meetings; TMs joke a lot and get coffee for one another	TMs are up to date in terms of the production targets; “during that period I improved our SOPs”; “Our team board enabled us to monitor the status of ideas”	“I know how it can be improved and I read a lot about lean to educate myself”; people smile and joke; when a TM notices a mistake, he stops the full production line
<i>Commodity</i>			
HLLs	Lean mentioned nine times in annual report; plant director promotes lean; regular Gemba walks; new digital team performance dashboard; “collaboration (. .) is key”	Lean mentioned three times in annual report; plant director promotes lean; regular Gemba walks; new storage boards and a pallet truck; visit by global directors	Lean mentioned three times in annual report; plant director promotes lean; regular Gemba walks
TL	TL is often on the workfloor; solves issues; laughs and jokes often. During meetings he shares improvement ideas	TL tries to improve his amount of listening to TMs. He is involved in process optimisation	TL jokes a lot with TMs, manages process improvements, but rarely gives compliments
TMs	Individual TMs are very driven and motivated. They want to reach the highest production targets; communication with TL during team meetings is only one-way	“I did well today, my production was higher than John’s”. “During the kaizen we opted to place cameras above our machines to ease our monitoring. We have just bought them”	TMs take over each other’s machines during breaks; “I help my colleagues when I see it is needed”; when their dashboard shows “red” figures, TMs work hard to turn them “green”
<i>Government</i>			
HLLs	Lean not mentioned in annual report; “I got infected by the lean virus”; politically imposed downsizing; “we need more time to implement lean than given”	Lean not mentioned in annual report; new lean-minded higher-level manager; TL is asked to manage a second team; the director and lean programme manager come to visit	Lean not mentioned in annual report; reorganisation; reduced attention for lean
TL	The TL smiles and jokes a lot. He does not intervene in the team conflict and does not seem to grasp the performance figures	“As I assumed things were going well, I shifted my attention to my new team. But the two rooms started quarreling again”	“Our leader’s role in solving our team conflict is minimal”; “He always praises us”; “daily meetings are not held daily”

Table 8. Illustrative observations and quotes of higher-level leaders (HLL), team leaders (TL) and team members (TMs)

(continued)

	T1/T2 (year 1)	T3 (year 2)	T4/T5 (year 3)
TMs	A TM explained how people of the other room did not join the team for a coffee break, apparently due to a conflict	“Continuous improvement also diminished. How many ideas are actually being shared now?”	“If the survey was just about my room, I would give higher scores”; A newcomer’s ideas “were not accepted by coworkers”
<i>Insurance</i>			
HLLs	Lean mentioned once in annual report; strategy focuses on customers; kaizen events are held regularly	Lean mentioned four times in annual report; reorganisation; TL fired; new but malfunctioning IT system	Lean mentioned three times in annual report; reorganisation (ongoing); new TL; IT system optimised
TL	TL often answers questions and regularly walks to people’s desks to have a chat, both formally and informally. She jokes a lot and focuses on a good team climate	An interim TL is appointed; “TL’s top-down push on facts and figures blocks our creativity”; “Each TL has different team performance ambitions”	Although the new TL is often in meetings with higher-ups, she socialises and shows individual consideration to TMs; the other TL is often sick and therefore absent
TMs	Issues are discussed elaborately during meetings and TMs look for solutions; “you learn from mistakes”; “ideas are mostly raised by the same TMs”	“After our lean-supportive TL was fired, TMs felt they could not talk freely. We kept improving, but our focus on lean diminished”; “We did not always have time for weekly meetings due to backlogs”	“TMs become annoyed by those who walk the extra mile”; “TMs take on tasks in order to secure their own jobs . . . they do not cooperate”; “ideas are shared by the same TMs”; senior TMs chair daily meetings
<i>Mail</i>			
HLLs	Lean not mentioned in annual report; lean-minded plant director; wall posters of the firm’s strategic focus on “excellent sorting” and reducing waste are hung strategically in the hallway; “Why is he visiting us? The attitude when walking the Gemba is key”	Lean not mentioned in annual report; reorganisation: Many permanent workers laid-off and low-wage, temporary, part-time workers recruited; team tasks moved to other departments	Lean mentioned twice in annual report; new plant director; second reorganisation; TL is dismissed and not replaced; new mail sorting lay out; no funds for small improvements; “the reorganisations are piling up”
TL	TL makes jokes and explains his personal situation during the meeting and avoids TMs’ questions during daily shifts	“You can depend on him. . . if you have some concerns. . . you can cry and laugh with him. He is just a great person”	The TL socialises with TMs but also warns when TMs are joking around; “leading such a large team is hard: I do not have enough time”
TMs	“By T2, we were actively adopting lean on our workfloor. All garbage was thrown away, we stuck visual lines on the floor”	“The reorganisation led to quite a bit of turmoil among TMs”; “A specialised improvement team repaired broken items”	5S revival action; “I am working extra time <i>only</i> because I like the TL”; “six months ago, lean practices were still up and running”

Note(s): HLLs = Higher-level leaders; TL = Team leader; TMs = Team members; SOP = Standard operating procedure. These representative observations and quotes of people in and around the teams are based on: interviews with the higher-level leaders at T1; content-analyses of the president’s letters and mission statements in the annual reports, field notes, an open-ended question in T4’s survey; and T5 retrospective group interviews. The Ts correspond to [Figure 2](#)

Table 8.

Table 9.
Work values
congruence of the three
actors per team
over time

	Truck		Commodity		Government		Insurance		Mail		
<i>HLLs</i>	Self-transcendence Openness to Change		Self-transcendence Openness to Change		Conservation		Self-transcendence Openness to Change		Conservation		
Examples ^a	Customer First (create customer value)	Respect for the Individual (utilise members' skills for continuous improvement)	Innovation (encourage new idea generation)	Recognition (show interest in people)	Credibility (keep promises)	Responsibility (deal well with responsibilities)	Respect for Every Human Social Progressiveness	Societal Involvement Customer Focus	Honesty Fairness Transparency (all these values aim to keep the trust of external business partners)		
	Quality (continuously improve products and services)	Communication (commit to develop our people)	Growth (commit to active, open dialogue)	Carefulness (treat people with respect)	Teamwork (use collective experience)	Trust (have confidence in people)					
	T2	T4	T2	T4	T2	T4	T2	T4	T2	T4	
	ST	OC	ST	OC	CON	CON	ST	OC	CON	CON	
<i>TL^b</i>	4.80	6.60	5.90	6.60	6.20	5.60	5.60	6.60	6.60	5.40	6.30
<i>TMs^b</i>	6.10	5.73	5.88	5.90	6.20	6.64	5.88	6.30	5.19	6.10	5.34
Note(s):	Higher-level leaders; TL = Team leader; TMs = Team members										
	^a The examples of higher-level leaders' espoused values were derived from annual reports and official organisational websites; these values did not change between T2 and T4 (these Ts correspond with those in Figure 2). These higher-level leaders' values were categorised by two independent raters, based on Schwartz <i>et al.</i> 's (2012) values clusters: self-transcendence (ST), self-enhancement (SE), openness to change (OC), and conservation (CON)										
	^b Team leader's and members' work values congruence with the categorised higher-level leaders values was defined based on a survey of team leader's and members' own values, on a -1-7 point Likert scale. The <i>italic-faced</i> averages of 5.60 and higher were deemed congruent with their higher-level leaders' values										

of time and some were “infected by the lean virus” (Table 8), the team leaders and members saw them at T1 as top-down controlling. For example, during a workflow visit some employees complained: “Why is he visiting us?” Hence, “the attitude when walking the gemba is key” (Table 8). The initial lean support from high-level leaders faded when they were replaced. Although the new managers did continue some level of financial support for the existing organisation-wide lean programmes, they only visited the teams incidentally, or not at all, thereby also missing chances for dialogue with team leaders and the teams. Lean was not kept as a strategic priority, given that it was not or rarely mentioned in the three annual reports from the organisations in which those teams were embedded (Table 8). Furthermore, the popular Insurance and Mail team leaders were fired by their higher-level leaders (at T2 and T5, respectively) and, from T3 onwards, lean resources were restricted due to reorganisations (Table 8). Consequently, from T3 onwards, short-term cost cutting occurred; malfunctioning IT systems or clocks (imprinted with “quality is being on time”) were not allowed to be repaired at T4, etc.

4.2 Team leader behaviours

The leaders of the two teams that continued improving their high performance balanced their relations- and task-oriented behaviours between T2 and T4 (Table 7). This was visible both during T4’s start-up meetings ($M_{task-oriented} = 45.39; M_{relations-oriented} = 52.73; df = 3, t = -1.76; p = 0.18$) and daily work settings ($M_{task-oriented} = 48.22; M_{relations-oriented} = 49.36; df = 3, t = -1.07; p = 0.36$). Specifically, we video-observed both team leaders engaging more in active listening and information sharing at T4 while decreasing their task monitoring. Daily start-up meetings took place around huddle boards whereby the team leader reported back on how the higher-level leaders had decided to implement the team’s solutions for issues that had been flagged by the team the previous day. The Truck team’s leader’s day was organised via the “leader standard work” tool: His time schedule hung on the team’s communication board. This included spending half of the time on the workflow. His individualised consideration was visible through bringing coffee, socialising with team members and giving compliments (Table 8). The Commodity team leader also showed an equal amount of relations- and task-oriented behaviours at T4 (almost 50–50%). Over time, he participated in process improvements and improved his active listening skills (Table 8).

Contrastingly, the leaders of the three lower-performing teams demonstrated, at T4, more relations-oriented behaviours in their daily work ($M_{task-oriented} = 39.02; M_{relations-oriented} = 58.91; df = 5, t = -2.11; p = 0.09$). Given that marginally significant differences were found in this small sample, it points to a trend that might show more prominently in large-sample studies. The finding was corroborated by the qualitative data: Especially the Government team leader significantly increased his relations-oriented behaviour during daily work settings, by providing individual consideration and agreeing more with his team members (Table 7). A Government team member noted: “He always praises us”. Also the Insurance team leaders at T4 socialised and showed individual consideration during the work day (Table 8). The Mail team leader socialised with team members during their shift but also gave warnings when team members joked around too much (Table 8).

During the videotaped meetings at T4 the leaders of the three lower-performing teams showed (marginally significantly) more task-oriented behaviours ($M_{task-oriented} = 58.59; M_{relations-oriented} = 40.35; df = 10, t = 1.95; p = 0.08$). Especially the Mail team leader stepped up his task delegating and left little room for employees to respond during the drastically shortened start-up meetings (Table 7). He even restricted members’ joking; he himself stated: “Leading such a large team is hard: I do not have enough time” (Table 8). At T4, several members of the Insurance team complained about their leaders’ increased task monitoring; they were also even absent during meetings at T4 (Table 8). But in contrast to the Mail and Insurance team leaders, the Government team leader did not seem to grasp, already at T2, the performance figures that were readily available. Perhaps because of it, at T4 he had reduced

his task-oriented behaviours and a team member noted: “The supposed daily meetings are not held daily” (Table 8).

4.3 Team behaviours

Between T2 and T4, the two highest-performing teams increased their performance monitoring during meetings, either through task monitoring or correcting (Table 7). Their members were constantly up to date with the production targets, displayed on real-time dashboards. They maintained their level of information sharing and provided considerable peer support through active listening, individual consideration and laughter. The Truck team members even increased their active listening significantly over time. At T4, a Commodity team member said: “I help my colleagues when I see it is needed” (Table 8). In terms of process improvement, the Truck team members placed sticky notes with improvement ideas on their huddle board; the members often agreed with those ideas after discussing them during start-up meetings. In fact, both teams actively improved their processes; at T4, this occurred especially through more frequent kaizen events and members’ participation in improving SOPs outside of start-up meetings.

A paired samples *t*-test comparing the video-coded behaviours of the three lower-performing teams at T2 and T4 showed that the initial peer support had decreased significantly in the meetings at T4 ($M_{T2} = 18.99$; $M_{T4} = 10.57$; $df = 2$, $t = 4.82$; $p = 0.04$). At the same time, their counterproductive behaviour had increased significantly ($M_{T2} = 14.97$; $M_{T4} = 41.82$; $df = 2$, $t = -8.17$; $p = 0.02$): there was a stark increase in showing disinterest over time in all three lower-performing teams (Table 7). Indeed, during the taped meetings we observed many members were engaged in side conversations or making facial gestures, like rolling their eyes, while others were talking. Some members even believed that colleagues cheated when registering their production numbers. In two of those three teams (Insurance and Mail), performance monitoring decreased significantly and process improvement was reduced (Table 8). An Insurance team member noted: “. . .our focus on lean diminished” (Table 7). Over time, meetings were cancelled increasingly, while the Mail team’s start-up meetings were drastically shortened and “only the ‘usual suspects’ come up with ideas” (Table 8). Along with the reduced higher-level leader support for lean, the three lower-performing teams gradually reduced their display of the four identified viable lean team behaviours.

4.4 Leader and member values linked to behaviours

The values endorsed by the actors in and around the two teams that continued improving their already high performance belonged to the self-transcendence and openness to change clusters (Table 9). The higher-level leaders’ espoused self-transcendence (such as respect and teamwork) and openness to change (i.e. quality and innovation) was apparent in their “peptalk”; A Truck higher-level leader stated at T2: “If everyone thinks about process optimisation, improvements will occur much faster, with better solutions” (Table 8). At T2, the Commodity higher-level leader explained that “it is not just a matter of having many highly-skilled team members, but the collaboration within the team is also key. If you have five super soccer players, you still need a goalkeeper” (Table 8). Congruent with what these higher-level leaders said, the team leaders and members scored high in terms of those values (Table 9). The self-transcendence values were also enacted by them through the abovementioned support. In line with the team leaders’ and members’ openness to change, the teams engaged more in process improvements and, while their leaders reduced performance monitoring, the teams showed more of it. In the teams that kept improving their performance, over time, all three actors’ behaviours became more closely aligned to their values.

At T4, the leaders and members of the three lower-performing teams had either partially incongruent values (Insurance) or reverted back to conservation-oriented values (Government and Mail). In terms of the Insurance team, their higher-level leaders' desired respect for every human (befitting self-transcendence; see Table 9), was not visible. Instead, at T3, the team saw their (beloved) team leader getting fired and replaced by a more conservative, fact-checking interim team leader (Table 8) while the reasons for the dismissal were kept vague. Despite their higher-level leaders' focus on customer-centric innovation, the teams rarely showed any actionability on this score, diverging from the values printed in the annual report (Table 8) while also scoring lower on openness to change (Table 9). Over time, all three teams decreased their focus on continuous improvement. In line with the Government and Mail higher-level leaders' conservation-oriented values (such as credibility, carefulness and fairness), both teams also showed limited process-improvement behaviours at T4 and, instead, resisted change and had difficulties adapting to new work procedures. This was reinforced by their mainly absent higher-level leaders and ongoing reorganisations. By T4, the Mail team leader had stepped up his conservation-orientation (Table 9). He explained: "We simply have no time for realising improvements".

5. Discussion

This abductive longitudinal field study uncovers how micro-level behaviour-value patterns of three intra-organisational actors are associated with the performance improvement of already high-performing lean workflow teams. Using a diverse array of methods for identifying higher-level leaders', team leaders' and the team's patterns, we also uncover a joint learning dynamic as a stable, collective activity pattern among these actors. We interpret this dynamic as a capability that explains why two of the five studied lean teams continued improving their already high team performance, and label it "coactive vicarious learning-by-doing", as will be defined next. Figure 3 summarises the findings in an effort to enrich the initial conceptual model, and corresponds to state-of-the-art in dynamic input-mediator-output-input team modelling (Ilgen *et al.*, 2005; Mathieu *et al.*, 2017). In the next paragraphs, four propositions are developed that portray the core findings and draw implications for large-scale deductive theory testing purposes.

Through quantitative and qualitative coding, we uncovered the nature of the behaviour-value patterns of high-performing lean teams and their (higher-level) leaders who kept improving their performance. Besides the expected verbal support, strategic clarity and resources (for lean practices), the higher-level leaders of the teams that continued to improve their already high performance offered frequent *face-to-face* support, thereby showing strong lean engagement (Van Beers *et al.*, 2021). Through their daily presence in the teams, the higher-level leaders built a relationship with the team while learning about its task-related challenges and performance (Sadun *et al.*, 2017). After the higher-level leaders witnessed that these forms of support were welcomed and paid off, they continued with it.

Similarly, the leaders of the teams that continued improving their performance attuned their behaviours over time; they dialogued with both the teams and their higher-level leaders, and offered factual information about goals, tasks and possible improvements (see also Secchi and Camuffo, 2016; Worley and Doolen, 2006). Due to their day-to-day interactions with the team, the team leaders adjusted their behaviours (Camuffo and Gerli, 2018; Tortorella *et al.*, 2017, 2020) so that, over time, they gradually *balanced* their relations- and task-oriented behaviours. Meanwhile, the teams mimicked and took over their team leader's relations-oriented provision of support and task-oriented performance monitoring, including information sharing and improving processes. These behaviours were also boosted via the lean practices in place that were actively used by them, such as the readily available visual performance dashboards (De Treville and Antonakis, 2006;

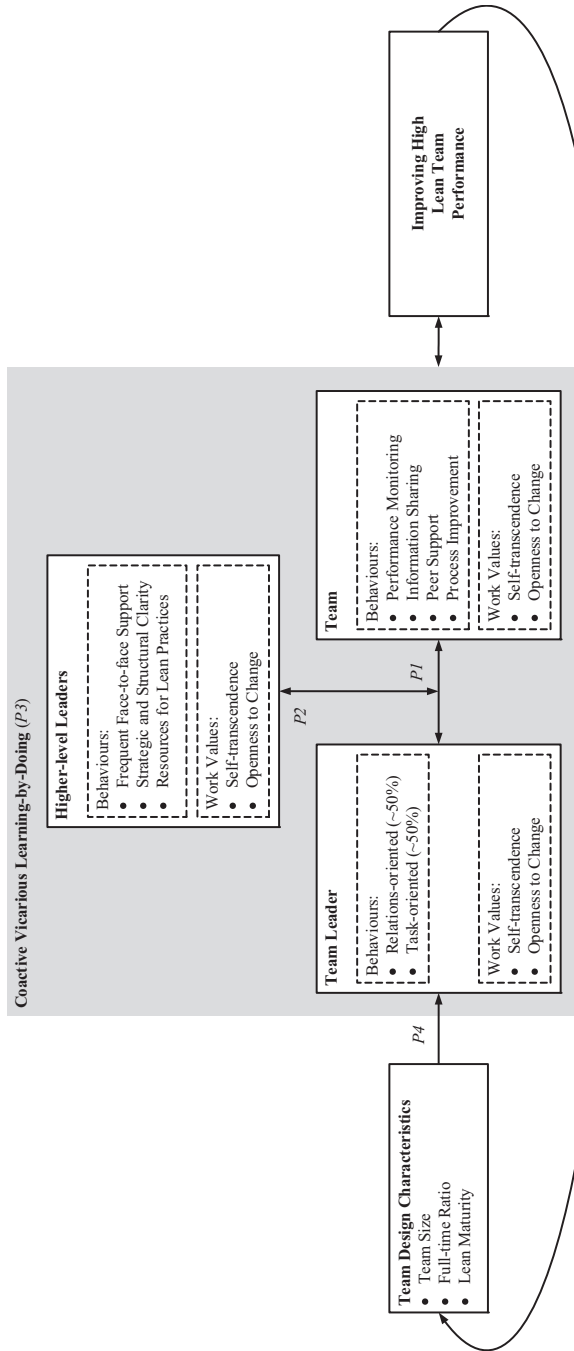


Figure 3.
Proposed model of
improving high lean
team performance

Hirzel *et al.*, 2017). It is as if team leaders who observe proactive lean team behaviours learn that they can relax their initial emphasis on task control and, instead, put more effort into strengthening the team-relevant relational ties. This team leader behavioural pattern aligns well with De Leeuw and Van den Berg (2011, p. 227) who stated that for shopfloor performance improvement to happen, team leaders should apply “a leadership style that focuses on task and relation equally”. Contrastingly, team leaders who remain, over time, either overly task- or relations-oriented, may either limit their teams’ improvement efforts, or reduce their efficiency, respectively, which is likely to curb a team’s potential performance improvement (Yukl, 2012).

The behavioural patterns in and around the lean teams that continued their performance improvement match well with each of the three actors’ self-transcendence and openness to change type values (see also Van Dun *et al.*, 2017). Over time, all three actors *aligned* their behaviours to express those self-transcendence and openness-to-change type values more fully. In line with both type of values, the members and leaders of those teams transcended their own interests and continued to collaborate well, continuously improve their operations and ensure the resources to do so. Indeed, a recent study by Groves (2020) found that employees’ self-transcendence and openness-to-change values, especially if their leaders espouse the same values, leads them to act upon change (or continuous improvement) as an opportunity for personal development. Certainly at T4, the three actors’ values of the two teams that continued improving their already high level of operational performance were strongly aligned with their shown behaviours.

Our observations enrich the social learning theory because teams do not only mimic their leaders, as suggested by Bandura (1977), but highly performing teams can also drive their leaders to strengthen the level of congruence in their behaviour-value pattern. For example, leaders may start to reinforce performance-monitoring team behaviours once they notice that those team behaviours lead to operational improvement. Alternatively, leaders may develop more relations-oriented behaviours (like the Commodity team leader) once they notice their team attains success in part because of such relational peer-supportive team behaviours. The new model (Figure 3), therefore, draws reverse arrows which are meant to reflect such *simultaneous or reciprocal* top-down and bottom-up social learning between team leaders and teams that keep improving their already high performance. Hence:

Pl. Improving high lean team performance requires distinct, aligned behaviour-value patterns from both teams and team leaders.

We initially expected higher-level leader impact on workforce teams through team leaders but actually our higher-level leaders either *strengthened or reduced* the effect of lean-supportive team leaders’ behaviour and their values on teams. Previous publications had already highlighted the importance of distinguishing lean leadership at multiple organisational levels (e.g. Netland *et al.*, 2019; Tortorella *et al.*, 2017). This study goes a step further by proposing a conditional or moderation effect of higher-level leaders’ behaviour-value pattern on the relationship between team leaders and their teams (Proposition 2). This is because higher-level leaders’ frequent face-to-face workforce presence enables them to role-model *and* learn from their team leaders and teams. We noticed from the two lower-performing teams (e.g. Insurance and Mail) that the effects of initially lean-supportive team leaders on their teams can be curbed when higher-level leaders do not show such consistent support. Similar effects have been suggested by other Operations Management (OM) scholars: Higher-level leaders are important shapers of organisational culture, which was proposed to moderate the link between OM practices adoption and performance (Marshall *et al.*, 2016). Magnani *et al.* (2019) prescribed that lean managers’ mentoring activities do moderate employee outcomes.

Our proposed moderation effect also differs from Nonaka’s middle-up-down management theory that suggests a central role for team leaders as linking pins between higher-level

leaders and workflow teams (Nonaka, 1988; Nonaka *et al.*, 2016). Instead of team leaders vertically translating workflow team interactions to higher-level leaders (Balogun, 2003; Huy, 2001; Nonaka, 1988; Nonaka *et al.*, 2016), a more dialogic, direct type of communication was observed here between the three actors in and around the teams that continued improving their already high level of performance, held together also by the congruent work values among them. In fact, this finding matches the more recent adaptive view on middle managers and the importance of dynamic interactions within and across organisational units for (lean) strategic sensemaking and implementation (Weiser *et al.*, 2020). Heyden *et al.* (2017) actually called for novel theorising about how both higher-level and team leaders' roles interact in realising strategic change, beyond top-down or bottom-up reasoning. Hence:

- P2. Higher-level leaders' frequent face-to-face workflow presence enables them to role model *and* learn from the behaviours and values of their lean teams and leaders, which moderates the relationship between lean team leaders and teams in improving their high team performance.

Furthermore, a stable, collective activity pattern in and around the teams was uncovered that explains *how* the cross-level aligned patterns of behaviours and values emerge over time. This pattern, "*coactive vicarious learning-by-doing*", is defined as "a relational process of coconstructed, interpersonal learning that occurs through discursive interactions between individuals at work" (Myers, 2018, p. 610). "Vicarious" means that people can learn from merely observing and interpreting (and not necessarily executing) others' behaviours and the consequences (Myers, 2018). In a follow-up study, Myers (2021) showed a positive relationship between coactive vicarious learning within MBA student teams and their performance; we observed this effect here in and around real lean teams. In particular, the two teams that kept improving their high performance showed a "doing" type of learning that matched their reflexive type of "talking" during start-up meetings, hence, *learning-by-doing* (Anzai and Simons, 1979; Argote and Miron-Spektor, 2011; Arrow, 1962; Berends and Antonacopoulou, 2014; Danese *et al.*, 2017; Epple *et al.*, 1996; Spear and Bowen, 1999). Learning from doing may happen after and during the frequent higher-level leaders' Gemba walks. The Gemba walks allow them to see with their own eyes and learn what is needed on the workflow while actively observing, interacting about and supporting process (and subsequent team performance) improvement. At the same time, workflow teams and their direct supervisors can learn from higher-level leaders' observations and intellectual stimulation. Such collective two-sided learning-by-doing in a lean context is a hierarchy-crossing process. An infrastructure of lean practices, enabled by higher-level leaders, seems to fuel this joint learning process, for instance during joint SOP examination meetings (like among the Truck team) and daily start-up meetings (Anand *et al.*, 2009). Van Beers *et al.* (2021) also noted, in a lean context, a hierarchy-crossing learning process through co-creative role-modelling of lean by top management, in conjunction with team leaders and their teams.

Seemingly ingrained team behaviours and values are found to fade when their leaders become invisible or reduce their regular face-to-face interactions with the team. Frequently absent leaders have fewer chances to transmit to and learn from the workflow what it takes to persist in improving their already high team performance. Despite the dictum "success breeds success", and the fact that high-performing lean teams engender "employee pull" (Keating *et al.*, 1999, p. 123), a team's behaviours and values, and consequently its performance improvement, can wane when higher-level leaders do not participate in the coactive vicarious learning-by-doing. Netland and Ferdows (2014) illustrated how impatient senior leaders withdraw their team support when they assume fewer future benefits. Hence, a less visible leader can have adverse effects on a team's level of psychological safety, which is a key to (lean) team learning (Van Dun and Wilderom, 2012).

Improving already high lean team performance thus requires patterns of specific values and matching behaviours from the cross-level actors, shaped through coactive vicarious learning-by-doing. This interpretation aligns well with [Secchi and Camuffo \(2016, p. 79\)](#) who noted that a successful lean system requires a “dynamic approach to learning and knowledge creation rather than simple replication”. The coactive vicarious learning-by-doing uncovered here provides a foundation for a lean team to flourish and may, in turn, contribute to developing a lean system dynamic capability. This meso-level dynamic capability differs from both cognitive dynamic managerial capabilities ([Helfat and Peteraf, 2015](#)) and zero-level or second-order capabilities ([Barreto, 2010; Schilke, 2014](#)). First, coactive vicarious learning-by-doing does not only entail cognitive learning but also behavioural learning-by-doing. It should be noted that this is a much more active and affective relational type of learning by doing than the “passive experiential” learning proposed by [Zollo and Winter \(2002, p. 340\)](#). Second, the identified capability here appears to be difficult to maintain, as shown by the three lower-performing teams in this study. The third proposition is thus:

- P3.* The cross-level aligned behaviour-value patterns of lean teams and their leaders emerge through their coactive vicarious learning-by-doing, which leads to improving their high team performance.

A final theoretical implication deals with the importance of contextual factors for lean leader behaviours ([Seidel and Saurin, 2021; Seidel et al., 2019; Tortorella et al., 2018](#)). The two lean teams that continued improving their performance may have benefited from their size. Balancing both relations- and task-oriented behaviours is more difficult in large teams where often a single leadership style is seen ([Tortorella et al., 2018](#)). Next, the consistently high-performing teams had a relatively high full-time employment ratio. When a team has more full-timers, the leaders can reduce their task instruction over time and then invest in more leader-member exchange relationships ([Seidel et al., 2019](#)). The amount of team leader task-instruction may have also been influenced by the fact that the three lower-performing teams were less experienced in lean and used fewer lean practices ([Bhasin, 2012; Negão et al., 2020](#)). Although each team’s organisation had implemented lean widely when the study began, and these lean programmes continued throughout the three years of the study, the two higher-performing teams’ organisations may have accelerated into an even more advanced lean stage during this period ([Negão et al., 2020; Netland and Ferdows, 2016](#)). Moreover, given that both teams which continued improving their high performance were embedded in manufacturing companies, whilst the others were from service organisations, means their machine-led work pace may have created more tangible problems which accelerated the learning opportunities and thus their lean maturity ([Netland et al., 2021](#)). Similarly, [Tortorella and Fogliatto \(2017\)](#) stressed the connection between lean maturity and a leader’s provision of support. When teams start to slack in performance improvement, their higher-level leaders may decide to modify the team design characteristics, e.g. via reorganisations, as was apparent in the three lower-performing teams. Therefore:

- P4.* A combination of contextual team variables such as size, full-time ratio and lean maturity, may affect team leaders’ behavioural pattern so that they, in turn, can guide their lean teams better to continue improving their already high level of performance, which may affect the team design characteristics.

6. Practical implications

Our findings revoke a widespread idea that improving lean team performance only concerns workfloor employees and formal back up from top executives ([Terry, 2018](#)): higher-level leaders must invest substantially, and even physically, in their workfloors. Daily Gemba

walks by them, and also by their lower-level managers, enable coactive vicarious learning-by-doing in and around lean teams, even if they are already high performing. If such a stable learning pattern is stimulated regularly by the higher-level leaders, befitting their self-transcendence and openness-to-change work values, the team leaders and members will continue improving their own work processes and performance. Visiting the workflow regularly enables higher-level leaders to learn about lean's implementation benefits and what kind of support they should offer next. Thus, senior managers cannot simply delegate their lean support to consultants (Van Beers *et al.*, 2021). Instead, consultants' interventions may need to ensure regular value-adding dialogues among the various leaders and their lean workflow teams which, in turn, could help establish the aligned behaviour-value patterns depicted in Figure 3.

7. Strengths, limitations and future research

Our longitudinal study of diverse teams "in the wild" uses objective *and* perceptual team performance data as well as behavioural precision through video-based coding, linked to people's values at three hierarchical levels. The small sample size is compensated by the multiple methods and initially invoked conceptual lenses that jointly serve to hone extant theory (Ketokivi and Choi, 2014). In addition to the advantages of using reliable high-resolution coding, the grouping of the fine-grained behaviours of members to the team level is based on the common assumption in the OB literature that such grouping is justifiable; these individual behaviours are measured namely during team settings in which the behaviours are displayed vis-à-vis other team members and/or their leaders (Klonek *et al.*, 2019).

Larger-scale studies testing Figure 3 ought to capture objective performance gains over even longer periods, and include financial (Bendig *et al.*, 2017; Camuffo, 2019; Galeazzo, 2021), environmental (Yu *et al.*, 2020) and/or customer outcomes (Bhasin, 2012). Such follow-up studies must also compare the team performance improvements over time of various within-organisational lean teams with similar tasks. These research designs could also be used to study further the onset of the values congruence among the various intra-organisational actors. Since we did not compare our studied teams with flanking within-organisational teams, it is too early to generalise the shown effects.

In addition, it is worth conducting intervention studies (Oliva, 2019) that also include employee well-being indicators, because continuous peak performance may lead to unhealthy side effects for the people involved (Carter *et al.*, 2013, 2017; Conti *et al.*, 2006). In light of the COVID-19 pandemic, the importance of face-to-face coordination in attaining team performance improvement (also evidenced by Gloor *et al.*, 2012; Hill *et al.*, 2019; Stefanini *et al.*, in press) poses another potential challenge. Studies of how (partially) *virtual* lean teams can adopt coactive vicarious learning-by-doing effectively over time are urgently needed. The degree to which the three behaviour-value patterns and their joint learning-by-doing might be generalisable to consistently high-performing non-workfloor or non-lean teams is intriguing, as is studying further the characteristics of such dynamic team-level learning. Furthermore, the cross-cultural context a lean team is embedded in might make a difference; compared to countries like Japan, the Netherlands has a much lower power distance and uncertainty avoidance (Erthal and Marques, 2018). Although the content of the behaviours and values seems to match the international lean literature, a cross-cultural lean-team comparison study of the three actors' values, behaviours and learning-by-doing is urgently needed.

Already more than a century ago Marie Parker Follett argued that all leaders must enable relational team learning and members' co-leading (McMackin and Flood, 2019). The present field study expands on how initially high-performing lean teams and their leaders (at multiple levels) can keep improving already high lean team performance: through their specific behaviour-value patterns and joint coactive vicarious learning-by-doing. Inducing these

patterns of Operational Excellence in and around a lean workflow team is no small feat; as noted by a Commodity team member: “Becoming the best lean team is an art. But staying the best is an even higher art”.

Notes

1. Employee turnover was moderate: At T4 only 11 respondents were newcomers. They were spread equally across the teams. Their responses were eliminated.
2. These members were nominated by their colleagues as being the “most effective team members”. If they had switched jobs by T4, we replaced them with the next most frequently nominated member.

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About the authors

Desirée H. van Dun is an assistant professor in Change Management and Organisational Behaviour at the University of Twente, the Netherlands. Apart from 10 years of lean management consulting experience, she has a cum laude PhD degree in Organisational Behaviour and Operations Management (2015); the thesis won various local and international awards. Her research has appeared in journals such as the *International Journal of Operations and Production Management*, *European Management Journal*, *Journal of Manufacturing Technology Management*, *International Review of Industrial and Organizational Psychology*, *BMC Medical Research Methodology*, *International Journal of Lean Six Sigma* and *Business Ethics: A European Review*. Van Dun is currently studying effective leadership and team dynamics in the context of lean (and green) management, agile, Industry 4.0, innovation and other forms of sustainable operational excellence. Desirée H. van Dun is the corresponding author and can be contacted at: d.h.vandun@utwente.nl

Celeste P.M. Wilderom holds the chair in Change Management and Organisational Behaviour at the University of Twente, Enschede, the Netherlands. In 1987, she obtained her PhD in Psychology from the State University of New York, Buffalo (USA) and then worked in the Economics and Business Administration Faculties at both Tilburg University and the Free University in the Netherlands. She has been an associate editor of various international management journals such as the *British Journal of Management*, the *Academy of Management Executive/Perspectives* and the *Journal of Service Management*; she is currently a member of various editorial boards. Her research pivots on effective leader- and followership as well as teamwork in various profit-making and non-profit work settings.