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Exploring communication practices in lean production☆

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ABSTRACT

This study examines the daily work practices at an organization that successfully incorporates lean production practices into the organizational culture, and reveals a pattern of practices used by managers in their daily work. This pattern of communication practices is consistent across the organization's manufacturing sites. Subsequent examination of archival qualitative data confirms the existence of the identified pattern of practices. An essential part of lean production is that participants are all involved in improvement activities. The collaborative nature of these activities highlights the importance of communication practices as a lubricant between managers and workers. The communication practices identified in this study appear consistently in strong lean production environments, while the opposite practices appear in weak lean production and traditional US-style environments.

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1. Introduction

With intense competition as the new norm, productivity improvement activities are extremely important. Lean production (LP) is an example of a business system innovation intended to increase productivity. This study examines specific management communication practices that are present in LP, and conversely, specific practices that are absent from LP, but that are present in traditional non-LP contexts.

LP consists largely of improvement work and is dependent on a set of collective activities (e.g., Quality Circles, and Just-In-Time) to benefit the organization. Transferring new knowledge, such as LP, is a challenging task, and increased competition makes mastering that challenge important (Lindlöf, Söderberg, and Persson, 2013). According to Daniel, Myers, and Dixon (2012), adoption of innovations involves making them part of everyday routines. Mol and Birkinshaw (2009) argue for further research on adopting management innovations; while Liukkonen (1992) shows that high work productivity requires high engagement from workers and managers alike.

In the LP context, Worley and Doolen (2006) argue that management communication and support play an important role in LP implementation. Even though management communication practices are

part of the innovations, limited research focuses on the granular level of communication practices.

To address this lack of research, this study develops an understanding of management communication practices employed in the LP context.

2. Literature review

This section describes aspects of LP, reviews communication issues related to innovations such as LP, and proposes using the lens of practice theory.

2.1. Management innovation—lean production

One recent innovation is LP (Dahlgard and Dahlgard-Park, 2006; Fullerton, Kennedy, and Widener, 2014; Holweg, 2007; Tillema and van der Steen, 2015). LP began based on observations of the Toyota Production System (Womack, Jones, and Roos, 1990). LP differs from traditional notions of management by the degree to which lower-level employees are required to add value to the process (Liker, 2004). LP also contains a number of conflicting goals and practices that generate significant tension, such as “increase customer value” and “reduce waste.” This conflict creates significant worker–manager interaction.

Despite examining LP as a technical system, many studies reveal that interpersonal variables and interactions affect the success of LP. In LP research dating back as early as Flynn, Sakakibara, & Schroeder (1995) and Flynn, Schroeder, & Sakakibara (1995), studies indicate that combinations of operations management and human resource management practices influence LP. Bateman (2005) notes that LP-driven improvements decrease without social enablers, while Bateman and

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Rich (2003) and Buchanan et al. (2005) note that gains from LP diminish over time without significant efforts in the social processes. Worley and Doolen (2006) and Worley and Doolen (2015) find that management support and communication are crucial in LP adoption. Storch and Lim (1999) and Jenner (1998) argue that LP requires clear communication, especially between managers and employees. Jenner (1998) concludes that such clear communication requires management communication styles that enact openness and participation. Goodridge, Westthorp, Rotter, Dobson, and Bath (2015) argue that adoption of LP requires a new style of leadership and communication practice. Leaders of the organization must learn behaviors that were not valued in the past (Mann, 2005, 2009).

In research about innovations, the knowledge management (KM) literature examines the role of knowledge-oriented leadership to achieve innovation (Chen and Huang, 2009; Darroch and McNaughton, 2002; Donate and Sanchez de Pablo, 2015). In line with this strand of research, Mol and Birkinshaw (2009) find positive effects of the introduction of new management practices on firm performance, which is consistent with reports on LP by Fullerton et al. (2014); Holweg (2007), and Tillema and van der Steen (2015). Additionally, Donate and Sanchez de Pablo (2015) emphasize that enhanced communication leads to higher participation, increased efficiency in problem solving, better marketing practices, and improved success. Gomez and Ranft (2003) find that communication openness is important for information sharing.

Both the LP and KM literatures indicate that communication is important in change-oriented situations, but previous studies do not examine the content of management communication at a granular level.

2.2. Practice theory

When using practice theory, researchers focus on the routine and repeatable actions of daily life (see Reckwitz, 2002; Schatzki, 1996; Schatzki, Knorr-Cetina, and von Savigny, 2001; Warde, 2005). According to Schatzki et al. (2001), practices are the source and carrier of meaning. For example, practices at work include how to talk at different times, how to respond to others, how to walk, how to make gestures, etc. (compare with *habitus*, Bourdieu, 1977). Practices are the product of sophisticated and complex social interactions.

An example of an LP practice is the Quality Circle (QC), which is a core part of LP. This was one of the first business tools observed in Japan and imported to the US; however, the importation did not include its context. QCs appear in the management science literature as far back as the 1970s. In their idealized form, the leader coordinates, while the group, as a collective, conducts the analysis of the quality problem. For the most part, QCs have not been successful in the west.

The description of QCs in previous studies did not include the communications practices; perhaps this omission was due to language issues, but more likely, it was because the people describing QCs saw business methods as just business methods, that is, detached tools used instrumentally. Growing up in the Taylorist tradition of separating thinking from doing (Taylor, 1911) leads to the belief that “doing” is a non-reflective and non-social practice.

This study focusses on identifying the granular practices in LP to develop an understanding of the LP’s unique practices.

3. Research method

This paper uses interviews to identify factors that operate in LP and then tests the findings against archival data using a deductive, theory-testing analysis.

Since the communications practices have yet to be articulated, qualitative data provides access to the unfiltered responses of participants. Interviews with 74 participants from six different Scania plants provide the initial data. The interviews ranged from 45 min to over 2 h. The interviewees described both what they do and the problems they encountered at work.

The concept of practices emerged from the empirical data as an important factor through a process of theory elaboration (Eisenhardt, 1989; Graebner, 2009; Van de Ven, 1989; Vaughan, 1992; Weick, 1989). This inductive process reveals a set of three pervasive management communications practices (which are described in the following section).

Qualitative methods are desired for deductive theory testing when “few or no quantitative measures exist” (Bitektine, 2009), or for phenomena that have not been well described (Yin, 2003). In deductive qualitative research, the analytical method is pattern-matching (Campbell, 1966; Hak and Dul, 2010a,b; Yin, 2003). When analyzing the archival data sets, the researcher must search for the set of communication practices described in the inductive results section.

The archival sources include five ethnographies and two academic books. The ethnographies are as follows:

- Ryoji Ihara (2003 Japanese/2007 English). A Toyota assembly factory in Japan;
- Darius Mehri (2005, 2006). A Toyota group (Hino) design organization in Japan;
- Satoshi Kamata (1973 Japanese, 1982 English). A Toyota plant in Japan;
- Laurie Graham (1995). A Subaru–Isuzu factory in the US;
- Solange De Santis (1999). A General Motors (GM) plant in Canada; and
- Ben Hamper (1991). Ford factories in the USA.

The academic books are as follows:

- Rinehart, Huxley, and Robertson (1997). The GM–Suzuki plant in Canada; and
- Fucini and Fucini (1990). The Mazda plant in the US.

Using this archival data greatly reduces many forms of bias in data gathering and interpretation, which increases the robustness of the findings. This type of qualitative archival data is more robust to threats to validity (Maxwell, 2004; cf. Campbell, 1966; Cook and Campbell, 1979). One lacuna is that the absence of a practice in the data is not evidence of absence, but may be an artifact of the data gathering and analysis method in the original study. Therefore, even though confirmation or disconfirmation is very strong for an identified practice, in the case of a non-observed practice, the archival data provides no insight. Although archival data does not speak to some aspects of evidence, the robustness of findings for matched patterns is very strong.

4. Data analysis and results

The analysis reports on the following three communications practices found at the case site: *blending*, *positive engagement*, and *soft words*. Although observations at Scania reveal only these positive practices, development of the opposite practices allows testing of a complete theoretical pattern of practices. The complete axes appear in Table 1.

Blending is a communication practice where the manager attempts to become part of the workers’ work situation, rather than being an outside actor. The prevalence of communication that was neither directive nor used outside information or power indicates a pattern of blending at Scania. Evidence includes exclusive use of phrases containing the word “we,” rather than “you” or “your work group.” By extension, the

Table 1
Management communication practice axes observed and derived.

| Original practice (observed) | Opposite practice (derived) |
|------------------------------|-----------------------------|
| Blending | Separation |
| Positive engagement | Negative engagement |
| Soft words | Hard words |

opposite practice, separation, indicates when exchanges between the manager and worker contain directive communications, including using words such as “I want you to...” and “your team.” In separation, the manager identifies himself as part of the company, with the worker treated as separate, or external, to the company. In blending, the manager uses communication patterns indicating the unity of the manager and the worker. The analysis did not identify any instance of separation at Scania.

Positive engagement is a practice where the manager is always positive in the sense of moving production forward through injecting energy into the process. Scania managers focused on asking questions such as “Why is it done this way?” and “Is this a better way to do it?” Negative engagement is the opposite pattern. The manager acts as a part of a control system in the sense of solely noting control failures. Consider the following example of negative engagement: “You made a mistake with this part. Do not do it again.” Negative engagement does not imply abusive or rough language, but rather the dampening of energy through only noting failures. The analysis did not identify any instance of negative engagement at Scania.

Soft words are a practice where the manager always responds in an emotionally positive manner, no matter the provocation. Hard words are the opposite pattern. With hard words, the manager engages in emotionally negative and disinhibited behaviors when interacting with workers. This would include chastising, demeaning, or yelling at them. The analysis did not identify any instance of hard words at Scania. The following section describes the details of the Scania case.

4.1. Practices at Scania AB

Scania develops, manufactures, and sells trucks with a gross vehicle weight of more than 8000 k. Scania started using LP in 1997 and has a relationship with Toyota/Hino to share methods. LP is deeply embedded in Scania's organizational life. Scania is also characterized by an extreme focus on work–life balance, and Scania managers are extremely critical of Toyota work–life practices. The interview questions included asking managers how they would instruct their workers to accomplish a task. The universal response was a surprised pause followed by the interviewee grasping for a response, which eventually resulted in the following kinds of statements: “I would never tell them that ... They know how to do their work ... I cannot tell them what to do...” These responses, and other similar responses, reveal a strong deployment of a practice referred to here as “blending.” Scania managers treat employees like real colleagues with their own sphere of activity and not as tools of management.

The following excerpt from the interview with two supervisors in Sweden, M and J, illustrates managers' perception of the practice of positive engagement and, to a lesser extent, blending:

Interviewer: ... are people willing to engage in long discussions to correct an issue, or do people give up quickly to preserve harmony? Interviewee J: ... I would say that they are willing to discuss how to ... in order to constructively make things to be better...sometimes I would wish them to shut up, but they won't. [laughter]. Interviewer: is it encouraged by higher levels to have them continue to be arguing about the issues, or is it...desired to have them “shut up”? Interviewee M: no, we want them to constantly ask the questions, we try to train ourselves to ask why...to see the improvements... [emphasis added].

A Brazilian Scania manager describes the importance of relationships thusly:

Today the workers suggest more and more improvements ... If you have a problem with the relationship, then no more improvements, no more suggestions. Before the [LP], the supervisor was not talking to the workers. Today, it is necessary for the supervisor to ask,

“OK, people, it is necessary to improve your area. Who has suggestions to improve? What's your feeling to change your area, to improve production, to improve safety, to improve quality?” And a line worker says, “Oh, I have one suggestion.” And then the supervisor and line worker walk over to the whiteboard. [supervisor:] “OK, who is responsible for this activity, this task?” [worker:] “OK, I am responsible” the line worker said, and then an engineer from process engineering volunteered also. The line worker from production and the engineer worked together and over several weeks improved the task together. So this event not only improved the process, but also the relationship between the workers, leaders, and support functions, because the main thing is improving the relationship, then it's easier to work... [emphasis added].

This excerpt reveals how specific practices are part of daily interaction. In particular, the supervisors engage in high levels of interaction with subordinates, which is an example of positive engagement.

The following excerpt reveals what one line-worker thinks a leader needs at Scania in Sao Paulo, Brazil.

Line worker: ... we have several Swedes in leadership positions. So, they show, indirectly, that bossing people is not the only thing that you have to think about when you are a leader. So, we have this example from them, like if I can say like that...we feel that, with Swedish people the leader does not have power over the others like we have here in Brazil. Here in Brazil, if the boss is telling you “do it,” even if you don't agree, you just have to do it. But within Scania, if the worker does not agree with what you are asking for, it doesn't matter that the boss is asking—it's not going to happen. This is what we understand of the relationship down here [in Brazil]. You cannot contact the boss in order to have someone do what he does not want to do. You have to convince them, collaborate, and cooperate.

This demonstrates the practices of blending and positive engagement, which have become part of how leaders in Scania act. The data contains similar examples from Scania plants in France and the Netherlands. There are no examples contrary to those presented.

A more in-depth discussion of two of the seven archival data sources follows. Both of the two selected works illustrate the Toyota context, which is to say, an extremely strong LP, but with a work–life situation that is much rougher than the Scania example. These two studies reveal that even with an extreme work–life imbalance, a strong LP organization maintains communication practices that are notable for their lack of roughness. There are no examples in either of these two books of a manager violating the concepts of blending, soft words, or positive engagement.

4.2. Ihara's QC example

Ihara (2007) describes his experience as a casual worker at a Toyota plant using ethnographic participant-observer methods. Overall, Ihara is quite critical of the work experience. As part of the book, Ihara describes the activities of a QC improvement process. The process deviates from textbook descriptions in that the superior does most of the work, even though he is at pains not to appear to be directing the event. In fact, in a close reading, you can almost hear him vibrating with the tension of trying to get the process moving, yet he never resorts to a directive. In addition, there are consistent objections from subordinates throughout the process, all of which get the response of soft words from the superiors.

The QC leader engages in repeated positive engagement practices throughout the process. His speech and actions are non-confrontational and supportive at every turn, even in the face of significant opposition, which is a practice of positive engagement. In several cases, the leader uses soft words in response to his subordinates' objections but never directly refuses to engage with their objections or wishes. The theme

leader attempts to blend with the circle members as equals, and attempts to make them feel that they are likewise responsible for the goal of the event. Therefore, the leaders use a combination of positive engagement, soft words, and blending practices in this QC circle. These three practices appear very clearly and repeatedly in this text.

Although the group members may remember the QC event as ineffective, they would not remember it as oppressive; Ihara also takes note of a number of small but positive learning experiences. However, Ihara does not note the experience gained by the theme leader and circle leader in interacting with subordinates without friction, that is, the development of the leader's ability to deploy the practices of positive engagement, soft words, and blending.

The team's explicit opposition did not result in any detectable friction with the leaders, nor was there any suggestion in the book that such reactions by management occurred, even though the author also reports a number of insubordinate or oppositional activities in other portions of the book. This book also shows that LP processes can be highly flawed in comparison with idealized versions of LP processes, yet still function on a sustainable basis.

4.3. Mehri's notes from Toyota-land

Darius Mehri is an American who worked for three years as an engineer at a Toyota group company. He describes many incidents of interpersonal communication that are consistent in their use of practices. In the following excerpt, Mehri reveals the practices of soft words and blending:

I did express my disagreement sometimes, but this was invariably frustrating and time-consuming. Higuchi [my boss] was usually surprised that I would question his wisdom at all, and we would discuss the issue at length, arguing back and forth, with me focusing on the abstract and him on the details. In the end, he wouldn't budge, so we would end up right where we had started.

In retrospect, most of the time he was correct. ... But what I found irritating was the assumption that there was only one way to approach the design project—his way, to focus on the concrete. Unless I had concrete results to show him, he wouldn't even consider what I had to say. However, if I could prove my ideas with results, he would affably and easily change his mind. Higuchi was open to new ideas—as long as I could prove them.

This excerpt reveals a conflict between the practices of the Japanese boss and the American worker. The boss uses positive engagement and soft words, even when dealing with a worker who does not follow the code and does not blend with the boss's opinion.

In *Notes from Toyota-land* (Mehri, 2005), Mehri provides numerous examples of the practices of positive engagement, soft words, and blending. In particular, Mehri documents the pervasive application of these practices even in the face of significant attempts to violate workplace norms.

4.4. Summary of results for all seven studies

The results of the analysis for all seven sources appear in Table 2. The sources include three Japanese organizations attempting to introduce their LP work practices to factories in the US (Subaru–Isuzu, Mazda, and Suzuki/GM); data from a Canadian GM plant that is using LP; and data from a pre-LP Ford situation. The three attempted LP implementations guided by Japanese firms ended up as well-documented failures. Many observers regard the widely known GM version of LP as weak. The Ford case is a quite stunning example of the bad side of factory work from the pre-LP period.

The analysis focused on looking for examples of the practices described above (blending–separation, positive engagement–negative engagement, and soft words–hard words). The researchers engaged in a constant comparison of the text, with the results presented in Table 2.

As seen in Table 2, the practices of blending, positive engagement, and soft words exist in all embedded LP work contexts, while the practices of separation, negative engagement, and hard words exist in failed LP, weak Canadian LP, and traditional US systems. This deductive confirmation of the existence of the three practice axes indicates that they are part of the LP approach in deeply embedded versions.

5. Discussion and contribution

This study reveals a set of practices through inductive analysis, referred to here as blending–separation, positive engagement–negative engagement, and soft words–hard words. Seven archival datasets provide the needed data to test the theory implied by these practices. The deductive theory testing process confirmed that the three practices exist at Scania.

This study develops theory at a very granular level by moving down the layers of abstraction to concrete actions that take place daily. Blending, positive engagement, and soft words are embedded management communication behaviors in LP situations and are thus theoretically linked to one another. Using data drawn from seven different sources for deductive tests greatly enhances the robustness of the results. Evidence of a specific practice existing in the archival data is very strong support for its existence. Confirmation of the inductive findings with these data sets through deductive testing provides an extremely robust confirmation of the theoretical linkage of blending–separation, positive engagement–negative engagement, and soft words–hard words to the traditional and LP contexts.

The practice theory approach (Reckwitz, 2002; Schatzki, 1996; Schatzki et al., 2001) leads to the development of a linkage between practices and theory. This approach focuses the researcher on facets of the work dynamic that are not readily perceptible in the more traditional approaches due to the traditional methods' focus on higher levels of abstraction.

Finally, through the practice theory lens, practice and theory appear tightly connected. For example, in this data the practices of blending, positive engagement, and soft words connect exclusively to LP management in experienced LP firms across national boundaries and do not

Table 2
Summary of management communication practices observed.

| Observed practices | Embedded lean | | | | Failed lean | | | Weak lean | Traditional US |
|---------------------|---------------|--------------|--------------|---------------|---------------|------------------------|--------------------------|------------------|----------------|
| | Scania | Toyota | Toyota | Toyota | Subaru | Suzuki GM | Mazda | GM | Ford |
| | Scania | Ihara (2007) | Mehri (2005) | Kamata (1973) | Graham (1995) | Rinehart et al. (1997) | Fucini and Fucini (1990) | De Santis (1999) | Hamper (1991) |
| Positive engagement | ✓ | ✓ | ✓ | ✓ | | | | | |
| Negative engagement | | | | | ✓ | | ✓ | ✓ | ✓ |
| Soft words | ✓ | ✓ | ✓ | ✓ | | | | | |
| Hard words | | | | | ✓ | ✓ | | ✓ | ✓ |
| Blending | ✓ | ✓ | ✓ | ✓ | | | | | |
| Separation | | | | | ✓ | ✓ | ✓ | ✓ | ✓ |

appear in the non-LP or weak LP firms. Conversely, in this data set, the practices of separation, negative engagement, and hard words appear exclusively in failed LP, weak LP, or traditional situations.

When collaboration is required to achieve innovation goals, specific communications practices appear to be required. This may be one reason that collaborative practices are fragile: since they rely on the nature of the communication practices, disruption of these practices alone can cause the overall system to become ineffective.

Using LP as an example of a management innovation, this analysis shows that specific management communication practices appear necessary for collaborative work. One clear example is that the QC activity (Ihara, 2007) benefitted Toyota, not because of the QC procedure, but because of the very skillful and determined communication practices of the theme leader, which included blending, soft words, and positive engagement. This study thus adds additional insight in adopting new management innovations, especially for collaborative environments (see Mol and Birkinshaw, 2009).

This study opens the door to the concept that similar practices are important in other operations methods. A number of future research avenues exist, examples of which include the following: examination of practices in different contexts; work that attempts to define the practices more precisely; discovery of other communications practices; and measuring levels of effectiveness with the communications practices and their connection to organizational outcomes.

The results indicate that managers who want to maintain the conditions necessary for instrumentally positive communication must use a seamless type of open and positive engagement, even in the face of difficulty and insubordination. It need not be as formal as the McDonalds greeting, but it must be a reflectively composed and consistent pattern of engagement.

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