

# ORGANISATIONAL FACTORS FOR ENHANCING TRAIN DRIVERS' PROACTIVE BEHAVIOURS TO MAINTAIN THE NORMAL OPERATION OF RAILWAY SERVICES

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## Abstract

The aim of this study is to reveal the organisational factors that affect train drivers' motivation to engage in proactive behaviours. Based on participant observation and theoretical considerations gleaned from previous research, the authors constructed a hypothesis regarding the causal factors behind proactive behaviours. The hypothesis was tested using a questionnaire survey. The results show that a driver's *work definition* is a core factor in motivation. Furthermore, positive feedback and workplace atmosphere are important factors in broadening each driver's work definition to promote proactive behaviours.

## 1. INTRODUCTION

Railway systems have many operational rules (ORs) and standard operating procedures (SOPs), and it is generally believed that railway safety and service quality can be maintained just by observing these ORs and SOPs. However, many train drivers engage in a range of autonomous proactive behaviours, and these behaviours are considered an important part of maintaining the normal operation of railway services. While some drivers follow these behaviours as part of their normal practice, other drivers do not practice such behaviours at all. What factors distinguish the two, and how can managers and organisations promote these proactive behaviours? Revealing the organisational factors related to such behaviours could prove very helpful for managers and organisations. This study aims to reveal these organisational factors.

First, we introduce examples of train drivers' proactive behaviours. We then propose several factors that influence proactive behaviours based on participant observation and on previous studies. Lastly, we examine the results of the questionnaire survey that was used to test our hypothesis.

## **2. EXAMPLES OF TRAIN DRIVERS' PROACTIVE BEHAVIOURS**

As the first step of this study, we observed the actual practices of drivers in one Japanese railway company. We identified certain driver behaviours that can be considered proactive, some of which are described in this section. Such behaviours are not specified in the ORs and SOPs. Furthermore, these behaviours are related to the activities for maintaining resilience (Hollnagel et al., 2011) and threat and error management (Helmrich et al., 1999); all of them include anticipating, preparing for, and managing threats to mitigate the risks of accidents, unsafe incidents, or other undesirable situations.

### **2.1 Preparing Reminders on Driving Timetable Cards**

Drivers in the company are required to put a driving timetable card on the console. Furthermore, drivers have to check the time in various scenes by pointing and calling in order to keep operations running on time. Some drivers write memos on the timetable card with a whiteboard magic pen or a dermatograph pen to remind themselves of important information. Such memos might, for example, refer to the speed limit that is specially set in advance at that driving for any reason; the sign of a stopping point at the station that is distinguished by the number of cars driven at that time; or places where the settings of certain machines need to be changed, such as the auto train stopping system, the wireless channel, and so on. The timetable card is covered by a plastic case; therefore, these memos are easily erased. Drivers prepare the memos during break time.

### **2.2 Whistling Just Before Arriving at Stations**

Some stations are located near curves, tunnels, or buildings that obstruct the view. People on the platform might hardly notice a train arriving at such a station. Consequently, there is a danger that passengers will touch the train while it is still running and be injured or, in some unfortunate cases, killed. Normally, station staff announce train arrivals at the station and drivers approaching such a station also will whistle to have them move to a safer area when they notice people standing or walking on the edge of the platform. Some drivers whistle in advance, during passing the curves, tunnels, or so on, to alert people at the station that the train will approach soon. While the practice of whistling is not specified in the ORs and SOPs, it is believed to be effective in reducing risks.

### **2.3 Monitoring Passengers at the Stations from the Driver's Cabin**

When a train stops at a station, the conductor, who rides at the back of the train, monitors people on the platform for safety. During that time, the drivers are normally in the driving seat waiting for departure. Some drivers, however, also monitor passengers from the driver's cabin, which is at the front of the train. The driver might, for example, spot a passenger who is caught in a closing door near the front, where there might be a blind spot for the conductor. The driver can then tell the conductor, who operates the door-closing switch, to open the door again. In addition, by showing his or her face through the window of the driver's cabin, passengers can ask the driver questions, enhancing the level of customer service.

### **2.4 Preparing a Guide for Passengers**

While trains are waiting at the platform, passengers sometimes ask drivers questions about the destination or timetable of a train, the most efficient route to their destination, transfers, and so forth. Drivers typically answer these questions by checking the information board on the platform, or they refer the passengers to station staff. Some drivers, however, prepare their own memos with information related to frequently asked questions so they can answer passengers swiftly, confidently, and politely. This behaviour contributes to railway service quality as well.

### **2.5 Picking Up Garbage**

Sometimes bottles or cans are left in the cabins by passengers. It is the cleaners' job to pick these up. Some drivers, however, collect such garbage when they have time. This behaviour is connected to the comfort of the passenger cabins. In addition, bottles and cans can cause train delays or machine troubles when they roll into a door that is closing.

## **3. FACTORS FOR ENHANCING PROACTIVE BEHAVIOURS**

While some drivers engage in most or all of the behaviours described above, others do not follow any of these practices. Here we discuss factors for distinguishing between proactive and nonproactive drivers. These considerations are based on interview data, our observations of the participants, and previous studies on the topic.

### **3.1 Work Definition, Proactive Behaviour, and the Meaningfulness of Work**

One reason for the absence of proactive behaviour is a lack of nontechnical skills. Nontechnical skills involve situational awareness, communication skills, and so forth (Komatsubara, 2011). There is, in fact, an effort to develop a training programme for train drivers to help improve their nontechnical skills (Bonsall-Clarke & Pugh, 2013). However, based on observations of actual driver practices, we believe work motivation

is also a major factor in proactive versus nonproactive behaviours.

*Work motivation* might easily be viewed as an employee's morale, passion, or sincerity in relation to his or her job. That is not correct here. We believe most train drivers are sincere about their work. Therefore, we consider work motivation as dependent on an employee's *work definition*. Drivers who adopt proactive behaviours believe such practices are very natural; the behaviours are ordinary for them, and they consider them part of their work. On the other hand, drivers who do not adopt such practices believe these behaviours are not part of their job. They believe their jobs entail only what is clearly defined by the ORs and SOPs and that proactive behaviours should only be adopted voluntarily since they are not required by the ORs and SOPs. In one instance, a driver was observed going through the passenger cabins from the back end to the front end of train that was in the storage track. The author accompanying the driver noticed a lot of garbage on the floors and on certain seats. The driver, however, passed through as if he did not notice the garbage at all. His behaviour seemed natural, as if he was not bothered by the garbage. This behaviour indicates to us that this driver's work definition did not in any way include the proactive behaviour of picking up garbage.

Drivers are usually not monitored by their managers, and performing alone is a characteristic of job. Therefore, drivers work in a fully autonomous situation. In such situations, employees' behaviours are basically self-regulated. Thus, we believe each member's work definition has to be closed up on a train driver while, for example, CRM skills related to like authority gradients are closed up on an aviation pilot's behaviour.

Interestingly, proactive and nonproactive drivers both have high self-esteem. Both believe they are doing their jobs. In light of the concept of work definition, such thoughts seem very natural. Drivers evaluate their performance based on their own criteria, and those criteria are linked with their individual work definitions. If a behaviour is not included in a driver's work definition, he or she neither adopts that behaviour nor evaluates himself or herself on performing or not performing that behaviour (since the behaviour is not in his or her purview in the first place). When drivers adopt behaviours they think are to be done, their evaluations of themselves are always good since, if they notice they can't perform a given behaviour, they make an effort to complete the behaviour. As stated above, most drivers are sincere and passionate about their work. As a result, they come to believe they can complete the work.

While all drivers have high self-esteem, their feelings of meaningfulness in their work are quite different. Drivers who adopt proactive behaviours feel more strongly that their jobs are meaningful than drivers who don't adopt proactive behaviours. Feelings of meaningfulness in work are thought to result from intuitive evaluations of the social meanings of work. Drivers who adopt proactive behaviours have wider work definitions than drivers who do not. This means that the former's connection to civil society is stronger than the latter's. Thus, feelings for the social meanings of work are stronger for proactive drivers than for nonproactive drivers.

### 3.2 Factors Affecting Work Definition

Work definition develops according to the various experiences employees have had since becoming train drivers (Wrzesniewski, 2001). Therefore, there are too many factors affecting members' work definitions to list them completely. On this premise, we will discuss some factors related to organisational management.

**Self-Consideration.** For each member's work definition to become complex, self-consideration is needed. When some drivers were asked whether they had considered why they work or how they would like to be as train drivers, some said they had never considered such a topic. Such drivers were not always the nonproactive ones; some looked more or less proactive. However, such drivers only adopted proactive behaviours because they were told to do so by their licencing trainers or because they emotionally felt the necessity of the behaviour in a given situation. In short word, their behaviour were not autonomous ones. Their work definition is very limited, not constructed by themselves, and not complex. In order to enhance truly autonomous proactive behaviour, it is necessary for organisation to prompt their self-consideration to broaden their work definition.

**Communication between Drivers and Managers.** As stated above, train drivers can perform their work with no contact with their managers. However, communication between drivers and their managers is necessary for developing more sophisticated work definitions. There are two effects of individual communication between drivers and their managers.

First, drivers can receive various kinds of information through conversation with their managers. This information can pertain to other departments—like station staff, signal controllers, maintenance workers, and management itself—to company philosophy or policies, to competing companies, to financial information, and so forth. While such information might not seem directly connected to the driver's job, it can broaden the driver's perspective and help his or her work definition become more complex.

The second effect is emotional. Work definition pertains to each member's sense of value. One's sense of value develops with the satisfaction of the needs of competence and relatedness, which are considered fundamental human needs (Gange & Deci, 2005). When a person feels competence and relatedness in a community, he or she accepts the sense of value shared among the members of that community. If communication between drivers and managers includes positive feedback, like praise and admiration for the drivers' daily performance, such communication can lead drivers to accept the managers' sense of value in which proactive behaviours are seen as desirable. On the other hand, if drivers feel their managers don't value their work performance, they will reject their managers' sense of value.

**Workplace Atmosphere and Managerial Leadership.** Atmosphere is believed to have a strong effect on work definition. People tend to behave according to the atmosphere of

their communities. Therefore, if the workplace atmosphere regards the proactive behaviours as things the drivers should do, then individual drivers will follow suit. However, if the atmosphere regards the behaviours as things that don't necessarily have to be done, then drivers will also consider the practices unnecessary. Another important factor concerns whether *the job* is the core of the workplace atmosphere or whether there are other topics. When the authors observed a certain driver's office, they found that most of the daily chatting among drivers was related to their jobs. In such an office, the drivers have to have a broad perspective on their jobs to participate in the daily chatting. This motivation to develop their perspective could also help with developing their work definitions. Furthermore, participating in daily chatting itself could lead to development. Through the process of talking about their jobs, their own positions would become clear, and also with articulating their thoughts, they could recognize their own thoughts that they establish unconsciously in their sense of value. On the other hand, in another certain driver's office, authors felt that there might be a norm members must not talk about any topic positively related to their job in daily chatting. In such an office, developing process of their work definition as stated above would not arise and their work definition would not be broadened so well.

Regarding managerial leadership, we often heard in one office that the atmosphere had improved since the present manager had come to the office. When we asked about the differences in managerial leadership, drivers usually discussed differences in management's passion for their work, their willingness to politely listen to drivers' opinions, and their attitude toward building good relationships with drivers. Thus, managerial leadership affects workplace atmosphere.

#### **4. QUESTIONNAIRE SURVEY**

To evaluate whether these factors actually affect each driver's work definition, we administered a questionnaire survey to all drivers in one Japanese railway company except for the drivers of the Shinkansen super express. The number of valid respondents was 2676. Items of questionnaire were answered on a scale of 1–5. The result of our statistical analysis by structure equation modelling is depicted in Figure 1.

The authors' proposed factors affecting drivers' proactive behaviours were mostly supported. In addition, some interesting points are suggested by these results. First, self-consideration strongly regulates work definition in this result. Based on this result, it can be expected that training programmes that facilitate train drivers' self-consideration would be very effective for enhancing proactive behaviours. Second, self-consideration is regulated by positive feedback, while work definition is not regulated by it directly. This suggests that the effect of positive feedback is mediated by self-consideration. That is, even if managers send positive feedback to drivers, there would be little effect on enhancing work definition unless there is attention to self-consideration. On the other hand, this result can also be interpreted as showing that self-consideration would be enhanced by positive feedback. Therefore, in addition to a

training programme as described above, positive feedback is required in daily management activity to build a foundation for self-consideration. Third, relationship strongly regulates positive feedback. This result supports previous research (Horishita et al., 2013) and suggests that giving superficial positive feedback without building good relationships has little effect; therefore, it is believed that building good relationships with drivers is also required in managerial practice to make positive feedback more effective.

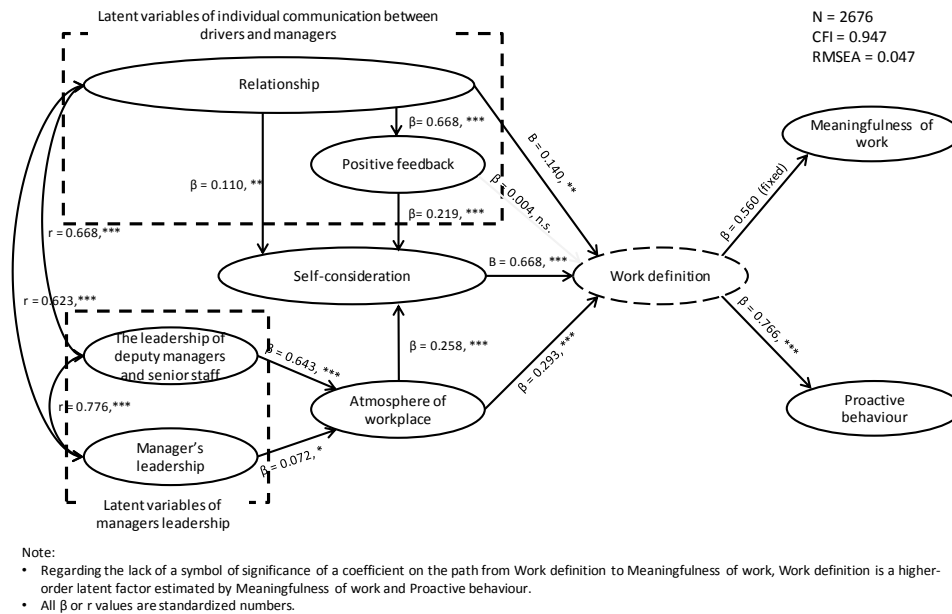


Figure 1. Model of the structure of train drivers' proactive behaviours

## 5. CONCLUSION

In this study, the authors examined causal factors related to train drivers' proactive behaviours, especially factors related to organisational management. We proposed *work definition* as a concept for understanding drivers' proactive behaviours in daily practice and also proposed with quantitative evidence some organisational factors that affect each member's work definition. Work definition pertains to one's sense of value. While we focused only on human relationships in this study, various factors related to management could affect it, such as the information environment surrounding the drivers or the job design itself. In future work, we will attempt to reveal these factors. Furthermore, in addition to a basic study, a practical study is needed to investigate ways to enhance drivers' proactive behaviours, mitigate risks, and prevent accidents or incidents.

As the limitation of this study, we only proposed the model based on the investigations of electric car drivers in one Japanese railway company. Therefore, if we discuss about drivers who work in quite different work situation like steam locomotives which are usually driven by a pair of drivers, their work motivation to proactive behaviour might be different from authors' model proposed in this study. In general, our model is largely depend on the characteristics of job of drivers that is to perform alone and not to be monitored by their supervisors, therefore, proactive behaviour of workers such as aviation pilots or maritime bridge workers who are engaged in their job with other members as a team would not be applicable. On the other hand, workers like one-man bus drivers, whose working situations are similar to train drivers targeted in this study, might be applicable with our proposal models to understand their motivation to proactive behaviour.

Furthermore, this model was tested only by a snapshot investigation in this study. For sufficient evidence, it is required to be tested by longitudinal study.

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