## *Lean on me: An impact study of mutuality supportive leadership behaviour on employee Lean engagement*

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## An impact study of mutuality supportive leadership behaviour on employee Lean engagement

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# Abstract

Total Quality Management (TQM) has been around in the West since the early 1970s. Over the last 40 years it has advanced from its early form, based around ‘quality circles’, to more advanced forms such as Lean and the now common Business Excellence (BE) models. However, up to 60% of implementations fail to deliver initially anticipated results. Research into Lean/TQM suggests that management commitment and conducive culture are key factors inhibiting subordinate engagement. Yet it is recognised that the ‘softer’ side of TQM is vital for its success and a key dimension of Lean/TQM philosophy. This thesis is a longitudinal study of an organisation in the throes of implementing Lean and struggling to engage its employees.

Taking a mutuality perspective, the Behavioural Perspective Model (BPM) provides a framework for understanding the manager-subordinate context and Lean engagement. The BPM, complemented by the incorporation of Deci and Ryan’s Self-Determination Theory (SDT), aids understanding of respondents’ learning history in a complex Lean/TQM environment. An objective of this research was to use the insight gained from taking a behavioural/SDT perspective to improve the ‘softer’, respectful side of TQM deployment as in managerial relational practice, thus enabling improvement in leader-subordinate, day-to-day relations and increased Lean approach behaviour.

The thesis is built around three interrelated projects. Project One investigates the deployment context, identifying engagement barriers and opportunities. Project Two, a longitudinal intervention based on mutuality supportive leader-subordinate behaviour, identifies positive affect across three surveys. Project Three, a survey-based study of the whole organisation (n=328), considers both ‘active’ and ‘not-active’ employees, finding significant differences in all key variables between the two groups, identifying ‘work climate’ and motivation as key influences on Lean engagement. This research provides tentative evidence that managerial commitment to a supportive work climate influences subordinate engagement and quality of engagement in Lean/TQM.

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## List of Abbreviations

| | |
|---|---|
| AR | Action Research |
| BE | Business Excellence |
| BPM | Behavioural Perspective Model |
| CAR | Competence, Autonomy and Relatedness |
| CET | Cognitive Evaluation Theory |
| CI | Continuous Improvement |
| COT | Causality Orientations Theory |
| FD | Finance Director |
| IM | Intrinsic Motivation |
| JIT | Just-in-Time |
| MD | Managing Director |
| OD | Operations Director |
| OEE | Overall Equipment Effectiveness |
| OEM | Original Equipment Manufacturer |
| OIT | Organismic Integration Theory |
| OL | Organisational Learning |
| OM | Operations Management |
| QC | Quality Circle |
| RB | Radical Behaviourism |
| RAI | Relative Autonomy Index |
| RAI2 | Adapted Relative Autonomy Index |
| RfP | Respect for People |
| RTC | Readiness to Change |
| SDT | Self-Determination Theory |
| SLA | Service Level Agreement |
| TPB | Theory of Planned Behaviour |
| TPS | Toyota Production System |
| TQM | Total Quality Management |

# Statement of Copyright

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# Chapter One: Introduction and Background

## 1.1 Introduction

This research is a behavioural study into complex human behaviour within a Lean/Total Quality Management (TQM) deployment environment. Management behaviour is often cited as a major barrier to employee acceptance of Lean/TQM (Mosadeghrad, 2014), with recent research indicating that Respect for People (RfP), a principle of TQM, is at times overlooked in pursuit of the technical and financial gains available to Lean/TQM adopters (Emiliani and Stec, 2005; Emiliani, 2008; Emiliani and Emiliani, 2013; Halling, 2013; Soltani and Phillips, 2010; Soltani et al., 2010; Soltani and Liao, 2012). Taking the perspective that commitment to RfP is expressed through the management-subordinate 'work climate' (Baard et al., 2004), represented by mutuality supportive behaviour (Foxall, 1999), this thesis seeks to explore the impact of management work climate on employee Lean/TQM engagement.

To conduct this research, Gordon Foxall's (1990, 1998) Behavioural Perspective Model (BPM) will be used as a framework for understanding the manager-subordinate bilateral relationship from a mutuality perspective (Foxall, 1999). The BPM learning history will be supplemented by the integration of Deci and Ryan's (2002) Self-Determination Theory (SDT) variables into the BPM framework. This is, as far as this researcher is aware, the first time that the two models have been integrated. In addition, it is the first time that the two models have been applied to a TQM environment, thus extending the scope of the BPM research programme. The combination of the two models promotes plurality in researching human behaviour (Foxall, 1998, 2007a), affording perspectives based on both intentional and extensional accounts of behaviour, thus offering a more complete interpretation of human interaction in the TQM environment. This research also incorporates the use of Action Research (AR) as the methodological strategy, aligning the technique to suit operant enquiry. AR provides the framework for both inductive and deductive approaches, thus promoting plurality in research techniques.

This chapter provides the background to the research, an overview of the interrelated research projects and the anticipated contribution to theory and practice. Chapter Two covers the literature supporting this area of research and, especially, concerns over the misuse of TQM aversively to control subordinates. The chapter also provides an overview of Radical Behaviourism (RB), covering the philosophy's historical roots through to its modern form. It then considers SDT and its relevance to the BPM as a

complementary addition, concluding in an adapted BPM framework for this research. Chapter Three considers the methodology underlying this research programme, which is based on an AR framework and thus incorporates both inductive and deductive approaches to behavioural research. Chapters Four, Five and Six cover the three interrelated research projects, with Chapter Seven discussing the overall findings and the contribution to theory and practice, outlining the subsequent steps taken in this research and concluding.

### 1.2 Background

The organisation, a steam turbine manufacturer, is in a state of transition. Firstly, government legislation requires power plants to become more efficient in energy production and carbon waste reduction. This has had a two-fold impact:

1. An initial surge in modernising steam turbine plant at UK power stations.
2. Plans to replace ageing plant, with cleaner, more efficient, gas turbine equipment.

Secondly, the organisation was purchased by Siemens in 2006 to bolster power plant service in the UK, resulting in a refocus of operations from a production-led culture to a service-led culture.

The organisation is moving through a period of transition to support these changes and, whilst the initial surge in modernisation has provided significant demand for the organisation, this is now coming to an end. The UK operation does not currently have gas turbine technology and is no longer 'allowed' to supply new installations. The manufacturing operation is now a spare part producer for an ageing fleet of steam turbines that will be replaced over the next 20 years. The result is that the company cannot rely on Original Equipment Manufacturer (OEM) status in the future and will have to compete on the basis of 'service' to win future work. To improve customer service, the company has moved to a project-based approach, whereby the project manager can choose from where he or she obtains components to support the field service team who are directly involved in maintaining and servicing customer plant. This places the manufacturing facility in direct competition with both internal and external competition for non-OEM products. Product cost, quality and delivery on time are a key focus for the organisation to stay competitive in this market. To improve the competitive position, the business has introduced Lean as the business improvement strategy to focus on the elimination of waste to improve cost, quality and delivery.

The programme was introduced using external consultants circa four years ago, through a two-day workshop for the workforce to illustrate the Lean approach, the associated benefits for the organisation and the implied job security for employees, thus gaining their support. The programme is now being deployed through an internal team, Business Excellence (BE), who, at the start of this research programme were becoming increasingly frustrated at the apparent lack of workforce (Ajzen, 2005) engagement with the Lean programme. Senior management actions, initially interested in gaining voluntary employee engagement, have increasingly focused on compelling compliance with the programme, by changing reward systems to encourage participation, making weekly Lean meetings compulsory, increasing the levels of employee monitoring to assess personal participation and project progress, and with the publication of monthly statistics to highlight engagement levels across organisational departments, colour coded to make it easier to identify the good from the bad.

Whilst senior management rhetoric was, still, of 'winning hearts and minds', their 'top-down' approach to deployment was increasingly focusing on compelling engagement, through aversive consequences of non-participation. This move did not appear to equate with the philosophy espoused by the quality gurus (Deming, Juran, Crosby and Ohno), who saw responsibility resting with senior managers to provide appropriate processes and direction to enable staff 'naturally' to engage in quality improvement (Deming, 1986). In earlier research (Leslie, 2006), this researcher identified a link between Organisational Learning (OL) factors in the deployment environment and quality programme, in a study examining 30 medium to large organisations. Such factors indicated more open environments (supportive management and empowerment) as being significantly related to deployment success. These findings are consistent with research findings across the OL and quality literature. There are numerous 'best practice' studies that regularly identify the 'hard' and 'soft' factors that influence success or failure. Powell (1995) suggested that the softer factors were more difficult to achieve and hence the point of strategic differentiation for an organisation, due to the inimitable nature of such efforts. The critical literature lends support to this from the perspective of management-employee relations, suggesting that the underlying premise of Lean and that of quality generally is either misunderstood or deliberately used to strengthen management control over the workforce (Seddon, 1992, 2005; Soltani et al., 2008b, 2010; Soltani and Liao, 2012; Soltani and Phillips, 2010; Soltani and Wilkinson, 2010). Whether such control is a result of misunderstanding or a deliberate intentional act is functionally immaterial, as both

apparently lead to aversive forms of control. Deming (1986) was very clear in wanting all forms of 'fear' to be driven out of an organisation, as only then will employees naturally engage in quality improvement activities. Behaviourists, whatever their ontological or epistemological orientation, warn against the use of threat or punishment, instead arguing for the use of positive contingent reward (Flora, 2004; Skinner, 1967, 1974) to promote 'self-regulated' motivation such as identification or intrinsic regulation (Carpenter, 1974; Deci and Ryan, 2002; Nye, 1979).

Foxall (1990, 1998) developed the BPM to explain complex human behaviour, that is, behaviour outside the control of the operant laboratory. Based on radical behaviourist principles, the model seeks to offer an alternative explanation of complex behaviour, in operant rather than cognitive terms. As such, the model explains behaviour in terms of learning history of reinforcement, contextual and bifurcated contingent antecedents. The BPM research programme has grown over the last decade to consider not only consumer interaction, but extending into areas such as drug abuse and environmental concerns (Wells and Foxall, 2011). The programme also extends knowledge through its ability to support pluralistic explanations of behaviour by incorporating other explanatory models, for example Ajzen's Theory of Planned Behaviour (TPB) (Foxall, 1998, 2007a; Wells and Foxall, 2011). This research seeks to extend the pluralistic scope of the BPM by establishing links with Deci and Ryan's (2002) SDT.

### 1.3 Overview of the Research Projects

Foxall (1999) considered marketing relations to include literal and mutual exchange. Literal exchange forms the economic basis of a marketing relationship, as firms exist to provide economic exchange as represented by the BPM as utility. In addition, the quality of exchange is expressed through relational mutuality. In organisational terms, the workforce has a marketing relationship with their organisation, labour is exchanged for compensation through pay and other tangible benefits, however it has long been recognised that employee engagement requires more than this (Deming, 1986). The BPM acts as the framework to consider mutuality relations with regard to manager-subordinate day-to-day work relations and Lean engagement, thus considering the impact of learning history and current antecedent contextual and contingent variables on Lean approach or avoidance behaviours.

Project One seeks to understand employees' accounts of their workplace experience and Lean engagement approach or avoidance behaviour. Methodologically the research approach is primarily inductive, comprising 58 interviews and 22 workshops to

gain first-hand accounts on the ground. This project is also used to establish the contingencies which will positively influence further engagement from participants.

Project Two is a longitudinal study into the impact of supportive leadership, based on mutuality and active listening behaviours, on a small group (n=7) of research participants involved in a cross-departmental Lean improvement (kaizen) initiative. SDT provides insight into the 'quality' of influence on behaviour, through expression of a range of variables representing changes in participant learning history.

Through an 18-month longitudinal intervention study, Project Two has two aims, the first considers SDT variables as constructs within a BPM framework, across three surveys, establishing a link between day-to-day managerial-subordinate relations and motivation towards Lean. The second involves seven participants identified in Project One, working in a mutually supportive context facilitated by the researcher. This intervention considers the impact on managerial-employee relations during the development of a practical collaborative Lean project. Using the three surveys, results are compared to a control group and hypothesis generated in Chapter Two.

Project Three is based on a company-wide survey (n=328) to establish any relation between Lean approach avoidance behaviours, engagement categories and SDT regulatory states. The findings indicate significant differences between employees engaged in Lean and those not engaged, identifying a relationship between managerial context and Lean engagement and disengagement quality of engagement. Overall, the research aims to contribute to TQM and OL theory by considering supportive management behaviour as the pragmatic manifestation of commitment to TQM and learning.

### 1.4 Contribution to Theory

This research aims to contribute to theory in a number of ways. First of all, by establishing links between the BPM and SDT, contributing to the pluralistic ideals of the BPM programme (Foxall, 1998, 2007a) and extending its scope into organisational theory, providing a platform for further research in this field. Secondly, organisational learning literature will benefit from understanding the impact of mutually supportive manager-subordinate relations in developing organisational competence at both individual and team levels, as well as overcoming cross-departmental boundaries to learning. Thirdly, this research benefits the quality literature through the provision of a pluralistic understanding of motivation and its operant influences. Of special note is the impact of supportive day-to-day relations on quality engagement. Before commencing

an expensive and often risky quality improvement programme, the organisation would benefit from an initial assessment of the manager-subordinate deployment environment.

### 1.5 Contribution to Practice

As applied research, theory and practice overlap, so the contributions to OL and TQM also impact on practice considerations. The ultimate aim is to provide research-based behavioural knowledge, gained from within the organisation. This can act as a catalyst for improving leader-subordinate relations, not only within a Lean framework but also on a day-to-day basis. This research provides the basis for further research into leader-subordinate relations, thus contributing to management theory and practice.

The next chapter starts by considering the research findings relating to TQM and OL practice illustrating an all too often 'mechanical' approach to TQM deployment. This approach often relegates the 'softer' behavioural aspects of deployment to a policy process, rather than a mutual interactive process, raising concerns over the use of TQM on subordinates. 'Wasteful' behaviour and its links to organisational learning and active listening are considered, developing the rationale for intervention. The chapter then moves on to consider the theoretical models underlying this research, considering Foxall's BPM and Deci and Ryan's SDT, concluding with the development of the joint SDT/BPM model used in this research.

# Chapter Two: Literature Review and Model Development

## 2.1 Introduction

Powell (1995) and Douglas and Judge (2001) highlight that sustainable strategic advantage is not found in the 'hard' technical aspects of change, rather that it resides in the 'softer' intangible, less imitable elements of organisational improvement. This is still true today, as up to 90% of change programmes fail to live up to expectations (Soltani et al, 2008b). Cândido and Santos (2011) performed an extensive literature review, finding failure rates of up to 80% for TQM initiatives and similar failure for other organisational change strategies, thus concluding that TQM suffers from similar issues as that of other organisational change initiatives. More recent literature considers the importance of appropriate culture (Gimenez-Espin et al., 2013; Green, 2012) and managerial values that foster trust and the satisfaction of employee psychological needs, in order to increase employee motivation towards TQM (Dahlgaard-Park, 2012; Emiliani, 1998, 2003, 2008; Emiliani and Emiliani, 2013; Jones, 1996; Halling, 2013; Soltani et al., 2008a; Soltani and Phillips, 2010; Hetland et al., 2011a).

Having considered TQM programmes from an OL perspective (Leslie, 2006), some insight was gained as to what an 'intangible architecture' might look like, including: collaboration, empowering people, collective vision, connecting the organisation to its environment and creating learning opportunities. Such insights, however, have already been proposed by the quality gurus themselves (Crosby, 1979; Deming, 1986; Juran, 1974, 2010; Ohno, 1988). As such, the OL perspective taken provides insight into what is missing, somewhat consistent with the current literature on culture and values. This research seeks to extend this understanding by considering them from a modern RB perspective, incorporating SDT. Of particular interest is the leader-subordinate relationship and how such bilateral dynamics impact on subordinate motivation and approach/avoidance behaviour during TQM implementations. This research considers the day-to-day leader-subordinate relationship from the subordinate's perspective, using a longitudinal study focusing on the impact of using mutually supportive behaviour in leader-subordinate interactions, on Lean[1] engagement and engagement quality. This approach complements the growing literature on the relational considerations of job design (Grant, 2007; Cullinane et al., 2013) and the impact of

[1]Lean is the approach to TQM adopted by the organisation under study. It emphasises the reduction of waste in the system, to reduce cost and improve service delivery, whilst balancing the system to meet customer demand.

relational waste on organisational engagement (Emiliani, 2003, 2008; Emiliani and Emiliani, 2013; Emiliani and Stec, 2005).

This chapter will proceed as follows. The first section considers the literature on TQM development from an OL perspective, moving on to a more critical review of implementations that appear to indicate management misunderstanding or misuse of TQM principles. The next section develops understanding of Lean/TQM from a leadership perspective, considering transformational leadership and the need to study the underlying supportive behaviour that makes it effective. Particular attention is given to Emiliani's (1998, 2003, 2005, 2013) examination of the principles supporting Lean/TQM, in particular the RfP construct and how its neglect can lead to wasteful behaviour. RfP behaviours are likened to OL behaviours (Jones, 1996) and supportive 'work climate' behaviours (Baard et al., 2004), suggesting strong similarity. The next sections extend this theme into consideration of active listening and mutuality behaviours (Foxall, 1999; Vella and Foxall, 2013), leading into a more detailed consideration of Lean/TQM behaviour in relation to BPM and SDT. To test the relationship between mutuality supportive leader behaviour and Lean/TQM engagement and engagement quality, nine hypotheses are developed for empirical testing, identifying the mediating variables affecting Lean/TQM engagement and engagement quality.

The final section of this chapter concentrates on developing the research model around Foxall's (1990, 1998, 2007a) BPM, using SDT variables to explore learning history, changes in which are proposed as indicators of OL. The BPM provides a post-Skinnerian model for interpreting complex human behaviour. The model will be adapted to incorporate Deci and Ryan's (2002) SDT variables, to extend the interpretative scope of the BPM. This, as far as the researcher is aware, will be the first time that these variables have been considered within this framework and within a TQM environment. Also the first time that the work climate variables of Baard et al. (2004) have been experimentally tested in a longitudinal intervention. Thus, findings will make an original contribution to theory and to practice.

### 2.2 An OL Perspective on TQM Evolution

The founders of the quality movement recognised the inextricable link between learning and continuous improvement (CI) (Juran, 1969; Ishikawa, 1985; Deming, 1986). It was one of the basic principles that the quality movement was built upon (Hackman and Wageman, 1995). Subsequent studies acknowledge the importance of learning in

quality improvement initiatives. Sohal and Morrison (1995) indicate that learning is an output of an effectively implemented Lean/TQM programme. Barrow (1993, p. 39) argues that learning should be the 'most compelling reason for undertaking a TQM effort'. Hill et al. (2001, p. 144) argue for learning agendas to be incorporated into CI initiatives (Barrow, 1993; Hill et al., 2001; Sohal and Morrison, 1995). However, Lean/TQM deployments have been subject to mixed success (Cândido and Santos, 2011; Douglas and Judge, 2001; Emiliani and Stec, 2005; Mosadeghrad, 2014; Schonberger, 2007; Soltani et al., 2008a). Many writers offer advice as to the reasons for programme implementation success or failure, as illustrated in Table 1. Whilst organisations appear to have been competent in deployment of TQM tools (Powell, 1995), it would appear that the 'softer' more intangible environmental factors, such as management commitment, leadership quality, employee involvement and supportive culture, that facilitate employee engagement, are often found deficient.

This section starts with a review of Lean/TQM evolution, taking a learning (Hines et al., 2004; van Kemenade, 2014) perspective to consider stages of Lean/TQM adaptation over 30+ years, before considering research findings on barriers to Lean/TQM engagement that particularly highlight management deficiency in creating a supportive environment for Lean/TQM and OL. Leadership research is reviewed, leading to a more behavioural perspective on management behaviour and how it supports the softer aspects of Lean/TQM and OL through current research in this area, highlighting the opportunity to contribute to this area of knowledge and the question that guides this research. Finally, the importance of this research is considered by recognising the 'double-edged' nature of Lean/TQM and the consequences on employees and ultimately Lean/TQM success of not creating a supportive culture to balance the soft and hard aspects of this management approach (Emiliani, 2003; Emiliani and Emiliani, 2013; Emiliani and Stec, 2005; Found et al., 2009; Halling, 2013; Ingelsson and Mårtensson, 2014; Mosadeghrad, 2014; Soltani and Phillips, 2010; Soltani and Wilkinson, 2010).

## 2.3 Evolution of Lean/TQM

### 2.3.1 Quality through control

In the East, quality management practice largely followed the development of Toyota. Toyota's approach to quality and management developed early in the twentieth century, influenced by Taylor and Shewart's approach to progressive management, which reflected the importance of cooperation, as well as scientific management, a

point missed by many Western organisations (Emiliani and Emiliani, 2013; Emiliani and Stec, 2005). Following the Second World War and facing scarce resources, the Toyota Motor Corporation started to develop their approach to production, the Toyota Production System (TPS), which had two main objectives: 'to eliminate waste' and to 'create value for the end customer'. Kaizen (improve for the better) and RfP are the twin pillars of the TPS and reflect the principles that guide behaviour in Toyota and support the approach to management and quality. In the West, quality management practice from the 1920s through to the 1970s focused on control. Controlling the workforce through the tools and techniques of scientific management that supported conformance to quality standards, thereby minimising variation, was the management objective. Management behaviour centred on telling and directing, using their 'hard' skills to measure and test work to ensure their lazy, immature employees were not passing off poor quality work. Such a distrustful approach being consistent with McGregor's Theory X (van Kemenade, 2014).

### 2.3.2 Quality as continuous improvement

From the late 1970s, the need to satisfy the customer led to an evolution of quality towards continuous improvement: a stage in Western managements' approach to quality where successful companies recognised the need continuously to learn and improve in order to maintain commercial competence and access to markets. This, suggested as a paradigm shift (Hines et al., 2004), reflects the influence of Deming, Shewart, Juran and Imai, for example, using management science and employee participation. The familiarity of Western management with Toyota's approach started around the early 1980s (Emiliani and Stec, 2005), becoming more widespread with the publication of the book *The Machine That Changed the World* (Womack et al., 1990). Western managers were introduced to the Lean tools, e.g. 5 Whys, seven wastes, Just-in-Time (JIT), Kanban, employee problem solving and mistake proofing. Emiliani (Emiliani and Stec, 2005) provides an account of the introduction of the TPS to companies in Connecticut, USA, in the late 1980s when representatives from Toyota presented their approach. Somehow, American business leaders and academics failed to grasp the RfP principle. It appeared to get lost in translation for many companies, with the exception of a few, such as Wiremold. This is one possible explanation as to why many organisations concentrated on the 'tools', whilst not embracing the RfP principle (Emiliani and Stec, 2005). Hines et al. (2004) suggest that it was the performance gap, of what was now known in the west as 'Lean', over traditional mass producers, that sparked the interest of Western management, who embraced the tools

yet generally neglected the human dimensions of the TPS (from now on called Lean). Such failure was often due to the difficulty in generating the required changes in behaviour (culture and mindset). Hines et al. (2004) use McGill and Slocum's (1993) four-type taxonomy of organisational learning to describe the evolution of Lean in the West. The first, or **knowing stage**, bounded by a rationality philosophy that believes there is one best way, defines waste from an engineering perspective resulting in single-loop learning, using Lean/TQM tools to generate improved knowledge and understanding to improve action. This early stage, pre-1995, was very prescriptive in the application of tools and techniques, somewhat similar to van Kemenade's (2014) 'control' paradigm. The second, or **understanding organisation stage**, use Lean/TQM in a limited way (usually shop floor) to reinforce the company's culture, using a prescriptive best practice approach to implementation that is not open to further learning or change. This, too, appears to align with van Kemenade's (2014) control paradigm, as learning is limited and primarily used to reinforce existing management behaviour, focused on control through best practice.

More advanced forms of the CI paradigm (van Kemenade, 2014) started to emerge from the latter part of the 1990s, when organisation models such as the European Foundation for Quality Management developed, with awards to motivate companies in their improvement efforts. This stage reflects a third level of learning, the **thinking organisation stage**, a move in management thinking and behaviour towards supporting a 'value stream' approach to improve quality cost and delivery for customers. At this stage, the process of identifying value streams generates questioning of existing practices and behaviours potentially facilitating 'double-loop' learning, as existing practice becomes subject to scrutiny. Western leadership styles had to adapt, developing a more relational approach to leadership through development of 'soft' interpersonal skills, enabling leaders to 'sell' and coach employees in their ideas, seeking employee engagement and involvement in their deployment. This approach is more akin to McGregor's Theory Y, 'employees like to work' (McGregor, 1960), however the primary interest is still very much task focused, centred on the hard tools to control both process and employee. At this stage of quality development, management have not fully understood, or are not fully committed to TQM as a philosophy and have not let go of traditional leadership practice, with TQM existing alongside traditional top-down management practices, albeit supported by quality frameworks (Emiliani and Stec, 2005; Hines et al., 2004; van Kemenade, 2014; Soltani et al., 2008b). With a focus on quality, cost and delivery, limiting the amount of learning to more tangible aspects of value, intangible elements remain largely ignored

and may lead to a piecemeal approach focused on applying a tools approach to improve customer value, still fundamentally missing the RfP principle.

### 2.3.3 Quality as commitment to learning (learning organisation)

This stage of evolution is based on Hines et al. (2004) 'commitment' paradigm. This **learning organisation stage** (van Kemenade, 2014) reflects a much more strategically contingent approach to Lean behaviour, actively identifying stakeholder needs and the organisation's contextual contingencies, adapting the tools and techniques to help maximise learning for employees, customers and suppliers. Lean becomes both strategic and operational and is thus the basis for the total management system of an organisation (Hines et al., 2004; Emiliani and Stec, 2005). This stage aligns with van Kemenade's (2014) commitment paradigm, requiring high levels of employee and management commitment to learning together. The supporting facilitative style of leadership creates an environment where learning becomes everyday practice, where ideas for change are hypotheses to be tested and subjected to further improvement as knowledge and practice improve. For many organisations, this will require double-loop learning and even 'deutero-learning' (Bateson, 1972), which refers to learning how to learn. Leadership focuses on building relationships to support participation, cooperation and employee commitment to the organisation and its objectives. The more traditional styles of management, through command and control, have become outdated and there is a growing realisation that the hard technical tools of quality are largely ineffective without the soft skills to engage employees in a respectful manner, using more supportive, facilitative transformational or servant leadership styles to relate to employees. These skills include interpersonal competence along with self-awareness and self-management skills. This commitment stage of development reflects a balanced approach to TQM through a focus on both kaizen and RfP, or 'soft' TQM (Emiliani, 1998; Hines et al., 2004; Jones, 1996; van Kemenade, 2014; Seddon, 2005; Soltani et al., 2008b).

In summary, these paradigm stages, control, CI and commitment, are adapted from van Kemenade (2014) and Hines et al. (2004), reflecting three stages of TQM evolution. The transition from control to CI requires single-loop learning for leadership as TQM is used to focus on the processes and people, potentially exerting even greater control over both process and workforce, requiring little change in management approach. Achieving relational engagement and commitment to TQM is likely to require a major shift in leadership behaviour (Emiliani, 2003; Hines et al., 2004; Jones, 1996; Seddon, 2005), thus requiring double-loop learning, a paradigm shift in management

behaviour. There are two key points from this analysis. Firstly, the evolution of Lean/TQM appears to be highly dependent upon an organisation's ability to learn and, secondly, learning is dependent on the softer dimension of Lean/TQM, which requires leadership behaviours supportive to learning. The literature substantially supports these findings, highlighting three points.

Firstly, some researchers have identified links between OL and quality initiatives such as TQM as a means to achieve CI, rather than double-loop learning. For example, Barrow (1993) found a correlation between process improvement and OL. Wang and Ahmed (2003, p. 12) argue that OL and TQM are 'mutually dependent' whereby 'effective learning mechanisms' need to be built in order to support TQM (Wang and Ahmed, 2003, p. 12; Deming, 1986). OL 'frameworks provide useful ways of thinking about TQM and CI' (Murray and Chapman, 2003, p. 281). Lin and Hui (1999), in an empirical study of Lean deployments, suggest that success is not solely dependent on structural organisational adjustments, rather that the internal organisational conditions into which the programme is received need careful attention (Lin and Hui, 1999). These researchers understand the importance of taking a learning approach, supported by research indicating linkages between quality programme failure and barriers to OL (Hackman and Wageman, 1995; Beer, 2003), but tend to limit their findings to learning that supports single-loop CI, similar to van Kemenade (2014).

Secondly, some authors argue that the pre-existence of 'softer, intangible' factors are essential to Lean/TQM initiative success (Winter, 1987; Spender, 1993; Szulanski, 1993; Powell, 1995; Douglas and Judge, 2001). The quality literature offers substantial acknowledgement of these factors and stresses their importance for enabling learning in quality improvement initiatives (Deming, 1986; Juran and Gryna, 1988; Barrow, 1993; Sohal and Morrison, 1995; Wang and Ahmed, 2003). The existence of these tacit, intangible learning factors is, for some authors, a resource-based advantage to an organisation providing the internal context to facilitate greater engagement in Lean/TQM initiatives (Powell, 1995; Reed and Lemak, 1998; Douglas and Judge, 2001), however the need for soft factors to pre-exist negates an organisation's ability to learn and adapt.

Thirdly, recent research into TQM barriers (see Table 1) substantially focuses on top and middle management commitment, finding that training and understanding of tools and techniques, employee involvement and empowerment, and customer focus, are important barriers to TQM success (Powell, 1995; Antony and Banuelas, 2002; Taylor and Wright, 2003; Wee and Quazi, 2005; Schonberger, 2007; Das et al., 2011; Talib et

al., 2011; Mosadeghrad, 2014). These barriers particularly highlight the softer factors that support or thwart Lean/TQM progress, suggesting the difficulties that organisations face in achieving commitment-based Lean/TQM, grounded in an OL culture.

Mosadeghrad (2014) conducted a meta-review of TQM failure research over the past 30 years (1980–2010), seeking to identify the common themes. After reviewing and evaluating 400 documents, he focused on 54 papers as relevant to Lean/TQM implementation barriers, of which 70% were survey based, with 30% based on interviews and case studies. Content analysis revealed 54 obstacles to TQM success, of which, deficient leadership and management, poor quality culture, insufficient education and training, lack of employee involvement and inadequate resources, were identified as the most prevalent barriers. Mosadeghrad (2014) indicates that TQM failure can be attributed to an inappropriate model of TQM, method of implementation, and environment for implementation, highlighting the importance of supportive leadership throughout these stages:

> 'many of the obstacles identified in this study that hinder TQM efforts are leadership factors, or strongly influenced by leadership' (Mosadeghrad, 2014, p. 177).

These findings are generally consistent with current thinking surrounding the ambiguity of TQM impacting on model choice and methods of implementation (Soltani et al., 2008a), suggesting that it is not a universal approach, rather one that requires decisions to be made regarding type of TQM model and approach to implementation, without losing sight of Lean/TQM underlying principles (Emiliani, 1998; Emiliani and Emiliani, 2013; Emiliani and Stec, 2005). Such decisions, generally made by senior management, are under the influence of management's knowledge of TQM philosophy (Antony and Banuelas, 2002; Taylor and Wright, 2003; Mosadeghrad, 2014; Emiliani and Stec, 2005; Emiliani and Emiliani, 2013), their mobility (Schonberger, 2007) and attitude towards risk (Emiliani and Stec, 2005; Schonberger, 2007). This in turn will be influenced by their experience and training in TQM, preoccupation with short-term profits and associated competitive pressures, and their perception of likely middle management resistance (Soltani, 2005; Soltani et al., 2008a; Soltani and Phillips, 2010; Emiliani, 2003; Emiliani and Stec, 2005). Mosadeghrad (2014) found that, through multiple regression, unrealistic expectations of management, poor planning, resistance, poor leadership and turnover, accounted for nearly 70% of TQM problems, thus lending further evidence to the influence of management on model choice, implementation and environment. The inability of management to create a collaborative, cooperative culture, that facilitates learning, appears in the literature as a primary impediment to

Lean/TQM success. Emiliani and Stec (2005) refer to research conducted by the Lean Enterprise Institute (LEI, 2004) who were interested in the current state of Lean deployments in America. Based on data from 999 respondent organisations, they found ten common obstacles, of which management 'backsliding to old ways of working' (36% of respondents) and 'lack of implementation know-how' (25%) were the most common. These findings are consistent with Mosadeghrad, who states:

> 'Top-down authoritative leadership style must be replaced with a more supportive, democratic, charismatic and participative style that allows employees' involvement in the TQM programme' (2014, p. 26).

Das et al. (2011) surveyed TQM managers from 265 manufacturing companies in Thailand, to establish their evaluation of senior management competency, considering this a potential barrier to TQM success. Trust, empowering others, ability to influence without control and ability to coach others, were relational elements included in the 21 competencies tested for. Their research found management competency predicted 'top management commitment' and 'employee involvement' along with other constructs, although they only singled out cognitive skills, emotional resilience and personal drive, as significant competencies, making no reference to the above relational elements. Mosadeghrad (2014) found that management competence expressed as deficient leadership correlated with low employee interest in TQM and low employee trust in management, leading to lower employee involvement. Talib et al. (2011), in their review to identify similarities and differences in TQM and supply chain practices, reviewed 21 research papers relating to success factors in implementing and adopting TQM practices. Based on frequency of reports, they found top management commitment, customer focus, employee involvement, training, supplier management and CI as the six most frequently cited success factors. Of interest here is that CI appears sixth on the list, recognising the importance of establishing the relational elements first, although this research did not and was not designed to consider the underlying relational behaviours supporting commitment and involvement.

Whilst the literature offers substantial support to the importance of top management commitment and of creating a supportive culture to promote collaboration and commitment between key stakeholders (Table 1), there is a research gap regarding the leadership behaviours underpinning support for collaboration and cooperation in a Lean/TQM environment. This review will now consider research into leadership styles and behaviours that underlie the creation of a collaborative, cooperative culture.

**Table 1: Barriers to TQM**

| Factors significantly influencing TQM/research authors | Powell (1995) | Antony and Banuelas (2002) | Taylor and Wright (2003) | Flynn et al. (1994) | LEI (2004) | Wee and Quazi (2005) | Schonberger (2007) | Soltani et al. (2008b, 2010) | Das et al. (2011) | Talib et al. (2011) | Halling (2013) | Mosadeghrad (2014) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Management commitment/ attitude** | • | • | • | • | • | • | • | • | • | • | • | • |
| **Employee involvement/ empowerment/teamwork** | • | • | • | • | • | • | • | | • | • | • | • |
| **Supplier involvement** | | • | | • | • | • | • | | • | • | • | • |
| **Customer focus** | | • | • | • | • | | • | | • | • | • | • |
| **Training in tools** | | • | | | | | • | | • | • | • | • |
| **Understanding TQM philosophy** | | • | • | | • | | • | • | • | • | • | • |
| **Understanding TQM tools** | | | • | • | • | • | • | | • | • | • | • |
| **Principle elements of management commitment/attitude that need to improve** | | | | | | | | | | | | |
| **Culture change** | • | • | • | | • | | • | • | | • | • | • |
| **Supportive, participative management** | • | • | • | • | • | | • | • | • | • | • | • |
| **Cooperation/collaboration** | • | • | • | • | • | • | • | • | • | • | • | • |
| **How ?** | | | | | | | | | | | | |
| **Improving management competence** | | | | | | | | | • | | • | |
| **Improving management understanding** | | | • | | | | | | | | • | |
| **Use of reward and recognition** | | | | | | | | | • | | | |

## 2.4 Leadership Research Post-1990

Leadership research, post-1990, has tended to focus on Bass's (1985) 'transformational leadership' style, considered superior for learning and Lean/TQM, in comparison to alternative traditional styles of leadership based on command and control, that form a 'transactional' relationship with subordinates. Transformational leadership seeks to motivate and engage workers through support, inspiration, intellectual stimulation and challenge. By acting as inspirational models, providing individual consideration and creating contexts that support increased levels of learning, 'transformational' leaders have been found to have significant positive affect on subordinate behaviour, extending beyond exchange-based behaviours exemplified by transactional leaders. Considerable research supports these claims (Judge and Piccolo, 2004). Kovjanic et al. (2012) find that the research to date focuses on three mechanisms, based upon followers' self-perception, attitude towards the leader and perceptions of their job, finding a transformational leadership style as having positive outcomes for followers and concluding that the accumulated evidence leaves little room for controversy on transformational leadership's positive affect.

Recent research is starting to look more deeply into the reasons why transformational leadership is so effective, of particular interest is emerging research into 'learning climates' (Hetland et al., 2011b) and 'psychological needs' (Kovjanic et al., 2012; Hetland et al., 2011a). Hetland et al. (2011b), in a cross-sectional study of 1,061 Norwegian postal workers, found substantial relationships between a transformational leadership style and employee perceptions of autonomy, team support and opportunities to develop. Hetland et al. (2011a), carried out a cross-sectional survey of 1,300 Norwegian cross-occupational employees, to test for differences in psychological needs satisfaction between transformational and 'management by exception' leadership styles. They found significant positive relationships between transformational leadership and the needs for relatedness and autonomy, with modest negative correlations found for management by exception. Similarly, Kovjanic et al. (2012) performed two cross-sectional studies of German (n=442) and Swiss (n=410) employees, finding that three psychological needs, competence, autonomy and relatedness (CAR), were equally important in mediating the link between leadership and job satisfaction.

These findings suggest that transformational leaders' effectiveness may be due to the 'work climate' they create based on learning principles, and their ability to satisfy

followers' psychological needs. Such findings are supported by Marescaux et al. (2012), who conducted a nationwide survey concerning Belgian employee talent management (n=5,748), where the psychological needs for CAR (Deci and Ryan, 2000) were tested as mediators between human resource practices such as training, participation and developmental appraisal, and human resource management outcomes (work engagement, organisational commitment and employee turnover intention). Their findings indicate that perceptions of autonomy and relatedness partially mediate the relationship between human resource practices and human resource outcomes, commitment and engagement. Marescaux et al. (2012) conclude by arguing that it is not merely the presence of human resource factors, rather the quality of their deployment through management behaviour, that impact on psychological needs satisfaction.

In summary, leadership research, since the 1990s, has primarily focused on transformational leadership, finding substantial evidence of its positive effect on followers. Recent research has started to consider how it is so effective, through consideration of the impact on environment, through employee perceptions of organisational climate and through studies into the impact on followers' psychological needs, in mediating effective behaviour. Findings suggest that it is not the mere presence of management practices in the workplace, rather the deployment quality that counts (Marescaux et al., 2012), exemplified through the 'climate' brought about by management behaviour. Lean/TQM research highlights the importance of competent, committed leadership. Leadership research further supports Lean/TQM findings that positive, engaging leadership is essential for success. Emiliani (1998) indicates that leadership behaviour needs to be aligned with Lean/TQM values, in particular the RfP principle, otherwise it becomes 'wasteful'.

### 2.4.1 Wasteful behaviour

Emiliani and Stec (2005) suggest that there are 11 common problems with management, of which six are relevant to this research. Firstly, misunderstanding of Lean/TQM as a 'manufacturing thing' (p. 375) rather than a management system, results in an over-reliance on the tools. Secondly, leadership behaviour is still rooted in command and control, batch thinking, whilst expecting the workforce to change and focus on waste elimination. Thirdly, senior managers espouse support for Lean/TQM, yet do not get involved, thus communicating through their inconsistency that they are not committed. Fourthly, management turnover is inconsistent with

learning Lean/TQM, as Emiliani (2003) found management stability in organisations reporting Lean transformation success. Fifthly, managers tend to focus on short-term, rather than long-term results. This being due to the sixth factor, the primacy that senior managers give to the bottom line over other stakeholder interests, such as employees, customers and suppliers. All of these management behaviours create what Emiliani (1998) calls 'wasteful behaviour'.

One of Lean's key focuses is the elimination of waste (*muda* in Japanese), which according to Taiichi Ohno, at one time Toyota's chief engineer, has seven sources: Transport, Inventory, Motion, Waiting, Over-processing, Over-production, Downtime. These, known as the '7 wastes', accompany *mura* (unevenness) and *muri* (overburden), to provide focus for improving business processes (Ohno, 1988). Emiliani (1998) argues that there is an eighth waste brought about by behaviour, in particular leadership behaviour, that does not support the RfP principle, fundamental to the Lean/TQM approach. Emiliani (1998) contrasts leadership behaviours that are wasteful to, or supportive of, Lean.

**Table 2: 'Wasteful' compared to 'Lean' behaviours**

| Wasteful behaviours | Lean behaviours |
|---|---|
| Confusion/uncertainty | Self-awareness/generosity |
| Unnecessary commentary | Humility |
| Irrelevant observations | Compassion |
| Random thoughts | Suspension |
| Self-imposed barriers | Deference |
| Ego/irrationality | Calmness/quietude |
| Positions/revenge | Benevolence/reflection |
| Inaction/preoccupation | Honesty/listening |
| Negativity/gossip/sarcasm | Patience/understanding/respect |
| Extreme flattery/cynicism | Trust/sincerity |
| Deception/selfishness | Discipline/rectitude |
| Subjectivity/bias/prejudice | Equanimity/objectivity |
| Selfishness/pride | Rectitude/wisdom |
| Criticism | Balance |

Source: Adapted from Emiliani (1998).

According to Emiliani (1998) wasteful behaviour upsets 'flow' in an organisation, by creating unevenness in relations, destroying trust and promoting competitiveness, leading to defensive behaviour (Argyris, 1999), restricted learning and a tendency towards transactional relations (Emiliani, 1998), thus limiting Lean/TQM progress. Without these underlying behaviours an organisation tends towards 'fake Lean' (Emiliani, 1998; Emiliani and Emiliani, 2013), or 'imitation Lean' (Emiliani and Stec, 2005; Emiliani and Emiliani, 2013), as only the hard, tools-based principles are

applied, ignoring the RfP that underlies the behaviours required to create relational flow in an organisation (Emiliani and Emiliani, 2013). Flow is the term Emiliani (2013) uses to reflect harmony in relations, essential to teamwork and learning. Susan Jones (1996) identifies respect, trust, honesty, humility, fairness, justice, empathy and liking of people as essential attitudes or values underlying collaborative behaviour. These underlying values support the skills of listening, openness, non-abrasiveness, tolerance of mistakes and opposing ideas, non-judgemental, genuineness, consistency, objective rationality and self-reflection/appraisal.

Similar to Emiliani (1998, 2013), Jones (1996) identifies key behaviours. She also identifies what she believes are the underlying values that support them. Without these values, inter-personal skills are likely to reflect selfish or 'hierarchical', 'zero-sum' values, not conducive to cooperation and collaboration (Jones, 1996), similar to Emiliani's (1998) wasteful behaviours. Jones (1996) identified these behaviours as essential to OL, providing the underlying support for collaborative team learning, the essential mechanism by which organisations learn (Crossan et al., 1999). Emiliani (1998) identified these behaviours as essentially representing the RfP principle supporting Lean, providing the contextual support for kaizen (CI) team learning. Therefore, the conditions that support OL are substantially similar to those that support RfP and kaizen, as illustrated below in Table 4. According to Emiliani (2005, 2008, 2013) the function of management within a Lean/TQM environment is to support, facilitate and engage in activities that continue to deliver customer-focused value to the benefit of all stakeholders. He defines Lean leadership as:

> 'Beliefs, behaviors, and competencies that demonstrate respect for people, motivate people, improve business conditions, minimize or eliminate organizational politics, ensure effective utilization of resources, and eliminate confusion and rework' (2008, p. 34).

**Table 3: Comparing RfP behaviours to OL supportive behaviours**

| Wasteful behaviours | Lean behaviours | OL behaviours |
|---|---|---|
| Confusion/uncertainty | Self-awareness/ generosity | Self-reflection & appraisal |
| Unnecessary commentary | Humility | **Humility**/non-judgemental |
| Irrelevant observations | Compassion | **Empathy**/non-abrasive |
| Random thoughts | Suspension | |
| Self-imposed barriers | Deference | |
| Ego/irrationality | Calmness/quietude | |
| Positions/revenge | Benevolence/reflection | Openness |
| Inaction/preoccupation | Honesty/listening | ***Honesty***/listening |
| Negativity/gossip/sarcasm | Patience/understanding/ respect | ***Respect***/tolerance |
| Extreme flattery/cynicism | Trust/sincerity | ***Trust***/genuineness |
| Deception/selfishness | Discipline/rectitude | Consistency |
| Subjectivity/bias/prejudice | Equanimity/objectivity | ***Justice***/objectivity |
| Selfishness/pride | Rectitude/wisdom | ***Caring (liking)*** |
| Criticism | Balance | ***Fairness*** |

Source: Adapted from Emiliani (1998); Jones (1996). Items in bold represent Jones (1996) 'values'.

This primarily behavioural definition of leadership does not directly refer to customer value. Understanding that ultimately customer value is derived from organisations developing learning behaviours 'to enable information flow between people and processes', by 'eliminating waste, unevenness, and unreasonableness'. The way to achieve this is by gaining balance (harmony) between kaizen and RfP (Emiliani and Emiliani, 2013, p. 409). CI and the associated tools and techniques can only be effectively utilised, for the benefit of all, in environments, or cultures, that promote collaboration and cooperation (Emiliani and Emiliani, 2013), a view supported by F. W. Taylor and the progressive management movement (Emiliani and Emiliani, 2013; Halling, 2013; Taylor, 1914; Wu and Parker, 2014). Shook (2010), reflecting on his experience of introducing the TPS at New United Motor Manufacturing Inc (NUMMI), a joint venture experiment between Toyota Motor Corporation and General Motors Co, highlights the importance of behavioural change in establishing a supportive Lean culture:

> 'What my NUMMI experience taught me that was so powerful was that the way to change culture is not to first change how people think, but instead to start by changing how people behave — what they do. Those of us trying to change our organizations' culture need to define the things we want to do, the ways we want to behave and want each other to behave, to provide training and then to do what is necessary to reinforce those behaviors. The culture will change as a result'.

Schein (2004) asserts that managers at all levels in an organisation are leaders and, as such, they are responsible for culture creation and management behaviour as they, through their everyday actions, will reinforce the attitudes and behaviours of their employees. Recent research lends support to a behavioural approach to understanding Lean values. Ingelsson and Mårtensson (2014), in a study of Swedish dental care providers, found leadership supportive of Lean through their behaviour (presence, encouraging CI, support in improvement activities, improving their own ways of working, taking responsibility for their own actions) an important factor in Lean implementation success. Found et al. (2009), reviewing the combined results of interview-based studies, from the University of Twente (Netherlands) and Cardiff University, into Lean leadership behaviour, found exemplary leaders in Lean indicated higher levels of behaviour, such as 'asking for ideas', that helped them sustain Lean. They also found, through feedback interviews, that both middle managers and team leaders learnt from such ideas, concluding that a culture conducive to learning and improvement resulted from such behaviours, facilitating Lean sustainability. In addition, Arumugam et al. (2013) studied 52 Six Sigma projects within an organisation, finding that a leader's ability to promote psychological safety (ability to be open with each other, valuing each other's skills and accepting each other's differences) was an important factor in teams being able to move from 'knowing what' to 'knowing how'. Finally, Baard et al. (2004) has researched autonomy-supportive leadership behaviours that appear very similar to the behaviours that engender Lean RfP and are supportive of OL (see Table 4 below). Baard et al. (2004) found these behaviours significantly correlated with employee well-being in the workplace, findings corroborated by other studies that focused on needs satisfaction (Deci et al., 2001; Van den Broeck et al., 2010). Other studies have found autonomy-supportive leader behaviour supports: prosocial behaviour in volunteer workers (Gagné, 2003) and knowledge sharing in a Danish IT company (Harder, 2008). Although there is some variation in findings to date, in that Gagné (2003) found no significant impact of autonomy-supportive leader behaviour on volunteer workers' needs (CAR), this line of research provides evidence that autonomy-supportive leadership can facilitate engagement and learning in the workplace.

**Table 4: Comparison of RfP, OL and supportive work climate behaviours**

| **Wasteful behaviours** (Emiliani, 1998) | **Lean behaviours** (Emiliani, 1998) | **OL behaviours** (Jones, 1996) | **Work climate (autonomy-supportive supervisor behaviour)** (Baard et al. 2004) |
|---|---|---|---|
| Confusion/uncertainty | Self-awareness/ generosity | Self-reflection and appraisal | Clarifies what and how |
| Unnecessary commentary | Humility | **Humility**/non-judgemental | Accepting of others |
| Irrelevant observations | Compassion | **Empathy**/non-abrasive | Able to share feelings |
| Random thoughts | Suspension | | |
| Self-imposed barriers | Deference | | Conveys confidence |
| Ego/irrationality | Calmness/quietude | | Emotionally competent |
| Positions/revenge | Benevolence/reflection | Openness | Promotes openness |
| Inaction/preoccupation | Honesty/listening | ***Honesty***/listening | Effective listener |
| Negativity/gossip/ sarcasm | Patience/respect/ understanding | ***Respect***/tolerance | Speaks respectfully/ seeks understanding |
| Extreme flattery/ cynicism | Trust/sincerity | ***Trust***/genuineness | Trustful |
| Deception/selfishness | Discipline/rectitude | Consistency | Encourages questioning |
| Subjectivity/bias/ prejudice | Equanimity/objectivity | ***Justice***/objectivity | Provides choice/options |
| Selfishness/pride | Rectitude/wisdom | ***Caring (liking)*** | Cares for others |
| Criticism | Balance | ***Fairness*** | Carefully and fully responds |

Source: Adapted from the above authors.

These findings support the important role of leadership behaviour in creating a climate supportive of OL, Lean/TQM and responsible employee autonomy. Such research is useful in identifying management behaviour that exemplifies soft or RfP aspects of Lean/TQM. One such behaviour is listening, an essential but often overlooked management behaviour that requires the presence of many of the above associated behaviours to be effective.

### 2.5 Developing a Respectful Work Climate: the Role of Supportive, Supervisory Listening Behaviour

Listening plays an important organisational role, facilitating learning through knowledge flow (Jacobs and Coghlan, 2005; Kubota et al., 2004; Welch and Mickelson, 2013) and strategy generation (Rutter, 2003), building of customer commitment (Román, 2014), employee commitment (Lobdell et al., 1993), employee trust, motivation and performance (Stine et al., 1995) and employee mental health (Kubota et al., 2004). According to Goby and Lewis (2000) effective listening skills are rated in the top ten managerial and leadership practices necessary for business effectiveness, yet rather than nurture and develop listening practice, listening is

often neglected, treated as a passive, automatic process, often overlooked and taken for granted (Welch and Mickelson, 2013).

Despite the importance of workplace listening being highlighted as far back as 1952 and popularised during the 1980s (Rogers and Roethlisberger, 1952/1991; Peter and Waterman, 1982), organisational listening research has waned in recent years. In their review of the workplace listening literature, Flynn et al. (2008) highlight the majority of research as being qualitative in nature, with a dearth of empirical research in the scholarly and business literatures. They suggest four possible reasons for this situation: first, an over-reliance on anecdotal evidence which in turn may be due, second, to no generally accepted definition of the listening construct, 'just what is listening and what are the component parts?' (p. 148). A third reason is a lack of a reliable, efficient, valid and accepted measure of worker listening skill and use of that skill. Finally, the growing complexity of the workplace increases the challenges faced by researchers (Flynn and Bodie, 2007; Flynn et al., 2008). Such complexity also creates opportunities. Recent research into workplace listening is starting to address these issues.

From a leadership perspective, Kluger and Zaidel (2013) investigated the relationship between constructive and destructive listening skills and supervisors' interpersonal/technical orientation to identify any links between orientation and listening behaviour. In a two-stage, cross-sectional study of 238 Israeli employees, from numerous organisations, principal component analysis identified four factors, representing listening skill (constructive/destructive) and supervisory orientation (interpersonal/technical). Constructive listening skills (including showing interest, emotional competence, encouraging clarification, using silence, indicating understanding, showing patience, and being other-focused) positively correlated with interpersonal leadership style ($r=0.71$), $p<.05$) and negatively correlated with technical orientation ($r=-0.52$, $p<.05$). Destructive listening (including arguing, interrupting, talking-over, focus on self, disinterest, impatience) correlated negatively with interpersonal leadership style ($r=-0.53$, $p<.05$) and positively with technical style ($r=0.67$, $p<.05$).

These findings add weight to accumulating evidence that active supportive or empathic listening improves the well-being of co-workers, as it requires the listener to engage with the speaker in a non-judgemental, constructive manner (Jones, 2011). Similarly, Bodie et al. (2012b) conducted a study involving 417 undergraduates to explore the relationship between (un)supportive listening

behaviours and the relationship with '(un)supportive person' construct, using lay conceptualisations. Their findings for 'supportive listener' were generally consistent with scholarly descriptions: friendly, understanding, non-judgemental, encouraging, truthful, optimistic, attentive, responsive; not dissimilar to Baard et al. (2004) and Jones (1996). Whilst they found 'supportive listener' findings strongly related to 'supportive person', similar to Kluger and Zaidel (2013), Bodie et al. (2012b) noted that it was not an isomorphic relationship, rather supportive person attracted molar descriptions of attributes, whereas supportive listening comprised behavioural descriptions of the supervisor in relation to the listening process.

### 2.5.1 Active listening process

Active listening, or active empathic listening, and supportive listening have significant overlap (Bodie et al., 2012a) and will be treated as synonymous for this research. At a more molar level of analysis, the listening process comprises the 'ability to effectively attend to, interpret, and respond to verbal and nonverbal messages' (Jones, 2011). Encompassing cognitive, affective and behavioural responses, active listening goes beyond passive listening, requiring the listener actively to participate in the construction of meaning, restricting personal judgement in pursuit of developing understanding of the other's perspective. Hoppe (2007) identifies this as the initial stage in active listening, 'understand first'. Key listener behaviours include the use of questions to help develop understanding, the ability to remain silent and use non-verbal cues (back channelling), eye contact and open posture. This stage of the process is very other person-centred and can itself lead to reports of positive feelings (Jones, 2011), indicate understanding and respect (Baard et al., 2004; Emiliani, 1998), empathy and caring (Baard et al., 2004; Jones, 1996) and start to build trust and promote openness in the relationship (Baard et al., 2004; Hetland et al., 2011a).

The second stage of workplace active listening, according to Hoppe (2007), involves bringing in the listener's perspective and working with the member of staff to create joint understanding. This stage can potentially be problematic, if bringing in the listener's perspective undermines the other's sense of competence or autonomy (Deci and Ryan, 2002; Hetland et al., 2011a; Lobdell et al., 1993). This stage requires openness, respect for the other, encouragement to question and careful and full responding, as well as an ability to maintain self-awareness and humility when developing joint perspectives (Baard et al., 2004; Jones, 1996). Jones (2011) highlights that behavioural coordination is important when listening supportively, as

the reciprocal nature of interaction is based on the partner's preceding behaviour and that may lead to approach behaviour or avoidance behaviour. Staying aware of a subordinate's requirements, expectations, desires and goals are essential to maintaining approach behaviour (Jones, 2011).

The third stage is 'moving to action' (Hoppe, 2007). This stage concerns the agreement of actions and deadlines to effect change. From an autonomy-supportive perspective, this stage provides the opportunity to strengthen supervisor-subordinate relations, or to undermine them. It is at this stage that the supervisor can convey confidence in and express their support of the subordinate's abilities, provide guidelines as to what success looks like and how it can be achieved, and continue to be available to the subordinate if required, providing informational feedback to help and support, rather than control (Baard et al., 2004; Deci and Ryan, 2000, 2002, 2008; Hetland et al., 2011a, 2011b; Jacobs and Coghlan, 2005). A supportive supervisor listens intently at this stage for opportunities to reinforce the subordinate's approach behaviour. SDT directs attention to the satisfaction of the subordinate's basic needs, in particular competence and autonomy, as this will support higher levels of personal regulation and motivation (Deci and Ryan, 2002), such support coming from positive informational feedback (Flora, 2004), to develop the other's sense of competence and autonomy.

### 2.5.2 Active listening and work climate

Baard et al.'s. (2004) autonomy-supportive supervisor behaviour reflects an actively supportive listening climate when compared to the literature on active listening. Whilst Baard et al. (2004) did not refer to active supportive listening, as they only tested for the level of employee experience through questionnaire, seeking understanding through enquiry, clarifying, speaking respectfully in a non-judgemental manner and fully and carefully responding to other's questions, are typical, listening-based, behaviours involved in developing individual and joint understanding (Hoppe, 2007). Emotional competence, ability to accept others and care for what they have to say, are qualities assigned to effective supportive listeners (Hoppe, 2007; Jones, 2011). Finally, Baard et al. (2004) include affective elements, such as feeling trust, cared for and the ability to be open, which are considered important elements for a collaborative learning environment (Jones, 1996) and also a result of effective active listening (Brownell, 2002; Hoppe, 2007; Jones, 2011; McGill and Brockbank, 2003; Nichols, 2009). SDT research on work climate has, to date, focused on survey-based studies that take a snapshot of

respondent perceptions in regard to work climate, needs satisfaction and well-being indicators (Baard et al., 2004; Deci et al., 2001; Van den Broeck et al., 2010). Whilst findings indicate a strong correlation between variables, they cannot conclusively identify direction of influence (Sekaran, 2006), providing opportunity for an experimental intervention, using supportive active listening. Therefore predicting that:

- Subordinates of supervisors trained in supportive active listening will report a more supportive work climate.

Based on the apparent link between Baard et al.'s (2004) autonomy-supportive work climate behaviours and their relation to listening behaviours, this research will focus on creating a supportive work climate (context), using active listening principles and behaviours to represent respectful engagement with research participants, supportive of the RfP principle as advocated by Deming, 1986; Emiliani, 1998, 2003, 2008; Emiliani and Emiliani, 2013; Emiliani and Stec, 2005; Halling, 2013; Ingelsson and Mårtensson, 2014; Jones, 1996; Mosadeghrad, 2014; Ohno, 1988; Soltani et al., 2008a, 2008b; Soltani and Phillips, 2010; Soltani and Wilkinson, 2010. Whilst Baard et al.'s (2004) work climate variables contribute towards a supportive context, they do not consider the impact of organisational structure and learning history on subordinate behaviour and perceptions of CAR.

### 2.5.3 Influence of organisational structure and learning history on listening

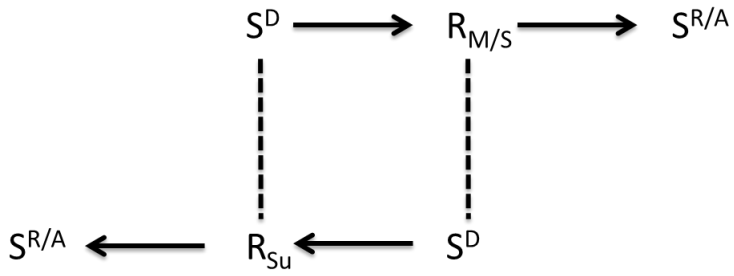
Stine et al. (1995) examined the impact of supervisory listening behaviour on subordinate perceptions of support, trust and motivation. They also considered the mediating effects of organisational structure on supervisor listening impact. The research conducted in a small US tool manufacturer (95 respondents) sought to identify listening behaviours that create a supportive interpersonal environment. Using a cross-sectional survey across multiple layers of management, they found that open, supportive listening behaviours were strongly related to perceptions of trust, support and intrinsic motivation (IM), but only in areas of the business that were more 'organic'. In 'mechanistic' areas of the business, supportive listening did not increase feelings of trust, support and motivation, in fact they found that absenteeism increased. A possible explanation for this is that their learning history, expressed through social norms not aligned with such supervisor behaviour, led to workers not positively responding to their supervisors' supportive listening (Stine et al., 1995). This research, indicates that supportive listening behaviours alone may

be insufficient to engage those without a supportive learning history. The next section sets out a three-stage listening process.

### 2.5.4 Bilateral behaviour

Managerial-subordinate behaviour comprises both verbal and non-verbal reciprocally reinforced interactions (Vella and Foxall, 2013). Considering manager-subordinate relations from such a perspective requires analysis in terms of 'the mutual qualification of behaviour setting scope and reciprocal management of reinforcement' (Foxall, 1999, p. 208). This perspective moves such a relationship beyond purely economic analysis to one that incorporates a psychological perspective. The economic perspective requires 'literal exchange' and follows a Coasian (1937/1988) perspective of economic efficiency underlying such exchanges (Foxall, 1999). The psychological perspective brings in the concept of 'mutuality relationships' involving 'behaviour setting scope management and or the management of reinforcement' (Foxall, 1999, p. 212). Taken together, literal exchange and mutuality relationship management form the basis of true, rather than pseudo, marketing exchange relations. Foxall (1999) offers the concept of 'bilateral contingency' to illustrate and explain the dynamics of such exchanges.

**Figure 1: Bilateral contingency model**




Adapted from Foxall (1999), Figure 1 illustrates the interplay between a manager or supervisor (M/S) and a subordinate (Su). The manager's behaviour acts as a discriminative stimulus to the subordinate, signalling subordinate contingencies. The subordinate's response, influenced (primed) by their respective learning history, is a discriminative stimulus to the manager, the manager reaction also primed by a personal learning history. The relationship between a firm, its agents and employees, is that of marketing exchange, that is, employees are contracted to work in exchange for benefits. However, changes in workplace practice, such as the introduction of Lean/TQM, may not involve any 'literal exchange', instead relying on mutuality contingencies to exceed the costs of change (Foxall, 1999). Taking a

bilateral perspective, it is predicted that such change requires careful management of mutuality relations to achieve employee engagement in Lean/TQM. Supervisor listening and associated behaviours can be considered part of a mutual contingency model. Underlying the bilateral contingency model is Foxall's (1994, 1998) BPM.

The BPM comprises the behavioural setting that consists of the current behavioural contexts (physical, temporal, social and regulatory stimuli) and the contingencies they signal, based on learning history. The BPM bifurcates contingencies into 'utilitarian' and 'informational': utilitarian contingencies reflect the benefit and cost in use, whereas informational contingencies are socially derived, reflecting performance and status for example. Similarly, SDT comprises motivational orientation (autonomous, controlled and amotivated), influenced by social context, the type of regulation it signals and a learning history of regulation and basic needs satisfaction (CAR) (Deci and Ryan, 2002).

### 2.5.5 Behaviour setting (context)

The managerial behaviour setting incorporates the physical, temporal, social and regulatory stimuli that influence bilateral intra-firm behaviours. Such behaviour can be explorative (rule-making) or exploitative (rule-following), both of which reinforce and or punish mutual behaviour (Vella and Foxall, 2013). According to March (1991), organisations require both behaviours to learn and adapt. Exploratory behaviour includes search, variation, experimentation, play, discovery, innovation and flexibility. Exploitative behaviour is emitted towards production, refinement, efficiency, selection, implementation and execution (p. 71). Lean/TQM requires both explorative and exploitative behaviours to reduce waste for the benefit of all stakeholders, through CI (kaizen) whilst maintaining RfP. According to Emiliani (1998), RfP is a mutual principle whereby managers create supportive conditions for workers and workers pursue CI supported by their managers. Mutuality in leader-subordinate behaviour, through RfP principles, is the key to Lean/TQM success (Halling, 2013). According to Foxall (1999), marketing managers circumscribe the market and reinforce customers to attract and retain them (Vella and Foxall, 2013). Within a Lean/TQM environment, managers will seek to circumscribe the behaviour setting and reinforce subordinates to attract them towards and keep them involved in Lean/TQM. The behaviour setting comprising the physical, temporal, social and regulatory stimuli signalling consequential utilitarian and informational benefits and costs (reinforcement and punishment). Individual learning histories, activated in

response to the setting, are primed by their respective history of reinforcement and punishment in similar settings (Vella and Foxall, 2013).

Foxall (1990, 1994) argues that the behaviour setting rests on a continuum from closed to open, reflecting the setting's relative stricture, the extent to which contingencies are within control of others (Vella and Foxall, 2013). In a closed setting, subordinates would have low levels of contingency control, managers directing reward and punishment stimuli at Lean/TQM compliance behaviour; such environments typified by limited employee choice. Conversely, more open environments provide greater employee control over contingencies. Deci and Ryan (2002) suggest that the amount of control in the environment has both immediate and historical affect, influencing an individual's motivation. Research has shown that more 'open' autonomy promoting environments significantly relate to autonomous regulation in individuals (Baard et al., 2004; Deci and Ryan, 2002; Ryan, 2009). Similarly, more 'closed' environments significantly relate to higher levels of aversely controlled regulation. SDT provides evidence of the link between employee-perceived autonomy and employee well-being, psychological capital and motivation; finding a lack of perceived autonomy as having negative affect (Bartholomew et al., 2011; Fernandez and Moldogaziev, 2013; Park and Searcy, 2012; Ryan, 2009). Such research being consistent with the work of Baard et al. (2004) in a study of two American work organisations (n=59 and n=528); work climate was significantly related to worker reported well-being and their reports of CAR. These findings have been supported by similar studies, including a Belgian and Dutch study (n=170 and n=261) (Van den Broeck et al., 2010) and a cross-sectional study of nine Bulgarian companies (n=431) (Deci et al., 2001).

SDT takes an intentional perspective to behavioural explanation, arguing that behaviour is the result of an individual's internal regulation, influenced by the present social environment, primed by a learning history of needs satisfaction, and whether it supports autonomous (self-determined) or compliant (controlled) behaviour Deci and Ryan (2002, 2008). Whilst recognising the influence of learning history and environment, SDT research does not consider the wider contextual consequences influencing behaviour, whereas a behavioural perspective, using the BPM, does (Deci and Ryan, 2002; Foxall, 2007b). However, in complex human environments outside the laboratory, operant behaviourism faces limited access to individuals' learning histories and therefore the ability to identify the connections between environment and behaviour extensionally is not always possible, thereby

requiring intentional explication of learning history to provide a fuller account of behaviour (Foxall et al., 2007). Self-determination, and its intentional stance, provides an opportunity to access learning history through respondent perceptions of work climate and basic needs (CAR).

From a Lean/TQM perspective, the environment should circumscribe stakeholder behaviour to that of mutual benefit, thereby supporting the RfP principle and OL (Emiliani, 1998, 2008; Halling, 2013; Jones, 1996). Listening as a supportive management construct requires time, appropriate physical environment, social acceptance and learning of skills (Brownell, 2002; Jones, 1996, 2011; Hoppe, 2007) and can be initially costly (punishing) to managers. Soltani and Phillips (2010) highlight the importance of a non-competitive, supportive 'atmosphere' amongst employees, to facilitate the cooperative context, essential to learning and Lean/TQM success. Mineyama et al. (2007) surveyed supervisors (n=41) and the staff (n=203) in a Japanese manufacturer, finding lower work-related stress for workers with better listening supervisors. Such findings are consistent with Jones (1996) who identifies listening as a core management competence essential for cooperation, OL and TQM. Based on Hoppe's (2007) three stages of listening (understand first, joint understanding, move to action), the antecedent context will either support or thwart these activities. As discussed earlier in this chapter work climate reflects manager listening behaviours directed towards understanding the other and promoting joint understanding, Therefore it is predicted that:

- Increasing supportive listening behaviour into a Lean/TQM context will lead to higher reported managerial work climate.

### 2.5.6 Learning history

Learning history reflects the reinforcement and punishment history of the individual resulting from past behaviour in the presence of antecedent and consequential stimuli; such operant history developing discriminant behaviour. In closed settings, such as the operant laboratory, learning history may be available due to the research subjects being pigeons or rats, whereby the researchers hold the subject's life history of detailed records in relation to experiments performed, the animal's behaviour in past circumstances and maybe even its current state of deprivation or satiation. However, in more complex human situations, where rigorous analysis is impossible (Skinner, 1974), such as the shopping mall or the workplace, such data is much more restricted and researchers have to use alternative methods to get an

insight into a respondent's learning history (Foxall, 1998). In such situations, the researcher is looking for a 'plausible account' (Foxall, 1998) and thereby trying to interpret rather than explain. Within BPM research, a popular methodology has been the use of the TPB. It has been applied to research into consumer brand choice (Foxall et al., 2007), participation in adult education (Silva et al., 1998) and adoption of new personal computing technology in the home (Venkatesh and Brown, 2001). Whilst an interesting area of research, the intention-action process is not of primary interest to this study. Instead this series of research projects takes an alternative perspective on learning history, considering subordinate experience of manager behaviour, as work climate, its relation to the development of participant CAR, and participant motivation, or priming, towards Lean/TQM.

### 2.6 SDT underlying Motivation/Regulation

#### 2.6.1 Self-determination theory

SDT is a framework motivational theory concerned with the impact of the social environment on an individual's social development, wellness and personality. In particular, to this research, SDT is concerned with how cultural and social factors promote and enhance, or undermine, human choice, impacting on both quality and sustainability of performance. SDT does not consider motivation a unitary construct, rather it differentiates types of motivation, distinguishing between autonomous and controlled motivations. Autonomous behaviour reflects emitted acts based on volition, choice and endorsement, whereas controlled behaviour is a consequence of pressure to act. Intrinsic and 'well-internalised' extrinsic contingencies represent autonomous motivation, whereas external contingencies, based on instrumental reward and punishment, or partially internalised introjected contingencies, such as social approval, represent controlled motivation (Deci and Ryan, 2000, 2002; Ryan and Deci, 1985).

**Cognitive Evaluation Theory (CET)** considers the effects of social context on an individual's *intrinsic motivation* (Deci et al., 1975; Deci and Ryan, 1980). It is argued that the environment contains a 'controlling' and 'informational' aspect, impacting on individuals' perceptions of causality and competence. High levels of control, reduce IM, shifting an individual's locus of causality to an 'external' orientation (Pelletier et al., 2001). Studies supporting CET (Deci and Ryan, 2002, Schmuck et al., 2000) support the findings that IM occurs when the task itself is inherently satisfying and that the individual is 'competent' to perform the task and perceives a sense of task

'autonomy'. **Organismic Integration Theory (OIT**) considers *extrinsic motivation* and the factors affecting internalisation and integration of values and regulations (Deci and Ryan, 1985; Ryan and Connell, 1989). This theory suggests that extrinsic values and regulations relate to activities people do not find interesting, optimally challenging or pleasing. It argues that internalisation 'naturally' occurs when a person feels competent and positively connected and supported by significant others (relatedness). **Causality Orientations Theory (COT)** proposes that 'a person's motivation, behaviour and experience in a particular situation is a function both of the immediate social context and of the person's inner resources that have developed over time as a function of prior interactions with social contexts' (Deci and Ryan, 2002, p. 21). COT describes 'inner resources' in terms of behavioural regulation orientation (Deci and Ryan, 1985) to indicate an individual's tendency towards a particular type of regulation and thus an indicator of learning history. Motivation (regulation) expressed as a continuum is shown below (Figure 2).

**Figure 2: Regulatory (motivation) continuum**


Source: Deci and Ryan (2002).

This represents a regulatory continuum spanning from no regulation, known as 'amotivation', whereby an individual has no interest in the activity or task, through to 'intrinsic regulation', whereby individuals engage through pleasure. This is the employee situation, being the result of the interplay between learning history, context and the contingencies they signal. The following explains these positions in more detail.

**Amotivation**, from an operant perspective, reflects a lack of appropriate contingent reinforcement influence on behaviour, indicating a lack of approach behaviour, possibly due to a history of punishment and or negative, aversive reinforcement (Baum, 2004; Flora, 2004; Skinner, 1974). **Introjected regulation** relates to behaviour in response to social expectations. These may be norms and rules set by significant others, which compel behaviour through feelings of obligation, guilt or shame. Deci and Ryan (2002) argue that such behaviour is not part of an integrated self, it is instead compliant behaviour to current or distal messages from significant others. Operant interpretation views such behaviour as 'rule governed'. Such rules, socially and personally derived, form part of the individual's learning history,

influencing behaviour (Zettle and Hayes, 1982). Such behaviour is of particular interest to Foxall (1994), recognising that operant contingencies do not fully account for consumer behaviour. **External regulation** refers to the use of reward and punishment (Deci and Ryan, 2002). If I do A, I will get/avoid B, therefore behaviour is purely instrumental to obtain something extraneous to the task or activity. Whilst Deci and Ryan (2002) recognise this as an incomplete portrayal of extrinsic reinforcement overall, their concern centres on the detrimental effects of non-volitional behaviour on individual well-being and regulatory orientation. **Identified regulation** represents behaviour consistent with one's values, beliefs or goals (Deci and Ryan, 2002). Behaviour such as this may not be pleasurable per se (although it often can be), but its value is recognised as important either to oneself or in relation to a significant other. Such regulation occurs when one is competent in the behaviour and has good relational support. Finally, **Intrinsic regulation** is described by Deci and Ryan (2002) as the pleasure derived from taking part in an enjoyable activity or task. In order to realise this pleasure, one must be both competent in the behaviour and act autonomously. It is the intentional equivalent of behaviourists' 'natural' reinforcement from competent acts, e.g. the pleasure derived from reading a book. If the activity is performed because one finds it pleasurable (positively reinforcing), this would be referred to as 'intrinsically' regulated behaviour. Rachlin (2004) suggests that IM, or regulation, as claimed by SDT, is nothing other than natural reinforcement, true intrinsic behaviour, more accurately evidenced by a lack of positive reinforcement in the immediate environment, and only becomes reinforcing as part of a temporally distal behavioural pattern of contingencies, not apparent to the observer. According to Deci and Ryan (2002), such regulatory priming results from a learning history of 'basic needs' satisfaction.

### 2.6.2 Basic needs theory

SDT claims evidence for three basic psychological needs innate to all humans, regardless of race or culture and evident in all developmental stages, which are important to maintain a healthy psyche. Although humans are not necessarily aware of such needs, they will 'gravitate towards situations that provide them' (Deci and Ryan, 2002, p. 7). These needs are for competence, autonomy and relatedness. Attention will now turn to a consideration of the basis for their claims. In particular, how they 'fit' into an operant interpretation of behaviour, how they relate to contingencies of reinforcement and what evidence there is of phylogenetic and ontogenetic value. The following expands on this.

### *2.6.2.1 Competence*

Competence is a significant barrier to successful Lean/TQM deployment. Insufficient training in and understanding of the tools and philosophy of TQM are recognised impediments to successful TQM. Emiliani (1998, 2003, 2008) highlights the importance of training, as an element reflecting RfP, within Toyota's management philosophy. Ever since Taylor (1914) developed his principles of 'scientific management' from observing distinct differences in levels of competence between workers, scientific and rationalist thinking influenced research into competence, until recently. Sandberg (2000) identifies three dominant approaches to competence research: **Worker-orientated** research defined competence as skills, knowledge, abilities and traits incumbent to successful workers. **Work-orientated** research focused on defining requisite competencies for task/role fulfilment, firstly defining competencies required to fulfil a task/role, then focusing on the employee. Both of these approaches are skills focused (Sandberg, 2000). An alternative approach defines work and worker as separate entities. This *interpretive* or *phenomenological* approach views competence as contextually experienced; work and worker cannot be separated (Sandberg, 2000). It is from this perspective, that Deci and Ryan (2002) define their version of competence:

> 'competence is not, then, an attained skill or capability, but rather is a felt sense of confidence and effectance in action' (Deci and Ryan, 2002, p. 7).

This definition reflects how one feels capable of influencing important outcomes in life, similar to Bandura's (1977) concept of 'self-efficacy', consistent with operant explanation of positively reinforced behaviour. Feelings of confidence and effectance are private events collaterally accompanying a history of positive past reinforcement and likely to occur on encountering similar situations (Baum, 2004; Flora, 2004).

> 'When a given act is almost always reinforced, a person is said to have a feeling of confidence' (Skinner, 1974, p. 64).

Reinforcement builds feelings of competence (mastery, power, potency). Skinner posits, 'In all this the behaviour is erroneously attributed to the feelings rather than to the contingencies responsible for what is felt' (p. 64). Conversely, when behaviour is unreinforced or punished, feelings of competence and mastery wane. Behaviour becomes less likely due to the absence of reinforcing contingencies. However, a lack of feelings (efficient cause) is often used to explain the reduction in behaviour rather than the ultimate cause being a lack of reinforcing contingencies (Skinner,

1974). Flora (2004) supports this perspective, adding that competence is 'fluency' or a high rate of correct response to environmental stimuli. Functionally, competence is appropriate behaviour, selected and contingently rewarded from the environment. Behaviour is shaped by contingently rewarding successively difficult responses; the respondent rewarded for discriminating appropriate responses to environmental stimuli. Inappropriate responding (behaviour) is not rewarded and extinguishes such behaviour. Once basic skills are established, fluency develops through repetition, with correct responding reinforced (Catania, 2007; Cooper et al., 2007; Johnson and Layng, 1992). Eisenberger (1992) explains that when competence is low, behaviour is experienced as effortful and aversive; as fluency increases, effort is replaced with feelings of pleasure and enjoyment, as behaviour becomes more effortless. Cheney (1999) argues that such 'shaping' of behaviour is important in developing 'self-esteem'. Competence or fluency is very important because competence increases the range of reinforcing contingencies available to a person. For example, if a person cannot read, they will not experience the natural pleasure of reading only available to those able to read. As their reading skills increase, greater reinforcement may be derived from more difficult texts along with the ability to understand, critique and argue; all of which were previously unavailable to them. Appropriate positive reinforcement is therefore essential to building competence (Flora, 2004). Deci and Ryan (2002) refer to competence as 'feeling' able to respond appropriately to environmental challenges. Appropriate behaviour will meet these challenges, inappropriate behaviour will not. Competent behaviour has survival value and, as such, has utility value to the individual as it attracts positive reward contingencies important for survival and reproduction. From this perspective, RfP necessitates work environments that support competence development. Competence is essential to feeling autonomously engaged in Lean/TQM. Supportive supervisors' behaviour is predicted to enhance perceived competence in subordinates, with competence building over time through positive contingent experience of supportive supervisors. To build competence Deci and Ryan (2002) highlight the role of relatedness in competence formation.

Bowlby (1988, 2005), a developmental psychologist identified the importance of secure attachment between a child and its caregivers in order for it to flourish and grow. A child, secure in receiving warmth and positive encouragement, is much more likely to demonstrate exploratory behaviours than its insecure equivalent. Such attachment history extends into our adult life, forming part of our learning history that

influences how we relate to others. The next section explores the construct of relatedness. It is therefore predicted that:

- Subordinates reporting to supervisors trained in supportive active listening perceive higher levels of competence in comparison to those who report to untrained supervisors.
- Subordinate perception of competence increases over time when exposed to supportive listening contexts.

#### *2.6.2.2 Relatedness*

Cooperation and reciprocation are fundamental to Lean/TQM and the RfP principle and OL (Crossan et al., 1999; Emiliani, 1998; Emiliani and Emiliani, 2013; Halling, 2013; Hetland et al., 2011a, 2011b; Ishikawa, 1985; Jones, 1996; Soltani et al., 2008a). Deci and Ryan (2002) describe relatedness as referring to:

> 'feeling connected to others, to caring for and being cared for by those others, to having a sense of belongingness both with other individuals and with one's own community' (p. 7).

Relatedness is therefore, not so much about sex or status, but rather feeling secure in community or unity. Deci and Ryan (2002) claim these needs are essential to human well-being, as evidenced in a substantial body of research covering differing life domains and cultures. Deci and Ryan (1985) describe relatedness as a need, which it is, in as much as it supports survival. As humans, our phylogenetic inheritance creates tendencies to form social alliances both within and outside the workplace. We are social beings who are willing to trust and support each other, even at expense to ourselves. Exchange is mutually beneficial and we are very sensitive and alert to signs of trust being breached by others who become selfish and cheat in relationships. Bernard et al. (2005) suggest that although selfish behaviour promotes individual survival, 'prosocial behaviour that develops interpersonal and group ties may also help increase inclusive fitness.' (p. 137). They argue that prosocial behaviour, such as altruism, results from evolved mental mechanisms (Bowles and Gintis, 2003, 2004) that provide a predisposition to cooperate with others, termed 'strong reciprocity' (Bowles and Gintis, 2004). Grant (2007), an organisational psychologist with interest in job design and motivation, argues that the relational aspects of job design have tended to be ignored in the past, with the focus having been on task structure and individual differences. Through a wide literature review he provides evidence that 'a growing body of

research suggests interpersonal relationships play a key role in enabling employees to experience their work as important and meaningful' (p. 394). He argues that the consequences of prosocial behaviour for individuals, is in *informational reinforcement* of the employee's positive social status and worth, granted by the beneficiaries of their actions. Grant also argues that such prosocial acts are likely to enhance feelings of competence and autonomy (Grant, 2007). Prosocial relatedness has high survival value; humans have developed a phylogenetic and ontogenetic capacity to behave prosocially in environments supportive of such behaviour. The interplay between individual learning history and environmental contingencies determines whether an individual behaves in a prosocial way. Grant (2007) recognises that individuals are more likely to act in a prosocial manner when they 'care' about the beneficiaries. Operant expression defines this as collateral feelings 'associated' with a learning history of positive reinforcement from this or similar individuals. Relatedness and competence play an important role in internalising extrinsic contingencies, both essential in formulating autonomous forms of regulation (Deci and Ryan, 2002). Identifying with Lean/TQM requires both perceptions of competence and sufficient social support (relatedness), to identify with Lean/TQM contingencies. A history of supportive peer-peer, as well as manager-subordinate mutual relations, is therefore important in developing relational conditions that positively influence Lean/TQM engagement. Three hypotheses arise from this. Firstly, mutuality supportive management listening behaviour should therefore lead to higher perceptions of subordinate relatedness. Secondly, mutuality supportive listening behaviour includes arrangement of contextual stimuli (physical, temporal, regulatory) to encourage social conditions conducive to supportive listening behaviours. Thirdly, relatedness will improve over time as subordinates experience the positive contingencies derived from supportive listening and develop a learning history conducive to supportive supervisory listening behaviour. Therefore it is predicted that:

- Subordinates reporting to supervisors trained in supportive active listening perceive higher levels of relatedness in comparison to those reporting to untrained supervisors.
- Subordinate perception of relatedness increases over time when exposed to supportive listening contexts.

#### *2.6.2.3 Autonomy*

Autonomy is an important element within Lean/TQM principles, especially the RfP principle. Essentially, quality decisions should be made as close to the work as possible, as in a true quality environment workers take pride in their work, decide on what needs to be done and when. Supervisors are there to support, not to control (Deming, 1986; Ishikawa, 1985; Nonaka and Takeuchi, 2011).

> 'Autonomy refers to being the origin or source of one's own behaviour […]. When autonomous, individuals experience their behaviour as an expression of the self, such that, even when actions are influenced by outside sources, the actors concur with those influences' (Deci and Ryan, 2002, p. 8).

Within SDT, autonomy concerns responsible choice, not complete unrestricted and irresponsible freedom (Deci and Ryan, 2002). An individual can follow rules set by others and still feel autonomous as long as the individual endorses the other's request (Deci and Ryan, 2002, p. 8). From a radical behaviourist perspective, the idea that behaviour is an expression of the self at first glance denotes a sense of 'free will', that is, behaviour is determined by something other than heredity, environment or learning history (Skinner, 1974), chosen by something within the individual (a homunculus or daemon). This position would be problematic for RB. However, Deci and Ryan (2002) state that 'individuals experience their behaviour as an expression of the self' (p. 8). Such an experience may be no more than an illusion, determined by inheritance and past learning history, that is temporally distant, yet creates a sense of 'self-endorsement' due to a history of positive reinforcement. Hebb (in Sappington, 1990) refers to this as 'soft determinism'. Daniel Dennett (1969/2010, p. 198) defines choice through deliberation before action as determining autonomous choice (in his case 'free will'). This is not in conflict with RB as such choice is likely determined by heredity and past environmental contingencies (Baum, 2004). From an operant perspective, autonomy is an inner experience, a collateral product resulting from repeated reinforcement of operant behaviour. Operant behaviour is often said to be under the 'will' of the acting person (Skinner, 1974, p. 44), perceived as choice, self-determination, a volitional act. Yet, at the same time, the environment is 'selecting' behaviour, based on the person's reinforcement history. Such selection takes place at the 'sub-personal' level (Foxall, 2007a), whilst the experience of choice is experienced at the 'personal' level.

Rachlin (2007) relates autonomy and free will to acts of self-control. Teleological behaviourism's concept of autonomy is premised on long-term, temporally-extended environmental forces (contingencies) controlling patterns of behaviour, rather than traditional RB concepts of operant contingencies acting in an immediate or delayed capacity. According to Rachlin (2007), autonomous decisions, are evidenced through behaviour unexplained by immediate stimuli or contingencies. He also rejects the concept of delayed reinforcement, as there is no reinforcement for individual acts of self-control (2004, 2007). Value is found in the wider pattern of behaviour this act supports. Rachlin noted that Skinner rejected the concept of free will as operant behaviour is controlled by its consequences, respondent behaviour is controlled by its antecedents, therefore unconditional free will is impossible from a RB perspective. Rachlin (2004, 2007) proposes an extension to Skinner's operant/respondent classification, as shown in the Table 4.

**Table 5: Rachlin's classification of operant response**

| Classification | Description |
|---|---|
| **Respondents** | Reflexes attributable to external stimuli |
| **Emitted operants** | Acts of high intrinsic value, such as eating, done for own sake |
| **Reinforced operants** | Acts not done for their own sake but for the sake of an extrinsic reinforcement |
| **Self-controlled acts** | Acts of low intrinsic value, never extrinsically reinforced, which are part of a pattern of acts of high intrinsic value |

Source: Adapted from Rachlin (2004, 2007).

Rachlin argues that autonomy or free will only occurs in the last category, 'self-controlled acts', as all others reflect behaviour ultimately caused by environmental contingencies. Self-control is only evidenced in behaviour that has low intrinsic value (the act itself is not immediately reinforcing) and not extrinsically reinforced. Acts of self-control are intrinsically reinforced by the wider pattern of behaviour they support. An individual act, itself not reinforced, often competes with alternative, more immediately rewarding, behavioural options. The SDT concept of 'identified regulation' aligns with Rachlin's argument, in that when an employee identifies with Lean/TQM, it sustains behaviour through otherwise monotonous, punishing tasks, as it fits with a wider motivating pattern of behaviour (Deci and Ryan, 2002; Deci and Ryan, 2000). Similar to competence and relatedness, mutuality supportive supervisory listening behaviour is predicted to increase subordinate perceptions of autonomy. Supervisors that arrange contextual contingencies, such as the regulatory environment, to support autonomy are predicted to be more successful

than those who do not. Finally, changing autonomy perception, similar to competence and relatedness is predicted to take time, therefore:

- Subordinates reporting to supervisors trained in supportive active listening perceive higher levels of autonomy in comparison to those reporting to untrained supervisors.
- Subordinate perception of autonomy increases over time when exposed to supportive listening contexts.

### 2.6.3 Discussion and summary

In summary, CAR represents the SDT of psychological needs, essential to human health and regulation. It is argued CAR also represents constructs that are congruent with Lean/TQM principles, especially that of RfP. Differential satisfaction of these needs influences the quality of regulation (motivation), in terms of the amotivation-intrinsic regulation continuum (supported by CET, OIT). Individual learning histories reflect past social contingencies, orientating behaviour according to stimuli from the current social setting (COT). The BPM takes an extensional perspective, considering wider environmental influences on behaviour (physical, temporal, regulatory, as well as social), providing a broader account of contextual influences on learning history. This research predicts that all three variables will improve in work climates that provide mutuality supportive conditions, reflected in this research through mutuality supportive supervisory listening behaviour. Such behaviours encompass contextual adjustment to the behavioural context, to support such behaviour and encourage positive responsible engagement in Lean/TQM. This is interpreted as a representation of the RfP principle. These predictions are captured in the following hypotheses.

| ***Initial Hypotheses*** | |
|---|---|
| H1 | Higher supportive listening behaviour leads to higher reported managerial work climate |
| H2 | Higher reported managerial work climate relates to higher reported CAR |
| H3 | Subordinates reporting to supervisors trained in supportive listening report higher work climate and CAR than those reporting to untrained supervisors |
| H4 | Subordinate perceptions of work climate and CAR increase over time when exposed to supportive listening |

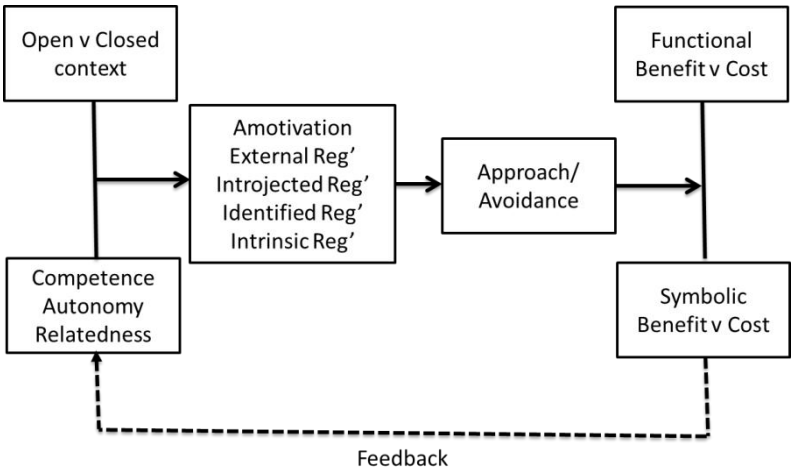
Respect for people takes time to learn and develop. Recent research suggests that new initiatives take time to impact on social norms (expectations) and personal

needs (requirements), thereby requiring time to impact positively on individual and group learning histories (Emiliani and Stec, 2005; Emiliani and Emiliani, 2013; Klonek et al., 2014), as, similar to a Lean/TQM initiative, leaders can expect change to take up to 10 years to become effectively integrated into the organisational culture (Emiliani, 1998; Emiliani, 2003). This research takes a longitudinal approach to examine the impact of the introduction of mutuality supportive supervisory behaviour within a Lean/TQM environment, as an experiment that predicts such behaviour influences higher quality Lean/TQM engagement through satisfaction of subordinate CAR needs. It also predicts that supportive listening behaviour is enhanced when contextual contingencies are adjusted to support mutuality. Work climate is therefore interpreted as managerial listening behaviour within a, more or less, supportive behavioural context. Perceptions of change in work climate become an important indicator of both individual and OL, along with changes in perceived CAR. Both SDT and the BPM framework are useful to the exploration of mutuality supportive behaviour, where SDT supports social behaviour potentially representing RfP principles and the BPM providing the wider contextual contingencies influencing behaviour. Yet the model is incomplete, as reinforcing contingencies require consideration. The next section considers behavioural contingencies from BPM and SDT perspectives.

### 2.7 Reinforcing Contingencies

The BPM extends the Skinnerian view on reinforcement to conceptualise it in terms of its informational and utilitarian consequences. Informational consequences embrace areas such as status (being seen with a Gucci bag) and progress (how well am I doing?); such comparisons signal fitness. Utilitarian reinforcement reflects the pleasures of possessing goods and services. Nicholson and Xiao (2007) have extended this concept further to represent functional (utility) and symbolic (informational) contingencies, their primary purpose being to make the concept more accessible to a wider, non-psychologist, audience. This thesis embraces these terms. The behavioural situation, based on environmental cues and individual learning history, signals the expected outcome (contingencies), towards which approach and avoidance behaviour is emitted. The actual outcome will act as feedback for an individual's learning history, increasing or decreasing the probability of similar behaviour occurring in similar circumstances in the future (Baum, 2004). The following diagram (Figure 3) illustrates an adapted BPM model.

**Figure 3: Adapted behavioural perspective model**




Source: Foxall (1998); Deci and Ryan (2002).

As discussed earlier, competency requires positive reinforcement (Flora, 2004). From a behavioural perspective, competence is defined as fluency of correct response to environmental stimuli; a functional response to environmental contingencies. Behaviour is shaped by contingent reward for successively difficult responses the respondent gives for discriminating appropriate responses to environmental stimuli. Inappropriate responses are not rewarded in order to extinguish such behaviour. Initially, contrived re-enforcers may be required to develop basic skills as learning new behaviour may be experienced as effortful and therefore aversive (Eisenberger, 1992; Flora, 2004). Such contingencies may be social (approval, praise, etc), physical (tokens, cash, pizza, etc) or temporal (time off). Once basic skills are established, fluency is developed through repetition, with correct responding being reinforced. Schedules of reinforcement are likely to move from rewarding each occurrence to more intermittent schedules of reinforcement (Flora, 2004; Johnson and Layng, 1992). As skill and therefore fluency develop, the feelings of enjoyment replace feelings of effort as skilful behaviour becomes more effortless and 'natural' reinforcement takes over as increased competence widens the available contingencies available to the respondent. The following table indicates the similarity between SDT and operant perspectives on motivation and reinforcement contingencies.

**Table 6: SDT regulatory states expressed in operant terms**

| SDT | *Amotivation* | *Relative Autonomy* | | | |
|---|---|---|---|---|---|
| | | External regulation/ motivation | Introjected regulation/ motivation | Identified regulation/ motivation | Intrinsic regulation/ motivation |
| **Operant** | No available contingencies/ punishment | 'Contrived' contingencies | Strong social/rule governed contingencies often aversive | Social and rule governed or immediate/ distal operant contingencies primarily positive | Natural contingencies |

Source: Adapted from Deci and Ryan (2002); Foxall (1994, 1998).

From an SDT perspective, the quality of motivation is enhanced as basic needs are more fully satisfied. A behaviourist interpretation of Deci and Ryan's (2002) three needs suggests that all three are constructs dependent upon positive reinforcement. As expressed earlier, relatedness is possibly the primary construct, in that the social or relational environment will determine the contingencies available to a participant. Managers who positively relate to their subordinates are likely to use appropriate positive contingencies in developing and maintaining competence, providing choice is likely to be part of the manager or supervisor's behavioural repertoire when engaging with subordinates. As competence develops, intrinsic motivation will take over from extrinsic and other lower forms of regulation, that is, the natural contingencies derived from task or activity, expressed as pleasure, will dominate over other contingent and motivational categories. This suggests a relationship between competence, autonomy and relatedness, whereby relatedness is the primary construct upon which competence is developed. As competence develops through positive reinforcement of appropriate behaviours, a wider range of natural contingencies becomes available to a participant, including the natural pleasures from competent behaviour. Such contingencies are experienced intentionally as intrinsic motivation, yet ultimate explanation resides in the environment, being natural reinforcement. In addition, contexts with a strong, positively reinforced relational environment lead to competent behaviour experienced as autonomy. Therefore concentrating on developing supportive relational structures to underpin the shaping of competent behaviour, participants, at all levels of competence, will experience greater 'feelings' of autonomy than those in more restrictive environments. This perspective is in contrast to SDT, as Deci and Ryan (2002) argue that higher forms of regulation, or motivation, are more autonomous, because

they are more aligned with an internal 'self' that identifies with the task or activity. The argument from a behavioural perspective is that the feeling of autonomy is a collateral by-product of positive contingencies supporting relatedness and competence, enabling access to a wider range of reinforcing contingencies. The greater the positive experience of relatedness and competence, the greater the experience of autonomy.

### 2.7.1 Aligning SDT variables to BPM contingencies

Foxall (1998) offers a model of contingent reinforcement based on the utility and informational consequences of consumer consumption. Within this section, an initial outline of these contingencies and their hypothesised relationship to SDT variables is made. As the projects proceed, the categories will be expanded.

#### *2.7.1.1 Utility*

Utility refers to the value in use to the individual from a product or service. It is used by Foxall (1998) to refer not only to the functional value but also to the feelings associated with owning and consuming:

> 'it is reinforcement mediated by the product or service; it inheres in the use value of the commodity' (p. 326).

Utilitarian reinforcement can be hypothesised as relevant to developing perceived competence, where feelings of competence arise when positively reinforced appropriate behaviour is positively reinforced; that is, when an individual acts on their environment, such as to improve a process, is such behaviour rewarded by the process becoming easier or more effective? Acts rewarded in the past become more likely to be emitted when similar circumstances present themselves in the future (Skinner, 1953). Such behaviour has functional utility, as positively rewarded.

#### *2.7.1.2 Informational*

Informational reinforcement is more symbolic in character (Foxall, 1998), as it is:

> 'usually mediated by the responsive actions of others, and is closely akin to exchange value. It consists not in feedback per se but in feedback on an individual's performance. [...] the level of correctness or appropriateness of a person's performance' (p. 326).

SDT considers the nature of control that contingencies exert upon people, from instrumentally controlling through reward and punishment, through to informational control via performance feedback (Deci and Ryan, 1980; Deci and Ryan, 2000; Deci and Ryan, 2002). Informational or symbolic reinforcement would therefore appear to be involved in developing perceptions of relatedness and autonomy. The contingent nature of informational feedback is important within SDT. Feedback that promotes responsible autonomous behaviour is related to perseverance, health and vitality, whereas 'controlling' feedback is related to opposite effects (Deci and Ryan, 2000, 2002). From a Lean/TQM perspective, the literature suggests that the experience of aversive relationships has a negative impact on employee engagement and, in particular, superior-subordinate interactions provide considerable performance feedback. Informational feedback is important in developing subordinate CAR. Mutuality supportive supervisors are predicted to improve subordinate perceptions of motivation towards Lean/TQM and reduce subordinate amotivation towards Lean/TQM, with quality of motivation improving as learning history develops. It is therefore predicted that:

- Subordinates reporting to supervisors trained in mutuality supportive listening perceive higher quality engagement in Lean/TQM than those reporting to untrained supervisors.
- Quality of motivation improves over time for subordinates with mutually supportive supervisors.

In summary, the BPM and SDT perspectives on contingencies are somewhat complimentary. Functional reinforcement appears somewhat consonant with the development of competence perceptions. Similarly, symbolic reinforcement is likely to impact on development of relatedness and autonomy perceptions. Whilst it is not the intention of this research to test for levels or changes in levels of functional and symbolic reinforcement/punishment, its overall presence and quality can be inferred from changes in the surrogate reported regulatory history (motivation). SDT can therefore assist operant interpretation of behaviour. From an OL and Lean/TQM perspective, monitoring learning history from a perceived work climate, CAR and motivational perspective, can provide an important insight into the state of organisational development regarding RfP. From a mutuality perspective, managers will only persist with supportive listening behaviour if the benefits outweigh the costs. It is predicted, therefore, that mutuality supportive managers, as indicated by subordinate work climate scores, have higher subordinate engagement in

Lean/TQM and higher quality engagement. Overall, these predictions are captured in the following hypotheses.

| ***Research Hypotheses*** | |
|---|---|
| H1 | Higher supportive listening behaviour leads to higher reported managerial work climate |
| H2 | Higher reported managerial work climate relates to higher reported CAR |
| H3 | Subordinates reporting to supervisors trained in supportive listening report higher work climate and CAR than those reporting to untrained supervisors |
| H4 | Subordinate perceptions of work climate and CAR increase over time when exposed to supportive listening |
| H5 | Subordinates reporting to supervisors trained in supportive listening perceive higher quality engagement in Lean/TQM than those reporting to untrained supervisors |
| H6 | Quality of motivation (RAI2) improves over time for subordinates with mutually supportive supervisors |
| H7 | Work climate has significant impact on active Lean engagement |
| H8 | CAR has significant impact on active Lean engagement |
| H9 | RAI2 has significant impact on active Lean engagement |

### 2.8 SDT from a Behavioural Perspective

Modern behaviourists do not deny that something inside an individual 'mediates' behaviour (Rachlin, 1989). Foxall expresses this as an individual's learning history, separating it from context by recognising the need for intentional expression (Foxall, 2007b). Staddon (2001) refers to internal 'states', derived from interaction with the environment, leaving an individual predisposed to act in a manner following patterns recently reinforced. Rachlin (2007) argues that intentions can only be explained from a temporally-extended viewpoint and that complex behaviour, often, cannot be explained from immediate intentional states or from immediate contextual contingencies. He argues that 'true' acts of autonomous behaviour are not intrinsically satisfying in the short term, something inside the individual mediates choice between short-term and long-term patterns of behaviour. Such choice can only be explained through behaviour itself (Rachlin, 2007). For the behaviourist, the ultimate cause of behaviour is in the environment, not in the individual. Most behaviour, if 'introspected or observed, is accompanied by collateral behaviours termed feelings' (Skinner, 1974). Intentional approaches to psychology argue that such feelings – intrinsic motivation, love, fear, for example – are the cause of behaviour. Such feelings, the behaviourist argues (Skinner, 1974; Baum, 2004; Rachlin, 1991), are often experienced along with other verbal and non-verbal

behaviour as internal behavioural reactions to outside stimuli. These reactions are evolutionary adaptations of value to the individual and species, not the cause of behaviour, rather behaviour requiring explanation, such explanation found in the environment (Skinner, 1974).

There has been much debate and contestation between behaviourists[2] and SDT supporters,[3] with the latter claiming that extrinsic rewards reduce IM and both sides claiming some form of victory over the other. This research is not particularly interested in this debate; all reinforcement/reward is viewed as extrinsic, it is just the nature of the reward, as it is either intrinsic (naturally inherent) to the activity or extrinsic to the activity. Practising behaviourists recognise the benefit of extrinsic or 'contrived' reinforcement, where intrinsic, or 'natural', contingencies are inaccessible or unavailable to an individual. Competence is required to access the natural intrinsic contingency of an activity. Developing competence may require support of extrinsic reward, until sufficient competence is developed. Flora (2004) uses many such examples from education and mental health. Toates (2009) notes the 'subtle and nuanced' value of the SDT approach in explaining behaviour, whilst not indicating how to accommodate the two in behavioural analysis.

This research seeks to draw on both behaviour theory (operant) and SDT to assist behaviourists in understanding the associated feelings attached to activities and their current dispositional state. This knowledge will assist in the design of appropriate contingencies to increase participation in activities such as Lean/TQM. Such insight can potentially provide the behaviourist with useful knowledge regarding the quality of reinforcement. Similarly, SDT researchers can benefit from consideration of social interaction within a wider behavioural context. Having considered SDT in relation to the BPM, the focus now turns to a consideration of the research gaps this thesis seeks to contribute to, the guiding research question developed from this review and a final review of the literature that highlights why this research is important, before moving on to consideration of the research model.

### 2.9 Research Gap

Whilst there are numerous papers that highlight the softer barriers to Lean/TQM, there is a dearth of research into the behavioural elements supporting the soft RfP

[2]See Flora (2004); Aselage and Eisenberger (2003) for a behaviourist perspective that provides evidence of the positive use of extrinsic reward in shaping behaviour.
[3]See Deci and Ryan (2002); Kohn (1999) and Pink (2010) for a self-determination perspective and note that both Kohn and Pink have not been directly involved in research.

dimension (Found et al., 2009). In a similar vein, the lack of clarity and definition of such behaviour limits construction of supplementary soft measures of Lean/TQM performance (Ingelsson and Mårtensson, 2014). From an OL perspective, there are few empirical studies into how constructive and wasteful leadership behaviours are related to the learning context at work (Hetland et al., 2011a). Foxall (2007a) proposes a model of bilateral contingency to describe not only the economic relation between manager and subordinate but also the psychological aspects of mutuality in relationships. Proposing that mutuality imbalance creates wasteful behaviour in organisations, through poor quality and quantity of engagement in programmes such as Lean/TQM, this research seeks to contribute to this area of interest. Through a combination of SDT and BPM, mutuality supportive behaviour can be studied in terms of its impact on participant learning history. The BPM takes a primary role in Project One, as a qualitative study into a Lean/TQM implementation, providing a framework within which the researcher explores the Lean/TQM experiences of many stakeholders, developing an understanding of the influences on mutuality relations within the participating organisation.

This research particularly considers Baard et al.'s (2004) autonomy-supportive, supervisory work climate constructs and the relationship to psychological need satisfaction, Lean engagement and quality of Lean engagement motivation. A research need which is supported by Fernet (2013), who calls for more investigation into conditions that foster, not impede, motivation and psychological health. Whilst Baard et al. (2004) have tested the relationship between work climate perceptions and the relation to psychological needs and well-being, such research, based on cross-sectional surveys cannot establish causation. This research seeks to address this gap, performing a longitudinal experiment aimed at introducing Baard et al.'s behaviours into a Lean/TQM environment and monitoring the impact on participant learning history (Project Two). The research also contributes to TQM literature in that it considers employee engagement at several levels within an organisation, an approach that Bhamu and Singh Sangwan (2014), in their review of Lean manufacturing research, have identified as a research gap, as most studies focus on senior leader opinions, with few studies considering lower level employees. Project Three addresses this and contributes further to work climate research in taking an organisational-wide study that predicts employee engagement and engagement quality in relation to work climate quality and basic needs satisfaction (CAR).

### 2.9.1 Primary research question

Considering that Lean/TQM commitment and OL appear predicated on work climates reflecting employee supportive management behaviours, do these behaviours directly influence engagement and quality of engagement in Lean/TQM?

The nine hypotheses test supportive behaviour as a direct influence on Lean/TQM and as a potentially indirect influence through CAR variables, competence, autonomy and relatedness.

## 2.10 Why This Research is Important

The significance of this question lies in research indicating that, without leadership behaviour supportive of the RfP principle, Lean/TQM takes on a form of tool-based monism that can be 'mean' (Emiliani and Stec, 2005). Halling (2013) identified literature indicating the 'double-edged' nature of Lean that, absent from the RfP principle, can lead to intensified work pace, resulting in job stress and health problems (Carter and Gray, 2007; Landsbergis et al., 1999; Parker, 2003). In addition, he found negative impact on motivation (Carter et al., 2011; de Treville and Antonakis, 2006; Mehri, 2006), reduced worker control and increased monotonous repetition (Börnfelt, 2006). Taylor and Wright (2003) investigated 113 UK organisations over a five-year longitudinal study which focused on perceived success and the associated factors. Their findings suggest that senior management's lack of understanding regarding TQM can be associated with management and employee involvement and lower perceived success in the programme. The 40% of organisations that had discontinued TQM over this period had indicated issues with understanding its principles. Of the remaining organisations, the more successful ones had used TQM to create an external orientation, rather than a purely internal operational problem-solving approach (Taylor and Wright, 2003). The issues are not with the tools and processes, but rather the intangible environmental elements to support engagement. Soltani et al. (2008a) were interested in the managerial orientation and attitudes towards control in TQM programmes. Whilst the quality advocates emphasised control of process (Hackman and Wageman, 1995), they found more emphasis on employee control to standards set by management. This case study research of three UK manufacturers found TQM used to exercise managerial coercive power rather than creating an empowering environment for the workforce. Such an approach did little more than reinforce established control structures over the workforce, promoting compliant

behaviour through increased procedures and controls (Soltani et al., 2008b). Similarly, Soltani et al. (2010) investigated the influence of very senior management on the implementation behaviours of middle management. Taking evidence from a study of 68 managers across three organisations, they found that senior management emphasis on control and detection (rather than proactivity and prevention) correlated with middle management focus on workforce control rather than process control and a short-term tactical orientation rather than a long-term view of improvement.

Soltani et al. (2010) argue that effective TQM implementations require a senior management orientation supportive of TQM principle, promoting 'a supportive atmosphere and a cooperative rather than a competitive relationship with middle and first line managers as well as non-management employees' (p. 370). Through a longitudinal study spanning two decades of Lean implementation at Vauxhall (GM) and Rover (BMW), Stewart et al. (2009) offer a critical account of Lean from a workforce perspective. Whilst recognising improved productivity across both organisations, they raise concerns over the impact of the cost to employees. Stewart et al. (2009) conducted a survey across both UK-based organisations to gain employee perspective on consultation, involvement, work conditions, work load and workplace stress. They found that line workers across both organisations reported workload increasing and autonomy reduced, along with greater management control and surveillance (p. 208). 54% of respondents found their work monotonous, 61% reported that they could not vary the pace of work, with 49% reporting that they felt exhausted at the end of their shift, with such monotony and exhaustion reported as spilling over and affecting workers' home lives. 68% of respondents reported little to no consultation in relation to company policy, with 40% reporting 'very little' to 'no influence' over the way they did their job. 73% of respondents reported that it was difficult to very difficult to change things that they did not like in their job. Finally, despite the rhetoric of worker autonomy, 73% responded as experiencing high levels (close to very close) of management surveillance, 49% reported that management were not interested in their welfare (a further 28% were 'not sure'); in addition 36% reported having experienced at least 'some' level of bullying from a manager. Such findings are in stark contrast to TQM guru claims of greater employee involvement, empowerment and engagement. Instead, a picture of monotony, exhaustion, control and disengagement emerges. Other studies also raise critical concerns over the impact of Lean/TQM (Table 7).

**Table 7: Research studies finding Lean 'mean'**

| Author | Type of Research | Findings |
|---|---|---|
| **Graham (1995)** | Case study | Increased work intensity/ job rationalisation |
| **Rinehart et al. (1997)** | Survey | Work overload/job rationalisation |
| **Brenner et al. (2004)** | Multi-sectoral study in US focused on lean techniques | Physical problems of cumulative trauma disorders associated with QCs and JIT |

Durand (2007) claims that Lean is the philosophy of workplace control; labour subordinated within an 'invisible chain' of tightly organised workflow (p. 202). Such claims, which do not deny the economic efficacy of lean, raise concerns relating to the intentional or unintentional human consequences resulting from work contexts, with lower worker autonomy, reduced job content (to increase speed) and management who direct and control, rather than consult and support. Seddon (2005) argues that failure to understand TQM philosophy leads to an over-reliance on tools of TQM and a focus on output through worker control. At the root of this is a lack of desire to change hierarchical power relationships, leading to a control focus, using tools to achieve the rhetoric of TQM engagement, without any fundamental change in organisational orientation (Seddon, 2005), a finding supported by other researchers (Jones, 1996; Mosadeghrad, 2014; Halling, 2013; Deming, 1986; Soltani, 2005; Soltani et al., 2008b; Soltani and Phillips, 2010; Soltani and Wilkinson, 2010; Schonberger, 2007; Emiliani, 1998; Emiliani and Stec, 2005).

The literature indicates that a balance is required between tools-based improvement and RfP; the key to this is respectful, supportive leaders at all levels. However, the literature also indicates that leadership and management commitment are common deficiencies in Lean/TQM implementations. The next section considers literature relating to supportive listening and respectful work climates.

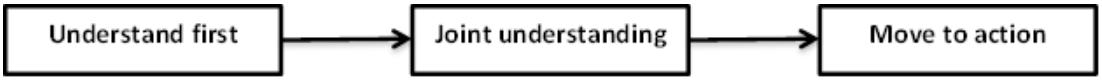
### 2.11 Behavioural Model for Exploring the Impact of Respectful Managerial Listening Behaviour

The following primary research model (Figure 5) is a synthesis of BPM and SDT elements that will form the basis of this research. Management (listening) behaviour utilises the physical, social, temporal and regulatory elements to create an environment which is conducive to supportive listening. Over time, management behaviour positively influences subordinate learning history (work climate, CAR).

This model predicts that CAR significantly mediates work climate influence on Lean/TQM engagement (approach/avoidance) and quality of engagement (motivation).

Hoppe (2007) highlights three key stages in active listening that this research will incorporate with BPM and SDT as part of the supportive supervisory listening behaviour process, consistent with RfP and OL principles (Baard et al., 2004; Deci and Ryan, 2000, 2002; Deci et al., 2001; Deming, 1986; Emiliani, 1998, 2003, 2008; Emiliani and Emiliani, 2013; Emiliani and Stec, 2005; Gagné, 2003; Gagné et al., 1997; Hetland et al., 2011a, 2011b; Jones, 1996, 2011; Soltani et al., 2008a, 2008b; Soltani and Phillips, 2010; Soltani and Wilkinson, 2010). First, understand context and learning history; second, create joint understanding with key stakeholders and third, move to mutual action (kaizen) for the benefit of all (RfP).

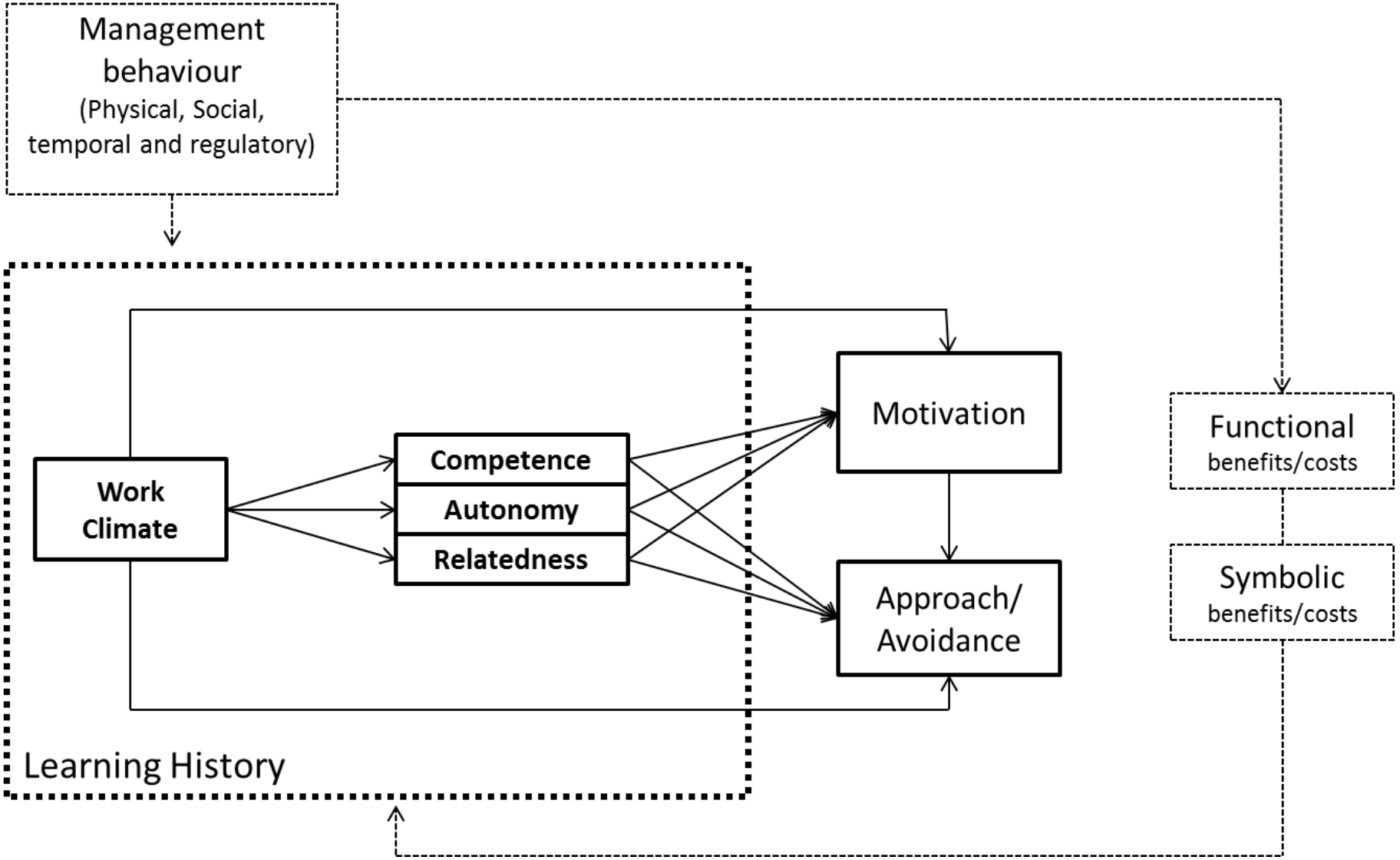
**Figure 4: Stages in active listening**




Source: Adapted from Hoppe (2007).

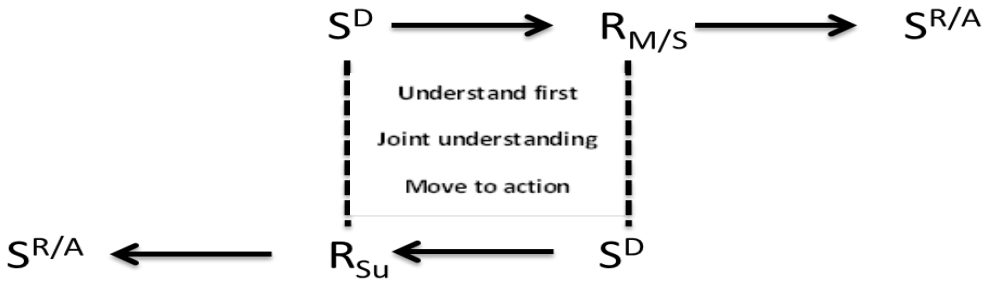
These stages represent a process of developing understanding and action, consistent with AR principles, for consideration in the next chapter. To facilitate this process, a framework to guide exploration and explanation of the social and wider environmental factors influencing complex human behaviour within a Lean/TQM implementation environment is required. Foxall (1990, 1994, 1998, 1999, 2004, 2007a) offers such a model. Foxall (1999, p. 207) argues that marketing firms exist 'in order to reduce the transaction costs involved in finding and retaining customers [...] to economise the transaction costs of creating and maintaining long-term marketing and quasi-marketing relationships'. Marketing relations comprise literal exchange, an essential feature of a market-based relationship, and mutuality. Mutuality refers to the scope of mutual interaction, where 'the nature of the social physical, temporal and rule-based discriminative stimuli discriminative stimuli that compose the setting' determine the behavioural scope for each party (Foxall, 1999, p. 214). Lean/TQM principles follow a similar logic to that of the marketing firm, pursuing transaction cost reduction via the elimination of waste throughout the supply chain and the key to this is the involvement of all relational stakeholders including, customers, suppliers, organisational managers and employees (Deming, 1986; Emiliani and Emiliani, 2013; Halling, 2013; Ishikawa, 1985).

**Figure 5: Primary research model**



The BPM/SDT model provides the basis for understanding mutuality relations and Hoppe's (2007) listening stages provide a process for developing mutual understanding.

**Figure 6: Developing mutuality-based understanding**




Source: Adapted from Foxall (2007a); Hoppe (2007).

## 2.12 Summary and Conclusion

In summary, whilst OL authors (Hines et al., 2004; van Kemenade, 2014) suggest that Lean/TQM has moved through a series of paradigms from control through to commitment, the literature suggests that the softer elements of Lean/TQM are deficient and a barrier to successful deployment. Research indicates that without RfP Lean/TQM can be double edged (Emiliani and Stec, 2005), RfP being essentially behavioural. The literature generally supports the idea that Lean/TQM is more effective and beneficial to all when supported by a collaborative culture, exemplified by committed supportive leadership, supportive of staff and other stakeholders. Such leadership is typified by a 'transformational' rather than a 'transactional' style of leadership (Bass, 1991), and research is starting to consider the underlying mechanisms of this leadership style, although further research will help clarify supporting behaviours. The literature indicates a gap in research relating to leadership behaviours that support RfP principles, especially from an employee perspective, highlighting the opportunity for contributory research to address this gap. One such behaviour is that of listening, an ill-defined construct but one that appears to have much overlap with the behavioural elements in Baard et al.'s (2004) SDT work climate questionnaire, providing the basis for experimental study in a Lean/TQM context. Taking a view on leader behaviour from a combined BPM and SDT can potentially provide support to Emiliani's (1998) view on Lean supportive behaviour and Jones' (1996) view on OL supportive behaviour. As such, this research seeks to offer an original contribution to the Lean/TQM and OL literature,

by considering the influence of work climate and CAR on Lean/TQM engagement and engagement quality. These variables were reflected in nine hypotheses for testing during the project phase of this research. This contribution also supports more recent research from Found et al. (2009), as well as Ingelsson and Mårtensson (2014), relating to the identification of the softer aspects of Lean/TQM engagement.

| ***Research Hypotheses*** | |
|---|---|
| H1 | Higher supportive listening behaviour leads to higher reported managerial work climate |
| H2 | Higher reported managerial work climate relates to higher reported CAR |
| H3 | Subordinates reporting to supervisors trained in supportive listening report higher work climate and CAR than those reporting to untrained supervisors |
| H4 | Subordinate perceptions of work climate and CAR increase over time when exposed to supportive listening |
| H5 | Subordinates reporting to supervisors trained in supportive listening perceive higher quality engagement in Lean/TQM than those reporting to untrained supervisors |
| H6 | Quality of motivation (RAI2) improves over time for subordinates with mutually supportive supervisors |
| H7 | Work climate has significant impact on active Lean engagement |
| H8 | CAR has significant impact on active Lean engagement |
| H9 | RAI2 has significant impact on active Lean engagement |

# Chapter Three: Research Methodology

## 3.1 Introduction

This chapter develops the methodological approach that underlies this research. Blaikie (2007) suggests that major choices have to be made before undertaking social enquiry, including: the research problem or problems, the types of question being considered, the strategies used to answer these questions, the researcher's stance towards those researched and the research paradigm, including its ontological and epistemological assumptions regarding the nature of reality and the foundations of knowledge (p. 5). The chapter first considers these choices, and then turns to consideration of relevance and rigour in research, before providing an overview of the research approach.

### 3.1.1 The research problems

This research considers the impact of mutually supportive management listening behaviour on subordinate learning history represented through changes in reported work climate, competence, autonomy and relatedness, as well as changes in motivation towards Lean/TQM. SDT research using the work climate approach has to date concentrated on cross-sectional workplace studies, finding significant correlation between work climate and CAR (Baard et al., 2004; Deci et al., 2001; Van den Broeck et al., 2010). This thesis argues that Baard et al.'s (2004) work climate reflects behaviours and affective responses indicative of management behaviour supporting RfP principles (Emiliani, 1998; Halling, 2013) and OL (Jones, 1996). To support this argument, management work climate is tested in three ways. Firstly, within a Lean/TQM deployment environment, providing a novel context to test the relationship between managers' work climate and subordinate CAR, as this research predicts findings consistent with earlier research regarding relations between these variables. Secondly, to extend work climate research, this study will perform a Lean/TQM intervention grounded in principles of bilateral mutuality (Foxall, 1999; Harris and Harris, 1995) and supportive active listening (Hoppe, 2007; Jones, 1996, 2011), representing RfP principles (Emiliani, 1998; Emiliani and Stec, 2005; Emiliani and Emiliani, 2013) and management commitment, a key barrier to Lean/TQM success (Das et al., 2011; Emiliani, 1998; Emiliani and Stec, 2005; Halling, 2013; Mosadeghrad, 2014; Soltani et al., 2008a; Soltani and Phillips, 2010; Talib et al., 2011). Predicting this interaction to improve subordinate reports of work

climate, CAR and motivation over baseline, this intervention is designed to provide evidence of direction of influence. The third and final test is based on an organisation-wide, cross-sectional survey to consider the variables in relation to Lean/TQM approach and avoidance behaviour, using regression analysis to identify the significance of work climate, CAR and motivation on predicting Lean engagement/disengagement. Findings from this research will extend SDT work climate research, through generating applied findings and testing key relationships in comparison to earlier findings. Lean/TQM and OL research also extend through evidence of practical management commitment and its impact on learning and subordinate engagement. The following hypotheses represent what will be tested during these research projects.

| ***Research Hypotheses*** | |
|---|---|
| H1 | Higher supportive listening behaviour leads to higher reported managerial work climate |
| H2 | Higher reported managerial work climate relates to higher reported CAR |
| H3 | Subordinates reporting to supervisors trained in supportive listening report higher work climate and CAR than those reporting to untrained supervisors |
| H4 | Subordinate perceptions of work climate and CAR increase over time when exposed to supportive listening |
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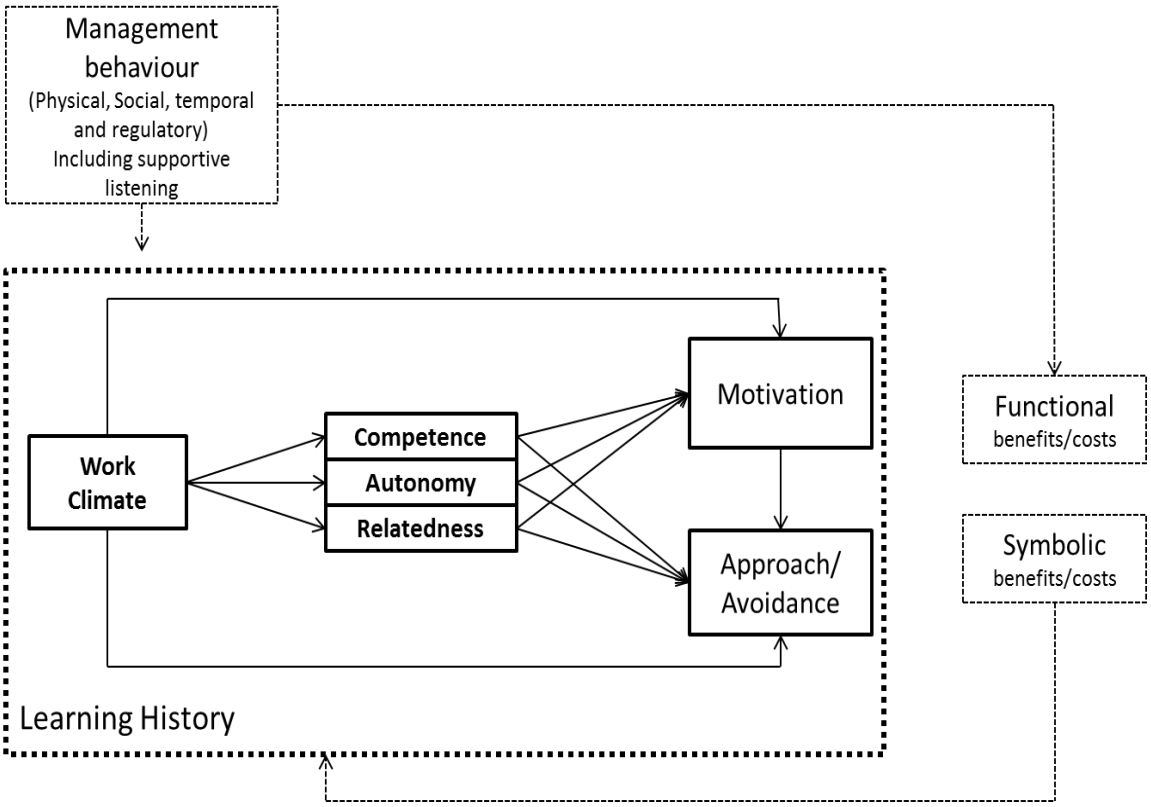
| H8 | CAR has significant impact on active Lean engagement |
| H9 | RAI2 has significant impact on active Lean engagement |

Whilst SDT variables measure the impact of management behaviour on subordinate learning and engagement, management listening behaviour is contextually situated, interacting with a subordinate's learning history and signalling contingencies influencing engagement and disengagement. According to Foxall (1998), managers adjust the physical, social, temporal and rule-governed elements of their environment to influence approach or avoidance behaviour. Supportive manager listening behaviour is part of this mix, requiring setting adjustments to enhance its affect (Hoppe, 2007). 'Practical' change in management listening behaviour, to be effective, also incorporates wider contextual change, for example finding time and place for listening, thus lending itself to a behavioural framework for investigation such as the BPM, which is chosen for this research. In turn, SDT variables offer an

insight into changes in subordinate perceptions of their environment, providing a view of their complex learning history, a known weakness of behavioural research outside the laboratory setting (Foxall, 2007a). From a behavioural perspective, this research concerns changes in respondent learning history, resulting from changes to context. Toates (2009) suggests a link between SDT and operant behaviourism, but as yet this researcher is not aware of any study that has incorporated elements of each model. The following model (Figure 7) illustrates this as being adaptable to reflect the specific research interests of each project.

**Figure 7: Adapted behavioural perspective model**




A radical behaviourist perspective is appropriate to this approach as it emphasises the importance of positively reinforcing environments (Nye, 1979; Skinner, 1953).

### 3.1.2 Problems from a research perspective

The theoretical hypotheses could be investigated through the use of questionnaires to establish what relations exist between variables. Similarly, the questionnaires, if administered 'bottom-up', that is asking respondents to reply with reference to their

leader, would also provide some insight as to what the relationships are like in terms of the questions asked. However, this approach is unlikely to be able to infer why the results are that way (causality). An intervention (experiment) taking an applied behavioural analysis approach, that is, measure the situation – intervene – measure the change, could prove a useful way to establish some confidence in relational direction and potentially provide additional data.

### 3.1.3 Summary

In summary, this research investigates the impact of supportive management behaviour on subordinate learning and engagement in Lean/TQM, taking such behaviour as the practical manifestation of management commitment to Lean/TQM, commitment identified as a major obstacle to deployment success, utilising Foxall's BPM (Foxall, 1998) as the research framework and SDT variables work climate, CAR and motivation representing learning history. Theoretically, this research will add to work climate research in three ways: by testing in a novel situation to establish replication of findings, assessing the impact of mutually supportive facilitator behaviour and subordinate training on work climate, CAR and motivation in a longitudinal study, and testing work climate as a predictor of Lean/TQM engagement as part of a cross-sectional organisational survey.

## 3.2 Science and Interpretation in Behaviourist Inquiry

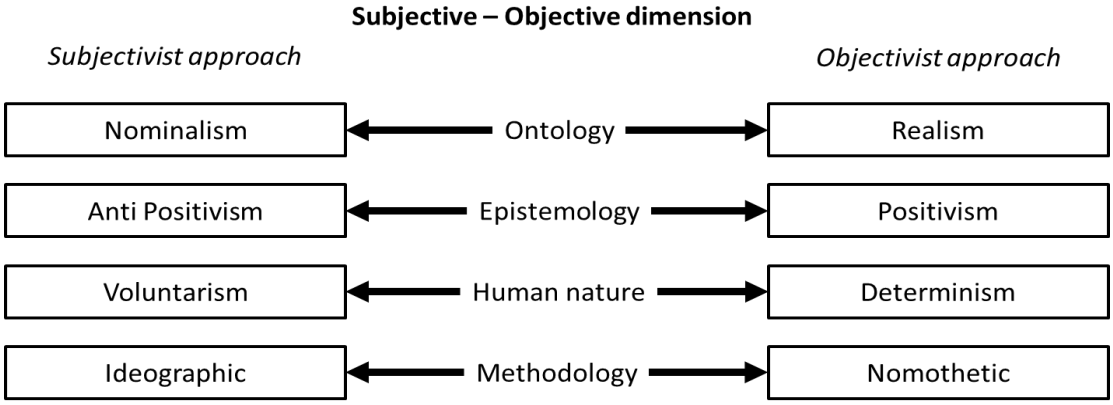
Adopting a radical behaviourist perspective to consider both SDT and TQM implementation behaviour requires adherence to its philosophical stance. 'Paradigm' is a term popularised by Thomas Kuhn (1962/2012)[4] to represent a philosophical stance. Pepper (1942) 'described a worldview as a set of assumptions about the world and about science as a methodology for discovering truth in the world' (Dahl et al., 2009). RB is the, paradigm, world view and philosophical stance that Skinner and Hayes (1976, p. 3) developed to explain human behaviour. As illustrated in Chapter Two, it differs both ontologically and epistemologically from early forms of behaviourism and pre twentieth-century philosophy (Baum, 2004). Before considering the approach taken in this research, some consideration needs to be given to a number of research dilemmas that require consideration when deciding

[4]'Paradigm shift' is the term he used to represent breakthroughs in scientific progress/thinking that disrupt linear progress and accepted thinking. Radical behaviourist thinking was such a shift, challenging Cartesian dualism and placing environmental influence (epistemologically and ontologically) as the cause of behaviour, rather than spiritual/mental essences.

on an appropriate research approach (Blaikie, 2007; Burrell and Morgan, 1979; Johnson and Onwuegbuzie, 2004; Mackenzie and Knipe, 2006).

Burrell and Morgan (1979) identify four strands of an ongoing debate regarding approaches to research, which they term the 'subjective-objective' debate, representing it along a continuum of competing dimensions, as illustrated in the following diagram (Figure 8) indicating the respective extreme positions which will now be described, incorporating more recent contributions from the social research literature.

**Figure 8: Burrell and Morgan's (1979) subjective-objective dimensions**




### 3.2.1 Objectivist approach

The ontology debate refers to the nature of reality, whereby 'realists' argue that there is a natural world that exists independently of human cognition or experience (Mertens, 2005), in other words there is an independent reality. Epistemologically, knowledge is established through the careful study of the natural environment using the 'scientific method', 'based on the rationalistic, empiricist philosophy that originated with Aristotle, Francis Bacon, John Locke, August Comte and Emmanuel Kant' (Mertens, 2005, p. 8). Such an approach 'reflects a deterministic philosophy in which causes probably determine effects or outcomes' (Creswell, 2003, p. 7). The behaviourist stance certainly embraces the position that human behaviour is determined by the environment, both phylogenetically and ontogenetically reflecting our genetic predisposal to survive and our ability to learn how to react according to our environmental consequences (Baum, 2004). The nomothetic stance of the objectivist position favours research premised on 'the approach and methods

employed in the natural sciences, which focus upon the process of testing hypotheses in accordance with the canons of scientific rigour. It is preoccupied with the construction of scientific tests and the use of quantitative techniques for the analysis of data' (Burrell and Morgan, 1979, pp. 6–7). Objectivists contend that 'time- and context-free generalizations are desirable and possible, and real causes of social scientific outcomes can be determined reliably and validly. [...] researchers should eliminate their biases, remain emotionally detached and uninvolved with the objects of study, and test or empirically justify their stated hypotheses' (Johnson and Onwuegbuzie, 2004). The objectivist approach is also referred to as a 'positivist philosophy' or 'positivist/post-positivist paradigm', (Azorin and Cameron, 2010; Johnson and Onwuegbuzie, 2004; Mackenzie and Knipe, 2006) favouring a quantitative, top-down research strategy (Blaikie, 2007). At the purist extreme, quantitative methodology is incompatible with qualitative methodology (Howe, 1988, quoted in Johnson and Onwuegbuzie, 2004).

### 3.2.2 Subjectivist approach

At this side of the continuum, ontologically, reality is a subjective experience whereby it 'is socially constructed' (Mertens, 2005, p. 12); there is no world independent of human experience, as there is no 'real' structure to the world and 'names, concepts and labels which are used to structure reality' (Burrell and Morgan, 1979, p. 4) are 'artificial creations whose utility is based upon their convenience as tools for describing, making sense of and negotiating the external world' (p. 4). Epistemologically, knowledge, and thereby truth, is contextually bound and can only be understood from 'the point of view of the individuals who are directly involved in the activities which are to be studied' (p. 5). In contrast to determinism, the subjectivist extreme position is one of complete autonomy, whereby humans are free to choose independently, regardless of environmental influence. To understand the subjective social world, a researcher needs to get close to the subjects to 'generate or inductively develop theory or patterns of meaning' (Creswell, 2003, p. 9) from the accounts provided by research participants as the researcher 'gets inside', 'involving oneself in the everyday flow of life' (Burrell and Morgan, 1979, p. 6). The subjectivist researcher rejects the objective position, arguing that 'multiple-constructed realities abound, that time- and context-free generalisations are neither desirable nor possible, that research is value bound, that it is impossible to differentiate fully causes and effects, that logic flows from specific to general, and

that the knower and known cannot be separated because the subjective knower is the only source of reality' (Johnson and Onwuegbuzie, 2004, p. 14).

The subjectivist approach is also referred to as the 'interpretivist/constructivist paradigm' (Azorin and Cameron, 2010; Johnson and Onwuegbuzie, 2004; Mackenzie and Knipe, 2006) that favours qualitative, inductive research methods over quantitative. At the purist extreme, qualitative methodologists claim superiority over their quantitative opponents.

### 3.2.3 A mid position: mixed method/pragmatic philosophy

According to Johnson and Onwuegbuzie (2004), this debate stretches back more than 100 years, so the above gives but a flavour of the ongoing argument between purists at each extreme. More recently a third paradigm has started to emerge, that of 'mixed methods' or pragmatic philosophy.

Early behaviourism, in particular the methodological behaviourism of Watson, was very much towards the positivist/objectivist extreme, whereas modern RB is more centrally positioned (Baum, 2004; Foxall, 1998). Skinner took an atheoretical position, concerned more with a pragmatic approach to developing a science of human behaviour than being caught up in arguments that had no functional value (Baum, 2004; Staddon; 2001). Baum (2004) explains that RB was indirectly influenced by Peirce and James, the early pragmatists, through Ernst Mach who was influenced by James. Pragmatists take the position that 'scientific explanation consists only in describing things in terms that are familiar. It has nothing to do with revealing some hidden reality beyond our experience' (Baum, 2004, p. 29). He goes on to say: 'In pragmatism… if we were to make a distinction between subjectivity and objectivity at all, it would differ altogether from the distinction made in realism. You could say that the conflict between subjectivity and objectivity is for the pragmatist resolved in favour of subjectivity. Since there need be no objective real world, "Objectivity", if it has any meaning at all, at most could be a quality of the scientific inquiry. The move most consistent with pragmatism would be simply to drop the two terms altogether' (p. 30).

This move towards a more pragmatic, pluralistic approach to research is echoed in the debates surrounding strategic approaches towards knowledge generation, which will now be considered as a continuation of the above approaches to research.

### 3.3 Research Strategy

Blaikie (2007, p. 56) states: ‘In order to generate new knowledge about social phenomena, researchers need to adopt a logic of enquiry, a research strategy (RS), to answer research questions’. Blaikie (2007) uses Peirce’s (1839–1914) inferential strategies of induction, deduction, retroduction and abduction as logics of enquiry for social research.

The traditional epistemological approach to behaviourist research was very much inclined towards an inductive positivist tradition, whereby an independent objective researcher would observe an external reality, altering variables, assessing results and generalising knowledge/theory from observations; the greater the number of observations, the more reliable the findings (Blaikie, 2007; Foxall, 1998).

#### 3.3.1 Induction

Although induction was strongly criticised as far back as the 1930s, the inductive research strategy and its claim to truth based on experience and verification (Blaikie, 2007), was popular up to the 1960s, when it came increasingly under attack. Karl Popper (1902–1994) was a severe critic of the inductive method, arguing that inductive inference cannot be logically justified as it involves ‘infinite regress’ (Popper, 1959/2002), that is, ‘to claim that the principle of induction is a universal statement derived from experience is to use the principle in order to justify it’ (Blaikie, 2007, p. 63). The inductive strategy has also been criticised for its assumption of a theory neutral observer being unrealistic, with Popper (1959/2002) arguing that observation often requires interpretation and that the observer has to know what they want to observe before they can see it and there is also the question as to how many observations are required in order to claim reliable knowledge (Blaikie, 2007). However, the bottom-up inductive strategy is not the only approach to generating knowledge, other strategies include the following.

#### 3.3.2 Deduction

Deduction, or the hypothetico-deductive method, is a top-down method used to test a hypothesis, taking a falsification approach to theory building, whereby knowledge is only tentative and subject to amendment based on future findings. Popper (1959/2002), the primary advocate for this approach, ‘required that for any theory to be regarded as scientific, it must be possible, at least in principle, to falsify it’ (Blaikie, 2007). However, deduction also has its problems in that it is argued that it

relies on induction for the source of theory propositions and where theory is not falsified the data lends ‘inductive support’ (Hempel, 1966).

### 3.3.3 Retroduction

Retroduction ‘entails the idea of going back from, below, or behind observed patterns or regularities to discover what produces them’ (Lewis-Beck et al., 2004), building hypothetical models to explain observed phenomena and then empirically testing the model to see how successfully it explains the observed phenomena (Harre, 1961 in Blaikie, 2007). The retroductive approach is purported to overcome the deficiencies found in both the inductive and deductive research strategies. Foxall (1998) refers to the BPM research programme as following a retroductive strategy.

### 3.3.4 Abduction

Finally, the abductive research strategy is advocated as an interpretive method for hypothesis construction, driving such theories from ‘social actors’ language, meanings and accounts in the context of everyday activities’ (Blaikie, 2007, p. 89). This strategy is described by Blaikie (2007) as a largely cognitive process, in uncovering the meanings, interpretations, motives and intentions of the social actors’ accounts, using everyday, first-order, concepts to describe the social situation and generate second-order theory that can be used for comparison to other social situations or for testing through other strategies, such as the deductive method.

Blaikie (2007) indicates that these four strategic approaches to social enquiry have their advocates and critics, but ‘constitute four different ways of generating social scientific knowledge by addressing the problem of where to begin and how to proceed’ (p. 56). He suggests that weaknesses in the inductive and deductive strategies, that apparently render them deficient, have led to the development or reclamation of two ‘alternative’ research strategies, abduction and retroduction (p. 82). However, rather than conceiving abduction and retroduction as alternatives, the next section suggests that retroduction (hypothesis construction) relies on the integration of abductive, inductive and deductive methodologies, recursively, in developing and testing scientifically valid knowledge.

Often retroduction and abduction are treated as being synonymous. However, according to Chiasson (2005), Peirce (1839–1914) offered three methods of inference (induction, deduction and abduction) as logics of inference. Abductive

reasoning was not only a distinct form of logical inference, a 'logic of discovery' and a method for developing hypotheses, it was also 'essential […] to his theory of pragmatism' (Chiasson, 2005, p. 223). Chiasson contends that abduction and retroduction should be regarded as separate terms, whereby the retroductive process is the 'full process of engendering a hypothesis' (p. 226). Abduction is 'the subordinate process of noticing an anomaly and getting an explanatory hunch (by means of *abduction*). Thus, for the "first stage" of reasoning to occur by means of retroduction, abduction must operate in recursive interplay with the other reasoning forms (deduction and induction) to engender a hypothesis worthy of acceptance and scientific inquiry' (p. 226).

### 3.4 Research Approach

Viewing research from this perspective, suggests an approach based on *methodological pluralism*, taking a *pragmatic stance* towards scientific enquiry. Such an approach is not inconsistent with wider calls for 'mixing' methods in organisational research in an attempt to move on from methodological orthodoxy, to one of methodological appropriateness (Azorín and Cameron, 2010; Cameron and Molina-Azorin, 2011; Johnson and Duberley, 2000; Johnson and Onwuegbuzie, 2004; Patton, 1990). The orthodoxy that has dominated RB is that of induction and, whilst it has proved successful in the operant laboratory, its appropriateness as a methodological strategy in the complex environments of social interaction is in serious doubt (Foxall, 1998). In the spirit of pluralistic enquiry Foxall (1998) calls for more of a retroductive approach to radical behaviourist enquiry, suggesting more appropriate use of the hypothetico-deductive method. This research follows Foxall's (1998) sentiments, seeking to push the boundaries further by embracing abduction and its recursive partners, induction and deduction, through the use of AR as the primary research framework.

To date, there is little behaviourist research, if any, that has taken or, rather, claimed to have taken, an AR approach and this is probably due to the dominance of cognitive epistemology and ontology surrounding this strategic approach to enquiry. However, with advances in behaviourist science embracing a pragmatic approach to pluralistic enquiry, AR can aid interpretation in complex social environments. AR methodology, with some adaptation to meet behaviourist requirements, offers the opportunity to extend available methodologies in developing radical behaviourist understanding in complex organisational environments. From a pragmatic perspective, the ontological dilemma is relatively straightforward: there isn't one!

RB is based on a pragmatic philosophical stance, which differs from the worldview of realism, of which there are many versions. Realism suggests an ontologically objective universe, independent of our senses, but only accessible through our sensing. As such we can develop our knowledge of the universe through sense data, albeit subjective. Baum (2004) states that epistemological 'explanation consists of the discovery of how things really are' (p. 23). He likens this approach, to that of 'explaining the workings of an automobile engine' (p. 23). For a more detailed coverage of realist ontology and epistemology, see Blaikie (2007).

At the start of this research programme, following the DBA training phase and experience as a practising manager involved in leading change, this researcher's epistemological perspective had become more subjective, recognising that knowledge creation is not theory neutral and that learning history influences observation of the world (Dahl et al., 2009; Skinner, 1974). At the same time, this researcher's ontological perspective recognises that there may be an independent external reality separate from human cognition. Johnson and Duberley (2000) refer to this position as critical realism, however such distinction is only important if it functionally benefits the research process and this is the position adopted for this research programme (Coghlan and Brannick, 2009). This pragmatic view is also consistent with Skinner's behavioural perspective, that human behaviour is determined by phylogenetic (evolutionary fitness) and ontogenetic (learning history) causes. As such, behaviourism follows an evolutionary epistemology whereby valid knowledge is based on its functional or survival value, or in Staddon's (2001) words: 'Truth is what worked in evolution' (p. 78).

Adopting this position does not require rejection of the positivists' pursuit of prediction and control, rather it reflects the complexity of social environments and the multitude of bilateral relations (multilateral) involving disparate and similar learning histories that emit complex reactions to environmental stimuli. This position recognises that behavioural science is not as yet at a point whereby it can reliably predict and control human behaviour at a high level of precision (Foxall, 1998; Staddon, 2001). In particular, unlike the laboratory, learning histories are generally not readily available to the researcher in social environments (Foxall, 1998, 2007a) and this level of complexity will pragmatically require the researcher to engage with participants to gain some understanding of the behavioural situation (context/ learning history) from a respondent perspective, although such understanding can only be tentative and subject to disconfirmation as research progresses (McNiff and Whitehead, 2011). Modern RB accepts that researchers do not have direct access

to a respondent's learning history, thereby tentatively relying on verbal responses, oral and written, as a surrogate to provide interpretative insight into a respondent's learning history and situation (Foxall, 1998). The participative nature of the AR approach adopted for this thesis will afford access to respondents' learning histories and situational responses, both individually and collectively, as well as being able to observe their respective behaviours throughout the programme.

### 3.4.1 Practice considerations

As a practitioner, the researcher will introduce mutually supportive behaviour in his interactions with research participants, predicting that supportive behaviour will have a beneficial influence on participants, reflected as improvement in their reports regarding work climate, needs and motivation. Such influence is co-created. It is situational, adjusted according to context and participants' reaction (stimulus to researcher). Foxall (1999) refers to this as 'bilateral contingencies', whereby each party's behaviour acts as a stimulus (based on related learning history) for the other party.

From a personal perspective, the researcher wants to improve personal practice and involve others in becoming aware of how their behaviour impacts on others. Skinner (1974) wrote about the need for self-awareness in order to change one's behaviour (Torneke, 2010).

Skinner was an egalitarian, he not only wanted to develop a science of human behaviour, he wanted to apply it for the benefit of humankind (Nye, 1979; Rutherford, 2009; Skinner, 1953, 1974; Skinner and Hayes, 1976). He recognised that humans operate on their environment in response to the positive (positively reinforcing) aspects of it and to reduce, escape or avoid the aversive (negatively reinforcing) aspects. Operant behaviour was the term he coined to describe human action elicited by the environment. Being both a realist and a determinist, Skinner believed that a science of human behaviour was possible and once discovered could be applied to improve the human condition, and that whilst the environment was the ultimate controller of behaviour an individual's ability to monitor oneself also played a role (Skinner, 1953, 1987).

### 3.4.2 A relational approach to research

This piece of research is an opportunity to engage others in the organisation in creating collaborative change. Whilst such engagement creates its own challenges

in maintaining quality and rigour, such an approach is consistent with the tenets of Deming (1986) and the roots of this research programme, being that of OL (Leslie, 2006). OL is not the theory underpinning this research, it is rather what happens to the organisation as a result of this research. More precisely, it is what happens to organisational members and how, as a result of their collective behaviour, the organisation's behaviour changes and is therefore deemed to have learned.

In the field of operations management (OM) the AR approach is becoming increasingly popular as a method of empirical research in organisations (Coghlan and Brannick, 2009; Scudder and Hill, 1998; Reason and Bradbury, 2001). In particular, AR as a research methodology meets the requirements of a 'hands on', 'learning in action' approach (Coghlan and Brannick, 2009; McNiff and Whitehead, 2006; Reason and Bradbury, 2006). Kumar (2012) echoes such sentiment in a recent article from the American Society for Quality, where he advocates the use of AR's cyclic approach to enhance the learning process from the plan/do/check/act cycle. Taking a multi-cycle approach, he argues, will increase internalisation of TQM, thus making it more effective. Such approaches will also contribute to knowledge regarding the individual level determinants of TQM engagement, an area that Tang et al. (2010) identify as being under researched in the TQM literature.

Recent examples of the use of AR to improve organisational change initiatives such as TQM include the following. Bell (2010) reports on the use of AR to develop a common approach for TQM to support quality across heterogeneous aviation projects; McAdam et al. (2008) used it to develop a strategic approach to applying TQM in complex business environments; and Nicolescu et al. (2009) used it to develop a theoretical model for applying advanced management systems, such as Six Sigma/Lean to complex organisations. The next section considers AR in more detail.

### 3.5 What is Action Research?

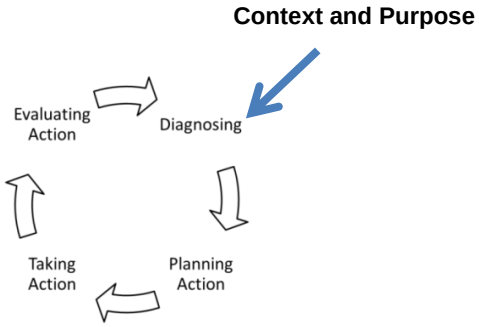
AR is often claimed to date back some 70 years to the work of Kurt Lewin in the 1940s. However, some claim its roots go back much further, tracing it to the work of Dewey (1938) or even Buckingham (1926). See French (2009) and Reason and Bradbury (2006) for several perspectives on this topic.

In principle, AR is about pragmatic, functional, situational learning. It developed in response to the then dominant paradigm of scientific research as a collaborative approach to learning, with an emphasis on practitioner learning, rather than

research being the domain of academic researchers. Schon (see Argyris, 1999) was interested in promoting the practical value of practitioner research and closing the gap with academic research in terms of what was considered 'real' knowledge.

As shown in Table 8, there are many derivatives of the action-centred approach, which vary according to the type of interaction or learning the researcher or system is trying to achieve. They are not mutually exclusive and the researcher/participants may find themselves engaging in different aspects, and or approaches, at differing stages of the research programme. What they all have in common is an action-reflection cycle to generate learning. What differs is who does the learning.

**Figure 9: Action-reflection cycle**




The action-reflection cycle starts with a 'pre-step', that is, an understanding of the context of the project, or as Coghlan and Brannick (2009, p. 21) suggest: 'Why is this project necessary or desirable?' or 'What makes it relevant?'.

**Table 8: Coghlan and Brannick's (2009) action research types**

| Type | Originator | Summary |
|---|---|---|
| Traditional AR | Kurt Lewin (1946, 1948) | Focus on collaboration between researcher and client aimed at problem solving and knowledge generation |
| Participatory AR | Various; emergent during 1970s | Focus on overcoming concerns of powerlessness and exclusion, through egalitarian participation, liberation and emancipation |
| Action Learning | Revans (1982) | Task becomes the vehicle for learning for people based on principles of: no learning without action, no action without learning. Those unable to change themselves cannot change what goes on around them |
| Action Science | Chris Argyris (1985) | Cognitive approach to change based on three models of theories in use and how they create defensiveness. To achieve change it is important to identify and change the underlying theories |
| Reflective Practice | Schon (1983, 1987,1991) | Focuses on the practitioner's critical reflection of their own practice to generate learning and change |

Source: Adapted from Coghlan and Brannick (2009).

### 3.6 Consideration of Relevance and Rigour

In choosing a research methodology, careful consideration is required to ensure that the approach is 'relevant' to the type of research and 'rigorous' enough to provide results that will stand up to scrutiny. So far this chapter has considered AR in terms of its appropriateness as an interpretative framework for radical behaviourist enquiry into TQM.

This section will take account of some of the wider contextual issues that need consideration in choosing a relevant approach and also how rigour will be maintained during the research process.

#### 3.6.1 Relevance

When deciding on a relevant research methodology there are several areas requiring consideration, including the one above posed by Coghlan and Brannick (2009).

Initial consideration is required as to the nature of the research undertaking. At this stage, the programme seeks to explore respondent responses with regard to the organisational Lean programme, particularly their reaction to the deployment context and current/prior experience of such programmes (learning history). Such requirements lend themselves initially to a qualitative, rather than quantitative approach, as exploration tends to require greater flexibility.

Consideration of stakeholder requirements is also required. In particular, the expectations of the sponsoring organisation, the requirements of the DBA and the interests of the researcher need consideration.

- The sponsoring organisation requires a result-orientated approach, as they have a real problem with low engagement in the TQM initiative (Lean) and are very concerned that a 'hands off' approach would do little to improve the uptake of Lean within the organisation.
- To gain a DBA requires contribution to both theory and practice.
- The research interest is testing ideas in action; the researcher's interest in engaging the research subjects in the research process (as a change agent) and jointly experiencing the development/implementation of new knowledge. As such, the researcher impacts on, and is impacted by, the research subjects in the process of developing joint meaning.

These requirements not only identify why the project is necessary, they also narrow the scope of relevant research methodologies.

### 3.6.2 Rigour

Although there is ongoing debate as to the appropriateness of transferring the methodological trinity (validity, generalisability and reliability) to a more naturalistic paradigm as per Tobin and Begley (2002), this researcher has sought to adopt a 'triangulation state of mind' in pursuit of a robust piece of research.

Whilst at this stage of the research programme it is not an objective to generalise findings, reliability and validity are maintained through triangulation using a pluralistic approach to methodology.

Interpretative methods, such as AR, are becoming increasingly popular in empirical OM research. Craighead and Meredith (2008) conducted a study into the evolution of research strategies in the field of OM, using journals recognised for publishing OM research. Their findings reveal an evolution from rationalistic analyses towards more interpretive analyses based on qualitative methods. AR is particularly useful as a grounded approach to theory building in OM settings, especially where the problem is not well defined (Westbrook, 1995).

In the programme used by the researcher, a combination of qualitative and quantitative methods ensured a degree of triangulation in information gathering, to provide a broader perspective with which to strengthen the validation process (Bouchard, 1976; Coyle and Williams, 2000; Creswell, 1999, 2003).

Research findings were openly tested with organisational participants and non-participants, within and across levels, leaving interpretation open to challenge and refinement. By ensuring a 'fit' between the researcher's and participants' view (Schwandt, 2001), credibility (validity) of findings should be enhanced (Janesick, 2000; Denscombe, 2002).

Interviews, group meetings, surveys and participant observation were the key tools used to elicit data. The researcher would summarise findings with the individual/ group and gain their agreement before using the data as input to further meetings or theory building.

The above approaches provided collaborative (Tobin and Begley, 2002) and inter-disciplinary (Janesick, 2000) triangulation. Individuals and groups were encouraged

to reflect on findings throughout the process. This formed a cornerstone for developing action.

An AR strategy is relevant to this type of enquiry as it meets the needs of the organisation, research approach and researcher. In particular, it provides a collaborative methodology to develop and test theory in action. To ensure rigour, a 'triangulation mind-set' is required using mixed methods and mixed perspectives to build robustness into the research process.

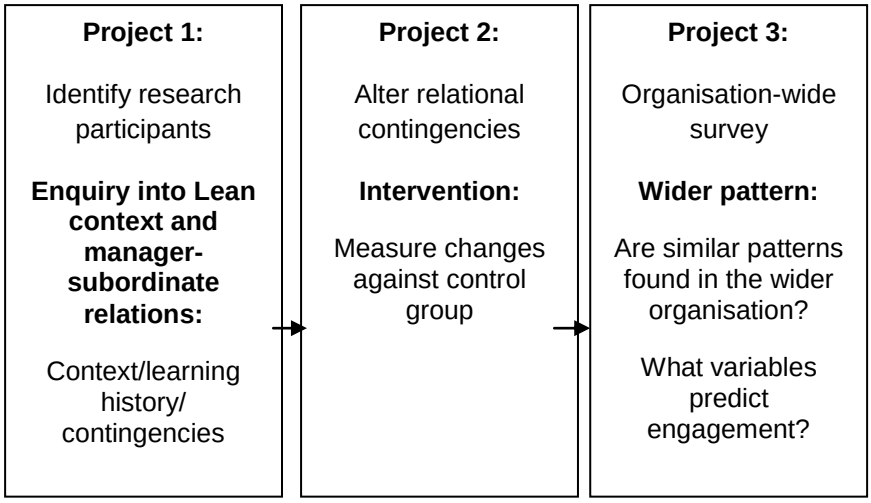
### 3.7 Action Research Process

Research was developed over three projects. The initial project focused on gaining access and developing an understanding of the initial research situation, potential participants and opportunities/approach to engage.

The second project concerned the development and implementation of an inter-departmental Lean/TQM process improvement initiative, identified in Project One. The research intervention focused on developing mutually supportive participant behaviours, to overcome a history of contested inter-departmental relations that appeared to be frustrating collaborative learning. Changes were made to the relational context, with results measured at the start, middle and end of the project relating to participants and non-participants from the same departments, as a control measure.

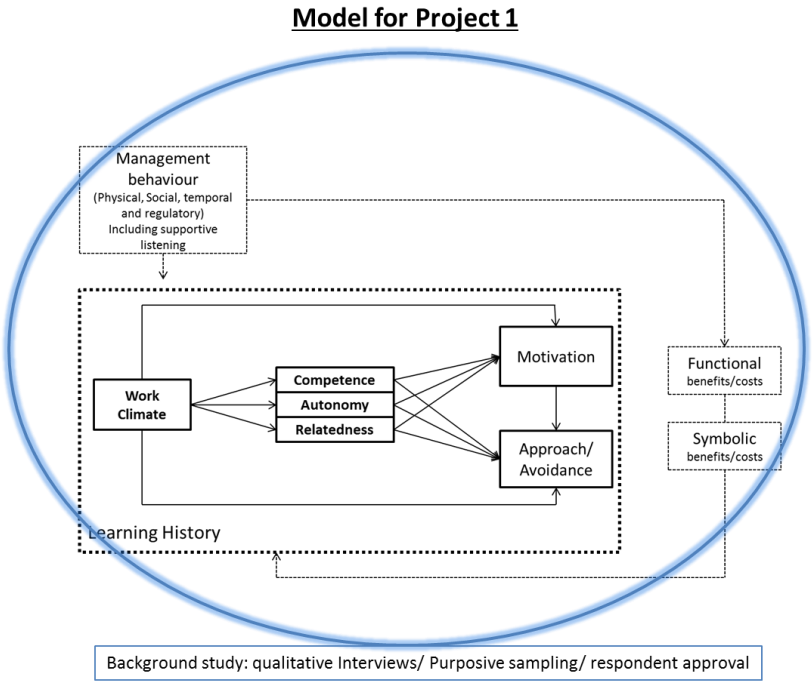
The third project resulted from senior management's interest in the findings from Project Two. A company-wide survey provided supporting data to establish the generalisability of Project Two's findings with regard to the wider organisation. The stages are illustrated in the following diagram (Figure 10).

**Figure 10: Project aims**



### 3.8 Projects Overview

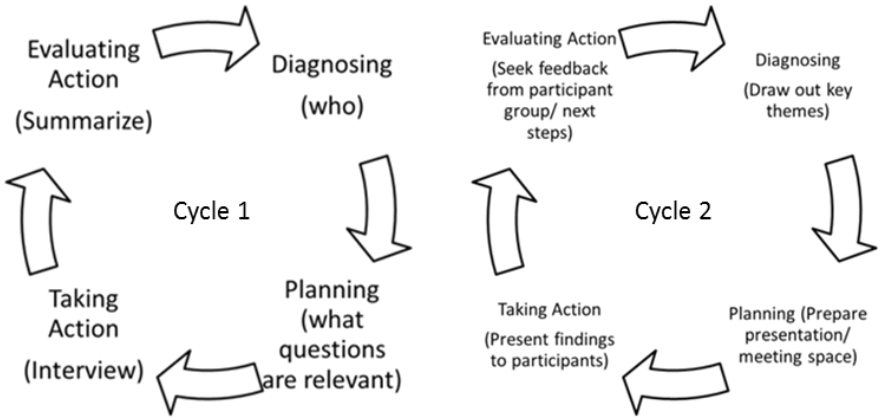
**Figure 11: Project model 1**




Project One concentrates on understanding the context (work climate), learning history, behavioural situation (regulation) and approach/avoidance behaviour in terms of the selected respondents. Being largely inductive, this stage of learning utilises qualitative techniques, such as semi-structured and unstructured interviews, to gain an understanding of the respondent's situation. Interviews and observation focus on eliciting responses related to a respondent's learning history, context and approach/avoidance behaviour. The primary 'learner' in this process is the researcher, requiring a deep understanding of the overall situation and an ability to gain access and permission from influential parties affected by the research. This is referred to by Coghlan and Brannick (2009) as the 'action learning' stage. From a radical behaviourist perspective, this stage provides some initial 'baseline' information, giving an insight into not only the respondent situation but also into contingencies that may be influencing behaviour (both natural and rule governed) (Dahl et al, 2009). This stage also seeks to identify contingencies that may influence engagement in the next research cycle, with particular interest being paid to respondents' verification of the data, to ensure their views are represented fairly. From an ethical perspective and consistent with a participatory ethos, overall findings will be shared with participants, ensuring that no-one is identified and that before the data is used to inform anyone else their permission will be sought.

There are two learning cycles within Project One. The first is personal to the researcher, considering who should be approached, what questions should be asked and establishing findings. This feeds into the second learning cycle, a verification cycle. This provides participant feedback to encourage engagement with the findings, to challenge or support the emergent themes and to identify other themes requiring consideration. Within this second learning cycle, the researcher continues to search for situational and contingency-related information to enhance understanding of the participant situation. The respective research cycles within this project look something like this:

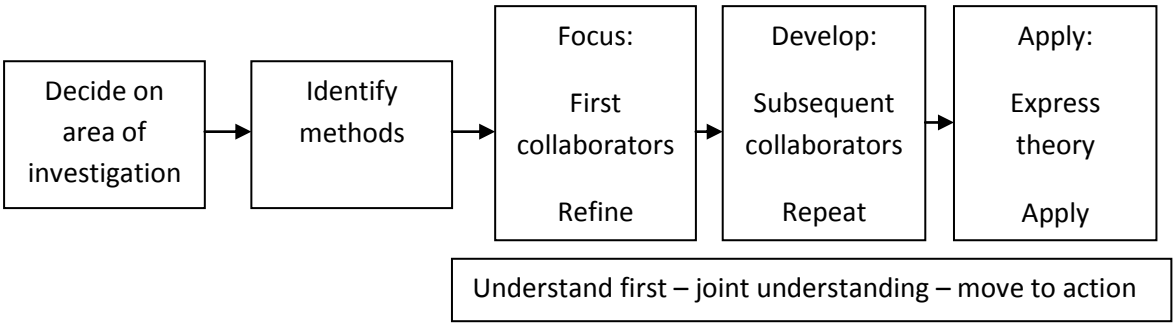
**Figure 12: Cycles within Project One**




### 3.8.1 AR design Project One

The following diagram (Figure 13) reflects an alternative way of considering the stages of the AR programme conducted during this stage of the research programme.

**Figure 13: Alternative perspective on research stages**

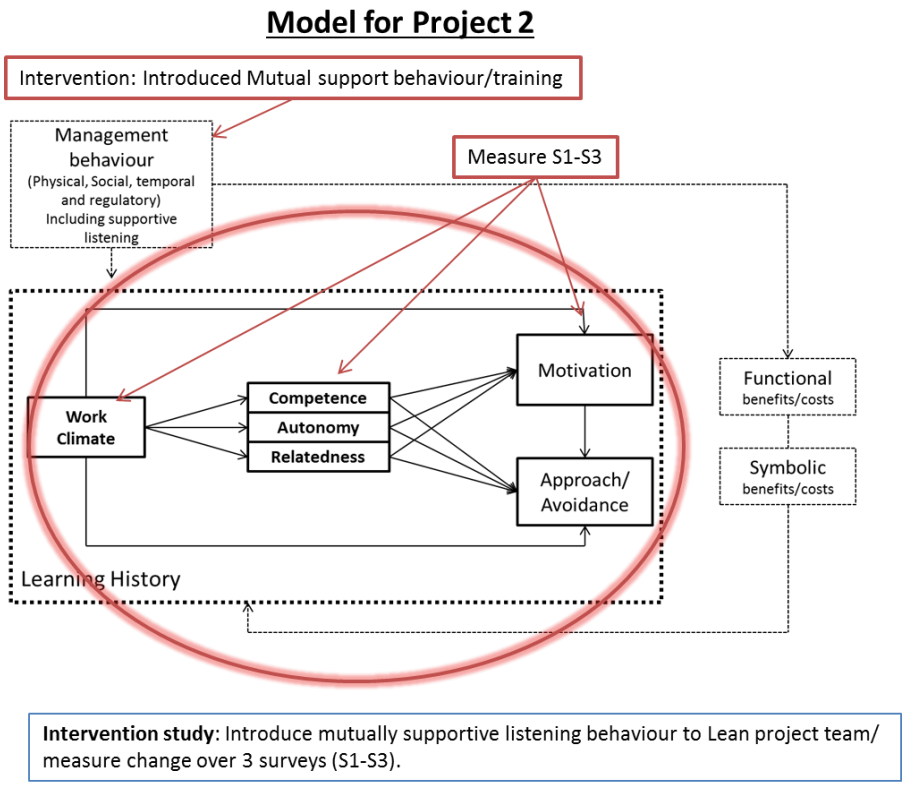



The linear appearance is only to demonstrate progress. Each stage is naturally iterative and may revert back to an earlier stage as new findings emerge. The model

acts as a framework to illustrate how the research methodology developed during deployment. Whilst a number of research questions/hypotheses had emerged during earlier research and from this programme's literature review, the area of application was not at all clear; a project needed to be 'found'. The researcher also needed to negotiate access, any such project needed to be meaningful (positively reinforcing) to participants, not just important to senior managers, although important, too, this top-down approach was already in operation and being criticised for being imposed. This research wanted to introduce 'new' behaviours into the participants' context in order to increase access to reinforcing contingencies, thereby increasing engagement in the TQM programme. In retrospect, negotiating access and the selection of a project proved to be an interesting area of research in itself.

### 3.8.2 Project Two

**Figure 14: Project model 2**

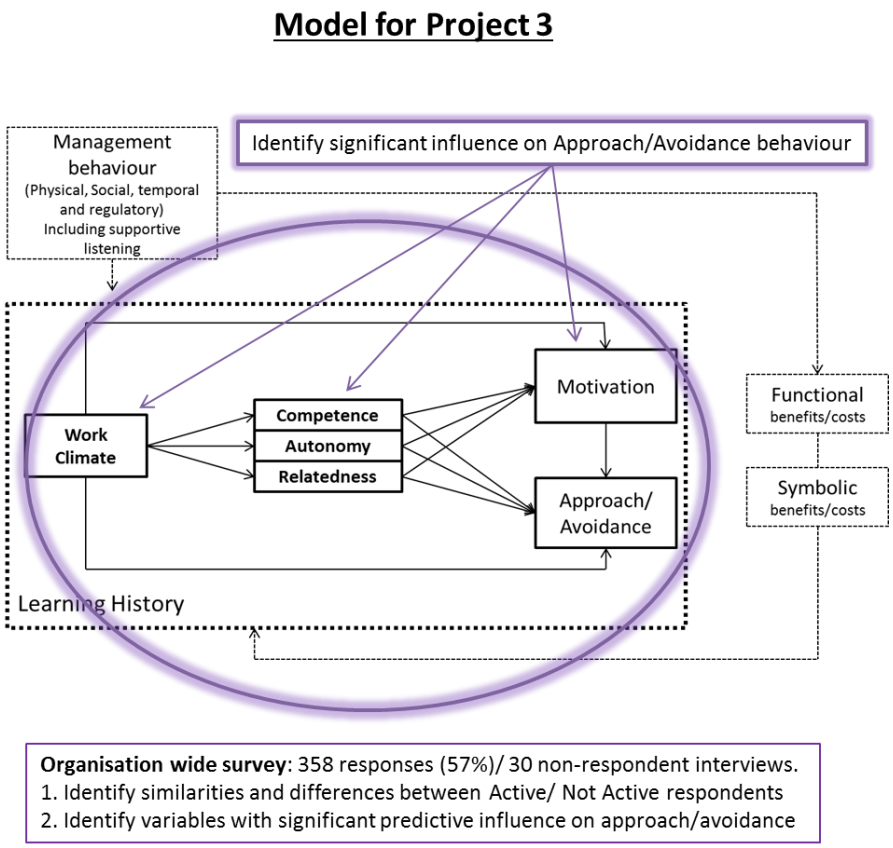



Project Two involves participants in enacting change, from investigation and design of a process, through to implementation and review. During this project these cycles were used to maintain group/participant learning and to assess relational approaches to engagement. A supportive active listening intervention was

introduced through facilitator behaviour and participant training, along with a relational 'metaphor' to improve leader-subordinate interactions. Surveys conducted at three points during this stage of research assessed context, learning history and motivation/regulation, and measured changes in participant perceptions regarding change environment and work environment. Non-participant surveys provided 'control' data for this stage of research.

### 3.8.3 Project Three

**Figure 15: Project model 3**




Project Three considers the wider organisational context and whether the findings are generalisable across the organisation (Denscombe, 2002; French, 2009.) Denscombe (2002) was concerned that AR cases are often not generalisable beyond the specific case. The aim of this study is to assess the wider organisation using the SDT questionnaire, to reflect on the findings and to prepare/plan further interventions to continue this research beyond this specific study. Following a presentation from the participants to senior management, an opportunity was granted to survey the whole organisation in order to identify whether similar

relational patterns exist across the rest of the organisation. Learning at this stage was moving towards the wider system to establish the predictive value of work climate, needs (CAR) and motivation on Lean/TQM approach and avoidance behaviour.

During this stage of the research, 'sustainability' (McNiff and Whitehead, 2006) of the AR approach would be tested with the earlier participants, as the researcher reduced interaction with the participant community, to observe continuity of process and collaboration/cooperation. Whilst a survey approach was the instrument for the principal research during this period, semi-structured and unstructured interviews continued to be used with existing participants.

### 3.9 Research Ethics

There were no concerns regarding vulnerable people taking part in this research. The main concern was in maintaining respondent confidentiality. Responses to management need appropriate framing to ensure no group or individual is singled out as a result of this research.

The research was designed to provide feedback at individual and group levels and to gain their permission to use data to feed back to others. The use of workshops provided ample opportunity for participants to share findings and participants were also encouraged to present up to senior management. This not only supported the researcher in his communication, it also provided a platform for discussion across organisational levels.

Access was the key risk to this research. Being internal to the organisation can be an advantage. However, it can also be a disadvantage by potentially preventing some employees from wanting to take part. A confidentiality statement in the introductory letter (Appendix 1) appears to have got round this problem, as well as the participatory nature of the research, with regular 'sharing' of findings between participants, especially in Project Two where a 'community of practice' approach was used to encourage wider participation.

### 3.10 Conclusion

This chapter has considered the philosophical, ontological and epistemological aspects that support using an AR methodology for behaviourist enquiry. Further consideration was given to the wider contextual influences on research approach,

including organisational requirements, the practical and theoretical nature of this research programme and the researcher's interest in taking a hands-on approach. Important to all research is maintaining rigour to enquiry, with this research recognising the advantage of adopting 'triangulation' in both methodology, data source and inference, by involving participants in verifying findings and combining both inductive and deductive approaches to inference. Finally, if the case has not already been made for the use of AR in behavioural enquiry, then the words of Shani and Passmore (1985) may help:

> 'Action research may be defined as an emergent inquiry process in which applied behavioural science knowledge is integrated with existing organisational knowledge and applied to solve real organisational problems. It is simultaneously concerned with bringing about change in organisations, in developing self-help competencies in organizational members and adding to scientific knowledge. Finally, it is an evolving process that is undertaken in a spirit of collaboration and co-inquiry' (p. 439).

# Chapter Four: Project One

## 4.1 Introduction

This initial phase of enquiry, as outlined in Chapter Three, concerns the prevailing learning histories influencing Lean implementation within a manufacturing organisation. Lean, for this research being synonymous with TQM. Using an adapted BPM framework to guide inquiry (Deci and Ryan, 2002; Foxall, 1998, 1999), the researcher has two objectives. The first is to gain an insight into the Lean/TQM deployment environment, through consideration of differing internal stakeholder group histories within the organisation and the relational contingencies that may be supporting or thwarting Lean/TQM engagement. The second objective focuses on identifying prospective research participants, establishing contingencies to engage them in a relational experiment to promote kaizen engagement (continuous improvement or improvement for the better). To achieve these objectives, this study has two phases.

The first phase focuses on gaining the perspectives from six stakeholder departments: Senior Management (SM), Lean/TQM implementation team (BE), Operational Support (OS), Engineering (Eng), Blade Shop support staff (BSS) and Blade Shop operators (BS Ops). Through 58 interviews and 22 presentations and workshops, this project uses the adapted BPM framework to guide development of initial insight into management and employee reports regarding Lean and the wider organisational context influencing Lean/TQM relations. The concept of mutuality (Foxall, 1998) is introduced later in the project to help to explain the relationship between two conflicting departments. The interviews identify factors in the relational context and learning history of employees and managers that not only appear to be influencing avoidance behaviour, but also provide tentative knowledge of relational and natural contingencies that could positively influence Lean approach behaviour and inter-departmental cooperation. In the spirit of behaviour-focused AR and cooperative enquiry, the second phase comprises six activities that follow on from the interview process, building on insight gained from the interviews, to challenge and positively influence respondents into taking mutually beneficial actions to improve their situation. From this, the BS and Eng participants identify a Lean/TQM project of mutual interest that will benefit the organisation and is supported by senior management.

The guiding question at the start of the project was simply ‘How do I get started’, as this research was not requested or guided by the organisation and consequently, at this early point, was more of interest to the researcher than to the organisation or its members.

### 4.2 Methodology

#### 4.2.1 Interview subjects

**Table 9: Summary statistics for interview groups**

| Stakeholder group | Suffix | Interviews | Male/Female | Av. Age | SD |
|---|---|---|---|---|---|
| **Senior management** | SM | 6 | 6/0 | 46.3 | 4.8 |
| **Lean implementation team** | BE | 6 | 6/0 | 38.7 | 8.1 |
| **Operational support** | OS | 14 | 9/5 | 37.7 | 9.0 |
| **Engineering** | Eng | 5 | 5/0 | 47.0 | 4.6 |
| **BS support staff** | BSS | 9 | 9/0 | 44.0 | 10.3 |
| **BS operators** | BS Ops | 18 | 18/0 | 47.7 | 7.0 |
| **Total** | | 58 | 53/5 | 43.0 | 9.2 |

(Note: BS = Blade Shop)

Data were collected from 58 subjects across a number of organisational departments. As identified in Chapter Two, top management commitment and the ‘style’ of implementation are two factors significant to implementation success. A *purposive sampling* approach was adopted (Sekaran, 2006) so that interviews started with the top management and the implementation team; these subjects formed the first and second groups to be interviewed.

#### 4.2.2 Interview process

The following interview process applied to all respondents during Cycle 1. Guided by Kelly who once wrote, ‘if you want to know what is wrong with someone, just ask him’ (Kelly, 1963), the interview began with the question ‘How do you find the Lean programme?’. This significantly reduced interview time and facilitated wider exploration of the respondents’ replies using a semi-structured approach. The interview focused on gaining respondents’ perspectives on the following areas: interest in programme and type of motivation; previous experience with change programme; how they perceive their present environment; what benefits they experience from Lean engagement; what frustrates them and why; how they find the process; are there links to others? and would they engage in a programme focused on their issues/opportunities?

Each interview closed with a summary of the key points made, to ensure correct understanding of the respondent and a request to use this summary in establishing an overall report for their department, which would be used for wider feedback but would not identify the source. The interviews were either audio recorded or notes were entered into a journal immediately following the interview. All respondents had received an introductory letter explaining the confidential nature of the interview and requesting permission to record. Whilst most were willing to be interviewed, many were uncomfortable being recorded. The interview started with an overview, based on creating an understanding of their perspective regarding their work on a day-to-day basis, plus their involvement and experience of the current Lean deployment. Beginning with some general questions regarding time with the organisation, time in the department, current role and who they reported to, the interview progressed to a number of open questions focused on encouraging respondents to report their learning history, context and regulation with regard to their work and the current Lean programme.

Usual opening enquiries, such as 'Please describe what you do' and 'What do you enjoy about your work/colleagues/Lean?' (adjusted according to stage of interview), were used to engage the participant. In order to move the conversation into specific areas, provide greater detail clarity and test emotional responses, the researcher invited the participants to expand their replies by asking them to 'Tell me more about your supervisor'; 'He sounds as though he really listens to you or does not listen to you… please tell me more about this'; 'I sense you really enjoy this aspect of your work, have I got this right?'; 'What would improve your relationship with x or this situation...?'; 'It sounds as though you get on really well with your colleagues, what about your supervisor?'; 'Tell me more about the Lean programme'; 'How have you got on with the Lean deployment team members?'. This line of questioning was often accompanied by a tour of their work area, providing an opportunity to observe and better understand their competence and experience of autonomy. Probing questions provided an insight into just how well they understood their job, customers, expectations of supervisors and how they experienced Lean. Such questioning also provided an insight into both rule-governed and natural contingencies that could be influencing the respondent's behaviour. Probing, accompanied by regular, short summaries, ensured maintenance of joint understanding. Within the summary, additional perspective would be added and tested, for example: 'I sense you really enjoy your work, but find x somewhat frustrating…'. This approach supported further exploration when required. This was

also an opportunity to test thoughts on participation and non-participation in Lean activities and gain further insight into what might be reinforcing such participation.

Towards the end of the interview, the respondent would be informed that it was coming to a close and a further summary to agree findings was followed by: 'Is there anything else that I should have asked, that you would like to discuss with me?'. The meeting would finish with a quick review as to how the information would be used and appreciation expressed for the respondent's participation.

### 4.2.3 Relevance of this approach

With the primary research interest focused on gaining understanding of the Lean engagement context and respective learning histories, this part of the research programme concentrated on context and diagnoses with the researcher primarily operating from a position of pragmatic AR (Coghlan and Brannick, 2009). By combining observation and participant reports to establish the relational dynamics that support Lean approach and avoidance behaviour, this approach appears consistent with behavioural philosophy in that it involves research action focused on pragmatic solutions relevant to the contextual situation, rather than a search for absolute truth or grand theory (Törneke, 2010). At this stage, the focus was on improving understanding of key dynamics within the Lean deployment context, identifying potential areas for improvement and locating interested participants, who would have their learning history and areas of motivational deprivation assessed.

### 4.2.4 Quality of interview process

In order to reduce interviewer bias the researcher joined a 12-month active listening programme, based on clinical therapeutic practice. The course, chosen because of its empathetic nature, focused on increasing awareness through participant and supervisor feedback on interviewer performance and offered the chance to practice different styles and techniques in a safe environment. It also provided the opportunity to review extracts of research interviews with a supervisor, to gain feedback on practice. Whilst this training cannot totally reduce bias, it led to the researcher becoming much more aware of how he impacted on the interview process, leading to changes in behaviour that engender higher quality responses from respondents. Törneke (2010) states that 'Once the ability to tact private behavior is established, this ability also becomes valuable to the individual. To quote Skinner once more, "A person who has been 'made aware of himself' by the questions he has been asked is in a better position to predict and control his own

behavior" (Skinner, 1974, p. 35). Being able to foresee and control one's own behavior naturally implies an increased ability to achieve things that are desirable to oneself' (Törneke, 2010, p. 39).

### 4.3 Initial Inquiry Phase

#### 4.3.1 Interview group one: Senior management

The research process started in January 2009 through initial interviews with the company directors. A short, semi-structured interview based around one question, 'How is the Lean deployment progressing?', was used to gain some understanding of their respective perspectives regarding the Lean deployment to date. As the programme was not formally supported at this stage, it was inappropriate to record the interview, either electronically or with notes. Instead, the question and some follow-up questions were memorised and presented as part of an initial conversation, before moving on to the main theme which was a short presentation of some earlier research conducted by the researcher. Four directors were interviewed with each *reporting* concerns over the lack of uptake and resistance from staff. They reported 'blame' for this on previous senior management teams and their 'old school' style. 'Old school' being synonymous with a 'command and control' management style. The researcher *observed* verbal commitment to the deployment, however there was inconsistency in reports. Two directors referred to Lean/TQM as being a journey that requires persistence and time:

> 'Lean is not going to be accepted overnight, it is going to take time. We need to gain employee trust … that we are not going to give up like the previous "old school" managers have done. 5S will get the place tidy and well maintained. Then we need to sort out processes and procedures and stick to them, this requires training and better quality supervision… It will take time' (SM3).

The following comment to the researcher exemplifies the alternative view:

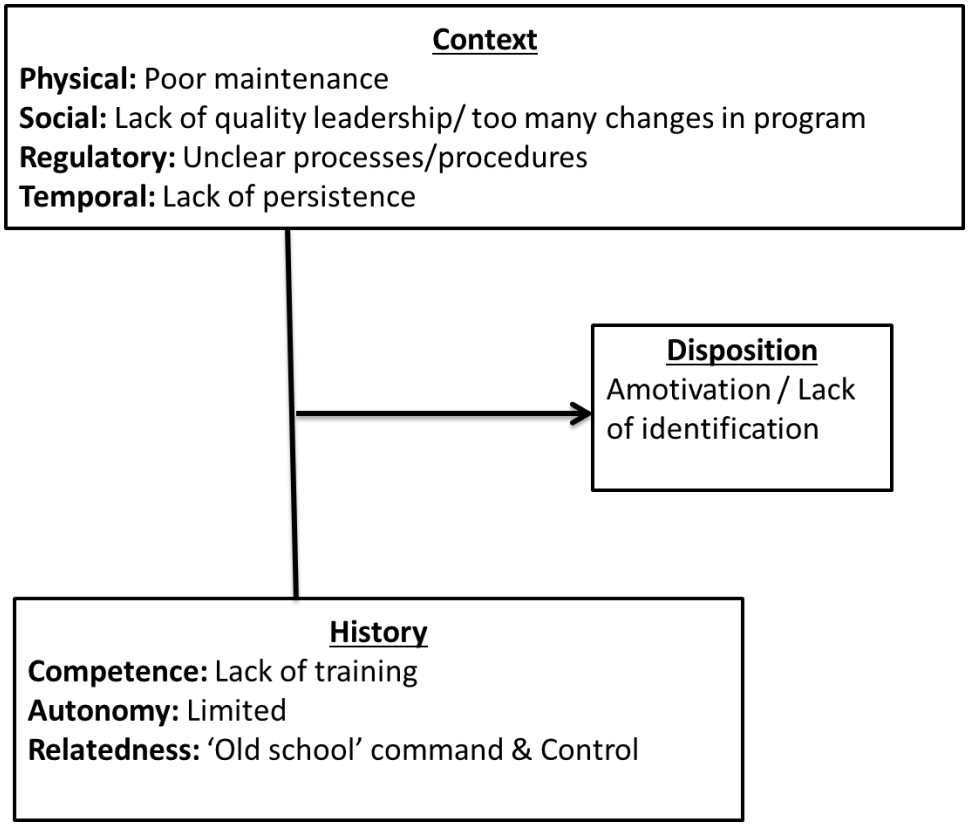
> 'This is not a democracy… anyone who thinks Lean is optional… there's the door' (SM1).

> 'BE will handle the process mapping, we have to have this completed in the next 3 months' (SM1).

The following diagram (Figure 16) summarises the commonly reported senior management views. Whilst a number of factors were identified as obstacles to Lean/TQM and reported as the perceived reasons for the current low staff

engagement with the programme, the benefits of 5S[5] improvements to the environment and the establishment of more reliable processes, further training and quality focused management, would all contribute to overcoming employee amotivation. The researcher found these views to be common amongst the senior management team, although it was observed that there was inconsistency in how long they were willing to wait for results. BE were responsible for Lean/TQM deployment, with assistance from external consultants, and became the next subjects for interview.

**Figure 16: Senior management situation**




### 4.3.2 Interview group two: Business excellence (Lean implementation team)

BE comprised a staff of six, representing a range of experience in change management and CI interventions. Whilst most had engineering or 'shop-floor' experience, only two had any formal quality qualifications. All had had training in Lean improvement techniques. All six BE staff took part in the interview process and

[5]5S is a term used, in this, to describe a process for cleaning and organising a work area. This area had been through a process of tidying up, cleaning (including painting, etc), organising work flow, organising work benches/tools (shadow-boards), clearing meeting areas and introducing Lean boards for capturing key metrics.

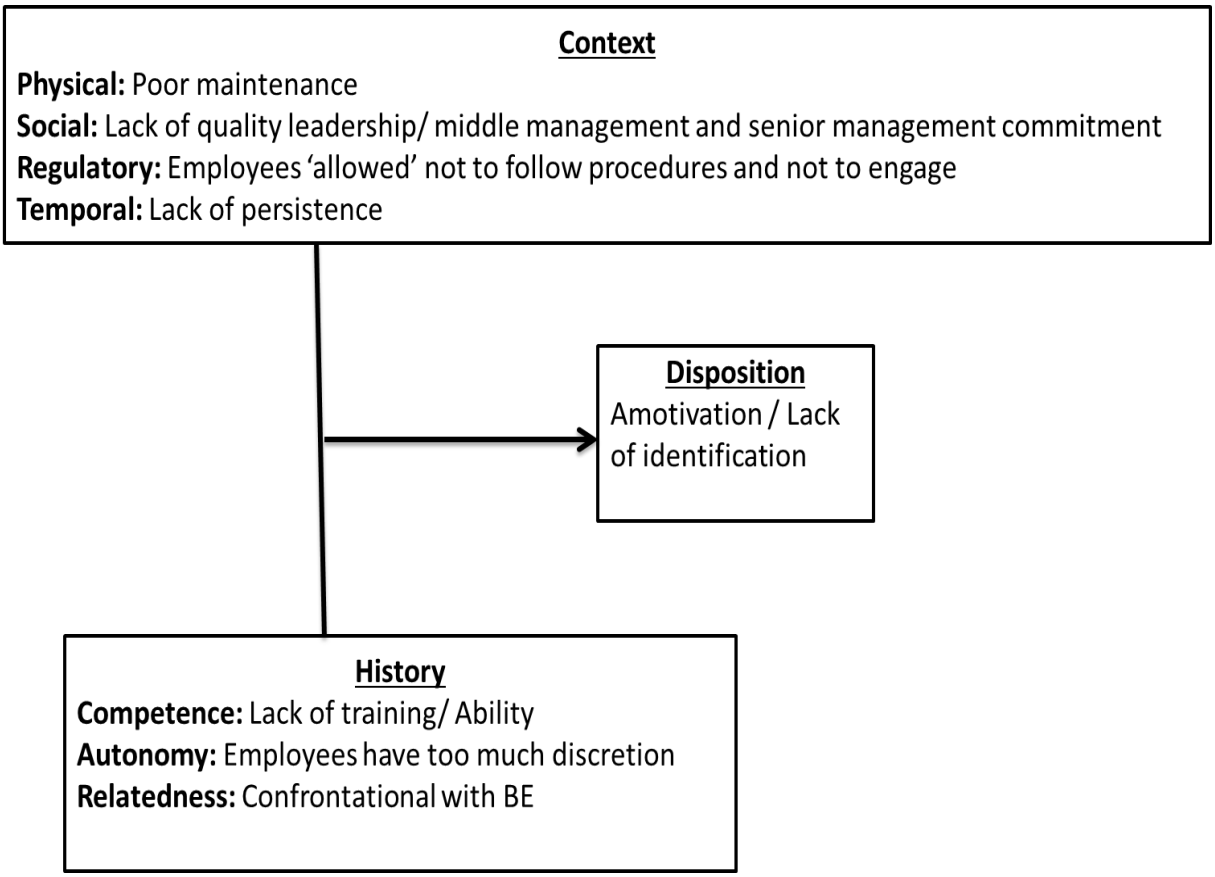
the results were summarised and presented to them, along with a short presentation on the research programme. Whilst the BE department found the results 'interesting', they did not see how this research programme would fit into the Lean deployment programme and were not keen on allowing access to their current projects.

Frustration was very evident within the BE team, with several of them reporting that more forceful action should be taken by senior management, to 'make them take part'. 'Them' being the employees resisting Lean. Four of the six BE respondents reported employees as having too much 'discretion' (autonomy) and wanted action taken against those that resisted their efforts to introduce Lean techniques. Several examples were verbally illustrated whereby they were not gaining employee support and consequently having to do the physical changes, e.g. 5S cleaning and sorting, by themselves:

> 'Getting 5S accepted is essential in winning hearts and minds. The factory's really untidy with junk everywhere that no one is using, but you try and get rid of it and see what happens… Machines are old and dirty, there is oil around them. How do we know if it is from an old problem, or indicates a problem now?... supervisors and management need to take ownership, but this will not happen unless senior management make them' (BE2).
>
> 'We've had to do all the cleaning [5S] and I am sick of it. They [shop-floor employees, supervisors and line managers] are all too busy, so we end up doing it and when we start throwing things away, they complain and even start bringing stuff back in. They are getting away with this and management are allowing them to do so' (BE3).
>
> 'What difference do you think you'll make?... I do not see why you need to do this work, we do not need it. What we need is management to support us and take ownership. Make them take part' (BE1).
>
> 'I blame the supervisors, they just want an easy life and I think they are not capable of supporting Lean, I do not know how they were selected, but most of them are clearly not good enough… their managers are not much better, I am fed up trying to get their support' (BE5).

The following diagram (Figure 17) illustrates reported BE feedback, indicating some similarity and some difference with that of the senior management team.

**Figure 17: Business excellence situation**




Whilst discussions with senior management and the BE Lean deployment team provided a management view on uptake issues and opportunities, the employee perspective was missing so this became the focus of the next set of interviews.

### 4.3.3 Interview group three: Operational support employees

On deciding a sample for interview, access to respondents was a key constraint. Six senior managers from a number of staff departments initially selected 10 respondents who were available for interview (considering 'work pressures'). However, as the interview process went on, potential respondents were directly approached without referral to their respective managers. In total 14 respondents took part in interviews across five support departments. A preoccupation with a recently deployed IT system and its associated problems appeared as a regularly occurring theme in the staff interviews, with each of the 14 respondents reporting multiple IT issues relating to the implementation, with little interest in Lean/TQM. After some reflection by the researcher this line of research was discontinued, to allow the IT issues to settle. The findings included here can be summarised as Lean

inactivity amongst corporate support staff being due to ‘IT problems’. This avenue of investigation was not very fruitful and required a different approach if the programme was to access employee reports on Lean/TQM implementation.

The AR question now became ‘How do I get this project off the ground?’. Fortunately the opportunity soon followed during a ‘quarterly communication meeting’ in which BE presented a Lean success story based on the application of 5S principles to a machining area within the Blade Shop (BS). Following the presentation the researcher approached the presenter and obtained a number of contact names for follow-up and possible interview.

### 4.3.4 Interview group four: Blade Shop operators

Learning from the first three cycles of enquiry suggested a more direct approach in seeking participation could be beneficial, but also carry some risk. An initial approach to the BS manager to explain the programme and gain his support did not gain access to respondents. After several weeks with no progress, a direct approach was made to the names gathered from the communications meeting.

Interviews took place with 18 operators in the blade-shop manufacturing area. During the interviews, several names were repeatedly mentioned and in line with *purposive sampling* became the criteria for continued respondent selection in this area (Sekaran, 2006). In all, 18 interviews were conducted until no new themes emerged (Glaser and Strauss, 1967). At all stages, individual interview summaries were confirmed with the interviewees and recorded in a summary table, as shown below (Table 10).

A follow-up meeting, attended by 10 of the 18 interviewed, was used to reduce 70+ factors to a smaller number of commonly-agreed themes. The resulting group summary, confirmed with the group, ensured as representative a view as possible (Figure 18).

**Table 10: Blade shop operators' interview summary**

## Summary of Bladeshop operator interviews

Key

+ Positive: Overall positive responses

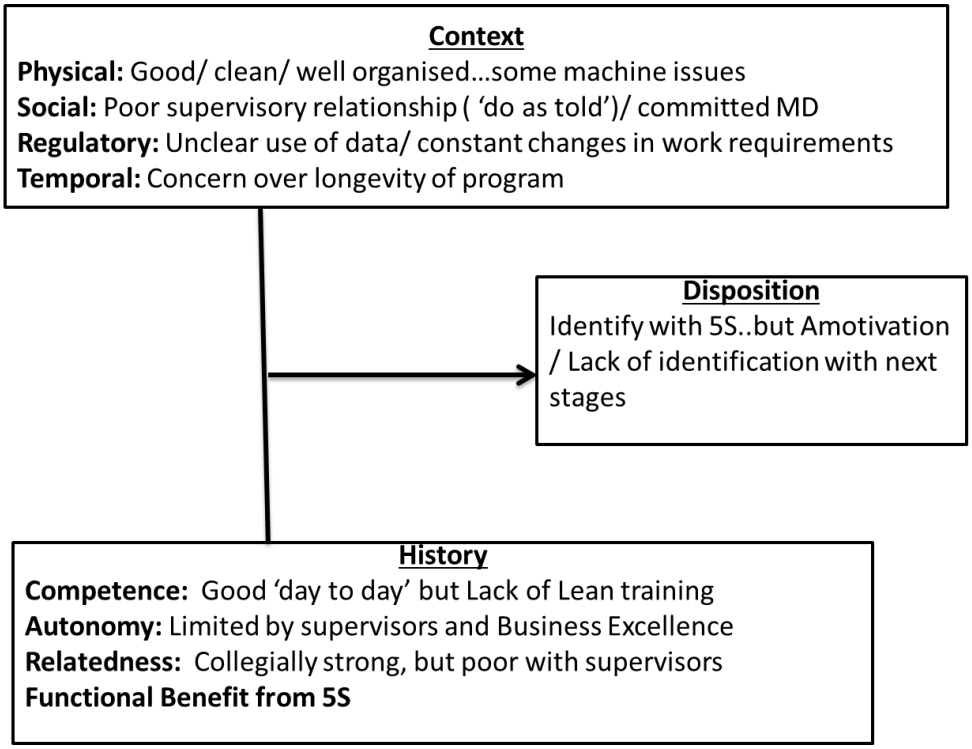
- Negative: Overall negative responses

o Neutral: Overall neutral responses

| | | | Responses Overall | | | |
|---|---|---|---|---|---|---|
| | | **Response category** | **+** | **-** | **o** | **Common Themes** (number of respondents) |
| Context History | Physical | Old equipment | | 12 | 6 | Difficult to maintain (12); High levels of downtime (14); Lack of investment (6) |
| | | New equipment | 14 | | 4 | Reliable (16); fewer process rejects (17) |
| | | Cleanliness | 17 | 1 | | Better working environment (18); Easy to maintain (14) |
| | | Layout | 12 | | 6 | Better (12); No space for wip (4); poor bench layout (6); easier to move work between machines (14) |
| | | Cost | | 10 | 8 | New benches unnecessary (8); Can company afford this? (14) |
| | | CT input | 15 | | 3 | Listens to team (12); works with team (15); sometimes 'pushy' (3); hard worker (16) |
| | | Other BE input | 1 | 11 | 6 | little consultation (14); own agenda (10); never around (8); critical/blame (7) |
| | Social | Teammates | 17 | 1 | | Trust each other (14); good atmosphere (17); helpful (15); understand each others strengths (8) |
| | | Supervisors | 3 | 6 | 9 | Remote (15); inflexible (10); try to help (4); little feedback (12); task focussed (14) |
| | | managers | | 12 | 6 | MD driving Lean (18); local managers focus on output (16); little lean guidance (11); fire fighting (15); 'them & us' (10); Do not listen/ follow up on requests (14); Low trust (12); Manager under pressure (6) |
| | | CT input | 15 | | 3 | Listens to team (12); works with team (15); sometimes 'pushy' (3); hard worker/ enthusiasm (16) |
| | | Other BE input | 1 | 11 | 6 | little consultation (14); own agenda (6); never around (8); critical/blame (12); Change being imposed/forced (10); Low trust (12) |
| | Regulatory | Work order/ priority/ information | | 16 | 2 | Constant changes in priorities (16); pressure for output (14); difficult to get office support (10); incomplete job information (10); confusing standards (9) |
| | | OEE | | 18 | | Initially supported (14); duplicate work/no feedback (18); Do not understand reasons for data collection (15); do not trust use of information (16) |
| | | 5s | 15 | 4 | 3 | Easier to maintain (16); patronising instructions (6) |
| | Temporal | Time for 'Lean' | 11 | 7 | | Work pressures (7); easy results (6); weekly meeting (9) |
| | | Longevity/ History | | 9 | 9 | Questionable management commitment (14); likely to change (9); ongoing support (12) |
| Reinforcement History | Reasons for Lean Approach / Avoidance | No Interest | | 18 | | All appear amotivated to OEE due to lack of feedback/action … they state that they are no longer willing to participate |
| | | Told to do | | | 18 | 5s Initially; OEE currently, but no longer responding to request |
| | | Paid to do | | | 18 | No additional payment for lean |
| | | Guilt/ feel good | | | 18 | No signs of Lean making participant feel betteror worse about themselves |
| | | Identify | 14 | 2 | 2 | Majority expressed benefits of 5s… although some had concerns |
| | | Enjoy | | | 18 | With possible exceptions (?), many expressed no intrinsic enjoyment in 5s. Exceptions made comments regarding positive feelings associated with lower levels of process rework and not working in untidy conditions. Whilst this further indicates identification, the researcher suspected that these respondents found their work more enjoyable as a result. |

The above table represents the researcher's interpretation of respondent interview responses

**Figure 18: Operational workers' situation summary**




The following comments reflect the researcher's observations of this area, having spent nearly six months within this department by this stage of the research process.

### 4.3.5 Context

From a *social* perspective, the members of this productive area appeared to have largely good relations with each other as a peer group. The average age of 47 reflects an ageing workforce with some members nearing retirement. There appeared to be a degree of rivalry between shift teams and some resentment towards one or two members viewed as 'slackers'. In terms of control, shift leaders would define the work schedule with any deviation requiring their authorisation. Workers appeared to have little discretion over work priorities and would often be observed by the researcher as having to change jobs, midstream, based on supervisor instruction, despite the negative impact of such change on operator satisfaction from not being able to complete the job. Operators would regularly express their dissatisfaction to the researcher, on having to make such changes:

> ‘The lads are really pleased with the new layout, although BE could have consulted us about the layout… My frustration is with the way we do the work, always switching jobs because there is a problem elsewhere and we need to machine a new part for them. This is bloody stupid as it must be costing thousands in lost time and is really frustrating to us. We ask the shift leader if we can finish the job we are on, but he tells us that we must stop and set the machine up for the urgent job. Tell me, does this make sense to you?’ (BS Op4).

*Technically,* this area could be split in two. One area had undergone 5S and the employees in this area were generally appreciative of this. However, they strongly criticised the implementation team to the researcher, based on a lack of consultation and listening. The researcher was taken to see examples of changes introduced by the Lean implementation team that made work more difficult for operators. The second area appeared as though it was starting to go through 5S, but it had stopped. Here the workforce had refused to work with the Lean deployment team, owing to new equipment being introduced with no consultation with the employees in this area. The employees had refused to use the new equipment and continued to work with the old. They used the interview time to take the researcher around the productive area and explain why they could not use it. Their argument was based on how the new equipment would lead to an inferior quality product and was functionally inadequate.

The work environment is controlled by detailed job specifications that reflect one aspect of the *regulatory* element of their context. The high level of mechanisation in the area required the operators to carry out low-level programming of jobs as well as checking correct set-up of tooling and materials for machining. The researcher observed most workers in this area appearing pleased to demonstrate their knowledge of this and ideas they have for improvement. Other aspects of the regulatory environment were more problematic.

Based on these findings, the researcher concludes that the BPM context for these operators, on a day-to-day operational basis, could be described as relatively closed, that is the operators appear to have quite limited discretion on work priorities and also experience limited input into 5S changes in the area. So, from a Lean perspective, the implementation context also appears relatively closed. For example, following 5S, the next stage of Lean was to introduce production metrics that required workers manually to record all shift activities. The participants reported that they had initially engaged in the manual recording, although they did not understand why they had to do it as it was costly to them in terms of additional time

spent recording and did not directly offer any functional benefits. Participation was compulsory, as instructed by the department manager and the BE Lean support team. However, operator participation was reported to the researcher as having ended after four weeks because they had received no feedback from management or staff regarding what it was being used for. To gain a better understanding of all shop-floor employees engaged in this recording process, three workshops conducted by the researcher sought to solicit overall opinion. Eighteen employees took part, including operators and their immediate supervisors. A common theme emerged from these workshops where participants reported frustration at the lack of feedback and were concerned as to how the data would be used. Several participants commented on previous quality implementations, whereby data were used 'against' the employees in the form of reprimands and criticism for poor output, even though the causes of machine breakdown had been given. Their reports highlighted frustration that, despite providing what was requested, management used the information as a means for criticism rather than a means for improving the quality of process and machinery. The operators reported that they had now disengaged because they were getting no feedback at all. A visit by the researcher to the administrative office revealed that although the data had been received, no one had done anything with it because they were too busy.

### 4.3.6 Learning history

Operators came across as very *competent* in their day-to-day work and often invited the research interviewer to their work station to explain what they did and give examples as to how they improve their work and the things that frustrate them. It appeared as though the shop floor were very competent at day-to-day tasks and came across as being quite capable of taking responsible *autonomous* decisions in their work, yet supervisors would set, then frequently change, schedules and priorities, sometimes mid-shift, thereby frustrating operators and affecting output and *undermining local autonomy*. With regard to Lean, there was general support for the programme to date, evidenced through observation of 5S success and operators' initial support of Overall Equipment Effectiveness (OEE), although experience of earlier programmes (going back many years) provided cause for concern as to how long management would commit to it. 5S had been successful; some BE staff were very helpful and others unhelpful. Lean competence was less clear, as training appeared to be somewhat sporadic and, as observed by the researcher, the operators were heavily dependent on BE to run Lean meetings and make changes.

No one had had any training in Lean techniques, although it was starting to take place and the organisation was recruiting 'Lean coordinators' for each shift. There was also concern, as reported above, over the use of data.

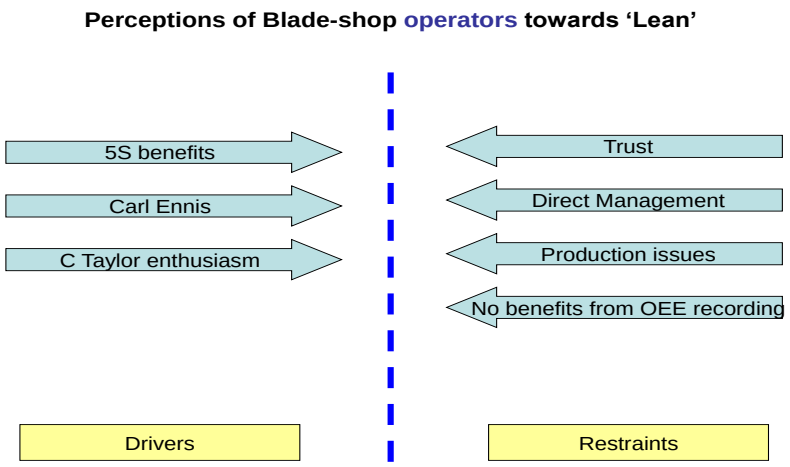
When the researcher was present at the operators' workstations, it was not uncommon for the respondent's colleagues to pass comment, often in a jovial manner, as to how much better they were at the job than the respondent. During private interviews with the researcher respondents regularly reported their respect for their colleagues. Observed behaviour and interview reports supported good collegial *relationships* within and across shop-floor teams. This was not the same for their relationship with the support department, whereby their responses were largely negative.

During this phase, the researcher had occupied a small office close to the workstations, firstly to facilitate familiarity and trust with respondents and secondly, to be able to observe behaviour and follow up quickly with respondents. On several occasions, this researcher witnessed shift supervisors shouting at shop-floor staff. On further investigation, shop-floor operators reported supervisors as having no interest in workers' issues, just wanting targets met, regardless of machine or workflow problems. Follow-up interviews with the shift supervisors, confirmed the *poor relationship*, their perspective being that of the shop-floor staff being awkward and 'always having an excuse', as well as being resistant to change. The shift supervisors had a similar perspective to BE, in that they wanted management to 'force' the shop floor into taking part in Lean. The supervisors reported a lack of management support.

### 4.3.7 Overall

The 18 operators who took part all agreed that this part of the 'Lean' deployment had been successful, although they expressed their frustration with reference to how they were 'engaged' by BE. The key themes are captured in the following diagram (Figure 19).

**Figure 19: Blade shop operators' perceptions of Lean**




The operators were concerned that the 'driving force' of Lean may not be sustained over the coming years. This concern reflects a learning history that has seen such initiatives start, only to come to a halt if too much money was required, the managing director (MD) moved on or there was an economic downturn. This concern appeared to be consistent with the directors' views. There were also concerns surrounding the current implementation with little trust of management and staff in the operators' support function within BS; in particular they were frustrated at how they were being asked to record performance (OEE) data relating to their machines and themselves but did not receive any feedback. They were also suspicious as to the use of the data. Within a month of these interviews, the operators had stopped recording the requested data in protest at no feedback. The above diagram, agreed with the operators interviewed, is a summary of the key points and permission was given to present these findings to their support department.

### 4.3.8 Discussion from a behavioural perspective

The physical context was generally, both functionally and symbolically, positively reinforcing, eliciting largely positive comments from the operators regarding this stage of the Lean deployment. The operators appeared to discriminate this part of the deployment from other initiatives that had 'failed' in the past, locating credit with the MD (as a distal influence, but important) and the BE leader on this project (CT). Although there were indications of some dissatisfaction regarding layout and operational choice/restrictions, overall this stage of the project was positively

reinforcing and the operators were engaged in the supporting activities. The next stage of Lean deployment introduced greater contextual regulatory requirements with the introduction of OEE recording. Despite initial operator concerns regarding the use of data and the duplication of effort, it would appear that some generalisation from 5S may have been reinforcing early engagement, as recording took place for four weeks. However, the lack of any feedback, and thereby a lack of positive reinforcement resulted in this approach behaviour becoming extinct.

Despite BE's protests and insistence that the operators comply with their requests, BE appeared to lack any reinforcement schedule to support their demands. The differences between the two stages of Lean were not adequately considered. That is, despite the operators having a learning history of change initiatives that were more costly than beneficial, 5S was able to provide positive functional reinforcement in a short space of time, thereby reducing the temporal gap between effort and reward. In some early instances, the functional benefits were almost immediate (cleaning, sorting, reconfiguring, painting), leading to positive comments regarding the impact on work and how much better it was to work there, thereby increasing the 'value in use' of the workplace and the positive feelings associated with it (Flora, 2004; Foxall, 1999). Symbolically, participation was both positively reinforcing and costly.

Operators expressed concern over the expense of the improvements. They reported a learning history of having to make do as, historically, fluctuations in the market would lead to relatively frequent cycles of hiring and redundancy. To remain competitive costs had to be minimised, therefore there was no money for such 'nice to haves' as new benches and a clean, freshly painted workplace. The operators, even the relatively new ones, were concerned over such expense, although they appreciated the improved environment. This was also reflected in their comments regarding the MD as he was discriminated as the operant influence on the entire Lean programme, that is, the ultimate cause. His support appeared to have a positive symbolic influence on the operators, however their concern was whether such support would continue as they had a learning history suggesting otherwise, based on previous senior managers' lack of persistence with such programmes. The operators appear to be demonstrating rule-governed behaviour with regard to spending on new equipment that is historically embedded, resulting in a 'put up with' type of behaviour that is now being challenged by the Lean programme. Whilst the results are functionally beneficial to the operators, there is a degree of concern as to whether this will leave them vulnerable in the future, owing to their respective

history. New members also seem to be conditioned (influenced) in the same way. Based on this interpretation of the operators' situation, it would appear that functional contingencies were relatively more reinforcing to the operators than symbolic, rule-governed, contingencies. This inference suggests that the operators are likely to be strongly influenced by the functional benefits experienced at this stage of implementation, such positive response behaviour acting as an antecedent signal to BE, positively reinforcing their approach behaviour in terms of introducing the next stage of Lean. An operant review of the next stage suggests that BE introduced OEE without consideration of the reinforcing consequences.

From an operant perspective, there appears to be a number of issues surrounding the introduction of OEE.[6] Firstly, if BE had recognised the importance of early functional reinforcement to the operators, they may have considered acting on the operators' most important concerns, to provide both functional and symbolic reinforcement in a short period of time, thus further creating a positive impact on learning history. During interviews, operators had highlighted that the data reflected their known and already reported concerns:

> 'They either don't listen or don't trust what we tell them. We all know what is wrong with these machines, they are old and have been poorly maintained. On top of that, jobs are not ready when we need them, so machines can lay idle and we have to change jobs to get through urgent parts because someone did not order enough in the first place. We know all this, so why do we have to measure it before anyone will do anything about it? … they don't do anything with what we send them anyway, so we have stopped filling in their forms' (BS Op9).

Listening to, accepting and acting on the operators' 'advice' could lead to positive functional improvement, for both operators and BE, and symbolic reinforcement would be dually reinforced as both parties benefit from 'trusting' each other, thus improving social relations (Emiliani, 2003; Foxall, 1999; Jones, 2011; Stine et al., 1995). Based on operator responses during interview, they came across as very amotivated towards OEE and earlier (historical) CI programmes, suggesting that 'avoidance' behaviours are likely to occur in contexts that offer low functional and symbolic reinforcement. Secondly, BE misjudged the relational context surrounding

[6]OEE, a data-based method for measuring equipment performance and identifying areas for improvement, was introduced as a means of improving machine productivity. It was more detailed than the electronic/manual data collection method used at present, which required operators manually to capture data on an on-going basis for support staff to analyse in order to identify areas for improvement. The data collected by OEE included information that could be directly related to specific operators, something not available before. Although the operators had previously highlighted problems with production equipment, they were directed by BE to comply with the recording request, as this data would confirm or refute operator claims of major equipment issues. After recording data for four weeks, with no feedback, recording stopped.

the operators and support staff. Their history reflected aversive control rather than positive reinforcement. Considering the requested method for OEE required an extended period of recording prior to action, ultimate functional benefits would be distal and uncertain, whilst more immediate symbolic reinforcement was likely to continue as before (Rachlin, 1991). From this perspective, this approach was unlikely to influence behaviour towards ongoing engagement in OEE.

Thirdly, BE did not consider the impact of OEE analysis on the support staff. Considering their history of firefighting, supported by proximal schedules of positive and negative reinforcement, it would appear unlikely that they would embrace this task any more than all the others that were currently being delayed. This situation appears similar to Rachlin's (1991) 'primrose path' concept of addictive behaviour, whereby the long-term benefits of changed behaviour are clear and positively reinforcing, but short-term acts, that lead to the ultimate change, are much more costly than current, often positively reinforcing, short-term behaviour (see also Flora (2004). Baum (2004) refers to such situations as a 'contingency trap', whereby nothing changes and long-term benefits are never realised. Much current behaviour in this operational area appears to be symbolically reinforced ('thank you for getting me out of this crisis'), so BE providing significant symbolic (relational) reinforcement for completing the OEE analysis may have improved response behaviour until natural functional benefits are realised.

*Overall* this interpretation concludes that the operators had had a positive functional experience from the 5S initiative, emitting behaviour whereby they generally 'identified' with the improvements to date (Deci and Ryan, 2002). However, they became 'amotivated' with regard to the OEE initiative, whereby the positive effects of 5S were outweighed by the consequences of OEE, thus invoking responses from their prior learning history of low functional and symbolic benefit. There was also a general consensus amongst the operators that they had no voice. Instead they were expected to cope with the firefighting and day-to-day messes and, at the same time, embrace changes such as Lean and do as they were told. As such, the combination of historical factors and current contextual factors leads to the conclusion that the operators were generally amotivated towards Lean (although they were benefitting from 5S). The lack of management, supervisor, support staff and BE feedback of any kind was both functionally and, importantly, symbolically costly to the operators, leading to their avoidance behaviour (stopping recording OEE). Functionally their efforts were not valued, at times criticised and on occasion ridiculed, leading to feelings of frustration. Symbolically, their efforts were not valued either, as

demonstrated by reports of the lack of feedback. Maybe the positive reinforcement of their efforts (behaviour) could have circumvented the operators' apparent amotivated state. Listening to, and appreciation of, their efforts, even without the ability to take things further at this stage, could potentially maintain a positive disposition towards future efforts (Deci and Ryan, 2002; Flora, 2004; Skinner, 1953). From this it appears that 'amotivation' is nothing more than a lack of access to positive contingencies within the environment (Baum, 2004; Flora, 2004; Skinner, 1953) as indicated in Chapter Two.

Whilst conducting the interviews, BS operators had named several people (staff) within the support function, forming the selection criteria for the next round of interviews.

### 4.4 Interview Group Five: BS Support Staff

Support staff comprises the BS manager, three shift supervisors and two quality-support staff and the balance are involved in the scheduling and technical facilitation of production. In total nine support staff took part in interviews, out of 14 in the department. Four of them were directly named from shop-floor respondents, with the others emerging as subjects during interviews with the first four. The average age of the participants was 44 years (SD 10.3) with an average of 23.9 years of service (SD 11.6). All supervisors had passed engineering apprenticeships and all other support staff had degree, or degree equivalent, qualifications, with two holding advanced qualifications and one working towards a PhD. No participant had any formal Lean/TQM training, other than a one-day, company-run introduction to Lean. Interviews stopped at nine participants, as, at this point, no new themes were emerging (Sekeran, 2006). Interviews followed the same format as those before. A lack of familiarity with respondents had many of them initially on guard, with only one agreeing to recording of the interview. Recognising that this interview felt different to the others, based on the researcher noticing the respondent regularly looking at the recording device, it was at this point that the researcher decided to stop recording future interviews, as it was getting in the way of more open responses. Table 11 below illustrates the findings.

**Table 11: Blade shop support staff interview summary**

## Summary of Bladeshop Support staff interviews

Key

+ Positive: Overall positive responses

- Negative: Overall negative responses

o Neutral: Overall neutral responses

| | | Response category | Responses Overall + | - | o | Common Themes (number of respondents) |
|---|---|---|---|---|---|---|
| Context History | Physical | Old equipment | | 9 | | Unreliable/Difficult to maintain equipment (9); High levels of downtime (9); Poor support from maintenance department (5); Lack of investment (7); |
| | | New equipment | 9 | | | More efficient and reliable (9); fewer process rejects (7); less operator input (5); inefficiently loaded/used (5); Require improved support processes (6) |
| | | Cleanliness | 9 | | | Improved working environment for operators (9); Not extended into office environment (7) |
| | | Layout | 5 | | 4 | Improved machine layout/ cell working (7); old machines 'out of place' (4) |
| | | Cost | | | 9 | Under-utilised machines/ small batches (6); over processing due to overly tight machine tolerances (7) |
| | | CT input | 9 | | | Led 5s implementation (9) |
| | | Other BE input | | 6 | 3 | Little input into 5s (6) |
| | Social | Teammates | | 4 | 5 | Mixed atmosphere (9); generally helpful (7); Trust issues (4) |
| | | Supervisors | | 5 | 4 | Not enough time on shop-floor (6); inflexible (6); competence (4); self focussed (4) |
| | | managers | | 9 | | MD driving Lean (9); Senior management unsupportive/ never around (7); local manager not coping/ being undermined (7); little lean guidance (8); fire fighting (9) |
| | | Engineering | | 9 | | Mixed relations with Engineering staff (9); Engineers overly controlling (7); not responsive enough to Blade shop requirements (8); |
| | | CT | 9 | | | Hard worker/ keen (9); local driving force (6); engages people (7) |
| | | Other BE Staff | | 9 | | Not interested in local issues/ own agenda (9); forcing OEE (4); Do not listen (5); At times openly critical/ abusive (4) |
| | Regulatory | Work order/ priority/ information | | 9 | | Lack of reliable loading schedule (9);Constant changes in priorities/ fire-fighting (9); pressure for output (9); difficult to get Engineering support (9); incomplete job information (9); confusing standards (9) |
| | | OEE | | 8 | 1 | No time to support OEE (8); BE unsupportive (6) |
| | | 5s | | 7 | 2 | Shopfloor staff supporting (7); Not extended to office environment (8) |
| | Temporal | Time for 'Lean' | | 9 | | Work pressures (9); No support forsignificant staff ideas (5); suggestion scheme not working/ slow, if any, response (8) |
| | | Longevity/ History | | 9 | | Past lack of support leaves management commitment in doubt (9); past ideas unsupported (6) |
| Reinforcement History | Reasons for Lean Approach / Avoidance | No Interest | | | 9 | Most appear amotivated to OEE due to lack of feedback/action ... unresolved issues relating to unsupported improvement ideas (8) |
| | | Told to do | | | 9 | Will only take part if beneficial (9); |
| | | Paid to do | 3 | | 6 | Some payments received for improvement ideas |
| | | Guilt/ feel good | | | 9 | No signs of Lean making participant feel betteror worse about themselves |
| | | Identify | 9 | | | 5s appears beneficial to shopfloor ... office impact currently unclear |
| | | Enjoy | 2 | | 7 | Two staff members clearly enjoy improvement activities, the rest do not appear to findsuch activity intrinsically enjoyable |

The above table represents the researcher's interpretation of respondent interview responses

The table summarises the nine individual interviews which focused, as before, on an exploration of the respondents' learning history with regard to their work and Lean/TQM context and their motivation (reinforcement history) with regard to Lean/TQM. The interviewees were guided towards contextual response categories relating to the physical, social, regulatory and temporal aspects of their respective environments and the emergent themes are recorded in the table.[7] The researcher also noted each participant's behaviour when making the point, that is, was it positive (+), negative (-) or indifferent (o) as an indicator of the theme's motivational impact on the respondent.

Reinforcement history was based on the researcher's judgement of interviewee responses overall, combined with direct questions. For example, such questions as: 'I get the impression that you are in agreement with the 5S improvements as being good for the department; is that correct?' were used to test whether the respondent identified with 5S. Similarly: 'I get the impression that you have no interest in Lean and are not likely to get involved; am I correct?' or 'What would happen if you were told that you must take part?' were used to test for amotivation and whether it would resist directive instruction. Together, interviewee reports and direct observation provided the basis for completing the respondent's reinforcement history. Cumulatively, the researcher formed an impression of the disposition of the BS support staff towards Lean/TQM.

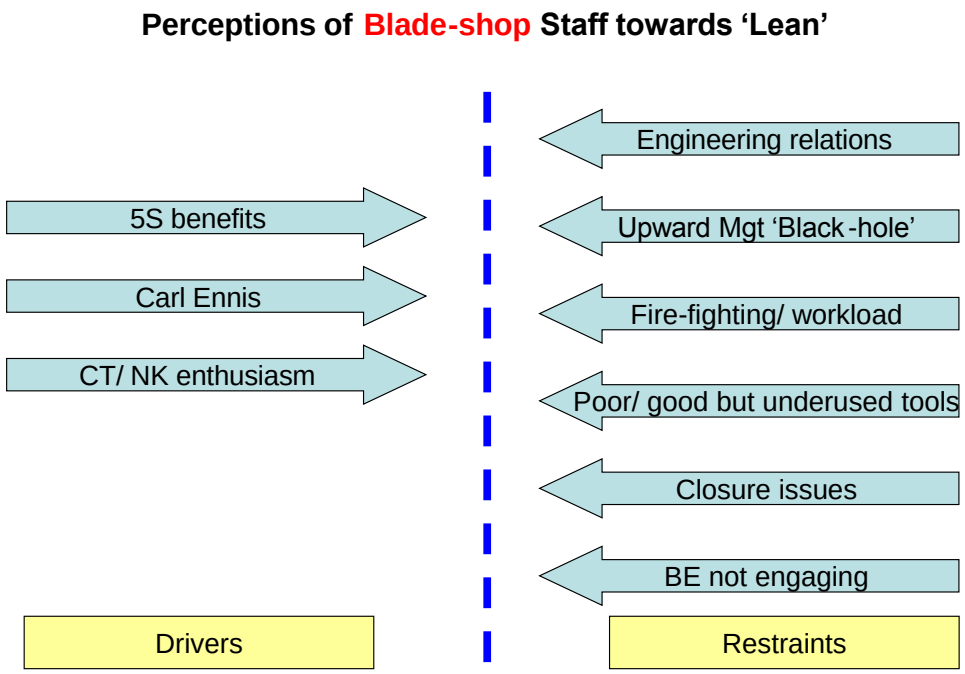
There was an overall positive response to 5S and the efforts of CT, similar to that of the BS operators. There were a number of significant negative issues relating to work pressures, constant firefighting, a history of poor management support, concerns over the current manager, poor relations with Engineering and concerns over BE's agenda and their lack of interest in BS priorities, along with some intra-department relational issues. Taken together, these issues form a significant restraint against Lean/TQM approach behaviour within the BS support function. These findings (Figure 20) were confirmed in a BS support department workshop, where interview participants were invited to identify the drivers and restraints for Lean/TQM.

The staff also identify with the benefits of the 5S programme and its *physical* improvement to the shop floor. However, there was no apparent sign of 5S in the support department.

[7] Note: Table reflects the key themes emerging from this process.

*Socially* there appeared to be less cohesion between support staff members, with a number openly criticising their manager and his lack of direction and leadership. However, it was more often that the department manager was referred to in a sympathetic manner by his staff, during interview, as they felt that he was not in control but it was not his fault. Either way, the staff reports suggested that their manager was not in control. An interview with the manager reflected a similar theme. He reported that he felt under threat from his superiors who were not supporting him. Subsequent inspection of the departmental performance data indicated below target performance. The researcher observed that the manager was demoted during this phase of research and replaced by a member of staff already within the department.

**Figure 20: Blade shop staff perceptions of Lean**




*Relationships* with the Engineering department came across as being very poor. The support staff saw Engineering staff as being very unsupportive and 'controlling', not willing to help in resolving departmental difficulties. Good relations are important here as Engineering has a significant impact on the departments' regulatory environment. Similar to the operators, the support staff identified the MD as the distal driving force behind Lean, along with one or two committed individuals in BE.

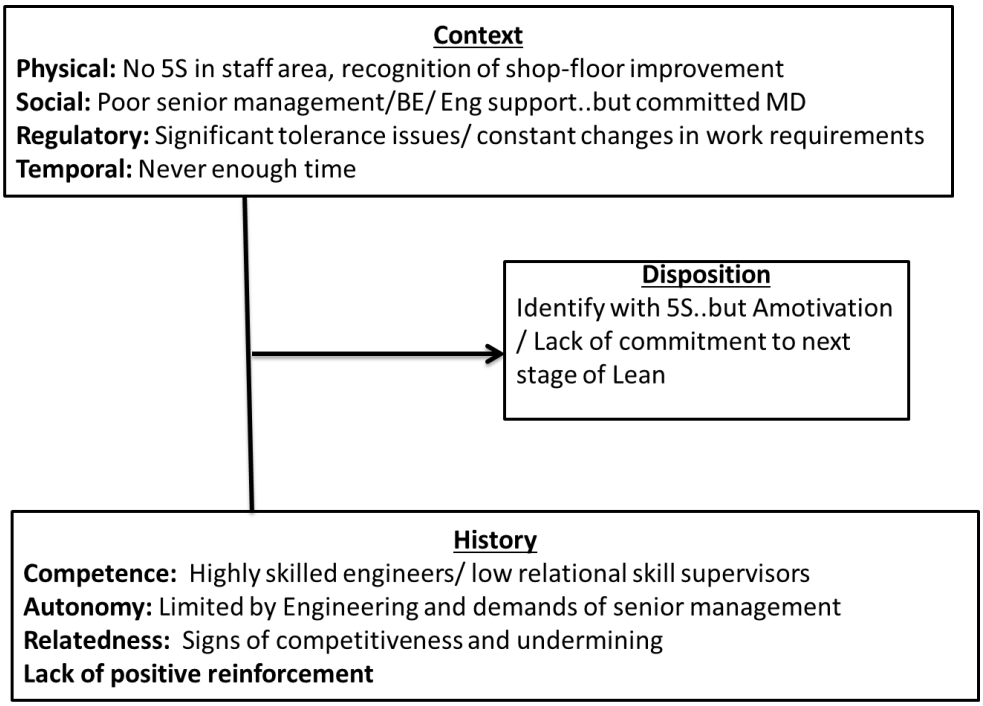
However, they also identified senior management as acting as a restraint. Upward management were reported as being remote and unsupportive, turning down and ignoring ideas presented to them. During interviews, several improvement ideas surfaced, although the individuals felt they were wasting their time as no one was willing to support them. *This lack of support* extended to BE. The researcher observed several respondents reporting that BE had their own agenda, ignoring anything outside it and even going as far as ridiculing ideas offered to them. There appeared to be a lot of resentment towards BE.

Engineering defines the product dimensions and *regulatory* tolerances allowed in production. However, modern systems for measuring were starting to identify higher levels of tolerance failure, requiring high levels of rework and thus firefighting. This was becoming ‘a way of life’ in the department, with the term representing the day-to-day production crisis that they all engaged in. Several respondents reported to the researcher that they actually enjoyed it as it was a way of gaining recognition and provided satisfaction in being able to resolve the issue. It became apparent, from observation and interviewee reports, that there was a lack of positive, day-to-day, reinforcement in the department. The management focus appeared to be on what was wrong or explaining why they had missed deadlines. It seemed unsurprising that an opportunity to gain a positively reinforcing ‘thank you’ for putting out a ‘fire’ would be pursued. The researcher noted that the ‘thank you’ would often come from supervisors or managers further down the production process, desperate to receive overdue product. Based on these findings the BS support staff’s situation is summarised in Figure 21.

### 4.4.1 Discussion

Overall, there was a definite sense of frustration, bordering on apathy and amotivation with many of those interviewed. Production targets were not being met, budgets overspent due to high levels of rework and generally a sense of being blamed. Some indicated that they had enjoyed the interview process, as it had allowed them to express their frustrations and they were hopeful that it might lead to some improvement.

**Figure 21: BS support staff situation summary**




The *contextual climate* in this operational area was *relatively closed*. Engineering tolerances severely affected output and although they would regularly approve dispensations, BS were very restricted by what they believed were unduly tight and restrictive manufacturing tolerances. In addition, a perceived lack of senior management support and increasing budgetary demands were reducing managerial and departmental behavioural scope. Lean adoption was approached on a must-do basis. That is, they would only do what they had to and this was the reason for not processing the data collected from the shop floor. Whilst it had been a priority for the operators to record data, the output was not due and, therefore, not given priority. As such, the department manager's 'Lean' engagement behaviour was restricted to whatever must be done now to meet BE requirements and can be construed as typical 'compliant' behaviour, having symbolic, rather than functional significance, aimed at avoiding aversive consequences of non-compliance with the BE timetable.

This pattern of context, history and consequences reflects what appears to be a situationally apathetic and amotivated department. The department staff identified Engineering contacts, expressing interest in discovering the 'Engineering' perspective. They were willing to take part in a joint meeting with them to go through and discuss the findings. The next section develops the Engineering perspective, before going on to discuss the emergent pattern of bilateral relations.

### 4.5 Interview Group Six: Engineers

Three engineers identified as directly supporting the Blade Shop were interviewed, with a further two identified during the interview process. Nothing additional emerged after five interviews, so the process stopped there. These engineers had an average age of 47.0 years (SD 4.6), with an average of 24.2 years' service (SD 6.1). All engineers had degree or degree equivalent qualifications, with no formal Lean/TQM qualification other than the one-day, in-house introduction.

Engineering interviews are summarised in Table 12. Their experience of Lean to date was similar to that of the BS department, in that although they had had limited 5S experience, they reported good support from a BE staff member (NK) in setting up 'Leanboards'[8] and facilitating improvement meetings. Whilst the Engineering work environment is as similarly pressured as that of BS, with lots of firefighting, the researcher observed a much more collegial and supportive climate in the department. Of note was the level of reported respect between the manager and his staff, who stated that his organised approach to work greatly alleviated many of the pressures staff faced. As a major issue for the BS department was their relationship with the Engineering department, the Engineering interviews focused on exploring the operational relationship with BS. What emerged from the interviews was a pattern of behaviour whereby each department (BS and Eng) was struggling to gain overall control in the relationship. The researcher observed what appeared to be deeply-rooted antagonism between the two departments, yet it was not exactly clear as to what it was that they differed on. They both reported that they wanted to achieve high quality, profitable output, yet they could not agree with each other on anything, so it seemed.

The engineers' interviews established similar issues to the Blade Shop, such as 'firefighting', and when gently challenged during the interviews the respondents admitted to the satisfaction gained from resolving an urgent issue. They, too, had concerns relating to trust, especially not trusting the BS motives for requesting changes to product specifications or product tolerances. Several improvement opportunities emerged during interview, appearing to be quite similar to those emerging from the BS interviews. There was definite frustration from two of the interviewees and a degree of resentment, apparently due to a lack of support from senior, middle and upper management.

[8]Leanboards are a common information point for each department and form part of the 5S process. They are also a central point for weekly team meetings.

**Table 12: Engineering staff interview summary**

## Summary of Engineering staff interviews

Key

+ Positive: Overall positive responses

- Negative: Overall negative responses

o Neutral: Overall neutral responses

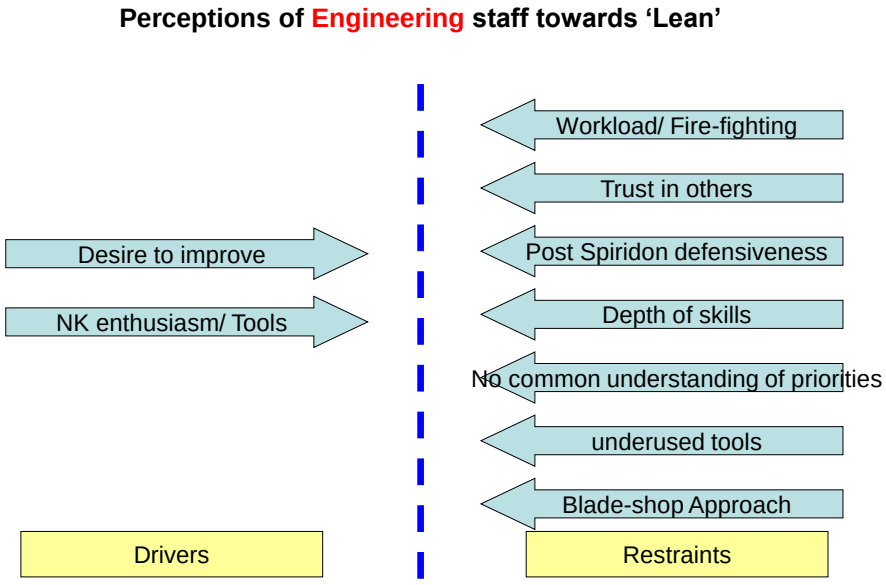
| | | | Responses (Overall) | | | |
|---|---|---|---|---|---|---|
| | | Response category | + | - | o | Common Themes (number of respondents) |
| Context History | Physical | Old equipment | | 5 | | Many designs pre-CAD (Computer Aided Design)/ much updating required (5) |
| | | New equipment | 5 | | | CAD is underutilised / Benefits department / benefit limited due to many modifications (5) |
| | | Cleanliness | | | 5 | Limited 5s in department/ generally tidy (5); opportunity for better organisation of drawings (4) |
| | | Layout | 4 | | 1 | Teams organised around internal customer (4) |
| | | Cost | | 5 | | Regular design modifications and tolerance dispensation place high demand on department (5) |
| | | NKinput | 5 | | | Set up 'leanboard' area for improvement meetings (5) |
| | | Other BE input | 3 | | 2 | Limited wider BE input, other than setting up 'leanboard' (3) |
| | Social | Teammates | 5 | | | High level of trust between colleagues (5); Good atmosphere/ helpful/ supportive (5); many specialist staff/ 'one deep' (5) |
| | | Supervisors | | | | Not applicable |
| | | managers | | | 5 | MD driving Lean (3); Senior management do not understand engineering workload/ pressure to improve staff utilisation (5); local manager very organised and highly respected by team (4); constant fire fighting (5) |
| | | B Shop | | 4 | 1 | Variable relationship (5); expect unreasonable response times (5); quick to blame/ antagonistic (3); low trust in B-shop motives (5); Often take issues to senior management in order to influence engineering decisions (3) |
| | | NK | 5 | | | Very supportive / good facilitator (5) |
| | | Other BE Staff | | 3 | 2 | Not applicable |
| | Regulatory | Work order/ priority/ information | | 5 | | Lack of reliable loading schedule (4);Constant changes in priorities/ fire-fighting (5); pressure for output (5); pressure from internal customers affecting ability to prioitise work (5); job information often poor (4); conflicting drawing standards (3) |
| | | Design Tolerance | | 5 | | Very significant and contested area, surrounding necessity for current 'tight' engineering standards (5); High quantity of authorised dispensations (5); regular disputes with manufacturing areas (5) |
| | | 5s | | | 5 | Approach ok in principle/ not applied to engineering as yet (5); questions raised over Lean's focus on waste reduction, whilst new computer system required greater effort with no apparent benefit (3) |
| | Temporal | Time for 'Lean' | | | 5 | Positive about Lean potential (5); Primary concern is workload (5) |
| | | Longevity/ History | | | 5 | Past lack of support leaves management commitment in doubt (5); past ideas unsupported (2) |
| Reinforcement History | Reasons for Lean Approach / Avoidance | No Interest | | | 5 | All respondents appear keen to improve how they do their work (5) |
| | | Told to do | | | 5 | Choose repective activities appropriate to them (5) |
| | | Paid to do | 2 | | 3 | Two people received reward payment for ideas |
| | | Guilt/ feel good | 1 | | 4 | One staff member stated that he feels guilty when not working on improvements |
| | | Identify | 5 | | | All respondents stated how waste elimination is important to improving their work (5) |
| | | Enjoy | 1 | | 4 | One staff members clearly enjoys improvement activities, the rest appear too busy in daily 'firefighting'. |

The above table represents the researcher's interpretation of respondent interview responses

The Engineering manager explained to the researcher that they are responsible for the product overall, that is, design and performance. They have designed products to exacting standards and in the past would even specify on what machine the product would be manufactured. Whilst he recognises that technology has moved on significantly over the last two decades, raising choice in manufacturing technique, he maintains that Eng must have the final say in any deviation from design. The BS interviews revealed that they want Eng to 'let go' so that they can decide on the most efficient process. This appears to be the intractable crux of the dispute between the two departments. The researcher concludes from this that both departments have been trying to force the other into a relationship on their respective terms. As such, each is competing for dominance rather than collaboration, resulting in distrust and an inefficient contested relationship.

Following the individual interviews, Engineering participants took part in a workshop to identify their common themes, which is illustrated in Figure 22 below.

**Figure 22: Engineering staff perceptions of Lean**

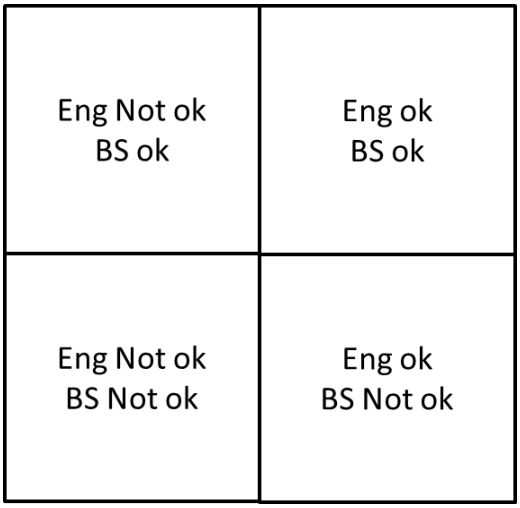



### 4.6 Discussion on Bilateral Mutuality

In this section, instead of using the BPM framework, the bilateral theory of mutuality (Foxall, 1998) is used to examine the findings. The following 'mutuality metaphor' (Figure 23), illustrating relational balance/imbalance, was used in inter-departmental workshops to help participants to monitor and adjust to changes in relational

dynamics. The metaphor is used here, as part of the discussion on mutuality, to illustrate relational findings.

**Figure 23: Mutuality metaphor used in workshops**




The bilateral relationship between BS and Eng can be considered from a perspective of mutuality imbalance, that is, if the BS department is okay, then the Eng department is not. Similarly, if the Eng department is okay, then the BS department is not. This reflects an imbalance in relational mutuality, whereby each department is trying to establish a dominant symbolic position. Eng restricts BS behaviour, functionally through design control regulations (including 'tolerances') and temporal restrictions, such as in response lead times. Response lead times further limit BS behavioural flexibility, thus creating functional restrictions regarding response times for manufacture (Foxall, 1998). Unfortunately, the outcome appears to be mutual functional weakness, as both departments appear to be utilising resources in contesting each other's symbolic position in order to advance their own. As such, the functional and symbolic consequences are costly for both departments, as engagement is reinforced by avoidance of aversive consequences. Symbolically, both departments demand responses from each other, with no regard to the functional burden it places on the other. Additionally, behaviour focuses on achieving relational dominance over the other, with each department blaming the other's lack of competence for its inability to achieve targets. As such, no discretionary effort is afforded to each other, work being done in time to avoid reprimand and to meet strict lead times.

Both departments appear to be behaving in an avoidant manner, that is they will only do the absolute minimum to avoid aversive symbolic and functional

consequences. Whilst each department has individuals who are clearly competent, relationally able and capable of being 'autonomously engaged', that is, in pursuit of *functionally important* improvement ideas, together they are dysfunctional and caught up in departmental conflict and avoidance behaviours. Together, avoidant-type behaviour is presented as a group learning history that appears to be one of conflict, stemming back many years. Skinner (1953, 1974) argued that an understanding of an object's learning history was important in trying to explain current behaviour. This certainly appears to be true of behaviours in this relationship. At a wider level, senior managers appear to have adopted positions which seem to be symbolically reinforcing such conflict. Consideration of the reporting structure indicated possible causes of such positions.

The engineering department did not report to the local MD, instead they were part of a global engineering service, servicing local and international engineering requirements. As such they were locally autonomous and worked to strict engineering criteria. The BS, however, reported to the local MD and were quick to place 'blame' for manufacturing issues on the Eng department. The 'literal exchange' (Foxall, 1999) relations between Eng and BS were globally determined by a formal 'service level agreement' (SLA), which maintained Eng's status in defining production requirement, including design and manufacture requirements. However, BS argued that the Eng design criteria was no longer appropriate for current manufacture capability. Exchange relations were determined by the SLA and whilst the basis for 'literal exchange' was formalised, the exchange quality or 'mutuality' (Foxall, 1999) was severely contested. Within such a contested relationship, the seeds of what would eventually turn out to be truly beneficial to both parties existed.

### 4.7 Summary

So far, in trying to understand the relational context, this stage has explored inputs from 58 interview participants across key areas of the business involved in the early stages of Lean deployment. The majority of participants indicate that they recognise the commitment to Lean by the organisation's MD, however they are more sceptical of support from other senior managers.

BE face quite aggressive implementation targets, set with senior management. They are currently frustrated at the relatively slow uptake and support from operational departments and would like a more forceful approach to gain engagement. Whilst

technically competent, they appear to miss the relational aspects of engagement, possibly resulting in lower levels of engagement than was otherwise available to them. An example within the BS department was explored, where the functional aspects of reinforcement had been ignored or missed when initiating an OEE project.

BS operators reveal dissatisfaction with previous attempts at TQM, but demonstrate positive response to functional reinforcement experienced during 5S. Yet this gain appears to be lost due their experience with the OEE project. As such, they demonstrate both approach (identified with) and avoidance (amotivated with) categories of behaviour. BS support staff come across as largely demonstrating avoidance behaviour, focusing primarily on the symbolic importance of maintaining approval from significant others, whilst functionally failing on more general objectives. This disposition appears to play out with the BS operators, who are expected to comply with the short-term demands of the support staff. This has resulted in a rather poor relationship, as supervisors offer little choice to the operators as short-term (immediate) demands often override the relative benefit of 'completing a job' and thus lead to frustrating and costly interruptions to production schedules.

The relational behaviour between BS and Eng follows a similar theme. Both departments appear to be trying to limit the scope of the other, resulting in adversarial and punishing consequences. However, they also appear to be jointly frustrated by this, yet appear unable to break out of this behavioural pattern. It appears as though symbolic consequences are reinforcing key participant behaviours, at the expense of functional improvement.

During the interview process, opportunity for a collaborative project between these two departments started to emerge. Although the ideas required development, they appeared to offer potential for functional improvement and symbolic benefit to both BS and Eng. This researcher inferred that BS operators were experiencing the functional consequences of problems stemming from the BS-Eng relationship. Therefore improvement in the relationship would have functional benefits for the BS operators. From a research perspective, this also presented an opportunity to explore and work with individual and group relational dynamics. It also required the active involvement of the researcher in addressing relational (symbolic) and competence (functional) aspects of the programme. The problem facing the researcher at this stage, was that the symbolic, contested relationship between BS

and Eng was preventing them from engaging in projects of joint benefit. The researcher's approach was to maintain mutuality during a series of activities which focused on developing the ideas that emerged during the research phase into joint proposals for a defined project to be presented to senior management. The following activities supported this process.

## 4.8 Follow-up Improvement Activity: Collaborative AR between Blade Shop and Engineering

During interviews with both departments, ideas emerged for improvement activities previously rejected by senior management. These activities further the research as outlined below. The first activity was to bring together a BS engineer and an engineer from Eng. The second one involved four workshops, two with BS staff and two with Engineering staff. The third one was a joint meeting between BS and Engineering to discuss and reflect on the findings. The fourth one involved four further workshops to develop ideas. Finally, the fifth one involved a collaborative presentation of the findings to senior managers.

### 4.8.1 Activity 1

The first activity involved two engineers, PK and JG.

***PK (BS1)***

PK, a highly-experienced manufacturing engineer with advanced skills in machine programming, had expressed high levels of frustration at management's lack of support for improvement ideas he had offered up, extending over several years. Observation of his work area provided many indicators that this person was an 'innovator' who not only identified with CI, he found it intrinsically reinforcing, yet his presented behaviour appeared more consistent with amotivation and avoidant behaviour.

The researcher observed his work area was full of creative symbols, from the latest machine tool samples, to sample pieces from his latest production trials. When PK was interviewed, he became clearly pleased when the interviewer passed comment on the interesting 'clutter' in his work area, thus suggesting that such 'clutter' had symbolic importance for him. He spoke of how he enjoyed improving the functional capability of both machine and process. He really enjoyed this type of work. PK was in his forties, had been in this role for over 10 years and did not plan on doing anything else. It was clear during this part of the interview that he took pleasure in

being able to pursue his improvement ideas. He also reported that he enjoyed his reputation as being the department 'boffin', messing around with his latest ideas, fixing the latest production 'fire' and advising others on machine programming. Both the functional and symbolic aspects of his role indicated that these were highly reinforcing for him, thus further indicating that this person could be considered an 'innovator', yet his day-to-day regular behaviour was more akin to avoidance.

During the interview, PK's demeanour changed as he started to reflect on his increasing frustration regarding a lack of support for an idea he had put forward, on several occasions, only to be met by rejection. At this stage he became tearful and upset, having to take short breaks to compose himself before continuing with his account. The interviewer focused entirely on PK's account, using active listening to understand the history of the idea, the functional and symbolic benefits for him, the department and his key supporters. What resulted was an account of a rather unclear idea towards automating the Eng-BS interfaces, leading to a higher level of production automation. His attempts at explaining the concept and gaining support had, to date, not been successful (he reported he had been trying for seven years). Based on this extended interview, the researcher started to suspect that the problem was not so much a lack of management support, although this is what it appeared to be, but rather a lack of management understanding regarding the proposed concept and the organisation's ability to support it. Without this clarity it was unlikely that PK would ever be supported. This, however, had not been communicated to PK by any of the managers he had interacted with and he felt as though he was being ignored. This understanding of PK's history appeared to account for his 'avoidance' type behaviour. He expressed that he 'will do what he has to' and not put forward any more improvement ideas, as 'they only get rejected'. This 'rule' appeared to have a strong discriminatory effect, dominating PK's behaviour. From a research point of view, the way forward with PK would be to help him to develop his ideas into a coherent proposal with particular emphasis on the functional and symbolic costs and benefits.

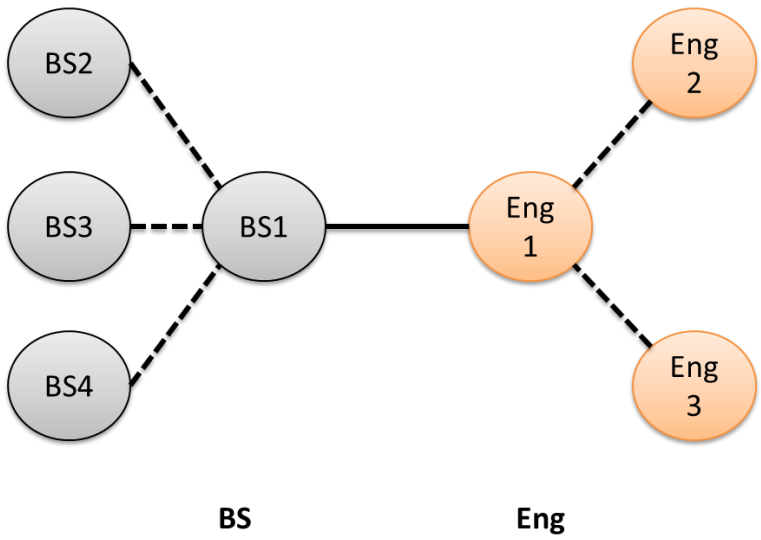
***JG (Eng1)***

The other engineer in activity one was JG, who was chosen because during interviews with the Eng department he had expressed improvement ideas that, to the researcher, had some similarity with that of PK. JG was functionally interested in improving the interface process between Eng and BS. He had also worked for the organisation for over 15 years and was an experienced design engineer, with a

particular interest in the more advanced aspects of the design software Autocad©. In this respect he was very similar to PK, that is, an innovator with regard to design software and its possibilities within the workplace. However, he also came across as being amotivated, due to a lack of support from management. JG agreed to a further interview regarding these ideas, during which time it became clear that whilst there were similarities with PK, there were also distinct differences which lay in the area of control in particular. From JG's perspective, the 'system' would enhance Eng control and from PK's it would enhance production's requirements over Eng.

Whilst this symbolic power dynamic was a concern, there appeared to be sufficient conceptual overlap between the two respondents to request a joint meeting. This took place and both agreed that between them there was sufficient functional overlap in ideas to explore them further, although at this time a common project was not yet clear. Both respondents named others in their respective departments that would need to be engaged in the concept formulation. Further discussion revealed the following relational pattern (Figure 24).

**Figure 24: Relational links supporting research project**




PK (BS1) and JG (Eng1) would act as the common link between the two departments, with each developing their respective requirements with their own teams. The department manager was included for each department as essential to support any emergent project.

JG and PK classified (predicted) the prospective team members' contingent 'interest' as participants in any emergent project. BS2, BS3 and Eng2 would be

primarily reinforced by the functional improvements from the project, whereas the respective departmental managers, BS4 and Eng3, would need to be seen as supporting the project, if senior management gave it the go-ahead, providing the initial symbolic reinforcement required to get the project started.

### 4.8.2 Activity 2

Following on from the meetings with PK and JG, their ideas were put forward to others through two departmentally-focused workshops for each department, four in total. During the workshops, a number of broad areas for conceptual development emerged and the researcher sought to verify the respective party's interest in the project. The Engineering manager (Eng3) behaved in a very supportive manner during the discussions, with a particular interest in how the project could overcome some key inter-departmental interface issues. He indicated that he was very willing to support and take part in such a project. BS4 supported his position, through behaviour that indicated interest only when it was suggested that the BS would be able symbolically to strengthen its position with the Engineering department. Although he welcomed the functional aspects, this came across as secondary to the BS being able to 'persuade or force' Eng into coming into line with BS expectations.

### 4.8.3 Activity 3

The two preceding activities established a number of improvements that could have functional benefit for both departments. A joint meeting between BS support staff and Eng staff was held to discuss the findings from activities one and two. The researcher acted as a facilitator for the meeting and encouraged dialogue and reflection on the issues presented, steering participants away from blaming each other for their poor relationship. The focus was on exploring common ground and opportunities.

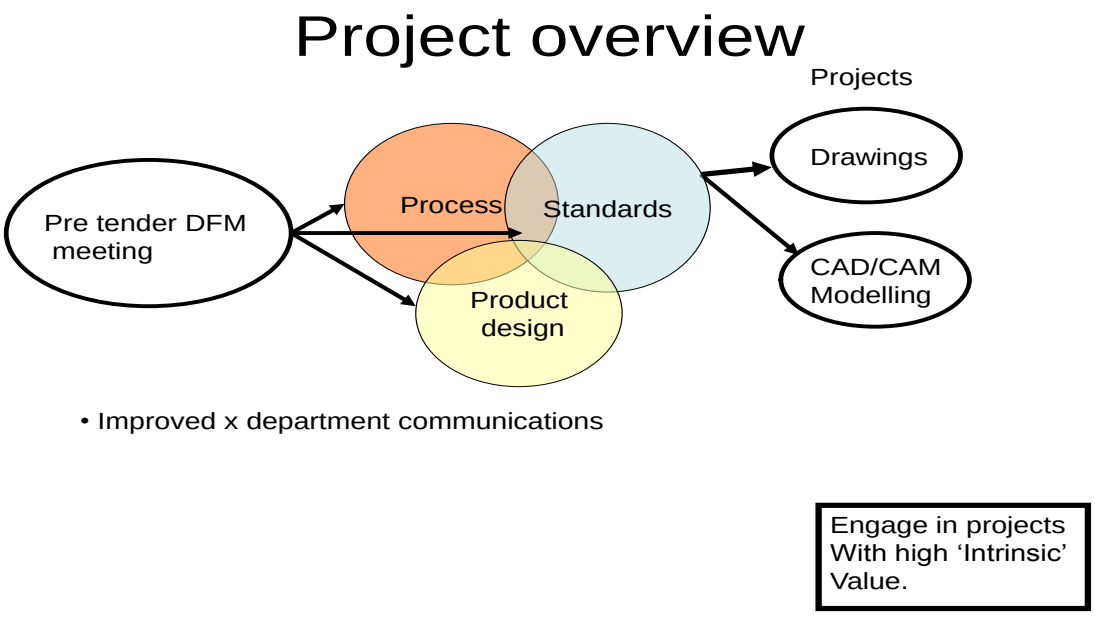
The meeting started with a review, using the respective departmental summaries, of the key points agreed by each department. The researcher had sought permission from several of the respondents to discuss in this meeting ideas for improvement and why they were not being jointly pursued. A Powerpoint© slide with the words 'Have we learnt how to be helpless' was presented as the researcher/facilitator opened discussions on ideas that could have a positive functional impact for both departments. PK and JG supported the message, stating that something had to be done to overcome the regular firefighting that was becoming the norm. For the next half hour, participants explored the issues they were facing and their concerns over

their ability to resolve them without more time, more staff and more support. However, the meeting ended with agreement that there was ground for collaborative projects of common benefit, to explore in a series of workshops. Away from the meeting, individuals on both sides reported positive feelings towards the potential of the workshops, but also reflected concerns as to whether each side was genuinely willing to 'change their ways'. The researcher observed at this point that each department saw the other as the one that needed to change 'their' ways. This suggested a positive attitude to the functional efficacy of a joint programme, but a need to support the symbolic aspects of the relationship.

### 4.8.4 Activity 4

Over the next month, four workshops took place. During this period, the group of participants reduced to seven members who had a direct interest in the programme. This group identified three conceptual areas with potential for functional development (Figure 25).

**Figure 25: Overview of identified projects, as presented to senior management team**




(Note: x department = cross-department.)

In order to monitor the symbolic aspects of the relationship, the two-by-two grid, was used as a method to 'check in' with participants in order to help bring to the surface any relational or mutuality imbalance (Foxall, 1998) arising in the workshop dynamics.

Although the approach 'felt' a little strange to participants at first, by the second workshop it had become a means of communication. For example, participants would usually place themselves as ++ at the start of a meeting and would largely stay in that box. On one occasion of note, a participant (BS4) moved his marker to the -+ position, indicating that he was not okay with what everyone else was agreeing on. He was given 'space' to explain his concerns without interruption and his comments changed the direction of the workshop, opening up further consideration and leading to a modified joint position. After the meeting, BS4 indicated that somehow he had not been able to get his point across earlier and this mechanism allowed him to highlight his concern. This approach continued throughout the project.

### 4.8.5 Activity 5

The findings from these workshops were presented to senior managers on 22 September 2009 by members of the project. After some discussion, the Operations Director (OD) and the Finance Director (FD) made clear their support for the programme and their willingness to 'sponsor' it, to transform the concepts into implementable programmes. The head of Lean deployment (BE) was somewhat sceptical about the programme, as it lacked full time participants and did not have a Lean facilitator. The researcher, concerned about the symbolic significance of this project, committed to regular progress reviews with BE to allay their concerns. Following this, the researcher had follow-up meetings with the senior management team, which received a different response.

The first meeting took place with the department heads for production and engineering, along with the OD, their boss. During the meeting there were some strong 'defensive', and at times hostile, reactions as managers sought to blame previous 'old school' managers for not supporting ideas. This researcher chose not to mention that the frustration also lay with them, as some of these ideas had been presented to them in the past 18 months. The meeting concluded with the OD stating that 'nothing new' had emerged but that they were happy with the programme continuing.

The second meeting took place with the BE team in charge of Lean deployment. The presentation had little interruption or discussion at first, then changed with some very strong opinions from two of the deployment team. Their perspective appeared to be very 'top-down' in that:

> ‘these employees are paid to do a job, so should get on with it and do as they are told’ (BE3).
>
> ‘senior management should force these people to get on with Lean… We should not need to be doing research to get them to engage’ (BE1).

The researcher found little interest from BE in the ideas that were coming out of the BS or Eng departments. The BE team were clearly annoyed with the research proposals presented by the researcher. It later emerged, in an interview with a senior manager, that BE were missing their targets for implementation and under pressure to catch up. This would appear to be a very likely contributor to their frustration.

The third meeting took place with the FD. He was interested in the approach to this programme as well as the findings to date. Discussion relating to the previous two presentations took place and he expressed concern over their reactions. He also wanted faster progress in getting this programme to deliver results.

The next stage of the research programme focuses on creating greater self-awareness within this part of the organisational system, in order to facilitate change. To achieve this, the researcher concentrates on increasing relational awareness amongst participants through the introduction of the ‘grid’ as a first step in this process.

### 4.9 Conclusion

This project was one of enquiry into the prevailing relational context regarding a Lean implementation within a manufacturing organisation. Using the adapted BPM as a guide, this project considered the bilateral relations of 58 participants who took part in semi-structured interviews.

Whilst the operant interest of this initial stage of enquiry focused on leader-subordinate relations, the largely inductive process revealed a much more complex contextual environment, in which such relations came out as part of many forms of bilateral relationships: manager-subordinate, subordinate-subordinate, department-department, and so on. It appears that competing contingencies were reinforcing competitive behaviour between the Blade Shop and Engineering departments impacting on relational mutuality at all levels. Rigour of approach was maintained by regular triangulation, through feedback with participant groups and workshops to develop ideas. In all, 22 feedback sessions and workshops were involved in the project.

The ideas that emerged from the interview stage of the project provided the functional basis for a series of five activities, that not only developed the basis for a number of functionally-beneficial project concepts but also started to develop mutually-beneficial bilateral relations during this process. The next stage is related to Project One as it continues the work started with the Blade Shop and Engineering departments, developing their ideas from concept through to project and on to implementation. Three surveys will gather data, at different stages, to test SDT variables against the BPM model, whilst experimenting with the use of active listening and bilateral mutuality to support an open management context.

# Chapter Five: Project Two

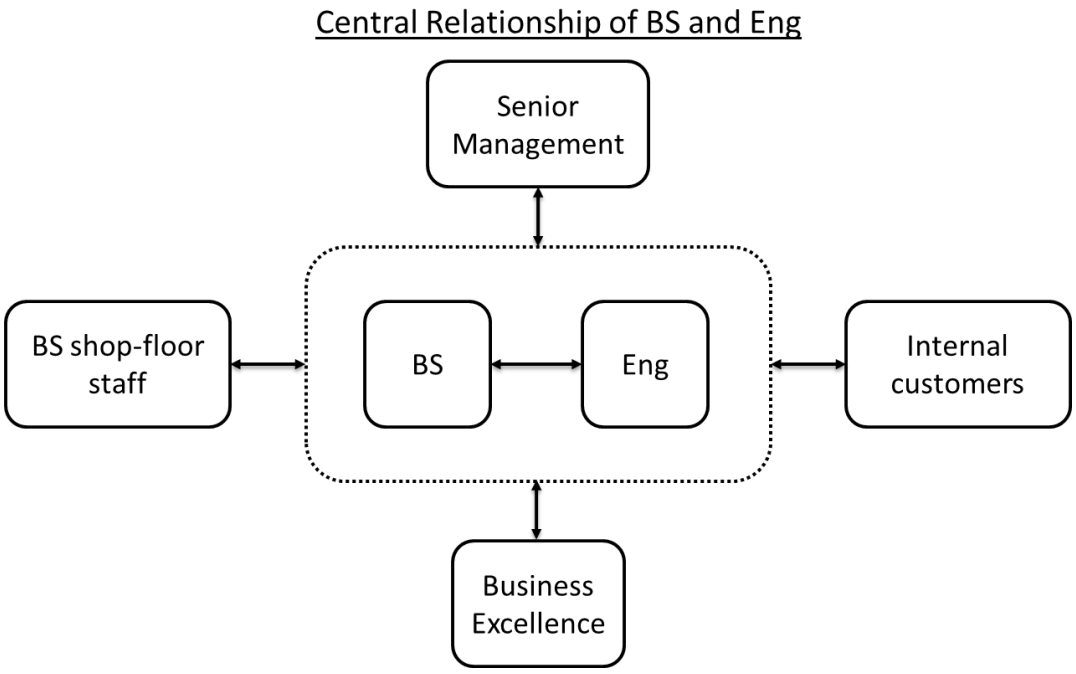
## 5.1 Introduction

Project One focused on exploring the situational factors influencing the apparent success of Lean deployment in the Blade Shop department. Taking an operant relational perspective, a number of bilateral relations were explored through interview and group discussions. This inductive approach revealed a rather complex set of bilateral relations, of which one relationship in particular stood out, being commonly referred to as dysfunctional. The relationship between the Blade Shop and the Engineering department came up most often as being dysfunctional, apparently a relationship based on symbolic and functional dominance rather than mutuality (Foxall, 1999; Miller, 2003; Nowak, 2011; Sennett, 2012). Project One identified a number of improvement ideas of potential functional benefit to each department and, importantly, of contingent interest to those willing to participate in developing such ideas into an implementable project.

Project Two is the next phase of the AR project, focusing on developing the business improvement ideas identified in Project One through to implementation within the organisation. This stage of the research reflects a point where the two departments involved (BS and Eng) have identified projects of contingent benefit to their own areas. Following Hoppe's (2007) active listening process stages, Project One focuses on developing understanding of Lean/TQM history, along with areas of contingent interest and Project Two focuses on developing joint understanding and moving to mutual action. Project Two is therefore a kaizen (continuous improvement) project with two stages, the first generating joint mutual conceptual ideas for development and the second developing these ideas through to implementation.

The second Lean/TQM principle, respect for people, is this project's experimental focus. Recognising an adversarial history of relations between these departments, this experiment focuses on creating a mutuality supportive work climate to facilitate participant engagement in jointly developing and implementing their ideas. Baard et al. (2004) found that perceptions of supportive work climates relate positively to employee psychological needs (CAR) and well-being, findings supported by other studies (Deci et al., 2001; Van den Broeck et al., 2010). This experiment seeks to replicate and extend these cross-sectional findings, through an active listening intervention.

**Figure 26: BS and Eng central relationship**




## 5.2 Outline of the Intervention Experiment

### 5.2.1 Participants

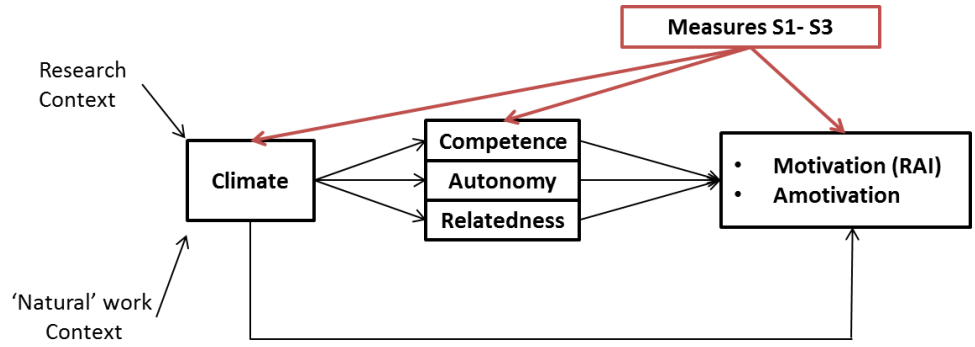
The seven participants (3 Eng and 4 BS) who agreed to participate in this project comprised two department managers, three section heads and two specialist staff as shown below. The average age was 44 (SD 3.0) for Eng staff and 40 (SD 6.7) for BS. All participants had worked for the organisation for at least seven years within their respective departments and qualified to degree or degree equivalent level.

**Table 13: Research participants**

| Position | Eng | BS | Total |
|---|---|---|---|
| **Department Manager** | 1 | 1 | 2 |
| **Section Head** | 1 | 2 | 3 |
| **Specialist** | 1 | 1 | 2 |
| **Total** | **3** | **4** | **7** |

### 5.2.2 Design

**Figure 27: Project Two research model**




This project creates an environment to support participants in developing and implementing their ideas. Such an environment is referred to as 'research context' and will be the setting in which supportive active listening behaviours will be introduced and tested for in terms of changes in participants' perceptions of work climate, CAR and motivation/amotivation. The project started in September 2009, with the kaizen project having two parts. The first, Part A, relating to the selection and its operational development, was completed in July 2010 and the second, Part B, relating to implementation of the process improvement, was achieved by February 2011. During this period, three surveys measured for changes in participants' perceptions of the key variables in both their day-to-day 'natural' work context and the research context, to establish if a facilitated supportive listening environment has a significantly different influence on participants than their day-to-day, natural work context. This study predicted that the research context would have a significant positive effect on participants, in comparison to the natural work context, leading to mutuality supportive actions (behaviour).

**Table 14: Project timeline and key stages**

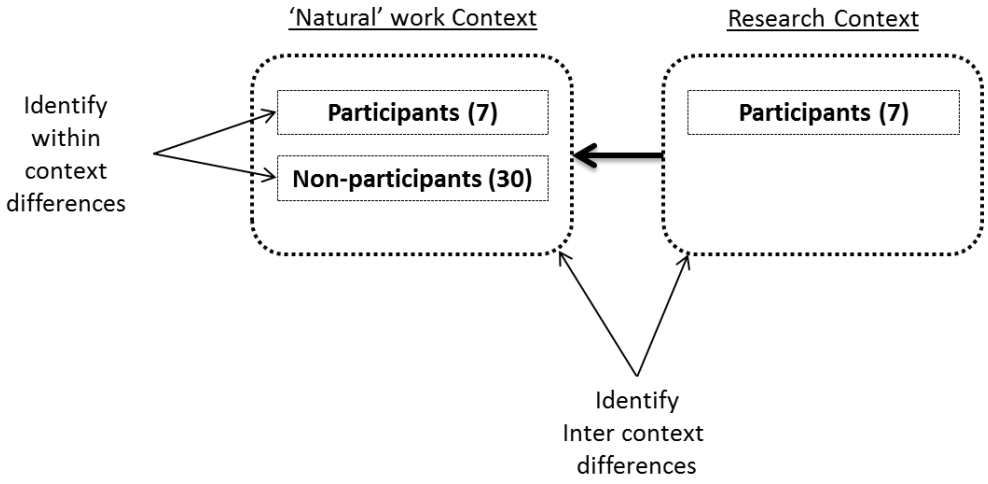
| Survey | Stage of Project | Research Context Measure | 'Natural' Work Context Measure |
|---|---|---|---|
| S1 (Sep 2009) | Baseline | 0 | 7 + 30 |
| S2 (Jul 2010) | End of Part A | 7 | 7 + 30 |
| S3 (Feb 2011) | End of Part B | 7 | 7 + 30 |

With the possibility that learnt behaviour from the research context would transfer to the participant natural work context, a comparative 'non-participant' group was identified to provide control data. This non-participant group, of 30 colleagues not

directly influenced by the participant group, other than the departmental manager, and distributed near evenly across the two departments, comprised six supervisors and 24 subordinates, none of which reported directly to the participant members.

S1, the baseline survey, identifies any difference between the participant and non-participant groups; S2 and S3 compare participants who complete two sets of questionnaires for research context and natural work context, to identify significant differences in variable measures. S2 and S3 also compare participants in their natural work context to the control group, identifying any significant variance. S3 to S1 survey comparisons were also considered to establish significance of change. Evidence of behaviour transfer from the research context to the natural work context could be an indicator of 'double-loop' learning, whereby a Lean/TQM intervention that combines *kaizen* with *RfP* principles, through mutuality based active listening, influences behavioural practice in the wider organisational setting, suggesting the organisation experiences an episode of learning amongst its members. The diagram below (Figure 28) illustrates the research relationships considered through the three surveys. The research context is the intervention setting for mutuality supportive active listening behaviour, with the thicker arrow indicating an anticipated transfer of noticeable behaviour into the work context. The next section considers the active listening intervention.

**Figure 28: Research population**



### 5.3 Supportive Active Listening Intervention

In Chapter Two consideration of work climate and RfP identified a number of related behaviours that are also common to supportive forms of active listening. Leaders that seek to understand first, create joint understanding and then move to mutually agreed action are predicted to improve work climate, perceived CAR, reduce amotivation and increase the motivation of their employees. Having trained in empathetic active listening the researcher, as facilitator, modelled such behaviour. Starting in October 2009, supportive active listening became the norm for facilitating the participant group activities. Initially introduced via the researcher/facilitator's behaviour, in a meeting room setting close to the operational area, the facilitator modelled listening behaviour and encouraged mutuality through engaging all participants in developing the conceptual ideas. The prediction being that supportive active listening behaviour would foster observable mutuality supportive behaviour in the participant group. The researcher observed participants responding positively to researcher-participant interactions but this was largely unilateral, that is, participants did not start to adjust their behaviour to that of the facilitator. The researcher suspected that participants did not have a learning history supporting active listening and, without the behavioural skills or reinforcement history, it was very unlikely that participants would readily model their own behaviour on the facilitator's. To overcome this, a training/coaching intervention was developed by the researcher based around Hoppe (2007) and Harris and Harris (1995). The seven research participants attended three, two-hour, weekly workshops designed to develop basic active listening and relational awareness skills. Each session is now considered.

#### 5.3.1 Intervention session 1

The first session focused on staying quiet, raising personal awareness, concentrating on the other, types of listening and types of listener, with particular emphasis on how participants respond to such behaviour. Four short practice exercises provided the opportunity for participants to try out the techniques and reflect on how it compared to their normal practice and that of others.

#### 5.3.2 Intervention session 2

The second session focused on the use of basic clarifying questions, identifying content and intent and summarising. Using two groups, four exercises that built upon each other, provided the opportunity for participants to practise themselves,

observe others and reflect on their practice. Participants were encouraged at the end of the session to try out the techniques before the next session.

### 5.3.3 Intervention session 3

The first part of this session considered development of joint understanding and mutual action. The second part considered mutuality aspects of the listening-speaking dyad, in particular, how active listening techniques provide structure for the speaker to aid listening. The researcher/facilitator engaged participants in a short reflective discussion covering learning from the three sessions, during which all seven participants stated that there was benefit in the techniques, although they raised concern over the amount of time it takes. The researcher explained that any new skill takes time to learn and the project workshops provide an opportunity for practice. To help monitor participants' relative mutuality, an A3 two-by-two grid (Figure 23) was provided for participants to identify how they perceive themselves in relation to others during the workshops.

### 5.3.4 Post-training workshop application

Following the training phase, the researcher modelled active listening practice with the participants, providing informational reinforcement to them as they applied these skills in interacting with both the researcher and each other. Participants were encouraged to 'check-in' their position on the grid, especially if the researcher noticed a change in a participant's tone or body language. Actions and priorities were jointly agreed within the group as appropriate and confirmed by the participants responsible for the action. This approach continued for the duration of the project.

### 5.3.5 Prediction

With basic training completed, it was predicted that:

- Participants report higher work climate, CAR and relative motivation than the control group.
- Participants report lower amotivation than the control group.

Baard et al. (2004) considered work climate in relation to CAR needs and their relation to employee well-being, however this research takes a different perspective, considering work climate and CAR needs in relation to employee motivation.

### 5.4 Outline of the Intervention

There were two distinct activities during this research, the first being the AR project in terms of developing a concept through to ‘go live’ and the second being the gathering and analysis of statistical data to support the theoretical expectations of the project. This section sets out to provide some background understanding of what took place, providing a narrative account of events. The key relational intervention techniques used in this project were based on relational mutuality considerations (Foxall, 1999), as introduced in Project One, and also the introduction of active listening to programme participants in order to support the development of mutually beneficial bilateral relations. This will be considered in more detail in the following section. The following account will be split into parts A and B.

#### 5.4.1 Part A

Commencing in October 2009, the researcher met with the seven participants identified through Project One, as a group, once a week over an eight-week period. This stage of the research programme had two dimensions, the first was to agree upon a preferred project and the second was to improve the relational environment. A meeting place was chosen based on its being relatively unfamiliar to the participants, comfortable, accessible at the times required and away from distractive influences, such as noisy machinery and colleagues, who had to date regularly interrupted meetings for what often appeared to be trivial issues. During the first meeting participants agreed two hours to be a suitable duration for the meeting and set the start times for future sessions. Rules were established regarding phone calls, turning up on time and being prepared. They asked the researcher to facilitate the session, appointing no formal leader at this stage.

Over the first two sessions, the researcher focused on facilitating discussion relating to the project’s technical focus. Progress was slow and difficult, the researcher observed the participants accepting phone calls, arriving late and leaving early (especially the two department heads), looking at and typing emails, interrupting the person speaking, arguing, taking sides, withdrawing and, in one instance, verbally attacking another because the other disagreed with his point of view. Whilst this was not happening all the time, when such events did occur it was very disruptive as, for example, the participants would have to bring a manager ‘up to speed’ after he returned from taking a phone call and stepping outside the meeting room. Quite simply, the participants were breaking their own rules and it appeared to happen

most frequently with the departmental managers. Away from the sessions, participants stated their frustration, often directing it at the other department or blaming unavoidable work pressures for their behaviour. At this stage, the first survey's draft results were available and the researcher arranged to hold the next session with the two department heads to discuss some of the initial results. The results indicated a significant correlation between 'manager' behaviour (antecedent context) and subordinate amotivation (now confirmed as $r=-.539$, $p<.05$) and no significant correlation between manager behaviour and relative motivation. Following some discussion on the variables (in particular, the presence of amotivation during Project One), the researcher proposed that the next three sessions be used for exploration of mutuality and active listening techniques. During these sessions, the participants took part in exploring a number of techniques to help attentiveness within the group and to become aware of changes in mutuality.

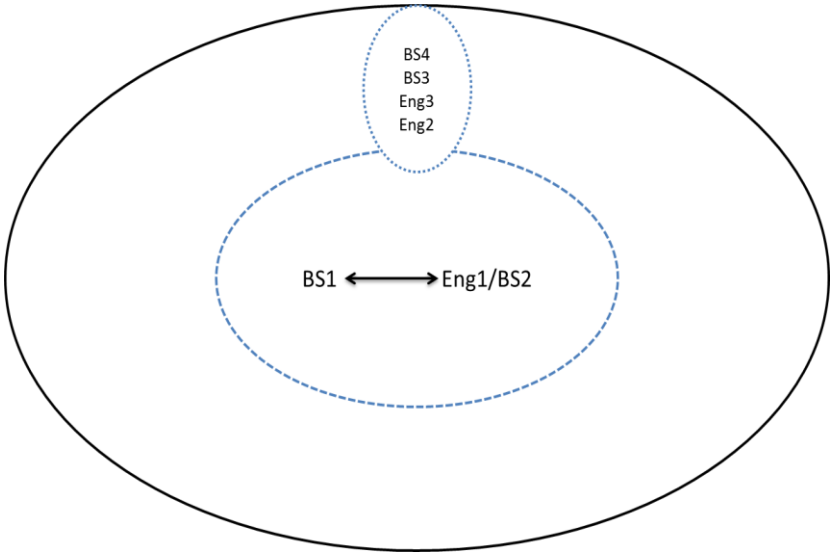
By December 2009, with the active listening training complete, the programme returned to a focus on establishing the technical feasibility of each of the three projects. At this point, the researcher was attentive to facilitating the relational aspects of the sessions whilst one of the managers became the technical lead (technical aspects were beyond the competence of the researcher). Over this period there was an observable difference in participant interaction, for the better. Interruptions would still occur but they had become the exception rather than the norm and if anyone was going to be late a message was sent in advance. By February 2010, with the principal project now selected, the participants presented their recommendations to the senior management team and, after some discussion, were given approval to develop the concept. The project selected would have clear benefit to each department, although each 'side' stated that the other would benefit more.

### 5.4.2 Part B

This next stage of the programme required a different way of engaging. By the middle of March 2010 it was clear that the work required to develop the concept did not require everyone to be involved. There were two broad areas of development, one of which would be handled by PK from BS and the other required collaboration between JG (Eng) and DG (BS). These became the 'core' participants, who would meet twice-weekly for developmental work and bi-weekly with the wider group for a shorter, one-hour meeting to discuss progress and areas of assistance. During this stage, other members would join the core group as and when required. This model

is based around the ‘communities of practice’ concept (Wenger, 1998; Etienne et al., 2002) and, whilst requiring a less-traditional management approach, proved to be an effective way of tackling this stage of the programme. As facilitator, the researcher’s role started to focus more on maintaining communication within the ‘community’. The wider community included the senior management team as well as colleagues and technical ‘experts’ who needed to be kept involved ‘relationally’ to maintain support.

**Figure 29: Illustration of relational structure supporting Project Two**




By July 2010 the concept was ‘operationally ready’. The participants had developed some of the technical system to prove that it could work and in so doing identified areas of competence that needed to be brought into the community to assist in the final development. There were still one or two areas of technical risk that required resolution and funding. The group took the developed ‘functional’ concept to senior management and performed a simulated trial of the system in front of them. Symbolically, it was important that senior management could see the relational improvement between these, previously ‘warring’, departments. The presentation was well received by senior management and funding was approved. Following the presentation, the MD and FD met with the researcher and noted their observation of the improved relationship between the two departments. Work towards implementation started in September 2010. During this phase, the ‘core’ group would regularly change as technical experts were brought in to help with the programme. In addition, the wider community, in terms of the non-participant BS and Eng staff (along with others), who would be affected became involved. This proved to be one of the most problematic aspects of the programme.

By January 2011 the programme had delivered the first concept into operations, with the second ready for discussion and budgetary support. The second concept was approved and received a multi-million pound budget to purchase more advanced equipment to work with the new system. Approval was based on improved efficiency of three times that of the existing equipment and system. Due to development and lead times, the equipment was not in production until spring 2012. By spring 2013 it was delivering twice the benefit predicted.

### 5.4.3 Summary

This section has provided an outline of the intervention and considered one of its principal techniques, active listening. The approach taken in Project Two was to apply active listening to the programme environment as part of the AR intervention, to identify what impact it has on the participants as measured in their questionnaire and interview responses. The next section considers the questionnaire in relation to the model, before moving on to the results.

## 5.5 Measures: Survey Questionnaires

This section considers the questionnaires used to test the key variables as perceptions of work climate and CAR along with motivation and amotivation. All questionnaires use a seven-point Likert scale.

### 5.5.1 Context as climate

The impact of context or, more specifically for this research, manager-subordinate contextual factors were assessed using Deci and Ryan's (2002) work climate questionnaire. Comprising 15 questions (Figure 30), this questionnaire provides some insight into the contextual relationship between supervisor and respondent, along dimensions of choice, support, trust and encouragement. An environment high in choice, support and encouragement is considered 'relatively open' in this analysis, as opposed to a 'relatively-closed' environment with low choice, low support and low positive encouragement. Baard et al. (2004) found alpha coefficients exceeded 0.70, indicating internal reliability, with good retest reliability at alpha 0.80.

**Figure 30: Work climate questionnaire**

| Question no. | Work Climate questions |
|---|---|
| 1 | I feel that my manager/ supervisor provides me choices and options. |
| 2 | I feel understood by my manager. |
| 3 | I am able to be open with my manager at work. |
| 4 | My manager conveyed confidence in my ability to do well at my job. |
| 5 | I feel that my manager accepts me. |
| 6 | My manager made sure I really understood the goals of my job and what I need to do. |
| 7 | My manager encouraged me to ask questions. |
| 8 | I feel a lot of trust in my manager. |
| 9 | My manager answers my questions fully and carefully. |
| 10 | My manager listens to how I would like to do things. |
| 11 | My manager handles people's emotions very well. |
| 12 | I feel that my manager cares about me as a person. |
| 13 | I don't feel very good about the way my manager talks to me. |
| 14 | My manager tries to understand how I see things before suggesting a new way to do things. |
| 15 | I feel able to share my feelings with my manager. |

### 5.5.2 Learning history (CAR)

Through 21 questions (Figure 31) this questionnaire considers the variables: competence, autonomy and relatedness. Deci and Ryan (2002) found CAR support essential in developing autonomously-regulated behaviour. Relatedness refers to the collegial environment, rather than the hierarchical relations considered in the context questions. According to Deci and Ryan (2002), relatedness is an important element in either supporting or thwarting intrinsically-regulated behaviour. Low relatedness is associated with higher levels of extrinsically-regulated behaviour. From an operant perspective, competent individuals can enjoy the natural task reinforcement available from activities (Flora, 2004; Skinner, 1974). In a higher choice environment, the individual will feel more autonomous as more contingencies are available, for a given level of competence, than in a more restricted environment. The relational environment is also important in this as significant others can influence choice and this factor is considered through treating relatedness as a reflection of symbolic reinforcement (Foxall, 1999). The basic needs at work scale has been applied in relation to the work climate studies that apply to this research (Baard et al., 2004; Deci et al., 2001) and in relation to prosocial behaviour in the workplace (Gagné, 2003). Alpha coefficients within these studies range from 0.69 through to 0.81, indicating good internal and retest reliability.

**Figure 31: Psychological needs questionnaire**

| Question no. | Basic needs at work questions |
|---|---|
| | ***Autonomy*** |
| 1 | I feel like I can make a lot of inputs to deciding how my job gets done. |
| 5 | I feel pressured at work. |
| 8 | I am free to express my ideas and opinions on the job. |
| 11 | When I am at work, I have to do what I am told. |
| 13 | My feelings are taken into consideration at work. |
| 17 | I feel like I can pretty much be myself at work. |
| 20 | There is not much opportunity for me to decide for myself how to go about my work. |
| | ***Competence*** |
| 3 | I do not feel very competent when I am at work. |
| 4 | People at work tell me I am good at what I do. |
| 10 | I have been able to learn interesting new skills on my job. |
| 12 | Most days I feel a sense of accomplishment from working. |
| 14 | On my job I do not get much of a chance to show how capable I am. |
| 19 | When I am working I often do not feel very capable. |
| | ***Relatedness*** |
| 2 | I really like the people I work with. |
| 6 | I get along with people at work. |
| 7 | I pretty much keep to myself when I am at work. |
| 9 | I consider the people I work with to be my friends. |
| 15 | People at work care about me. |
| 16 | There are not many people at work that I am close to. |
| 18 | The people I work with do not seem to like me much. |
| 21 | People at work are pretty friendly towards me. |

### 5.5.3 Motivation (situation)

Foxall (1998) refers to the consumer situation as the interaction between context and learning history in relation to available contingencies. Deci and Ryan (2002) take an intentional stance towards behaviour, arguing that feelings of CAR create a regulatory disposition within an individual that in turn reflects motivational states, from no motivation, or 'amotivation', to a continuum from 'extrinsic' through to 'intrinsic' motivation. Influence is primarily from within. This research considers Deci and Ryan's (2002) 'regulatory state' to be the interaction of learning history (expressed in terms of CAR), context (as expressed through work climate) and available contingencies. The employee 'situation' is, according to the BPM, the interaction of learning history and context in the presence of available contingencies (Foxall, 1998). The situation will be represented by two regulatory states, the first being amotivation and the second being a regulatory index, named by Deci and Ryan (2002) as the relative autonomy index (RAI). The index represents a weighting

of regulatory influences based on the formula: - 2x Extrinsic regulation - Introjected Regulation + Identified Regulation + 2x Intrinsic regulation.

Based on a seven-point Likert scale, the RAI can span from -18 to +18, with negative results indicating dominance of extrinsic regulation and positive results indicating dominance of intrinsic regulation. The RAI, as a weighted measure of regulation, is supported by studies indicating internal reliability scores of alpha 0.72–0.81 (Lam and Gurland, 2008; Millette and Gagné, 2008; Roth et al., 2007). Questions supporting these motivational categories are as follows (Figure 32).

**Figure 32: Motivation (RAI2)/amotivation questionnaire**

| Question no. | Motivation/Regulation questions |
|---|---|
| | ***Amotivation*** |
| 2 | I used to have good reasons for doing Lean improvement activities, but now I am asking myself if I should continue doing it. |
| 9 | It is not clear to me anymore; I don't really think there is any benefit from participating in Lean improvement activities. |
| 12 | I'm not sure why I still engage in Lean improvement, it doesn't seem to be going anywhere. |
| | ***Extrinsic Motivation*** |
| 5 | My Manager or other company members give me money or other rewards when I put forward Lean improvement ideas. |
| 10 | My Manager, Supervisor, or colleagues tell me to do it. |
| 14 | My Manager, Supervisor, or colleagues would be mad if I didn't practice Lean improvement activities anymore. |
| | ***Introjected Motivation*** |
| 3 | I would feel bad about myself if I was not taking time to do Lean improvement activities. |
| 8 | It is absolutely necessary for me to do Lean improvement activities to feel good about myself. |
| 15 | I would feel awful if I didn't take part in Lean improvement activities anymore. |
| | ***Identified Motivation*** |
| 4 | It is a good way to improve my work. |
| 7 | I learn valuable lessons from Lean improvement activities. |
| 13 | I think Lean improvement activities are a useful way to improve in my work. |
| | ***Intrinsic Motivation*** |
| 1 | For the pleasure I feel when I take part in Lean improvement activities. |
| 6 | For the excitement I feel when I am really involved in Lean improvement activities. |
| 11 | For the pleasure of discovering new techniques. |

### 5.5.4 Approach/Avoidance

Within this project all respondents have stated that they are ‘active’ in the organisational Lean initiative. This behavioural variable is therefore unnecessary to this stage of the research.

## 5.6 Survey Administration

### 5.6.1 Overview

**Table 15: Project Two surveys**

| *Date* | *Survey Number* | *Who Surveyed* | *Context focus* | *No. surveys issued* | *No. survey responses* | *% Response* |
|---|---|---|---|---|---|---|
| Sep-09 | 1 | Participants | Lean Intervention | 0 | 0 | |
| | | Partcipants | Day-to-day workplace | 7 | 7 | |
| | | Non-participant control group | Day-to-day workplace | 30 | 24 | |
| | | **Total** | | **37** | **31** | **84%** |
| Jul-10 | 2 | Participants | Lean Intervention | 7 | 7 | |
| | | Partcipants | Day-to-day workplace | 7 | 7 | |
| | | Non-participant control group | Day-to-day workplace | 30 | 25 | |
| | | **Total** | | **44** | **39** | **89%** |
| Feb-11 | 3 | Participants | Lean Intervention | 7 | 7 | |
| | | Partcipants | Day-to-day workplace | 7 | 7 | |
| | | Non-participant control group | Day-to-day workplace | 30 | 15 | |
| | | **Total** | | **44** | **29** | **66%** |
| | | | | **125** | **99** | **79%** |

The research population was surveyed three times over the course of Project Two. In total, 125 surveys were issued, with 99 usable responses received, achieving an overall response rate of 79%. Of the 99 responses, 85 focus on the 'workplace' and 14 focus on the 'programme'. This difference in focus requires that they be treated as two separate populations for the largely correlational analysis, although they will be compared when considering the intervention impact. Each survey was checked and tested as follows.

### 5.6.2 Visual checks

Data were initially *visually checked* for unreliable responses. In particular, consistent extreme responses, that did not discriminate reverse scoring questions, were identified and excluded. This amounted to four for Survey 1, three for Survey 2 and none for Survey 3. Table 15 reflects the number of responses accepted after this check (Coolican, 2009; Field, 2009).

### 5.6.3 Internal reliability

Internal reliability was tested for using a Cronbach alpha test across the questions supporting sub-scales (Cronbach, 1951 in Field, 2009) for context (work climate), learning history (CAR) and situation (amotivation; external regulation; introjected

regulation; identified regulation and intrinsic regulation). The results are shown in the following tables.

**Table 16: Internal reliability test results, part A**

| Cronbach alpha test | | Work Climate | Comp' | Aut' | Rel' |
|---|---|---|---|---|---|
| Survey | n/ items | 15 | 6 | 7 | 7 |
| 1 | 31 | 0.930 | 0.726 | 0.703 | 0.850 |
| 2 | 39 | 0.944 | 0.702 | 0.756 | 0.791 |
| 3 | 29 | 0.965 | 0.668 | 0.805 | 0.828 |
| Total | 99 | 0.947 | 0.711 | 0.761 | 0.825 |

**Table 17: Internal reliability test results, part B**

| Cronbach alpha test | | Amotivation | External Reg' | Introjected Reg' | Identified Reg' | Intrinsic Reg' | RAI |
|---|---|---|---|---|---|---|---|
| Survey | n/items | 4 | 3 | 3 | 3 | 3 | 4 |
| 1 | 31 | 0.845 | 0.481 | 0.793 | 0.879 | 0.836 | 0.773 |
| 2 | 39 | 0.762 | 0.487 | 0.593 | 0.836 | 0.888 | 0.785 |
| 3 | 29 | 0.861 | 0.497 | 0.737 | 0.913 | 0.876 | 0.732 |
| Total | 99 | 0.819 | 0.507 | 0.704 | 0.873 | 0.866 | 0.759 |

In total, with the exception of external regulation, all items exceed 0.7 (as recommended by Nunnally, 1978), although it is noted that introjected regulation in Survey 2 and competence in Survey 3 were under 0.7. Pallant (2010) recommends the use of inter-item correlation, to check internal consistency of scales with few items, suggesting acceptable values >0.2 for all items (Briggs et al., 1980; Piedmont and Hyland, 1993). The three item external regulation scale does not meet this criteria. The question relating to reward was removed and the scale reduced to two items that have correlation r=0.301.

**Table 18: Inter-item correlation matrix for external regulation**

| | My manager or other company members give me money or other rewards when I put forward Lean improvement ideas. | My manager, supervisor or colleagues would be mad if I didn't practice Lean improvement activities anymore. | My manager, supervisor or colleagues tell me to do it. |
|---|---|---|---|
| My manager or other company members give me money or other rewards when I put forward Lean improvement ideas. | 1.000 | 0.167 | 0.123 |
| My manager, supervisor or colleagues would be mad if I didn't practice Lean improvement activities anymore. | 0.167 | 1.000 | 0.301 |
| My manager, supervisor or colleagues tell me to do it. | 0.123 | 0.301 | 1.000 |

### 5.6.4 Normality tests

Normality tests performed on each key variable, using a Kolmogorov-Smirnov test, indicated largely non-parametric data (as illustrated in Table 19 below) for workplace data. Based on these findings, non-parametric tests have been used to test for correlation or difference in variables.

**Table 19: Project Two normality tests**

**Tests of Normality across 3 surveys (excluding programme responses)**

| | Survey Number | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Context | 1 | .119 | 31 | .200 | .966 | 31 | .40 |
| | 2 | .125 | 32 | .200 | .953 | 32 | .17 |
| | 3 | .157 | 22 | .167 | .944 | 22 | .24 |
| Competence | 1 | .157 | 31 | .050 | .939 | 31 | .07 |
| | 2 | .099 | 32 | .200 | .966 | 32 | .39 |
| | 3 | .088 | 22 | .200 | .973 | 22 | .78 |
| Relatedness | 1 | .121 | 31 | .200 | .948 | 31 | .14 |
| | 2 | .101 | 32 | .200 | .973 | 32 | .58 |
| | 3 | .110 | 22 | .200 | .974 | 22 | .81 |
| Autonomy | 1 | .151 | 31 | .070 | .958 | 31 | .25 |
| | 2 | .166 | 32 | .025 | .957 | 32 | .23 |
| | 3 | .190 | 22 | .037 | .945 | 22 | .24 |
| Amotivation | 1 | .178 | 31 | .014 | .926 | 31 | .03 |
| | 2 | .185 | 32 | .007 | .897 | 32 | .00 |
| | 3 | .173 | 22 | .087 | .866 | 22 | .00 |
| RAI | 1 | .097 | 31 | .200 | .973 | 31 | .62 |
| | 2 | .109 | 32 | .200 | .976 | 32 | .68 |
| | 3 | .128 | 22 | .200 | .966 | 22 | .62 |

a. Lilliefors Significance Correction
*. This is a lower bound of the true significance.

**Tests of Normality across the three surveys (all data)**

| | Survey Number | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Context | 1 | .119 | 31 | .200 | .966 | 31 | .40 |
| | 2 | .123 | 39 | .139 | .937 | 39 | .03 |
| | 3 | .128 | 29 | .200 | .916 | 29 | .02 |
| Competence | 1 | .157 | 31 | .050 | .939 | 31 | .07 |
| | 2 | .108 | 39 | .200 | .965 | 39 | .26 |
| | 3 | .133 | 29 | .200 | .946 | 29 | .14 |
| Relatedness | 1 | .121 | 31 | .200 | .948 | 31 | .14 |
| | 2 | .115 | 39 | .200 | .967 | 39 | .30 |
| | 3 | .109 | 29 | .200 | .960 | 29 | .33 |
| Autonomy | 1 | .151 | 31 | .070 | .958 | 31 | .25 |
| | 2 | .152 | 39 | .023 | .966 | 39 | .28 |
| | 3 | .155 | 29 | .074 | .931 | 29 | .05 |
| Amotivation | 1 | .178 | 31 | .014 | .926 | 31 | .03 |
| | 2 | .208 | 39 | .000 | .854 | 39 | .00 |
| | 3 | .215 | 29 | .001 | .798 | 29 | .00 |
| RAI | 1 | .097 | 31 | .200 | .973 | 31 | .62 |
| | 2 | .112 | 39 | .200 | .974 | 39 | .50 |
| | 3 | .131 | 29 | .200 | .969 | 29 | .52 |

a. Lilliefors Significance Correction
*. This is a lower bound of the true significance.

This section considered the administration, preparation and checking of data. The following section moves on to consider the survey results.

### 5.7 Survey Results

In this section each survey will be considered in turn. Survey 3 will take an overall view involving discussion and interpretation of the findings over the course of the project.

#### 5.7.1 Survey 1 (September 2009)

Survey 1 was the ‘baseline’ survey for this project (Cooper et al., 2007). It is largely exploratory in nature as, having interviewed all members of the two departments, the researcher was interested as to whether participants would register any

significant differences in the key variables under study. As such, three ordinal categories are created to capture:

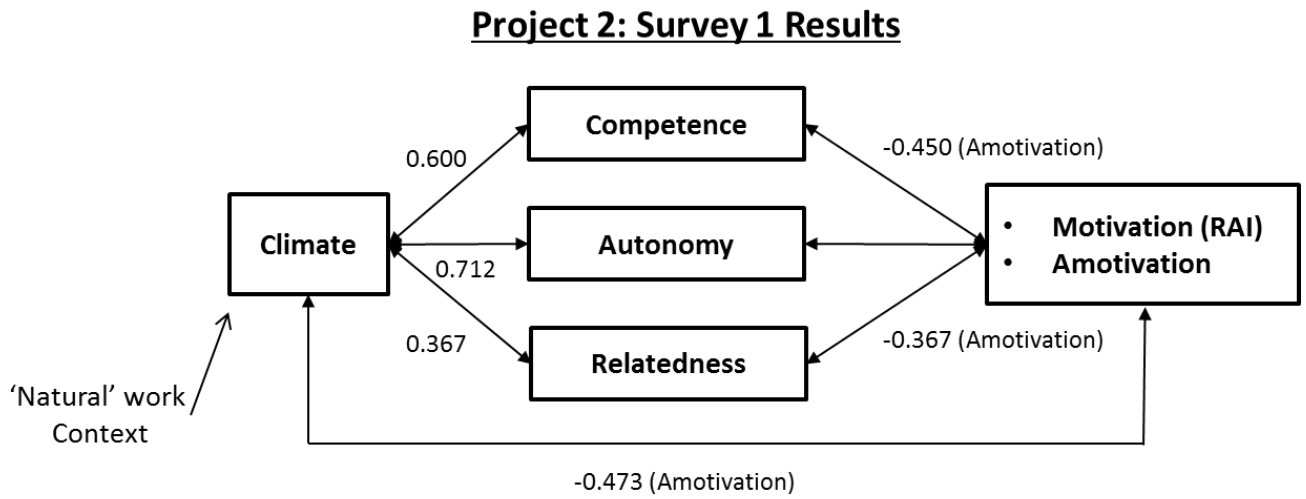
1. Non-participant to 'natural' work context (workplace) focused questions.
2. Participant response to 'natural' work context (workplace) focused questions.
3. Participant response to 'research' context (programme) focused questions.

Note that the questions are the same, but the focus is different. The workplace questions focused on *'natural' work context* relating to their relationship with their supervisor/manager, CAR and Lean regulation with regard to their experience of the company-wide Lean/TQM programme. The programme-based questions focused on the r*esearch context* relating to their relationship with the facilitator, CAR and their motivational regulation in relation to their experience of the programme-based improvement programme.

For Survey 1, questions focused on the workplace only to create a baseline against which changes in later response can be measured. Whilst the researcher had been engaged with the participants for some months, the nature of engagement was about to change. Previous contact was largely exploratory and conceptual, whereas engagement from here on focused on development and bringing these concepts into operation.[9] Survey 1 was also interested in testing for any links in the variables, in comparison to earlier work climate studies (Baard et al., 2004; Deci et al., 2001; Van den Broeck et al., 2010). To test for relation between variables, a Spearman's rho correlational test would be applied to the data to test for strength of variance (Salkind, 2012), exploration of causality being the subject of surveys two and three.

[9] Although the researcher now, with hindsight, believes that gathering such information would have been useful.

**Figure 33: Survey 1 results**




The above model (Figure 33) identified significant relationships between variables. Context correlated very significantly with learning history variables, competence (r=0.600, p<.05), autonomy (r=0.712, p<.05) and relatedness (r=0.367, p<.05); and situation variable amotivation (r=-0.473, p<.05). Learning history variables, competence (r=-0.450, p<.05) and relatedness (r=-0.367, p<.05) also correlated with amotivation, with no significant correlation with RAI.

**Table 20: Survey 1 correlations and averages**

| | Variable | Mean | SD | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| 1 | Context | 78.61 | 13.25 | | | | | |
| 2 | Competence | 5.05 | 0.97 | 0.600 | | | | |
| 3 | Relatedness | 5.32 | 0.98 | 0.688 | 0.498 | | | |
| 4 | Autonomy | 4.72 | 1.03 | 0.712 | 0.681 | 0.608 | | |
| 5 | Amotivation | 2.87 | 1.79 | -0.473 | -0.450 | -0.367 | -0.230 | |
| 6 | RAI2 | 1.64 | 4.99 | 0.210 | 0.019 | -0.025 | -0.022 | -0.448 |

(n=31)

A Mann-Whitney test for differences between participants (n=7) and non-participants (n=24) indicated no significant difference between the two groups, other than RAI2 (Adapted Relative Autonomy Index) which will be considered shortly. The similarity between the groups indicates the non-participant group is statistically similar to the participants and therefore a reasonably valid control group for comparison over surveys two and three. The only significant variance was found in the motivation variable RAI2.

**Table 21: Survey 1 significance of variance between participants and non-participants (a)**

**Survey 1: Test Statistics for Participants and Non-Participants[b]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 65.000 | 80.500 | 78.500 | 80.500 | 81.500 | 37.000 |
| Wilcoxon W | 365.000 | 380.500 | 106.500 | 108.500 | 381.500 | 337.000 |
| Z | -.899 | -.166 | -.261 | -.166 | -.119 | -2.223 |
| Asymp. Sig. (2-tailed) | .368 | .868 | .794 | .868 | .905 | .026 |
| Exact Sig. [2*(1-tailed Sig.)] | .391[a] | .872[a] | .800[a] | .872[a] | .908[a] | .026[a] |

a. Not corrected for ties.
b. Grouping Variable: Participant

Significant variance was found in RAI2 ($z=-2.223$, $p<.05$) between participants and non-participants. RAI2 comprises an adapted weighting of external, introjected, identified and intrinsic regulation, details of which revealed that the key variables influencing such difference were external regulation ($z=-1.996$, $p<.05$) and intrinsic regulation ($z=-2.497$, $p<.05$).

**Table 22: Survey 1 significance of variance between participants and non-participants (b)**

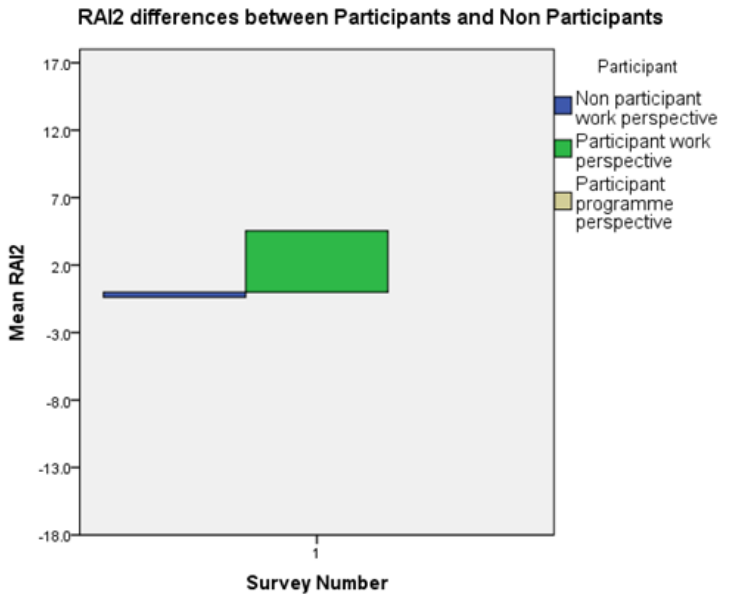
**Survey 1Test Statistics for differences between Participants and Non-Participants[b]**

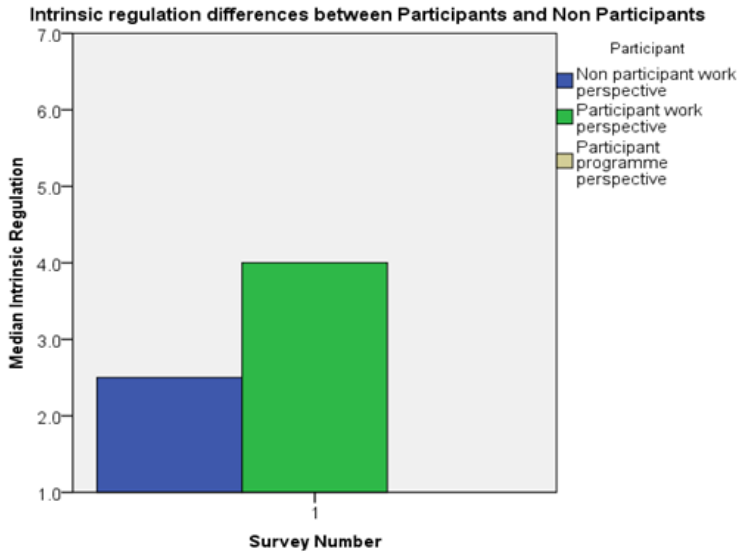
| | External regulation | Introjected Regulation | Identified regulation | Intrinsic Regulation |
|---|---|---|---|---|
| Mann-Whitney U | 42.000 | 28.500 | 76.000 | 31.500 |
| Wilcoxon W | 70.000 | 328.500 | 376.000 | 331.500 |
| Z | -1.996 | -2.646 | -.380 | -2.497 |
| Asymp. Sig. (2-tailed) | .046 | .008 | .704 | .013 |
| Exact Sig. [2*(1-tailed Sig.)] | .048[a] | .007[a] | .729[a] | .011[a] |

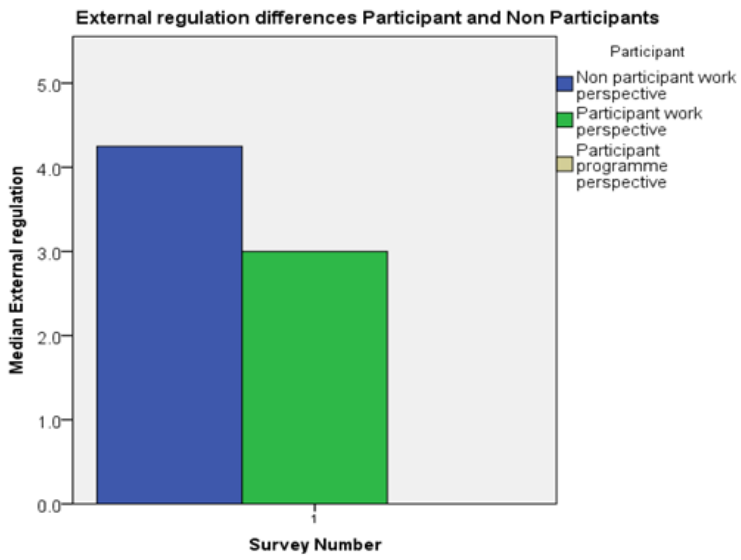
a. Not corrected for ties.
b. Grouping Variable: Participant

The charts in Figure 34 below indicate that participants (green) had a net positive RAI, being a reflection of the significantly higher level of intrinsic regulation and significantly lower level of external regulation in the respondents' data. It would appear from these responses that participants were more positively reinforced than non-participants.

**Figure 34: Survey 1 situational variables**



#### *5.7.1.1 Discussion of Survey 1*

With the primary objective of Survey 1 to establish baseline data, the results indicate only one statistically significant variance between the prospective participant group and non-participant colleagues, that of motivation (RAI).[10] Project One established participant personal and departmental interests in Lean/TQM and may have influenced this difference, although the workplace role of the participant group, who are also relatively senior in the organisation, compared to control group members is also likely to influence this result. Apart from this variable, all others are statistically similar to the non-participant control group. The findings raise questions regarding leader-subordinate relations within the natural work context, regarding Lean/TQM motivation or lack of motivation.

Although managerial climate relates positively to CAR, similar to earlier research (Baard et al., 2004; Deci et al., 2001; Van den Broeck et al., 2010), these results find a negative relationship between leader behaviour ($r=-0.473$, $p<.05$), expressed through work climate responses, and Lean/TQM amotivation; amotivation indicating a lack of contingency with Lean/TQM. The results also indicate that leader climate has no significant relation to Lean/TQM motivation. Only competence ($r=-0.450$, $p<.05$) and relatedness ($r=-0.367$, $p<.05$) correlate with amotivation, autonomy having no significant relationship.

Whilst direction of influence is not established from this survey, it appears from drawing on the qualitative findings of Project One that the BS and Eng work context does not currently support Lean/TQM engagement, as leader behaviour, personal competence and social relations appear to influence only the level of amotivation. A reasonable argument can be made for the pressures within the respective departments that inhibit time to explore the benefits of Lean/TQM. The prospective participants have explored the potential benefits and are in the process of operationalising their ideas. As such, they have connected to the positive contingencies possible through Lean/TQM; leader behaviour that maintains such symbolic connection is important until functional benefits are realised. This inference supports the literature on a lack of leadership commitment as a significant barrier to change. This argument is somewhat speculative until direction of influence is established, the focus of surveys two and three. Following this survey, the first

[10] RAI and RAI2 are used interchangeably during this research. RAI2 reflects an adjustment to external regulation, resulting from a lack of internal consistency found in one of the questions. RAI, being an aggregate motivation/regulation index, is affected by this adjustment, hence RAI2.

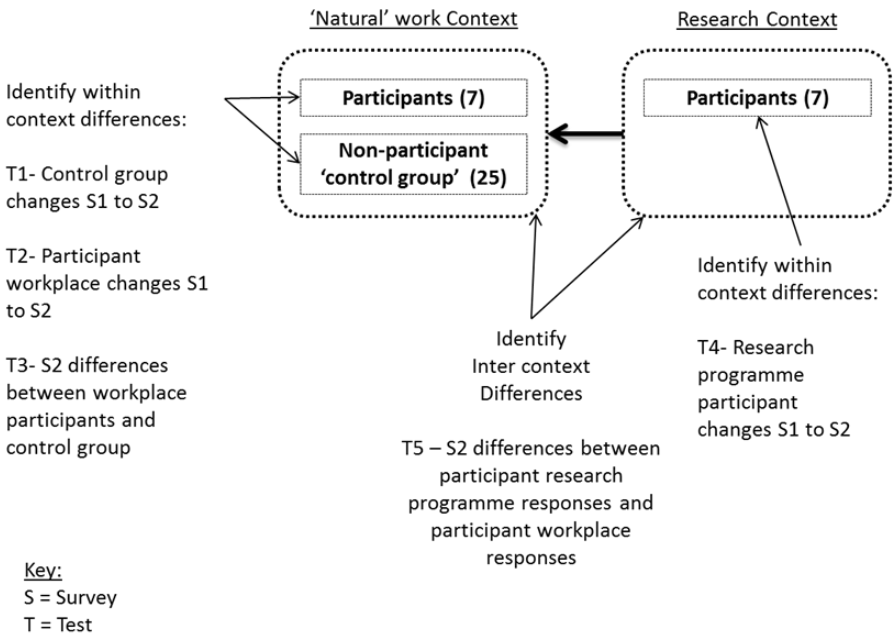
intervention took place as explained earlier in this chapter. The focus now turns to the second survey, which included the first reported data for participants to report on their experience of the programme intervention.

### 5.7.2 Survey 2 (July 2010)

Survey 1 established baseline data that indicated only one area of significant difference within the workplace (work context) between research participants and control group members, that of motivation towards Lean/TQM (RAI2). The participant group started to work together in October 2009 and participated in three, two-hour sessions, focused on developing mutuality supportive behaviour within an active listening framework. Following this, supportive active listening and mutual support tools have supported the facilitation of the group sessions, representing the RfP principle. Survey 2 is interested in establishing whether this approach positively impacted on the participant group, or not, and whether or not any of this behaviour has transferred into the workplace (work context). One of the aims of this survey was to try and explain causation, as well as strength of variance. To do this, the data explanation was built in three parts, the first considered the control, or in other words non-participant (n=25), group responses from surveys one and two compared to establish any changes in response to variables (T1). Secondly, the participant workplace responses (n=7) were tested to identify changes between Survey 1 and Survey 2 (T2) and to identify any Survey 2 differences to the control group (T3). Thirdly, participant responses to the research context were explored for differences between Survey 1 and Survey 2 (T4) and to their Survey 2 workplace responses (T5). This approach is illustrated below.

### *5.7.2.1 Surveys T1–T3*

**Table 23: T1–T3: Work context findings (July 2010) (n=32)**




### *5.7.2.2 T1: Control group findings (n=25)*

A Mann-Whitney test comparing the non-participant control group surveys, one and two, as illustrated in Table 24 below, established no significant changes in the response to the research variables.

**Table 24: T1: Control group differences, Survey 2 versus Survey 1**

**Control group test Statistics: Non-participants Survey1 vs Survey 2[a]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 299.500 | 295.000 | 257.000 | 292.500 | 272.500 | 287.500 |
| Wilcoxon W | 624.500 | 620.000 | 582.000 | 617.500 | 597.500 | 587.500 |
| Z | -.010 | -.100 | -.862 | -.150 | -.553 | -.250 |
| Asymp. Sig. (2-tailed) | .992 | .920 | .389 | .881 | .581 | .803 |

a. Grouping Variable: Survey Number

### *5.7.2.3 T2: Participant workplace findings (n=7)*

Similar to the non-participant control group, workplace responses from participants indicated no significant change across all variables, with the important exception of amotivation and RAI2.

**Table 25: Significance of changes in participant responses: Survey 1 to Survey 2**

**Participant workplace variances in RAI2: Survey 2 compared to Survey 1[b]**

| | External regulation | Introjected Regulation | Identified regulation | Intrinsic Regulation |
|---|---|---|---|---|
| Mann-Whitney U | 13.500 | 20.000 | 7.500 | 12.500 |
| Wilcoxon W | 41.500 | 48.000 | 35.500 | 40.500 |
| Z | -1.423 | -.585 | -2.250 | -1.545 |
| Asymp. Sig. (2-tailed) | .155 | .559 | .024 | .122 |
| Exact Sig. [2*(1-tailed Sig.)] | .165[a] | .620[a] | .026[a] | .128[a] |

a. Not corrected for ties.
b. Grouping Variable: Survey Number

**Survey 2 testsStatistics: Comparison of Participantschange in work place perspective (survey 1 vs survey 2)[b]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 19.500 | 18.500 | 17.000 | 19.500 | 8.500 | 6.500 |
| Wilcoxon W | 47.500 | 46.500 | 45.000 | 47.500 | 36.500 | 34.500 |
| Z | -.641 | -.771 | -.970 | -.640 | -2.081 | -2.305 |
| Asymp. Sig. (2-tailed) | .522 | .441 | .332 | .522 | .037 | .021 |
| Exact Sig. [2*(1-tailed Sig.)] | .535[a] | .456[a] | .383[a] | .535[a] | .038[a] | .017[a] |

a. Not corrected for ties.
b. Grouping Variable: Survey Number

A Mann-Whitney test (Table 25) revealed that a key variable that had significantly changed for RAI2 was 'identified regulation' ($z=-2.250$, $p<.05$). This survey's results indicated stronger correlations between many of the key variables, with context being very significant in relation to competence ($r=0.605$, $p<.05$), autonomy ($r=0.857$, $p<.05$), relatedness ($r=0.668$, $p<.05$), amotivation ($r=-0.431$, $p<.05$) and RAI2 ($r=-0.424$, $p<.05$). The results indicated that amotivation decreased and RAI2 increased significantly, with no significant change in context. However a visual check indicated the change was primarily due to a change in the workplace responses of participants. The charts below illustrate the reduction in amotivation and increase in RAI2 between the two surveys, whilst non-participant responses indicate no significant change. The context chart also illustrates improvement in participant workplace responses, albeit statistically insignificant, whilst non-participant results indicate no significant change.

**Table 26: T3: Comparison of participant workplace responses to control group for Survey 2**

**Survey 2: Participant workplace results vs Control group[b]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 51.500 | 63.500 | 60.000 | 68.000 | 31.500 | 1.000 |
| Wilcoxon W | 376.500 | 388.500 | 385.000 | 393.000 | 59.500 | 326.000 |
| Z | -1.643 | -1.097 | -1.256 | -.890 | -2.572 | -3.944 |
| Asymp. Sig. (2-tailed) | .100 | .273 | .209 | .373 | .010 | .000 |
| Exact Sig. [2*(1-tailed Sig.)] | .102[a] | .281[a] | .224[a] | .395[a] | .008[a] | .000[a] |

a. Not corrected for ties.
b. Grouping Variable: Participant

A Mann-Whitney test (Table 26) comparing the participant workplace responses to that of the control group found significant variance for amotivation (z=-2.572, p<.05) and RAI2 (z=-3.944, p<.05), with no significant variance for the remaining variables. In comparison to the Survey 1 findings, participants reflect significantly lower amotivation in Survey 2 than their non-participant control group colleagues, a difference not found in Survey 1. They also reflect increasingly higher motivation (RAI2) in comparison to the control group, as can be seen in Figures 35 and 36.

### *5.7.2.4 T1–T3 summary*

Between Survey 1 and Survey 2, the data provides no evidence of any significant variance in non-participant control group responses for all variables. Whilst Survey 1's only variance between the control group and research participant workplace responses was for RAI2, Survey 2 identifies an increased variance in motivation (RAI2) and significantly lower amotivation than the non-participant colleagues. The next section considers participant responses to the research (programme) context.

**Figure 35: Survey 2 movement in RAI/amotivation variables**

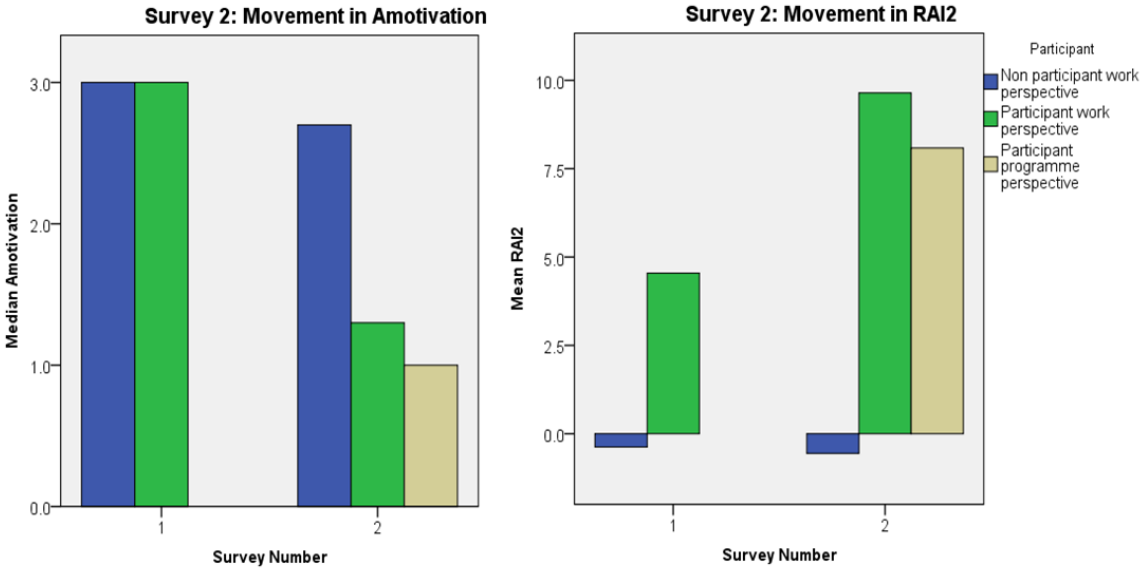
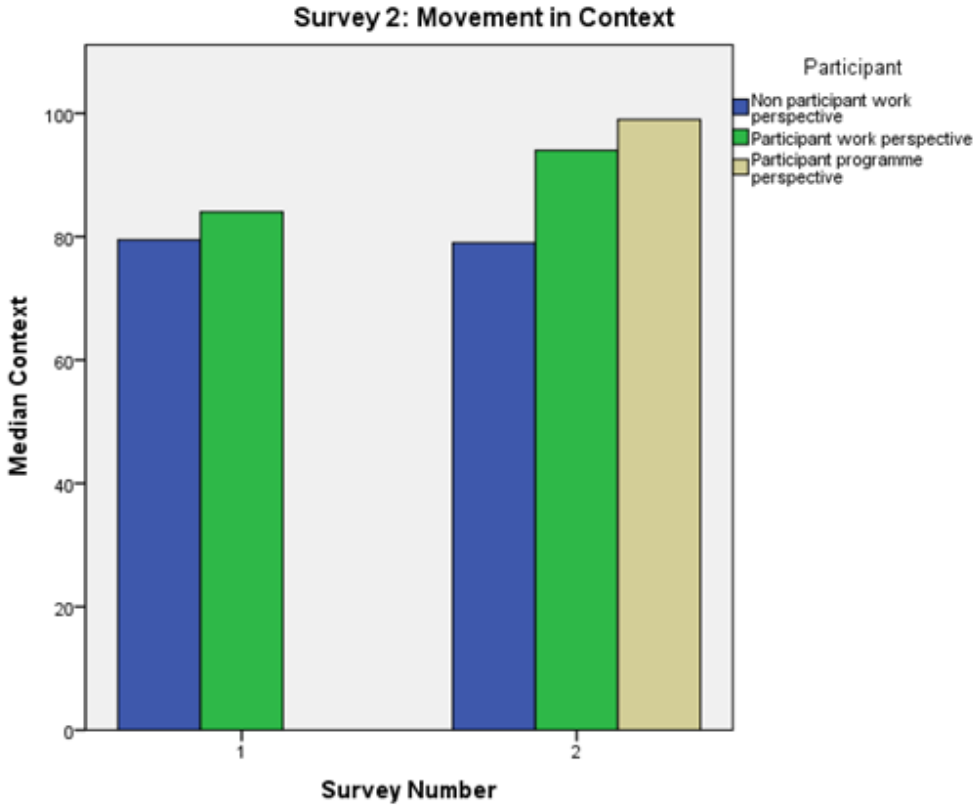


**Figure 36: Survey 2 movement in RAI/amotivation variables**




### *5.7.2.5 T4: Participant research context/programme findings*

As indicated earlier, Survey 2 included a questionnaire containing duplicate questions to the workplace questionnaire. It was aimed specifically at collecting participant responses to the programme environment in order to gain some indication of the type and strength of operant control affecting participants. A Mann-Whitney test comparing participant responses to the programme environment in July 2010 to participant responses to their workplace environment in September 2009 indicated some very significant variances.

**Table 27: Programme participant variance: Survey 2 versus Survey 1**

**Survey 2 test statistics: Programme participant variance survey 2 vs survey 1[b]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 3.000 | 6.500 | 3.000 | 5.000 | 6.000 | 16.000 |
| Wilcoxon W | 31.000 | 34.500 | 31.000 | 33.000 | 34.000 | 44.000 |
| Z | -2.753 | -2.358 | -2.753 | -2.497 | -2.426 | -1.087 |
| Asymp. Sig. (2-tailed) | .006 | .018 | .006 | .013 | .015 | .277 |
| Exact Sig. [2*(1-tailed Sig.)] | .004[a] | .017[a] | .004[a] | .011[a] | .017[a] | .318[a] |

a. Not corrected for ties.
b. Grouping Variable: Survey Number

Significant variances were indicated across context (z=-2.753, p<.05), competence (z=-2.358, p<.05), autonomy (z=-2.753, p<.05), relatedness ( z=-2.497, p<.05) and amotivation (z=-2.426, p<.05). No significant variance was recorded for reinforcement strength indicator RAI2. The direction of change was one of improvement across all variables, as illustrated in Table 28.

**Table 28: Participant average responses**

**Participant responses Survey 2(Programme) and survey 1(Workplace)**

| Survey Number | | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|---|
| 1 | N | 7 | 7 | 7 | 7 | 7 | 7 |
| | Mean | 82.86 | 4.943 | 4.714 | 5.143 | 2.857 | 5.257 |
| | Median | 84.00 | 5.500 | 4.600 | 5.100 | 3.000 | 4.900 |
| 2 | N | 7 | 7 | 7 | 7 | 7 | 7 |
| | Mean | 97.57 | 5.843 | 5.829 | 6.086 | 1.229 | 8.086 |
| | Median | 99.00 | 5.800 | 6.000 | 6.100 | 1.000 | 7.600 |
| | N | 14 | 14 | 14 | 14 | 14 | 14 |
| | Mean | 90.21 | 5.393 | 5.271 | 5.614 | 2.043 | 6.671 |
| | Median | 92.00 | 5.700 | 5.200 | 5.700 | 1.500 | 6.200 |

Median improvement was identified in relation to September 2009 (Survey 1) for context (15 points or 18%), competence (0.3 or 5%), relatedness (1.0 or 20%) and RAI2 (2.7 or 55%). Mean improvement in relation to Survey 1 was identified for autonomy (1.2 or 26%) and amotivation (1.7 or 59%). The researcher met with each of the participants to review their responses over the two surveys (see example document in Appendix 7). Whilst the meetings were primarily structured around the survey findings, the function of the interview was to get behind the numbers and gain some understanding as to what was influencing their participation in the programme. Two key themes emerged from the interviews, consistent with the researcher's impression from facilitating the workshops. The first was the opportunity to work on a 'meaningful' project and the second was the reduced interpersonal conflict and increased willingness to work with each other, rather than 'fight'. Of the seven participants, only two mentioned the facilitation style as directly impacting on engagement, the others made broader comments regarding the environment being more conducive to working together. Five of the participants commented on how the 'grid' was proving a useful way to raise issues and to act as a check as to whether they are acting in their own interest, rather than considering

others. Of the remaining two, one found it ‘unnecessary… as people should speak up’ (BS1, August 2010) and the other felt ‘indifferent’ towards the approach.

A Mann-Whitney test for variances between context variables across the two surveys revealed that the programme environment provided participants with greater choice and options ($z=-2.808$, $p<.05$); understanding of what they had to do ($z=-0.849$, $p<.05$); care in fully answering participant questions ($z=-2.543$, $p<.05$); listening to how the participant wanted to do things ($z=-2.225$, $p<.05$); care in handling emotions ($z=-2.097$, $p<.05$) and ability to share feelings ($z=-2.734$, $p<.05$). Survey 2 also revealed that research context programme participants reported relational improvement in comparison to Survey 1, indicating that they experienced more friendly relations ($z=-2.360$, $p<.05$) and being more able to ‘get along with’ their programme colleagues ($z=-2.347$, $p<.05$). In addition they indicated feeling ‘less pressured’ ($z=-2.415$, $p<.05$) and a greater ‘sense of accomplishment’ ($z=-2.563$, $p<.05$) than they had experienced in the workplace in September 2009. A check on the same questions, but this time comparing workplace Survey 1 to workplace Survey 2, indicates no significant variances. A further Mann-Whitney test to compare programme responses to workplace responses also reveals no significant variances, except for ‘sense of accomplishment’ ($z=-2.159$, $p<.05$) and ‘not having to do as told’ ($z=-2.334$, $p<.05$).

These results suggest that the programme’s relational environment had improved significantly from Survey 1 to Survey 2, findings that were consistent with the researcher’s observations of greater cooperation and less conflict as the programme had progressed. It would appear that the participants had experienced *positive relational contingencies* over this stage of the programme. Overall, it would seem that the programme environment had had a positive influence on participants so far, enabling both relational and competence-based reinforcement for programme participants. This appears to support the transition of some participants to ‘higher’ level engagement categories, as they came under the influence of positively reinforcing projects that they were denied access to in the past. The workplace results will now be considered and the BPM/SDT model reviewed, before moving onto a discussion of the results so far.

### *5.7.2.6 T5: Difference between research context and workplace context*

**Table 29: Survey 2: Significance of differences between research context and workplace context**

**Survey 2: Participant workplace results vs research context results[b]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 12.500 | 16.000 | 6.000 | 17.500 | 21.000 | 15.500 |
| Wilcoxon W | 40.500 | 44.000 | 34.000 | 45.500 | 49.000 | 43.500 |
| Z | -1.538 | -1.095 | -2.380 | -.899 | -.490 | -1.151 |
| Asymp. Sig. (2-tailed) | .124 | .274 | .017 | .368 | .624 | .250 |
| Exact Sig. [2*(1-tailed Sig.)] | .128[a] | .318[a] | .017[a] | .383[a] | .710[a] | .259[a] |

a. Not corrected for ties.
b. Grouping Variable: Participant

**Survey 2: Participant research context results vs control group results[b]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 6.500 | 36.000 | 17.500 | 28.000 | 21.500 | 7.500 |
| Wilcoxon W | 331.500 | 361.000 | 342.500 | 353.000 | 49.500 | 332.500 |
| Z | -3.697 | -2.355 | -3.198 | -2.717 | -3.038 | -3.647 |
| Asymp. Sig. (2-tailed) | .000 | .019 | .001 | .007 | .002 | .000 |
| Exact Sig. [2*(1-tailed Sig.)] | .000[a] | .018[a] | .001[a] | .005[a] | .001[a] | .000[a] |

a. Not corrected for ties.
b. Grouping Variable: Participant

Mann-Whitney tests (Table 29) indicate no significant difference between participant responses for workplace and research context variables, except for autonomy ($z=-2.380$, $p<.05$). On comparing participant to control-group responses, significant variances were found across all variables: context ($z=-3.697$, $p<.05$), competence ($z=-2.355$, $p<.05$), autonomy ($z=-3.198$, $p<.05$), relatedness ($z=-2.717$, $p<.05$), amotivation ($z=-3.038$, $p<.05$) and RAI2 ($z=-3.647$, $p<.05$).

Table 30 provides mean and median data for the two surveys, indicating stable to declining responses for the non-participant control group with participant workplace responses starting to increase. Whilst earlier analysis indicates few significant variances, the data suggest that, although insignificant at this point, there are signs of improvement in participant workplace variables. Of note is the median response for context (climate). Whilst mean scores indicate a 3% improvement in context (85.6 versus 82.9), the median reflects a larger average improvement at nearer 12%.

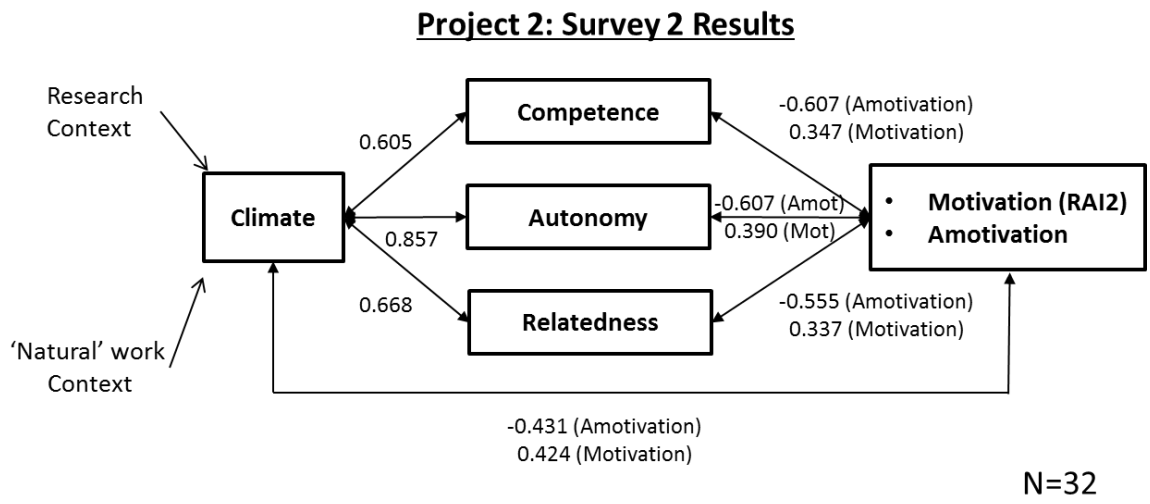
**Table 30: Survey 2 comparative data**

| | **Workplace context** | | | | **Research context** | |
|---|---|---|---|---|---|---|
| | *Non-participant control group* | | *Participants* | | *Participants* | |
| Survey | 1 | 2 | 1 | 2 | 1 | 2 |
| n | 24 | 25 | 7 | 7 | 7 | 7 |
| | ***Mean*** | | | | | |
| Context | 77.0 | 75.8 | 82.9 | 85.6 | 82.9 | 97.6 |
| Competence | 4.9 | 4.9 | 4.9 | 5.3 | 4.9 | 5.8 |
| Relatedness | 5.1 | 5.1 | 5.1 | 5.5 | 5.1 | 6.1 |
| Autonomy | 4.6 | 4.4 | 4.7 | 5.0 | 4.7 | 5.8 |
| Amotivation | 3.3 | 2.9 | 3.3 | 1.5 | 2.9 | 1.2 |
| RAI2 | -0.4 | -0.6 | 4.5 | 9.6 | 5.3 | 8.1 |
| | ***Median*** | | | | | |
| Context | 79.5 | 79.0 | 84.0 | 94.0 | 84.0 | 99.0 |
| Competence | 5.0 | 4.8 | 5.5 | 5.5 | 5.5 | 5.8 |
| Relatedness | 5.1 | 5.1 | 5.1 | 5.6 | 5.1 | 6.1 |
| Autonomy | 5.1 | 4.1 | 4.6 | 4.9 | 4.6 | 6.0 |
| Amotivation | 3.0 | 2.7 | 3.0 | 1.3 | 3.0 | 1.0 |
| RAI2 | -1.5 | -0.4 | 4.8 | 9.9 | 4.9 | 7.6 |

In summary, it appears that the significant improvements identified in the research context are starting to transfer into the participant work context, although presently insignificant, apart than motivation and amotivation. Particularly important is the improvement in participant climate perceptions, of significance in the research context, indicating stronger leader-subordinate bilateral (mutual) relations. Relatedness, indicating improved peer-peer interaction, has significantly improved within the research context and, although not statistically significant, participant work context results have also improved whilst non-participant relatedness remains constant. Based on these findings, the researcher draws the tentative conclusion that mutually supportive behavioural practices support Lean/TQM engagement. Creating supportive contextual conditions, conducive to mutually beneficial Lean/TQM engagement, appears to have a very positive impact on participants' relational perceptions, as well as their perceived competence and autonomy, resulting in lower amotivation and higher, positive, motivation towards Lean/TQM. Similar to Baard et al. (2004), these findings indicate significant correlation between work climate and needs variables (CAR). They also establish significant correlation for both work climate and needs variables with motivation/amotivation. Overall, the

findings indicate a significant relationship between management supportive behaviour, through work climate, employee needs satisfaction and motivation towards Lean/TQM. Project Two finds that RfP, expressed through management commitment to mutuality supportive behaviour, is related to employee need satisfaction and positive Lean/TQM experience (Emiliani, 2003; Emiliani and Emiliani, 2013; Emiliani and Stec, 2005; Halling, 2013; Jones, 1996, 2011; Soltani, 2005; Soltani et al., 2008b; Soltani and Liao, 2012; Soltani et al., 2010; Soltani and Phillips, 2010; Soltani and Wilkinson, 2010).

**Figure 37: Survey 2 workplace results**




### *5.7.2.7 Direction of influence*

Chapter Two argued for mutually supportive leadership behaviour, suggesting that such behaviour is not only consonant with RfP, it can drive down behavioural waste, through improving the relational environment to one based on joint benefit and mutual responsibility. Mutuality is an important element within bilateral relations and within SDT's concept of autonomy and relatedness, where responsible autonomy is emphasised. Whilst both these theories agree that context and learning history influence behaviour, the question here is which is the most influential.

The small workplace sample (n=32) provides insufficient data reliably to test (Field, 2009) the predictive influence of leader behaviour, as represented by context, along with competence and relatedness. Direction of influence is a key feature of Project Three.

**Table 31: Survey 2: Participant correlations**

**Survey 2 Correlations: Programme participants (workplace perspective) and Non-participants (worlplace perspective)**

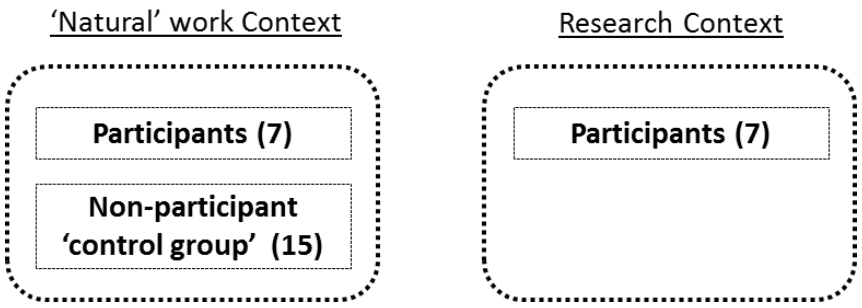
| | | | Modified BPM Categories | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|---|---|---|
| Spearman's rho | Modified BPM Categories | Correlation Coefficient | 1.000 | -.622** | -.844** | -.571** | -.692** | .695** | -.400* |
| | | Sig. (1-tailed) | . | .000 | .000 | .000 | .000 | .000 | .012 |
| | | N | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| | Context | Correlation Coefficient | -.622** | 1.000 | .605** | .857** | .668** | -.431** | .424** |
| | | Sig. (1-tailed) | .000 | . | .000 | .000 | .000 | .007 | .008 |
| | | N | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| | Competence | Correlation Coefficient | -.844** | .605** | 1.000 | .597** | .617** | -.607** | .347* |
| | | Sig. (1-tailed) | .000 | .000 | . | .000 | .000 | .000 | .026 |
| | | N | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| | Autonomy | Correlation Coefficient | -.571** | .857** | .597** | 1.000 | .676** | -.428** | .390* |
| | | Sig. (1-tailed) | .000 | .000 | .000 | . | .000 | .007 | .014 |
| | | N | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| | Relatedness | Correlation Coefficient | -.692** | .668** | .617** | .676** | 1.000 | -.555** | .337* |
| | | Sig. (1-tailed) | .000 | .000 | .000 | .000 | . | .000 | .030 |
| | | N | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| | Amotivation | Correlation Coefficient | .695** | -.431** | -.607** | -.428** | -.555** | 1.000 | -.672** |
| | | Sig. (1-tailed) | .000 | .007 | .000 | .007 | .000 | . | .000 |
| | | N | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| | RAI2 | Correlation Coefficient | -.400* | .424** | .347* | .390* | .337* | -.672** | 1.000 |
| | | Sig. (1-tailed) | .012 | .008 | .026 | .014 | .030 | .000 | . |
| | | N | 32 | 32 | 32 | 32 | 32 | 32 | 32 |

**. Correlation is significant at the 0.01 level (1-tailed).
*. Correlation is significant at the 0.05 level (1-tailed).

### 5.7.3 Survey 3 (February 2011)

The final survey for this project took place in February 2011, at which point the 'new' process was in place and operating. Survey 3 received its lowest response from non-participants, 15 in comparison to 24 and 25, for surveys one and two respectively. This appeared to be due to 'survey fatigue' (Porter et al., 2004) as several of the non-participants who did not respond referred to the survey as being 'pointless' when approached by the researcher. Including 'participant' responses, the overall data set was 32, representing 22 work-context responses and seven research-context responses. This section will consider all three surveys to achieve the following objectives. Firstly the development of the key variables will be considered for the three response groups.

**Figure 38: Survey 3 response**




#### *5.7.3.1 Survey 3: Overview*

**Table 32: Survey 3: Mean averages and correlations for work context responses (n=22)**

| | Variable | Mean | SD | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| 1 | Context | 80.50 | 14.98 | | | | | |
| 2 | Competence | 5.14 | 0.98 | 0.499 | | | | |
| 3 | Relatedness | 4.77 | 1.07 | 0.647 | 0.528 | | | |
| 4 | Autonomy | 5.30 | 0.95 | 0.829 | 0.486 | 0.712 | | |
| 5 | Amotivation | 2.27 | 1.18 | -0.139 | -0.342 | -0.347 | 0.014 | |
| 6 | RAI2 | 3.05 | 4.04 | 0.394 | 0.583 | 0.361 | 0.303 | -0.571 |

Results were generally consistent with the previous surveys. Mann-Whitney tests on Survey 3 data found no significant variance in workplace response between research participants and the control group, with the exception of RAI2 (motivation).

**Table 33: Survey 3: Significance of variance between workplace participants and control group**

**Survey 3: Workplace participants vs non-participant control[b]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 42.000 | 35.500 | 45.500 | 45.000 | 29.500 | 12.000 |
| Wilcoxon W | 162.000 | 155.500 | 165.500 | 165.000 | 57.500 | 132.000 |
| Z | -.741 | -1.201 | -.495 | -.532 | -1.647 | -2.855 |
| Asymp. Sig. (2-tailed) | .459 | .230 | .621 | .595 | .100 | .004 |
| Exact Sig. [2*(1-tailed Sig.)] | .490[a] | .237[a] | .630[a] | .630[a] | .106[a] | .003[a] |

a. Not corrected for ties.
b. Grouping Variable: Participant

No significant variance was found for work context between Survey 2 and Survey 3.

**Table 34: Significance of changes in non-participant workplace responses: Survey 2 to Survey 3**

**Comparison of workplace response: survey two to survey three[a]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 317.500 | 313.500 | 282.000 | 328.000 | 317.500 | 291.500 |
| Wilcoxon W | 845.500 | 841.500 | 810.000 | 856.000 | 570.500 | 819.500 |
| Z | -.608 | -.679 | -1.235 | -.423 | -.612 | -1.065 |
| Asymp. Sig. (2-tailed) | .543 | .497 | .217 | .672 | .540 | .287 |

a. Grouping Variable: Survey Number

Variance was found between participant work context and research context responses.

**Table 35: Survey 3: Significance of differences in participant research and workplace responses**

**Survey 3: Participant workplace responses vs research context response[b]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 8.500 | 10.500 | .000 | 10.500 | 16.000 | 6.000 |
| Wilcoxon W | 36.500 | 38.500 | 28.000 | 38.500 | 44.000 | 34.000 |
| Z | -2.049 | -1.803 | -3.165 | -1.797 | -1.360 | -2.364 |
| Asymp. Sig. (2-tailed) | .040 | .071 | .002 | .072 | .174 | .018 |
| Exact Sig. [2*(1-tailed Sig.)] | .038[a] | .073[a] | .001[a] | .073[a] | .318[a] | .017[a] |

a. Not corrected for ties.
b. Grouping Variable: Participant

With the exception of amotivation, there were significant variances in context (z=-2.049, p<.05), competence (z=-1.803, p<.05), autonomy (z=-3.165, p<.05), relatedness (z=-1.797, p<.05) and RAI2 (z=-2.364, p<.05). Previous comparisons found significant variance in autonomy only. As only RAI2 (z=-1.981, p<.05) significantly varied between Survey 1 and Survey 3, for participant workplace responses, it appears that these variances result from further improvement in the research context, reviewed in the next section.

**Table 36: Significance of changes in participant workplace responses: Survey 2 to Survey 3**

**Participant workplace responses: survey two vs survey three[b]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 22.500 | 20.500 | 23.000 | 23.500 | 24.000 | 9.000 |
| Wilcoxon W | 50.500 | 48.500 | 51.000 | 51.500 | 52.000 | 37.000 |
| Z | -.256 | -.512 | -.193 | -.128 | -.069 | -1.981 |
| Asymp. Sig. (2-tailed) | .798 | .609 | .847 | .898 | .945 | .048 |
| Exact Sig. [2*(1-tailed Sig.)] | .805[a] | .620[a] | .902[a] | .902[a] | 1.000[a] | .053[a] |

a. Not corrected for ties.
b. Grouping Variable: Survey Number

### *5.7.3.2 Development of key variables over the three surveys*

The group of charts (Figure 39) illustrates the key variables over the three surveys. For 'non-participants' no statistically significant variance was found for any of the key variables, although there are visual indicators of some improvement developing, with amotivation reducing and relative regulation moving from negative to positive.

**Table 37: Non-participant differences: Surveys 1–3**

**Non participant differences: survey one to three[b]**

| | Amotivation | RAI2 | Context | Autonomy | Competence | Relatedness |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 139.500 | 134.500 | 166.000 | 169.000 | 167.500 | 171.000 |
| Wilcoxon W | 259.500 | 434.500 | 466.000 | 469.000 | 467.500 | 471.000 |
| Z | -1.175 | -1.314 | -.404 | -.318 | -.362 | -.260 |
| Asymp. Sig. (2-tailed) | .240 | .189 | .686 | .750 | .718 | .795 |
| Exact Sig. [2*(1-tailed Sig.)] | .246[a] | .191[a] | .700[a] | .765[a] | .721[a] | .809[a] |

a. Not corrected for ties.
b. Grouping Variable: Survey Number

With regard to the workplace, although participants reported improvement across key variables, all were insignificant, except for amotivation which indicated a near significant variation (z=-2.037, p<.054). This is expanded upon below.

**Table 38: Participant workplace differences: Surveys 1–3**

**Participant 'workplace' change, survey one to three[b]**

| | Amotivation | RAI2 | Context | Autonomy | Competence | Relatedness |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 9.000 | 14.000 | 21.000 | 21.000 | 16.000 | 21.000 |
| Wilcoxon W | 37.000 | 42.000 | 49.000 | 49.000 | 44.000 | 49.000 |
| Z | -2.037 | -1.343 | -.448 | -.449 | -1.093 | -.451 |
| Asymp. Sig. (2-tailed) | .042 | .179 | .654 | .654 | .274 | .652 |
| Exact Sig. [2*(1-tailed Sig.)] | .053[a] | .209[a] | .710[a] | .710[a] | .318[a] | .710[a] |

a. Not corrected for ties.
b. Grouping Variable: Survey Number

The most significant changes between Survey 1 and Survey 3 were found for participant 'programme' responses, with all variables reporting statistical significance, apart from RAI2 which was near significant. Note that this test used participant workplace responses from Survey 1 as its reference point, as no programme measure was available at that time.

**Table 39: Participant programme differences: Surveys 1–3**

**Participant Programme change: Survey one to three[b]**

| | Amotivation | RAI2 | Context | Autonomy | Competence | Relatedness |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 4.000 | 9.000 | 1.000 | .000 | .000 | .500 |
| Wilcoxon W | 32.000 | 37.000 | 29.000 | 28.000 | 28.000 | 28.500 |
| Z | -2.804 | -1.983 | -3.009 | -3.169 | -3.158 | -3.073 |
| Asymp. Sig. (2-tailed) | .005 | .047 | .003 | .002 | .002 | .002 |
| Exact Sig. [2*(1-tailed Sig.)] | .007[a] | .053[a] | .001[a] | .001[a] | .001[a] | .001[a] |

a. Not corrected for ties.
b. Grouping Variable: Survey Number

Both statistical and visual evidence illustrate the improvement in programme participants over the course of this intervention, with no evidence from the non-participant control group, suggesting that the improvement was mitigated by other factors. Participants and non-participants only differed on relative regulation RAI2 ($z=-2.223$, $p<.05$) during Survey 1.

**Table 40: Survey 1 differences between participants and non-participants**

**Survey one: Difference between participants and non-participants[b]**

| | Amotivation | RAI2 | Context | Autonomy | Competence | Relatedness |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 81.500 | 37.000 | 65.000 | 78.500 | 80.500 | 80.500 |
| Wilcoxon W | 381.500 | 337.000 | 365.000 | 106.500 | 380.500 | 108.500 |
| Z | -.119 | -2.223 | -.899 | -.261 | -.166 | -.166 |
| Asymp. Sig. (2-tailed) | .905 | .026 | .368 | .794 | .868 | .868 |
| Exact Sig. [2*(1-tailed Sig.)] | .908[a] | .026[a] | .391[a] | .800[a] | .872[a] | .872[a] |

a. Not corrected for ties.
b. Grouping Variable: Participant

By Survey 3, very significant differences were evident, both visually and statistically, indicating significant variance between programme participants and non-participants across all key variables. It has already been explained that non-participants reported no significant change in any of the variables, suggesting a relatively stable context, history and reinforcement environment over this period.

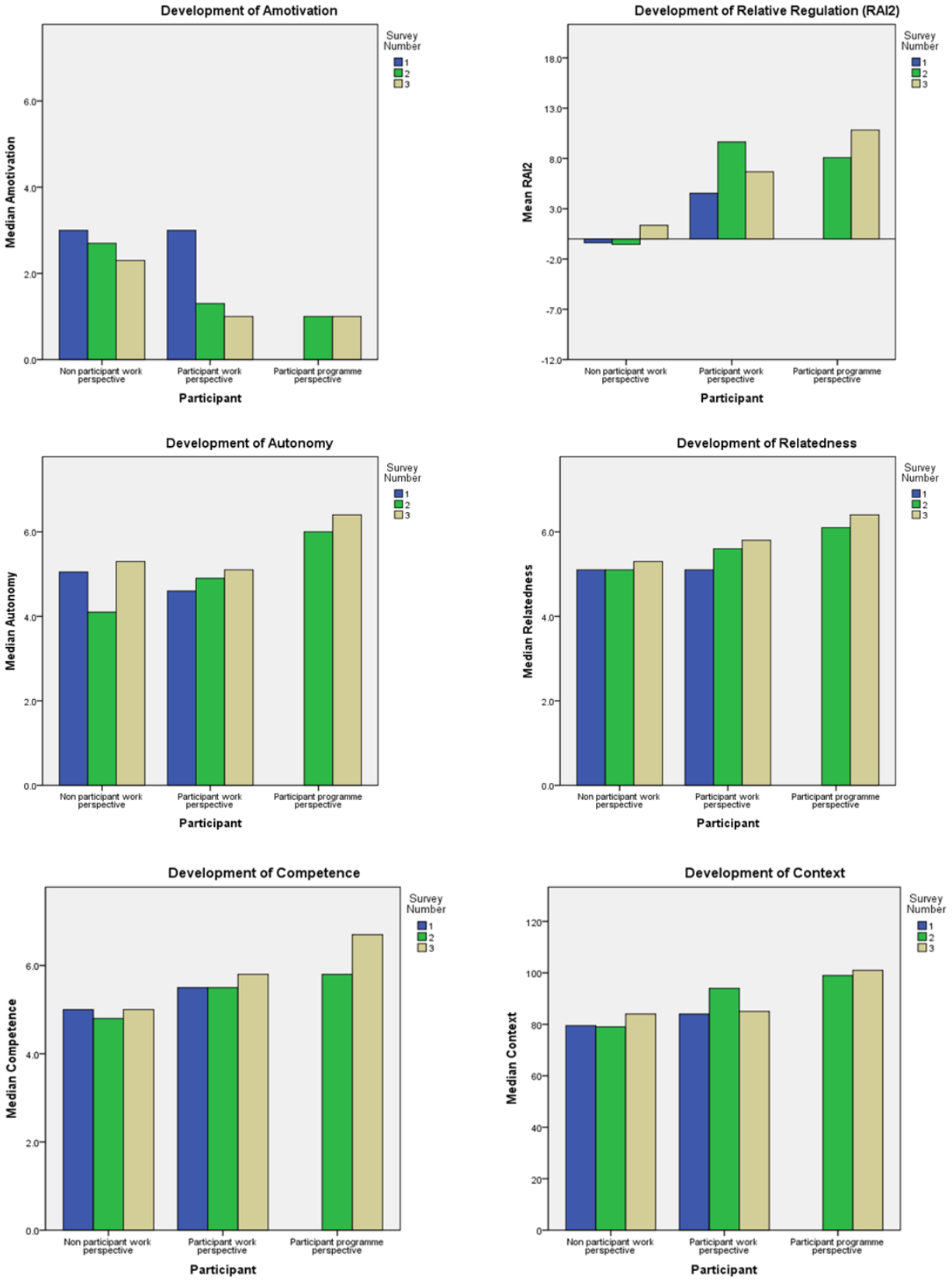
**Table 41: Survey 3 comparison of programme participants to non-participants**

**Survey three: Comparison between 'programme' participants and Non-participants[b]**

| | Amotivation | RAI2 | Context | Autonomy | Competence | Relatedness |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 8.000 | 3.000 | 2.500 | 4.500 | 3.000 | 8.500 |
| Wilcoxon W | 36.000 | 123.000 | 122.500 | 124.500 | 123.000 | 128.500 |
| Z | -3.221 | -3.489 | -3.527 | -3.398 | -3.498 | -3.113 |
| Asymp. Sig. (2-tailed) | .001 | .000 | .000 | .001 | .000 | .002 |
| Exact Sig. [2*(1-tailed Sig.)] | .001[a] | .000[a] | .000[a] | .000[a] | .000[a] | .001[a] |

a. Not corrected for ties.
b. Grouping Variable: Participant

**Figure 39: Development of key variables, Survey 1 to Survey 3**



Based on these findings, this researcher infers that the changes in the programme participant group are substantially as a result of the changes made within the engagement environment. The introduction of active listening and the relational metaphor to promote mutuality created a leader-subordinate environment supporting wider bilateral mutuality between peers and across departments. The fact that participants were able to work on a process, defined and developed by themselves to provide significant functional benefit for them, is further evidence that the context was sufficiently open to support access to positively reinforcing contingencies.

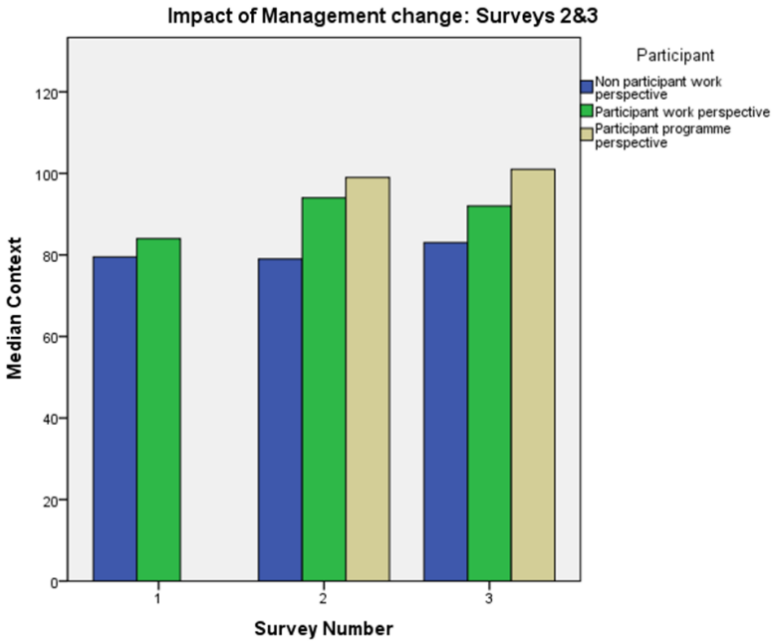
The intervention programme sought to create a highly supportive context for the participants to develop their new concept into a realised process. Based on their responses to surveys two and three, this appears to have been successful as the context improvement realised in Survey 2 continued through to Survey 3. The participant workplace improvement was not, however, maintained.

The participant increase in workplace context found in Survey 2 was initially rationalised by the researcher as some form of reinforcement generalisation from the programme environment into the workplace (Baum, 2004). Listening and relational behaviour training, in the first few weeks of Project Two, impacted on the managers of the departments as well as on their interested support staff, so it was easy to assume (and quite reinforcing for the researcher) that some form of transference or generalisation had taken place between the programme and the workplace. In fact, it was the general expectation or hypothesis that programme improvements would generalise into workplace improvements, for context, as used here, represents the supportive behaviour a subordinate receives from their manager.

However, the context is impacted on by wider influences and the workplace responses for two participants was affected by one of the managers on the programme being demoted to a lower position in the workplace and a colleague, also a programme participant, being promoted in his place. Both participants reflected lower responses in Survey 3 because neither liked the way the situation had been handled by their superiors. In effect, the two participants had experienced an aversive or punishing event with their respective senior manager and to illustrate the impact of this punishing experience, data were adjusted to include the prior survey response for each participant, instead of the current Survey 3 responses. The results are illustrated in the following chart (Figure 39), indicating a much

smaller reduction in Survey 3 results and suggesting that the event influenced these results.[11] However, even the adjusted results illustrate a reduction, albeit statistically insignificant, in participants' responses to workplace context. This indicated to the researcher that other factors were restricting generalisation.

**Figure 40: Change in management context according to subordinate reports, Surveys 1 to 3**




Interviews with the two respective managers identified a number of possible issues that worked against easy transference of the listening and relational behaviours into the workplace, with the most significant stated as 'I do not have the time to listen' (comment from Eng3, April 2011). A similar response was received from his BS department equivalent. This was not just the immediate time taken to listen, but the time fully to respond, the time to understand the other, when the manager already knew what the answer was. When asked if they would like more support to develop their competence in this area, they both agreed that they would but were concerned that the wider organisation required such support too and their efforts would be wasted if others were not receptive to listening and mutuality support themselves. As well as these temporal and social points, a number of other issues (which are not covered here) concerning the physical environment and organisational pressures and expectations were raised.

[11] Note: temporary adjustment to data for illustration only, with previous data reinstated.

The intervention programme concentrated on creating a relational context to support engagement. As such, skills improvement and support was provided to participants during the course of the programme, with the facilitator encouraging participants to move between the content of the programme (process development) and the process of maintaining mutuality between all participants (Foxall, 1999; Hoppe, 2007; Torneke, 2010). During the April 2011 interviews, several of the participants reflected on their experience, suggesting that 'as engineers' they were good at the 'content stuff', but not so good at the 'soft stuff' and that the workshops had raised their awareness of how they interact. All said that they had enjoyed the process, even though it had been 'tough at times' and that inter-departmental relations had improved as a result, although there was still an element of distrust.

**Table 42: Results of combined data, surveys 1 to 3**

| | **Workplace context** | | | | | | **Research context** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Non-participant control group* | | | *Participants* | | | *Participants* | | |
| Survey | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| n | 24 | 25 | 15 | 7 | 7 | 7 | 7 | 7 | 7 |
| | ***Mean*** | | | | | | | | |
| Context | 77.0 | 75.8 | 78.5 | 82.9 | 85.6 | 84.7 | 82.9 | 97.6 | 101.0 |
| Competence | 4.9 | 4.9 | 5.0 | 4.9 | 5.3 | 5.5 | 4.9 | 5.8 | 6.5 |
| Relatedness | 5.1 | 5.1 | 4.7 | 5.1 | 5.5 | 4.9 | 5.1 | 6.1 | 6.5 |
| Autonomy | 4.6 | 4.4 | 5.2 | 4.7 | 5.0 | 5.5 | 4.7 | 5.8 | 6.4 |
| Amotivation | 3.3 | 2.9 | 2.5 | 3.3 | 1.5 | 1.8 | 2.9 | 1.2 | 1.0 |
| RAI2 | -.4 | -.6 | 1.4 | 4.5 | 9.6 | 6.7 | 5.3 | 8.1 | 10.8 |
| | ***Median*** | | | | | | | | |
| Context | 79.5 | 79.0 | 84.0 | 84.0 | 94.0 | 85.0 | 84.0 | 99.0 | 101.0 |
| Competence | 5.0 | 4.8 | 5.0 | 5.5 | 5.5 | 5.8 | 5.5 | 5.8 | 6.7 |
| Relatedness | 5.1 | 5.1 | 5.3 | 5.1 | 5.6 | 5.1 | 5.1 | 6.1 | 6.4 |
| Autonomy | 5.1 | 4.1 | 5.3 | 4.6 | 4.9 | 5.8 | 4.6 | 6.0 | 6.4 |
| Amotivation | 3.0 | 2.7 | 2.3 | 3.0 | 1.3 | 1.0 | 3.0 | 1.0 | 1.0 |
| RAI2 | -1.5 | -.4 | .7 | 4.8 | 9.9 | 7.3 | 4.9 | 7.6 | 11.3 |

Table 42 illustrates that participants within the research context report an average 30% increase in 'history' variables of CAR and the manager-subordinate contextual climate (20%), here referred to as context. These variables also very significantly correlate with employee reports of motivational 'situation' regarding Lean. Amotivation has reduced to an insignificant level, whilst motivation (RAI2) has more than doubled with reported levels of competence ($r=-0.590$, $p<.05$), autonomy ($r=-0.388$, $p<.05$) and relatedness ($r=-0.521$, $p<.05$). Whilst participant workplace results indicate an initial improvement, then a drop, in manager-subordinate contextual relations and peer-peer relations, Survey 3 indicates sustained improvement in

workplace autonomy and motivation and a reduction in amotivation, whilst control data indicates little change over the period. In summary, this suggests that the improvement activities, both operationally, regarding work process, and relationally, through developing mutually supportive and accountable relations between facilitator-participants and participant-participant, have enabled participants to engage in Lean/TQM activities which are both functionally and informationally rewarding. This is indicated in increased motivation towards Lean/TQM, reduced amotivation and improved personal and group perceptions of CAR. Findings indicate that more open or supportive manager-subordinate contexts facilitate improvement in employee Lean/TQM engagement experience, affording access to contingencies influencing continued engagement in Lean.

### 5.8 Overall Reflection, Discussion and Conclusion

This longitudinal AR-based study extended the findings of Project One by developing concepts of contingent value (functionally and symbolically) to programme participants. Creation of an engagement context using principles drawn, in particular, from OL (Jones, 1996, 2011), Lean/TQM (Emiliani, 1998; Emiliani, 2003; Emiliani and Emiliani, 2013), SDT's work climate (Baard et al., 2004; Deci et al., 2001), mutuality (Foxall, 1999; Harris and Harris, 1995) and active listening (Hoppe, 2007), appears to have had a positive influence on participants' reports of CAR. Improvement was also identified in reports relating to a reduction in amotivation (punishment) influence and increased net positive reinforcement (RAI2).

On the ground, improvement in inter-department and peer-peer relations was clearly visible in their interactions, both to the researcher and to senior management. Major differences between departments were resolved by focusing on projects of mutual benefit, not only to the individuals and departments involved but also to the organisation. From a leader-subordinate perspective, raising relational competence, through training and reflection on the importance of mutuality, was important in creating a supportive relational environment. Initial attempts by the researcher to facilitate and lead by modelling supportive behaviour did not appear to work, possibly due to a mismatch between participant learning history and this type of leader behaviour, an issue highlighted by Stine et al. (1995). Post-training, the participants appeared to respond well to this supportive environment, as indicated in the results.

These findings support the importance of mutually-respectful behaviour, as detailed in Chapter Two, and appear to have helped participants to overcome barriers to Lean/TQM and learning together (OL), in fact they had to learn how to learn. From an organisational perspective, this project was recognised as a success by senior management, improved organisational practice and led to support for the next stages requiring further investment. Focusing on SDT's work climate behaviours alone would have proved insufficient. The BPM highlights the importance of temporal, physical, social and regulatory influences on behaviour. Initial exploration of these in Project One provided a valuable insight into the complex history of these participants, influencing the researcher's approach to engaging the participant group, not least of which was the insight into their functional interests and relational environment. Project One established the functional contingencies of interest to participants. A key contribution of Project Two was to support development of positive relational contingencies by making them contextually available and the above guiding principles supported this. Improving the relational context resulted in improvements recorded across all the key variables, suggesting the importance of a strong relational base. The key relationship tested was the one between manager/ supervisor-subordinate. This project indicates that a strong relational context between manager and subordinate supports positive development in CAR, as well as a more positive disposition towards engaging in activities such as Lean. Some parts of the project were beyond the immediate technical competence of the participants. Relational support enabled them to overcome this and access the required competence to complete the project. It would appear that they also report increased competence.

Deci and Ryan's (2002) amotivation and relative autonomy index (RAI) were applied to this project to represent the employee situation in relation to Lean. The other variables were assessed in terms of the day-to-day work context, to test the hypothesis that day-to-day manager-subordinate workplace relations affect Lean engagement. This project generally supported this hypothesis, with significant relations found between context, CAR, RAI, amotivation and BPM contingency categories. The intervention and its measures also indicate the direction of relationship, suggesting that a supportive context results in higher levels of engagement as predicted, reflecting improvement in needs (CAR), amotivation and motivational variables, a point for deeper exploration in the next project. Project Two supports H1–H6 and Project Three tests H7–H9.

| *Research Hypotheses* | |
|---|---|
| H1 | Higher supportive listening behaviour leads to higher reported managerial work climate |
| H2 | Higher reported managerial work climate relates to higher reported CAR |
| H3 | Subordinates reporting to supervisors trained in supportive listening report higher work climate and CAR than those reporting to untrained supervisors |
| H4 | Subordinate perceptions of work climate and CAR increase over time when exposed to supportive listening |
| H5 | Subordinates reporting to supervisors trained in supportive listening perceive higher quality engagement in Lean/TQM than those reporting to untrained supervisors |
| H6 | Quality of motivation (RAI2) improves over time for subordinates with mutually supportive supervisors |
| H7 | Work climate has significant impact on active Lean engagement |
| H8 | CAR has significant impact on active Lean engagement |
| H9 | RAI2 has significant impact on active Lean engagement |

### 5.8.1 Next steps

This project considered respondents who claimed to be 'active' in Lean. Project Three considers the wider organisation, capturing a 'snapshot' through a company-wide survey that seeks to consider both active and not-active respondents and the impact of the day-to-day leader-subordinate environment on Lean engagement.

# Chapter Six: Project Three – Organisation-wide Survey Considering Manager-Subordinate Engagement Environment

## 6.1 Introduction

Project Two identified the positive impact of a mutually supportive facilitative management style on research participants involved in a Lean/TQM intervention. Between surveys one and three significant improvement in manager-subordinate workplace contextual climate, learning history (CAR) and Lean/TQM motivation indicators (amotivation and RAI2) support this claim. A significant feature of Project Two was an intervention focusing on supporting participants in achieving mutually beneficial outcomes for themselves, their departments and the organisation. The results indicated positive impact of mutuality support on quality of participant engagement in Lean/TQM and found evidence of generalisation into the participants' day-to-day work environment. Whilst the results are significant and encouraging, they reflect a study on a small population who declared themselves as being engaged in Lean. Project three considers the wider organisational population as an opportunity to investigate the influence of day-to-day managerial-subordinate context and its relationship to Lean engagement as both enabler and barrier.

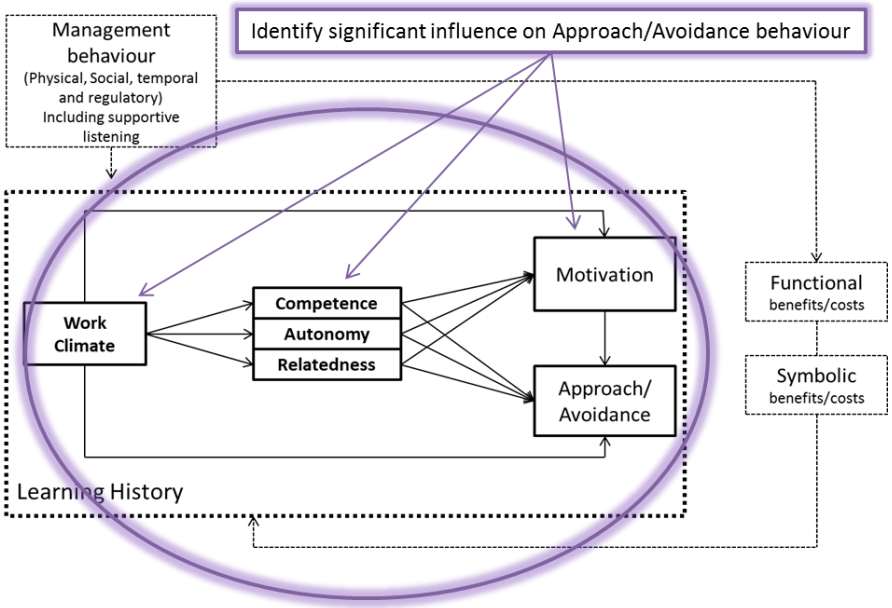
### 6.1.1 Hypothesis and prediction

Over the last two projects, the researcher observed the results of engaging participants in a project that is firstly meaningful (reinforcing) to them and then actively supported, providing the time, space and mutually supportive climate to connect participants to their project and not come under the influence of disrespectful behaviour. Consistent with the RfP, it is hypothesised that both managers and staff working in environments perceived as having higher levels of supportive manager/supervisor behaviour, will be more active in Lean and report higher needs satisfaction (CAR) and higher motivation than their not-active colleagues. Project Three explores the influences on engagement utilising a cross-sectional, multi-level survey to establish further evidence of the relationship between managerial context and employee Lean engagement. The project considers the research variables in relation to Lean/TQM engagement, predicting positive engagement in higher support, more open, contextual climates and negative engagement, or disengagement, in contextual climates with lower support behaviour. The relative influence of context, needs and motivation quality (RAI2) on

explaining changes in engagement is explored to provide insight into their impact on active Lean engagement.

### 6.1.2 Project design

**Model for Project 3**




**Organisation wide survey**: 358 responses (57%)/ 30 non-respondent interviews.
1. Identify similarities and differences between Active/ Not Active respondents
2. Identify variables with significant predictive influence on approach/avoidance

The previous projects focused on individuals who claimed to be active in Lean. This project is designed to explore subordinate perceptions of management work context and its relation to CAR variables, relative motivation and approach/avoidance, in order to establish which variables have significant influence on Lean approach/avoidance behaviour. The project introduces an additional variable 'active/not-active' to represent respondent approach/avoidance. Through a company-wide, cross-sectional survey (n=358) the findings are considered in two parts. The first part starts with a review of the survey, its administration and data analysis, before moving on to considering overall findings, similarities and differences between the active and not-active responses. The second part considers hypotheses H7–H9, using hierarchical regression to establish the influence of work climate on CAR and motivation and logistical regression to identify the variables that significantly predict Lean/TQM approach-avoidance behaviour.

### 6.2 Survey Administration

The same questions as Project Two were used (work climate questionnaire (Baard et al., 2004), needs fulfilment questionnaire (Deci and Ryan, 2002) and self-regulation questionnaire (Deci and Ryan, 2002) adapted to suit Lean), with an additional set of questions which sought to establish respondents' current Lean/TQM behaviour.

#### 6.2.1 Lean engagement questions

Four additional questions sought participant responses with regard to their relationship with Lean/TQM. The first three considered confidence and ability to engage in Lean/TQM with responses indicating Lean activity and the fourth questioned actual engagement and indicated the participant as being 'not-active'.

**Figure 41: Questions relating to Lean engagement**

Question 52: I feel confident in my ability to engage in Lean activities.
Question 54: I am able to engage in Lean activities.
Question 55: I feel able to meet the challenge of performing well in such activities.
Question 56: What Lean activities are you engaged in?

- 5S
- Process Improvement
- Other, please specify
- Not currently engaged in Lean

#### 6.2.2 Administration

The survey was administered confidentially through Surveymonkey® to try and maximise response. Issued to 624 respondents, it remained open for four weeks, during which time three reminders were issued. By day 10 the response rate was 22%. The researcher approached a number of respondents to try to understand what was influencing response rates. The most common initial response was one of being 'too busy' or 'not having enough time'. It also appeared that respondents were somewhat suspicious and concerned as previous surveys regarding Lean did not ask as many questions and were not as personal. To counter such concern, the researcher conducted a number of departmental and one-to-one conversations, to explain the confidential nature of the survey, that the questions did go beyond previous surveys and that this was research conducted as part of a Durham

University programme. In addition, confidential feedback was offered to respondents following conclusion of the survey. Although this was very time consuming, as more than 60 'conversations' took place, by the end of the survey period responses had risen to 358 (57%).

### 6.2.3 Survey data checks

Responses were analysed using SPSS and the data checked for completeness, during which 30 responses were rejected as having too many incomplete replies. Remaining response data (n=328), tested for normality using a Kolmogorov-Smirnov test, indicated a non-normal distribution requiring non-parametric testing.

**Table 43: Project Three normality tests**

| | Kolmogorov-Smirnov(a) | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Amotivation | .135 | 328 | .000 | .919 | 328 | .000 |
| External regulation | .104 | 328 | .000 | .966 | 328 | .000 |
| Introjected regulation | .136 | 328 | .000 | .898 | 328 | .000 |
| Identified regulation | .088 | 328 | .000 | .973 | 328 | .000 |
| Intrinsic motivation | .117 | 328 | .000 | .950 | 328 | .000 |
| Context | .106 | 328 | .000 | .948 | 328 | .000 |
| Autonomy | .092 | 328 | .000 | .974 | 328 | .000 |
| Competence | .075 | 328 | .000 | .986 | 328 | .002 |
| Relatedness | .073 | 328 | .000 | .977 | 328 | .000 |
| Engagement confidence | .204 | 328 | .000 | .892 | 328 | .000 |
| Engagement ability | .157 | 328 | .000 | .914 | 328 | .000 |

(a) Lilliefors Significance Correction.

### 6.2.4 Internal reliability

Internal reliability was tested using Cronbach's alpha test across the questions supporting sub-scales (Cronbach, 1951) for context (work climate), learning history (CAR) and situation (amotivation, external regulation, introjected regulation, identified regulation and intrinsic regulation) and the results are shown in the following tables.

**Table 44: Cronbach's alpha tests for Project Three data**

| Cronbach alpha test | | Work Climate | Comp' | Aut' | Rel' |
|---|---|---|---|---|---|
| Survey | n/ items | 15 | 6 | 7 | 7 |
| 1 | 31 | 0.930 | 0.726 | 0.703 | 0.850 |
| 2 | 39 | 0.944 | 0.702 | 0.756 | 0.791 |
| 3 | 328 | 0.936 | 0.725 | 0.754 | 0.794 |

| Cronbach alpha test | | Amotivation | External Reg' * | Introjected Reg' | Identified Reg' | Intrinsic Reg' |
|---|---|---|---|---|---|---|
| Survey | n/ items | 4 | 3 | 3 | 3 | 3 |
| 1 | 31 | 0.845 | 0.481 | 0.793 | 0.879 | 0.836 |
| 2 | 39 | 0.762 | 0.487 | 0.593 | 0.836 | 0.888 |
| 3 | 328 | 0.818 | 0.598 | 0.813 | 0.916 | 0.876 |

* note: alpha score = 0.354 for survey 3 prior to removal of 'financial reward' question

With the exception of external regulation, similar to Project Two, all items exceed 0.7[12] as recommended by Nunnally (1978) with RAI2 alpha = 0.88. Owing to the low number of items on this scale, Pallant (2010) refers to the use of inter-item correlation, where Briggs et al. (1980) recommend correlation values above 0.2. For a second time in this research, Deci and Ryan's (2002) construct for external regulation is not internally consistent. The question relating to reward was removed and the scale reduced to two items that have correlation r=0.427. The same adjustment was required during Project Two.

**Table 45: Inter-item correlation for 'extrinsic' variables**

**Inter-Item Correlation Matrix**

| | Question 10: My Manager, Supervisor, or colleagues tell me to do it. | Question 14: My Manager, Supervisor, or colleagues would be mad if I didn't practice Lean improvement activities anymore. |
|---|---|---|
| Question 10: My Manager, Supervisor, or colleagues tell me to do it. | 1.000 | .427 |
| Question 14: My Manager, Supervisor, or colleagues would be mad if I didn't practice Lean improvement activities anymore. | .427 | 1.000 |

[12]Despite introjected regulation falling below 0.7 in Survey 2, it exceeds this criteria for the larger Survey 3.

### 6.2.5 Re-test reliability

Over the three surveys reliability findings have been relatively consistent, indicating re-test reliability (Field, 2009).

## 6.3 Overall Findings

In this section, the overall data is considered to establish relational patterns in the key variables and differences in overall response in relation to managers and subordinates. In this larger survey, respondents were classified as being senior managers, middle managers/supervisors or staff/shop floor, these classifications were introduced to identify patterns in response across and between hierarchical groups. The following analysis considers the overall pattern in the findings before moving on to consider hierarchical similarities and differences.

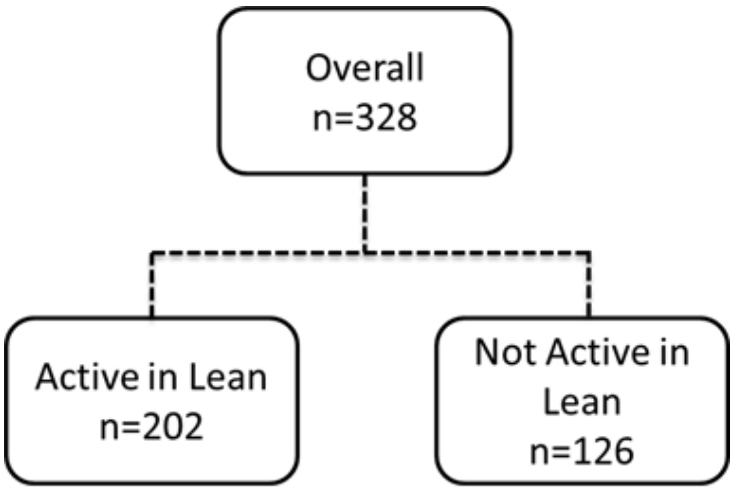
### 6.3.1 Participants

**Table 46: Survey respondent demographics**

| | | | Age | | |
|---|---|---|---|---|---|
| **Status** | **Gender** | **n** | **Mean** | **Median** | **SD** |
| **Senior manager** | Male | 4 | 43.8 | 44.0 | 4.5 |
| | Total | 4 | 43.8 | 44.0 | 4.5 |
| **Manager/supervisor** | Female | 6 | 37.3 | 36.0 | 4.2 |
| | Male | 47 | 46.6 | 46.0 | 9.2 |
| | Total | 53 | 45.5 | 45.0 | 9.3 |
| **Staff** | Female | 27 | 35.2 | 33.0 | 8.0 |
| | Male | 244 | 44.3 | 44.0 | 10.1 |
| | Total | 271 | 43.4 | 42.0 | 10.3 |
| **Total** | Female | 33 | 35.6 | 34.0 | 7.4 |
| | Male | 295 | 44.7 | 44.0 | 10.0 |
| | **Total** | **328** | **43.8** | **43.0** | **10.1** |

Overall, the useable responses represent 53% of the population surveyed (624). The 10% female response reflects the largely male population and is proportionally consistent. 50% of senior managers, circa 65% of managers/supervisors and 50% of staff responded. Of the 328 responses, 202 (62%) reported that they were currently ‘active’ in the Lean programme and 126 reported that they were currently ‘not active’ with Lean. A visual check of the data indicated active and not-active respondents reflected both positive and negative contingent influence, as indicated by RAI2.

**Figure 42: Survey 3 count of active and not-active responses**




### 6.3.2 Day-to-day subordinate learning experience of managerial context

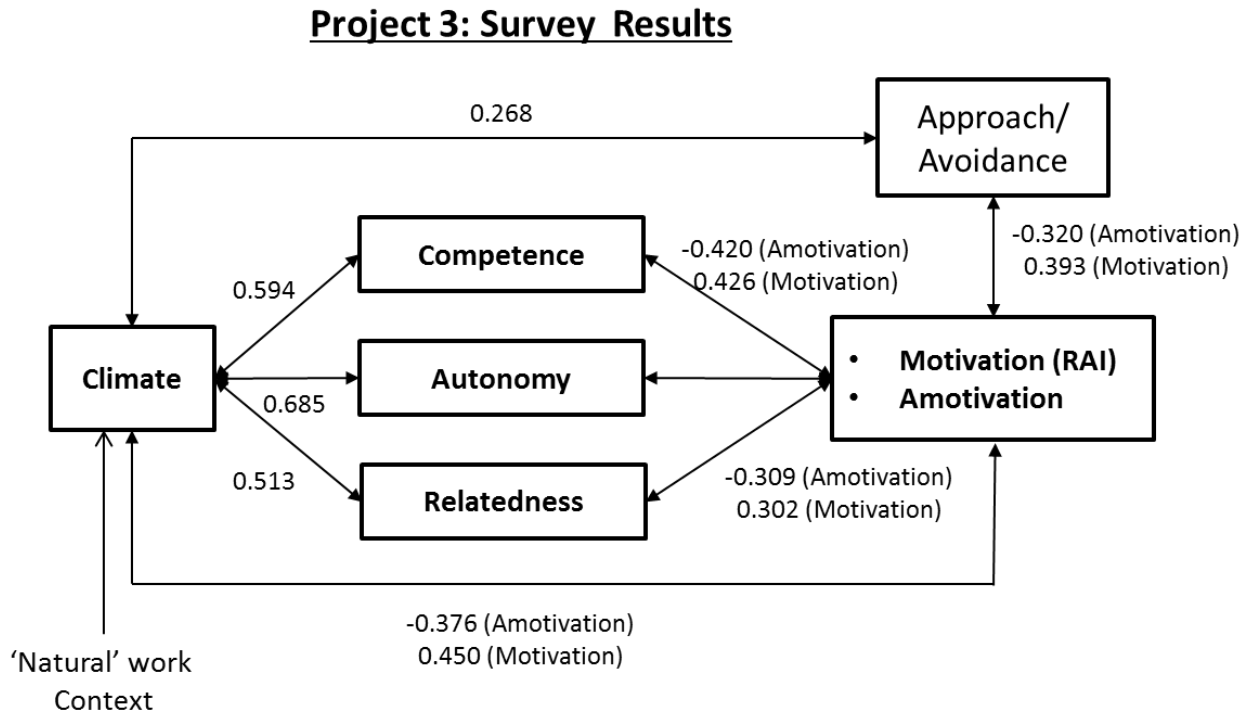
**Table 47: Survey 3: Average and correlational data (n=328)**

| | Variable | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Context | 73.70 | 19.52 | | | | | | |
| 2 | Competence | 5.00 | 0.92 | 0.594 | | | | | |
| 3 | Relatedness | 4.65 | 0.99 | 0.513 | 0.559 | | | | |
| 4 | Autonomy | 5.15 | 0.93 | 0.685 | 0.673 | 0.565 | | | |
| 5 | Amotivation | 2.83 | 1.43 | -0.376 | -0.420 | -0.309 | -0.391 | | |
| 6 | RAI2 | 4.11 | 7.29 | -0.450 | 0.426 | 0.302 | 0.440 | -0.811 | |
| 7 | Active in Lean | 0.61 | 0.48 | 0.26 | 0.09 | 0.064 | 0.199 | -0.320 | 0.393 |

A Spearman rank, one-tailed correlation found results similar to the earlier research findings of Project Two. Subordinate reports on managerial context very significantly relate to competence ($r=0.594$, $p<.05$), autonomy ($r=0.685$, $p<.05$) and relatedness ($r=0.513$, $p<.05$). Context was also found to very significantly relate to the subordinate's Lean situation, with amotivation ($r=-0.376$, $p<.05$) and personal regulation or motivation (RAI2) ($r=0.450$, $p<.05$). Approach behaviour ($r=0.268$, $p<.05$) or being active in Lean was found to be statistically significant but relatively weak. On controlling for respondents who were 'in-between Lean activities', the correlation increases to $r=0.423$ ($p<.05$), which would appear to be more consistent with the wider context findings of Project two. Amotivation correlated to competence

(r=-0.420, p<.05), autonomy (r=-0.391, p<.05) and relatedness (r=-0.309, p<.05), whilst RAI2 also significantly correlated with competence (r=0.426, p<.05), autonomy (r=0.440, p<.05) and relatedness (r=0.302, p<.05). Finally, approach behaviour expressed as 'active' and 'not active' significantly relates to competence (r=0.420, p<.05), autonomy (r=0.391, p<.05) and relatedness (r=0.309, p<.05).

**Figure 43: Survey 3 overall findings**




Whilst most results are quite similar to the earlier findings of Project Two, previous research did not test for correlation between context and Lean approach behaviour, as the departments involved claimed they were all actively participating in Lean activities. These findings indicate not only a distal influence of context through amotivation and RAI2, but also a potentially significant direct influence (r=0.423/ 0.268, p<.05), providing further indication that more open environments support Lean engagement behaviour. This section has identified relationships in the overall data, the next section considers similarities and differences in those active in Lean and those not active.

### 6.3.3 Findings on active and not-active respondents

**Table 48: Averages for active and not-active respondents**

| | Active | | | Not Active | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | +RAI | -RAI | Total | +RAI | -RAI | Total | +RAI | -RAI | Total |
| N | 165 | 37 | 202 | 71 | 55 | 126 | 236 | 92 | 328 |
| ***Mean*** | | | | | | | | | |
| Context | 81.5 | 59.8 | 77.6 | 70.5 | 63.6 | 67.5 | 78.2 | 62.1 | 73.7 |
| Competence | 5.2 | 4.3 | 5.1 | 5.0 | 4.8 | 4.9 | 5.2 | 4.6 | 5.0 |
| Autonomy | 5.0 | 3.9 | 4.8 | 4.6 | 4.1 | 4.4 | 4.9 | 4.0 | 4.7 |
| Relatedness | 5.4 | 4.5 | 5.2 | 5.1 | 5.0 | 5.1 | 5.3 | 4.8 | 5.2 |
| Amotivation | 2.1 | 4.3 | 2.5 | 2.5 | 4.5 | 3.4 | 2.2 | 4.4 | 2.8 |
| RAI2 | 8.8 | -4.4 | 6.3 | 4.7 | -4.9 | .5 | 7.5 | -4.7 | 4.1 |
| ***Median*** | | | | | | | | | |
| Context | 85.0 | 65.0 | 82.0 | 68.0 | 66.0 | 67.0 | 83.0 | 65.5 | 78.0 |
| Competence | 5.3 | 4.3 | 5.2 | 5.2 | 4.7 | 5.0 | 5.3 | 4.5 | 5.2 |
| Autonomy | 5.1 | 4.0 | 5.0 | 4.7 | 4.0 | 4.4 | 5.0 | 4.0 | 4.9 |
| Relatedness | 5.4 | 4.5 | 5.3 | 5.0 | 5.3 | 5.1 | 5.4 | 5.0 | 5.3 |
| Amotivation | 2.0 | 4.0 | 2.3 | 2.3 | 4.3 | 3.3 | 2.0 | 4.2 | 2.7 |
| RAI2 | 8.3 | -3.4 | 7.2 | 4.0 | -3.3 | 1.0 | 7.0 | -3.4 | 4.0 |
| ***SD*** | | | | | | | | | |
| Context | 15.699 | 20.913 | 18.713 | 18.552 | 19.597 | 19.253 | 17.320 | 20.108 | 19.517 |
| Competence | 0.890 | 0.726 | 0.942 | 0.866 | 0.860 | 0.867 | 0.889 | 0.843 | 0.916 |
| Autonomy | 0.797 | 1.029 | 0.943 | 0.896 | 1.123 | 1.025 | 0.846 | 1.085 | 0.994 |
| Relatedness | 0.832 | 1.024 | 0.926 | 0.899 | 0.965 | 0.925 | 0.861 | 1.017 | 0.927 |
| Amotivation | 0.859 | 1.345 | 1.283 | 0.881 | 1.298 | 1.475 | 0.887 | 1.316 | 1.429 |
| RAI2 | 5.012 | 4.057 | 7.039 | 3.482 | 4.545 | 6.203 | 4.960 | 4.338 | 7.293 |

**KEY**
+RAI: positive influencing contingencies
-RAI: Negative influencing contingencies

Data reveals four groupings regarding active-not-active response groups, when considered from their motivational response, reflected in positive or negative RAI2. The following analysis first considers active versus not-active responses, then positive versus negative RAI2 and finally the differences between positive and negative groups within active and not-active populations.

**Table 49: Significance of key variable variance active versus not-active**

**Survey 3: Test Statistics for Active vs Not Active (N=328)[a]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 8669.000 | 11282.000 | 9564.000 | 11612.500 | 7764.500 | 6626.500 |
| Wilcoxon W | 16670.000 | 19283.000 | 17565.000 | 19613.500 | 28267.500 | 14627.500 |
| Z | -4.858 | -1.730 | -3.788 | -1.334 | -5.964 | -7.302 |
| Asymp. Sig. (2-tailed) | .000 | .084 | .000 | .182 | .000 | .000 |

a. Grouping Variable: Active in lean

*Active versus not-active*: A Mann-Whitney test (Table 49) reveals significant variance across all variables between these categories, with very significant variance found for context (z=-4.858, p<.05), competence (z=-1.730, p<.05), autonomy (z=-3.788, p<.05), relatedness (z=-1.334, p<.05), amotivation (z=-5.964, p<.05) and RAI2 (z=-7.302, p<.05).

**Table 50: Significance of key variable variance between positively motivated active and not-active**

**Survey 3: Test statistics for +RAI Active vs Not Active (n=236)[a]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 3848.500 | 4842.000 | 4241.000 | 4809.500 | 4137.500 | 3017.000 |
| Wilcoxon W | 6404.500 | 7398.000 | 6797.000 | 7365.500 | 17832.500 | 5573.000 |
| Z | -4.178 | -2.114 | -3.365 | -2.181 | -3.605 | -5.906 |
| Asymp. Sig. (2-tailed) | .000 | .035 | .001 | .029 | .000 | .000 |

a. Grouping Variable: Active in lean

*Positive versus negative motivation (RAI2)*: A Mann-Whitney test (Table 50) reveals significant variance across all variables between these categories, with very significant variance found for context (z=-4.178, p<.05), competence (z=-2.114, p<.05), autonomy (z=-3.365, p<.05), relatedness (z=-2.181, p<.05), amotivation (z=-3.605, p<.05) and RAI2 (z=-5.906, p<.05).

**Table 51: Significance of key variable variance between positively and negatively motivated active respondents**

**Survey 3: Test Statistics for Active + RAI vs -RAI (N=202)[a]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 1192.500 | 1166.500 | 1160.000 | 1570.500 | 463.500 | .000 |
| Wilcoxon W | 1895.500 | 1869.500 | 1863.000 | 2273.500 | 14158.500 | 703.000 |
| Z | -5.790 | -5.876 | -5.895 | -4.615 | -8.106 | -9.499 |
| Asymp. Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | .000 |

a. Grouping Variable: Contingency

Within the active population, *positive versus negative RAI2*: A Mann-Whitney test (Table 51) reveals significant variance across all variables between these categories, with very significant variance found for context (z=-5.790, p<.05), competence (z=-5.876, p<.05), autonomy (z=-5.895, p<.05), relatedness (z=-4.615, p<.05), amotivation (z=-8.106, p<.05) and RAI2 (z=-9.499, p<.05).

**Table 52: Significance of key variable variance between positively and negatively motivated not-active respondents**

**Survey 3: Test Statistics for Not-Active +RAI vs -RAI (n=126)[a]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 1575.500 | 1673.500 | 1422.500 | 1952.000 | 336.500 | .000 |
| Wilcoxon W | 3115.500 | 3213.500 | 2962.500 | 4508.000 | 2892.500 | 1540.000 |
| Z | -1.855 | -1.374 | -2.609 | -.002 | -7.977 | -9.605 |
| Asymp. Sig. (2-tailed) | .064 | .169 | .009 | .998 | .000 | .000 |

a. Grouping Variable: Contingency

**Table 53: Significance of key variable variance between negatively motivated active and not-active respondents**

**Survey 3: Test Statistics for -RAI Active vs Not Active (N=92)[a]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 924.000 | 681.500 | 914.500 | 704.500 | 907.500 | 982.500 |
| Wilcoxon W | 1627.000 | 1384.500 | 1617.500 | 1407.500 | 1610.500 | 2522.500 |
| Z | -.745 | -2.680 | -.821 | -2.494 | -.880 | -.279 |
| Asymp. Sig. (2-tailed) | .456 | .007 | .411 | .013 | .379 | .780 |

a. Grouping Variable: Active in lean

Within the not-active population, *positive versus negative RAI2*: A Mann-Whitney (Table 52) test reveals significant variance across only autonomy ($z=-2.609$, $p<.05$), amotivation ($z=-7.977$, $p<.05$) and RAI2 ($z=-9.605$, $p<.05$). Context, relatedness and competence were all found to be non-significant. As all variables differed for the active RAI+ versus RAI- test, a further Mann-Whitney test (Table 53) considered active RAI- against not-active RAI-, finding only competence ($z=-2.680$, $p<.05$) and relatedness ($z=-2.494$, $p<.05$) with significant variance to each other, with both variables having a lower mean score for active, than not-active (competence 4.3 v 4.8, relatedness 4.5 v 5.0). With active RAI- results being statistically similar to the not-active RAI-, these data are treated as the same for the rest of the analysis, that is, the active RAI- treated as not-active data.

Finally, for active and not-active RAI+ groups, Mann-Whitney tests revealed significant difference across all variables, including context ($z=-4.782$, $p<.05$), competence ($z=-3.130$, $p<.05$), autonomy ($z=-4.287$, $p<.05$), relatedness ($z=-3.074$, $p<.05$), amotivation ($z=-4.426$, $p<.05$) and RAI2 ($z=-7.420$, $p<.05$). When tested against not-active RAI-, only autonomy ($z=-2.609$, $p<.05$), amotivation ($z=-7.977$, $p<.05$) and RAI2 ($z=-9.605$, $p<.05$) indicated significant variance. Therefore not-active RAI- data remains within the not-active population, resulting in a dataset of active 165 (202-37) and not-active 163 (126+37).

**Table 54: Significance of key variable variance between positively motivated active and not-active respondents**

**Survey 3: RAI+ Active vs Not-Active test Statistics[a]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 2769.000 | 3464.500 | 2978.500 | 3487.500 | 2933.500 | 1659.000 |
| Wilcoxon W | 4539.000 | 5234.500 | 4748.500 | 5257.500 | 16136.500 | 3429.000 |
| Z | -4.782 | -3.130 | -4.287 | -3.074 | -4.426 | -7.420 |
| Asymp. Sig. (2-tailed) | .000 | .002 | .000 | .002 | .000 | .000 |

a. Grouping Variable: Active in lean

**Table 55: Significance of variance for not-active positively motivated compared to negatively motivated participants**

**Survey 3: Test Statistics for Not-Active +RAI vs -RAI (n=126)[a]**

| | Context | Competence | Autonomy | Relatedness | Amotivation | RAI2 |
|---|---|---|---|---|---|---|
| Mann-Whitney U | 1575.500 | 1673.500 | 1422.500 | 1952.000 | 336.500 | .000 |
| Wilcoxon W | 3115.500 | 3213.500 | 2962.500 | 4508.000 | 2892.500 | 1540.000 |
| Z | -1.855 | -1.374 | -2.609 | -.002 | -7.977 | -9.605 |
| Asymp. Sig. (2-tailed) | .064 | .169 | .009 | .998 | .000 | .000 |

a. Grouping Variable: Contingency

The following charts (Figure 44) illustrate the relationship, by variable, between active and not-active engagement across organisational levels. Mann-Whitney tests for variances between manager and subordinate experience within active and not-Active categories revealed no significant variances between manager and staff variables for the engaged category, finding variance in context ($z=-1.542$, $p<.05$), competence ($z=-2.526$, $p<.05$), autonomy ($z=-2.326$, $p<.05$), amotivation ($z=-2.939$, $p<.05$) and RAI2 ($z=-3.166$, $p<.05$), with no variance found for relatedness. These findings indicate that active managers and staff have similar histories, at least statistically, whilst there is greater differentiation in experience between managers and staff within the not-active category. The findings so far indicate that active Lean/TQM respondents report a higher level experience of their immediate manager, indicating lower amotivation and higher motivation towards Lean/TQM. Whilst active managers report similar levels of competence and relatedness to their not-active peers, staff report higher levels than their peers.

**Figure 44: Survey 3: Key variable results**

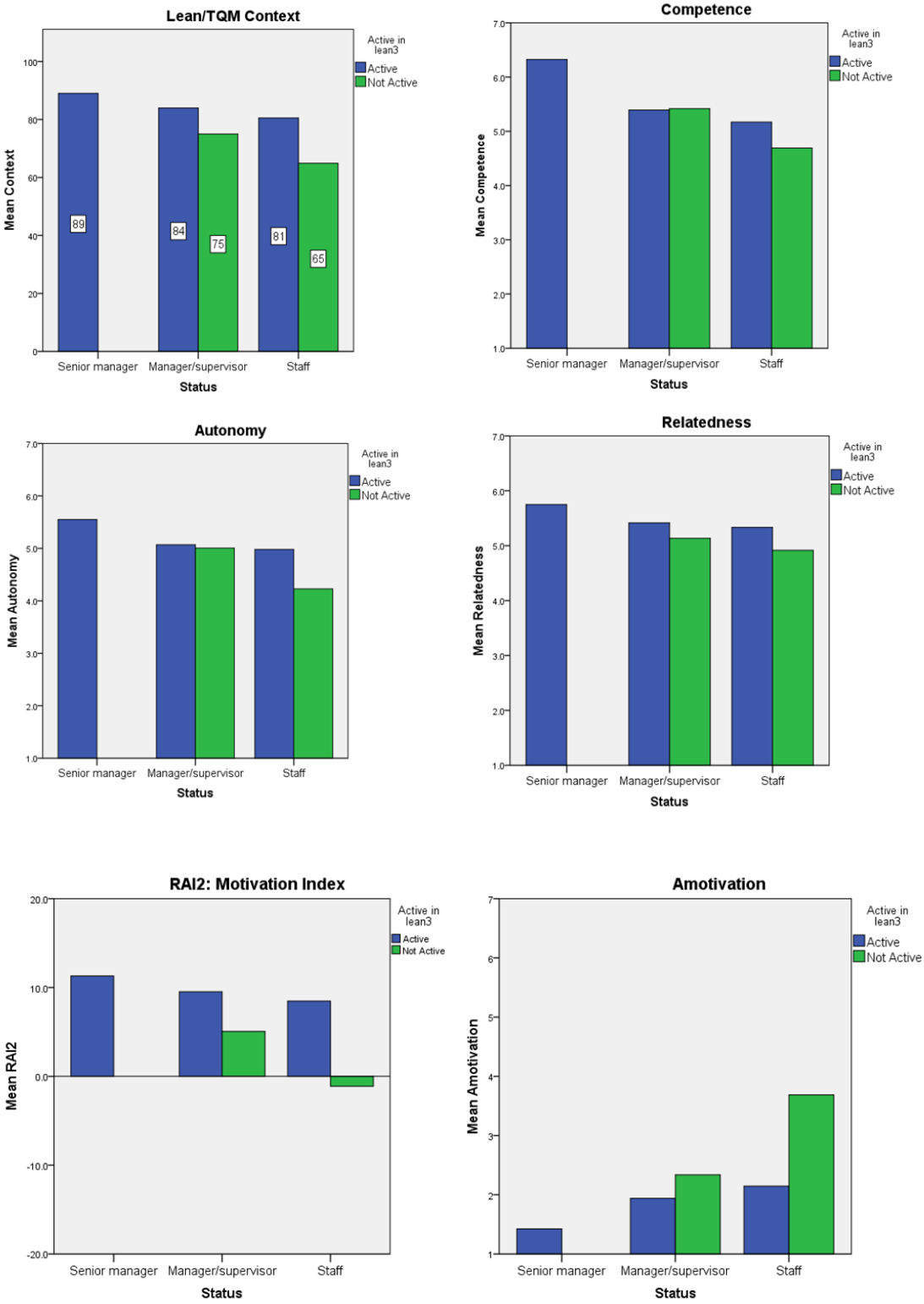


Table 56 below reflects the amended data, the basis for the next stage of analysis which is to predict Lean/TQM engagement, by first identifying the key variables influencing engagement.

**Table 56: Averages for positive and negative motivation (RAI2)**

| | Active | Not Active | | | Total | | |
|---|---|---|---|---|---|---|---|
| | +RAI | +RAI | -RAI | Total | +RAI | -RAI | Total |
| N | 165 | 71 | 92 | 163 | 236 | 92 | 328 |
| ***Mean*** | | | | | | | |
| Context | 81.5 | 70.5 | 62.1 | 65.6 | 78.2 | 62.1 | 73.7 |
| Competence | 5.2 | 5.0 | 4.6 | 4.7 | 5.2 | 4.6 | 5.0 |
| Autonomy | 5.0 | 4.6 | 4.0 | 4.3 | 4.9 | 4.0 | 4.7 |
| Relatedness | 5.4 | 5.1 | 4.8 | 4.9 | 5.3 | 4.8 | 5.2 |
| Amotivation | 2.1 | 2.5 | 4.4 | 3.6 | 2.2 | 4.4 | 2.8 |
| RAI2 | 8.8 | 4.7 | -4.7 | -.7 | 7.5 | -4.7 | 4.1 |
| ***Median*** | | | | | | | |
| Context | 85.0 | 68.0 | 65.5 | 66.0 | 83.0 | 65.5 | 78.0 |
| Competence | 5.3 | 5.2 | 4.5 | 4.8 | 5.3 | 4.5 | 5.2 |
| Autonomy | 5.1 | 4.7 | 4.0 | 4.3 | 5.0 | 4.0 | 4.9 |
| Relatedness | 5.4 | 5.0 | 5.0 | 5.0 | 5.4 | 5.0 | 5.3 |
| Amotivation | 2.0 | 2.3 | 4.2 | 3.3 | 2.0 | 4.2 | 2.7 |
| RAI2 | 8.3 | 4.0 | -3.4 | -.9 | 7.0 | -3.4 | 4.0 |
| ***SD*** | | | | | | | |
| Context | 15.70 | 18.55 | 20.11 | 19.72 | 17.32 | 20.11 | 19.52 |
| Competence | 0.89 | 0.87 | 0.84 | 0.87 | 0.89 | 0.84 | 0.92 |
| Autonomy | 0.80 | 0.90 | 1.09 | 1.04 | 0.85 | 1.09 | 0.99 |
| Relatedness | 0.83 | 0.90 | 1.02 | 0.97 | 0.86 | 1.02 | 0.93 |
| Amotivation | 0.86 | 0.88 | 1.32 | 1.49 | 0.89 | 1.32 | 1.43 |
| RAI2 | 5.01 | 3.48 | 4.34 | 5.97 | 4.96 | 4.34 | 7.29 |

**KEY**

+RAI: positive influencing contingencies

-RAI: Negative influencing contingencies

## 6.4 Predicting Lean Engagement

This section considers the key variables influencing Lean/TQM engagement. The research findings so far indicate that context positively relates to competence, relatedness, autonomy and motivation (RAI2) and negatively relates to amotivation. This analysis has two stages: the first uses simple and hierarchical regression to test the relation between key variables other than active/not-active and the second uses logistical regression to establish a predictive model for Lean/TQM engagement.

### 6.4.1 Stage 1: Explaining variance

**Table 57: Survey 3 hierarchical regression step findings**

| Overall: RAI2 (Motivation) | | | | Amotivation | | |
|---|---|---|---|---|---|---|
| | *B* | *SE B* | *β* | *B* | *SE B* | *β* |
| Step 1 | | | | | | |
| Constant | 4.14 | 1.67 | | 2.78 | 0.30 | |
| Age | -0.15 | 0.04 | -.21* | 0.03 | 0.01 | .20* |
| Status | 5.57 | 0.79 | .32* | -1.02 | 0.13 | -.30* |
| Step2 | | | | | | |
| Constant | -7.14 | 2.33 | | 4.71 | 0.46 | |
| Age | -0.11 | 0.04 | -.14* | 0.02 | 0.01 | .15* |
| Status | 4.14 | 0.85 | .24* | -0.78 | 0.14 | -.23* |
| Context | 0.15 | 0.02 | .39* | -0.03 | 0.00 | -.34* |
| Step3 | | | | | | |
| Constant | -10.29 | 2.55 | | 5.73 | 0.50 | |
| Age | -0.99 | 0.04 | -.14* | 0.02 | 0.01 | .14* |
| Status | 3.90 | 0.84 | .22* | -0.66 | 0.13 | -.19* |
| Context | 0.09 | 0.03 | .25* | -0.02 | 0.01 | -.22* |
| Autonomy | 1.53 | 0.56 | .21* | -0.36 | 0.11 | -.23* |
| Note: $R^2$ = .13 for step 1; $R^2$ =.14 for step 2; $R^2$ =.02 for step 3 (ps < .01). * p < .01 | | | | Note: $R^2$ = .12 for step 1; $R^2$ =.11 for step 2; $R^2$ =.03 for step 3 (ps < .01). * p < .01 | | |

To test the influence of context, competence, autonomy and relatedness on motivation and amotivation, a hierarchical regression controlling for age, status and gender in step 1, introduced context in step 2 and competence, relatedness and autonomy in step 3. Bootstrapping was used to normalise the non-parametric data (Field, 2009), testing for colinearity (VIF) and confidence intervals. Gender, relatedness and competence indicated insignificant (p>.05) results, with the key findings in Table 57 above indicating age (β=-.14, p<.05), status (β=.22, p<.05), context (β=.25, p<.05) and autonomy (β=.21, p<.05) having significant influence in explaining variance in motivation. A Mann-Whitney test reveals no significant variances between managers/supervisors and staff active in Lean, but very significant variance in all variables to staff not-active. To avoid the distorting effects of status the remaining analysis concentrates on staff level responses as indicated below.

**Table 58: Regression of age and context on CAR variables**

| *Staff* | Competence | | | Autonomy | | | Relatedness | | |
|---|---|---|---|---|---|---|---|---|---|
| | ***B*** | ***SE B*** | ***β*** | ***B*** | ***SE B*** | ***β*** | ***B*** | ***SE B*** | ***β*** |
| <u>Step 1</u> | | | | | | | | | |
| Constant | 5.51 | 0.23 | | 5.42 | 0.27 | | 3.42 | 0.25 | |
| Age | -0.01 | 0.01 | -.16* | -0.02 | 0.01 | -.20* | - | - | - |
| Context | | | | | | | 0.02 | 0.00 | .49* |
| <u>Step2</u> | | | | | | | | | |
| Constant | 3.19 | 0.32 | | 2.28 | 0.31 | | | | |
| Age | -0.01 | 0.01 | -.06* | -0.01 | 0.01 | -.07* | N/A | N/A | N/A |
| Context | 0.03 | 0.00 | .58* | 0.04 | 0.00 | .69* | | | |
| | Note: $R^2$ = .03 for step 1; $R^2$ =.32 for step 2 (ps < .01). * p < .01 | | | Note: $R^2$ = .04 for step 1; $R^2$ =.46 for step 2 (ps < .01). * p < .01 | | | Note: $R^2$ = .24 (ps < .01). * p < .01. N/A = Not applicable | | |

Age ($R^2$=.03) and context ($\Delta R^2$=.32) explained 35% of the variance in competence. Age ($R^2$=.04) and context ($\Delta R^2$=.46) explained 50% of the variance in autonomy. Finally, context ($R^2$=.24) and not age significantly explained the variance in relatedness. The significance of climate's influence is included in Figure 44.

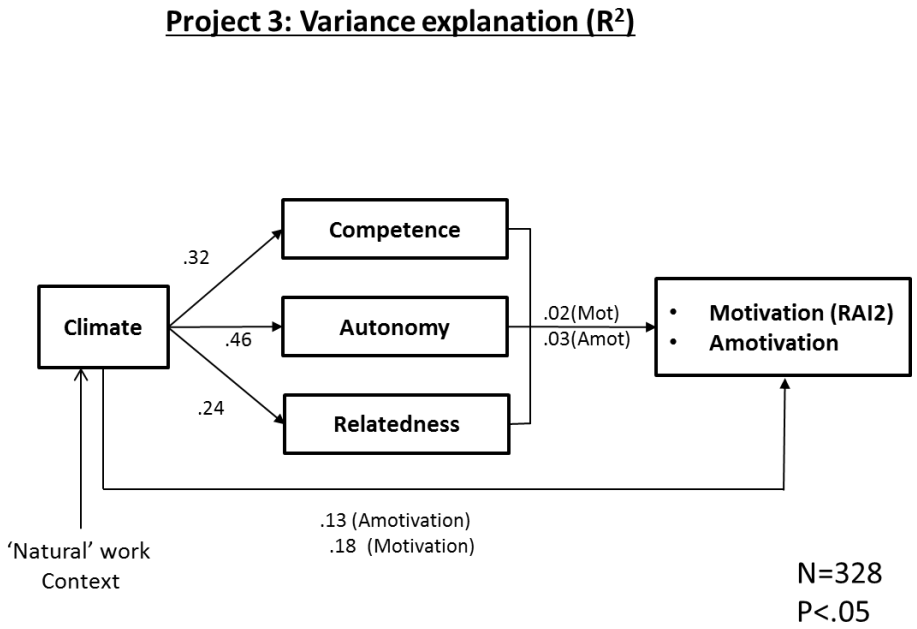
**Table 59: Hierarchical regression of age, context and CAR variables on motivation and amotivation**

| ***Staff (N=271)*** | RAI2 (Motivation) | | | Amotivation | | |
|---|---|---|---|---|---|---|
| | ***B*** | ***SE B*** | ***β*** | ***B*** | ***SE B*** | ***β*** |
| <u>Step 1</u> | | | | | | |
| Constant | 10.65 | 1.87 | | 1.49 | 0.39 | |
| Age | -0.18 | 0.05 | -.25* | .04 | 0.01 | .25* |
| <u>Step2</u> | | | | | | |
| Constant | -3.24 | 2.75 | | 3.86 | 0.52 | |
| Age | -0.12 | 0.04 | -.20* | 0.03 | 0.01 | -.18* |
| Context | 0.16 | 0.02 | .43* | -0.03 | 0.00 | .37* |
| <u>Step3</u> | | | | | | |
| Constant | -6.68 | 3.07 | | 4.64 | 0.57 | |
| Age | -0.11 | 0.04 | -.15* | 0.24 | 0.01 | .16* |
| Context | 0.11 | 0.03 | .29* | -0.02 | 0.01 | .20* |
| Autonomy | 1.51 | 0.60 | .21* | -0.35 | 0.11 | .24* |
| | Note: $R^2$ = .06 for step 1; $R^2$ =.18 for step 2; $R^2$ =.02 for step 3 (ps < .01). * p < .01 | | | Note: $R^2$ = .06 for step 1; $R^2$ =.13 for step 2; $R^2$ =.03 for step 3 (ps < .01). * p < .01 | | |

The next test focused on establishing the respective influence of context, competence, autonomy and relatedness on motivation and amotivation. Bootstapped hierarchical regression tests identified age as negatively affecting both motivation and amotivation ($R^2$=.06). Climate, or context, ($\Delta R^2$=.18) and autonomy

($\Delta R^2$=.02) are significant in explaining variance in motivation (RAI2). Similarly, climate ($\Delta R^2$=.13) and autonomy ($\Delta R^2$=.03) are significant in explaining variance in amotivation. Overall, these findings indicate that changes in climate explain significant, although somewhat modest, variance in respondent motivation and amotivation. Competence and relatedness indicate insignificant influence. The next stage considers influence on active/not-active behaviour.

**Figure 45: Variance explanation ($R^2$)**




Note: Age influences Competence 3%, Autonomy 4%, Motivation/Amotivation 6%.

### 6.4.2 Stage 2: Predicting active Lean engagement

This stage sought to identify the most significant influences on Lean/TQM engagement, using logistic regression tests with active/not-active as the dependent variable. The predictive variables were entered hierarchically in the order of context, competence, autonomy and relatedness as the next stage, with amotivation and RAI2 entered in the third stage. The model was run twice, with the first run identifying competence, autonomy and relatedness as either failing the confidence interval test or having explanatory insignificance. This run also identified a number of outliers (19) excluded in the second run. The second run, predicting context and RAI2 as having significant impact on Lean/TQM active engagement, offered the following model:

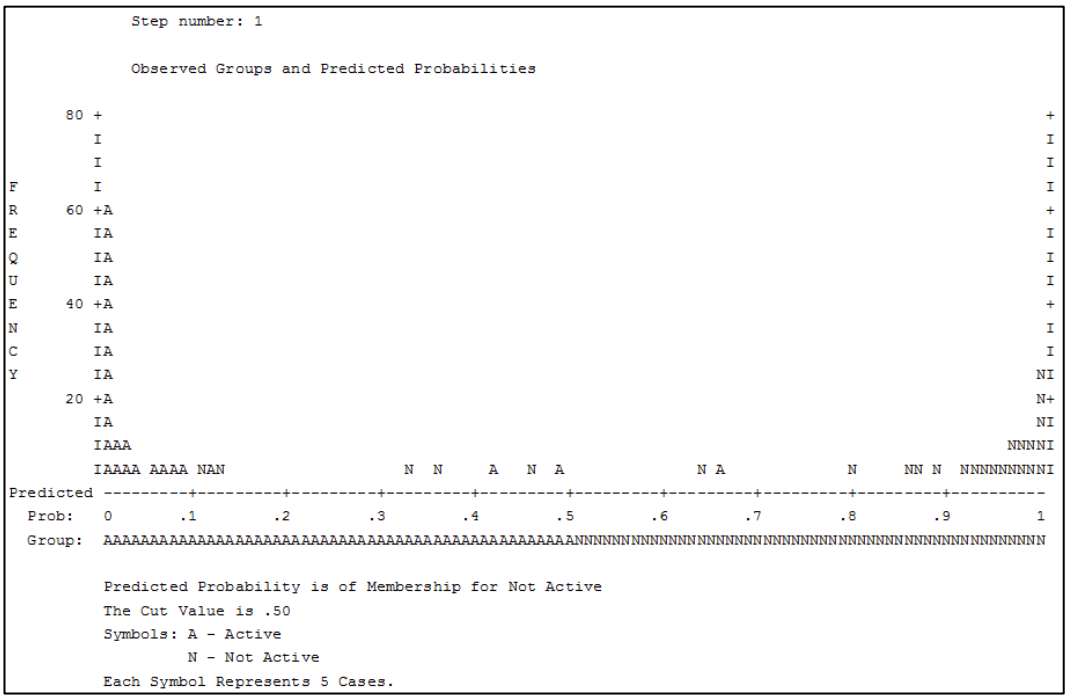
**Table 60: Predictive model for Lean/TQM engagement**

| | B (SE) | Lower | Exp b | Upper |
|---|---|---|---|---|
| Included | | | | |
| Constant | -5.092 | | 0.006 | |
| | (0.956) | | | |
| Context | 0.045 | 1.022 | 1.046 | 1.070 |
| | (0.012) | | | |
| RAI2 | 0.491 | 1.448 | 1.635 | 1.845 |
| | (0.062) | | | |

Note: $R^2$ = 0.31 (Hosmer- Lemeshow), 0.57 (Cox-Snell), 0.75 (Nagelkerke).
Format based on Field (2009).

Block 0 of the analysis indicated that the constant predicted 52% of outcomes, Block 1 indicated context and constant predicted 73% of outcomes, Block 2 with the inclusion of RAI2 increased prediction to 84% at 95% confidence. The following chart visualises the predicted probabilities providing visual support to model fit.

**Figure 46: Logistic regression chart of observed and predicted probabilities**



## 6.5 Discussion and Summary

This project has established the relative importance of context (exp b=1.047) and motivation quality (RAI2) (exp b=1.64) as significant influences impacting on Lean/TQM active engagement, the identification of these factors consonant with findings during Project One and Project Two. Of interest here is the lack of significance regarding 'needs' variables, competence autonomy and relatedness. Whilst these variables certainly increase as a result of intervention, as in Project Two, they do not appear to have direct influence on Lean/TQM engagement. Context does, however, have significant influence on changes in CAR, consistent with prior research (Baard et al., 2004; Deci et al., 2001; Van den Broeck et al., 2010), and when not controlled for competence ($t=2.72$, $p<.01$) and autonomy ($t=4.287$, $p<.01$) significantly regress on RAI2, explaining circa 20% of the change in motivation, similar to overall findings for context and autonomy established in this analysis. However, in this case it appears that it is context that explains the variance in competence and autonomy. It is also noted that other research, Kovjanic et al. (2012) for example, finds that competence, autonomy and relatedness directly influence the dependent variable, which in Kovjanic et al.'s (2012) example was on employee commitment and self-efficacy with 'transformational leadership' being the control variable. Further research can establish the reliability of this research's findings in this regard.

## 6.6 Summary and Conclusions

In summary, this project has, through regression analysis on the wider organisation population, established the importance of supportive climate and positive motivation in engaging both workers and managers in Lean/TQM, supporting hypotheses H7 and H8. Although the results found significant, yet modest, influence of autonomy on motivation, competence and relatedness were not significant. H8 is therefore not supported by these findings. The results also illustrate that motivation and climate are necessary to engage staff, as positively engaged employees found to be inactive in Lean reported lower levels of context than their active colleagues. (Note that they also reported lower average motivation, albeit positive.) The results also indicate no statistically significant variance across all variables, when comparing active managers to active staff, suggesting the importance of a mutually supportive environment for Lean engagement that positively reinforces both manager and subordinate.

With only circa 20% of motivation explained by context, further research could consider not only mutually respective leader behaviours but also how such behaviour is applied. For example, questions could consider how well managers help subordinates to connect to meaningful projects or activities. They could also consider prior experience of Lean/TQM, as positive learning history can positively align a subordinate or manager with the current initiative. This will be picked up in the next chapter, as this chapter concludes with finding support for the hypothesis that more open environments lead to higher engagement in Lean/TQM, thereby supporting the wider question on Lean/TQM supportive behaviour. Mutually supportive manager-subordinate behaviour that circumscribes context to provide mutual reinforcement, appears consistent with RfP principles.

| ***Research Hypotheses*** | |
|---|---|
| H1 | Higher supportive listening behaviour leads to higher reported managerial work climate |
| H2 | Higher reported managerial work climate relates to higher reported CAR |
| H3 | Subordinates reporting to supervisors trained in supportive listening report higher work climate and CAR than those reporting to untrained supervisors |
| H4 | Subordinate perceptions of work climate and CAR increase over time when exposed to supportive listening |
| H5 | Subordinates reporting to supervisors trained in supportive listening perceive higher quality engagement in Lean/TQM than those reporting to untrained supervisors |
| H6 | Quality of motivation (RAI2) improves over time for subordinates with mutually supportive supervisors |
| H7 | Work climate has significant impact on active Lean engagement |
| H8 | CAR has significant impact on active Lean engagement |
| H9 | RAI2 has significant impact on active Lean engagement |

# Chapter Seven: Discussion of Research Contribution

This chapter brings together chapters two through to six, discussing the project findings in relation to the theoretical and practice considerations of this research. Starting with a summary of the research, the chapter considers its theoretical contributions before concluding with a discussion on its implications for practice.

## 7.1 Summary of Projects

This research has demonstrated the positive impact of mutually supportive leader behaviour on subordinate Lean/TQM approach behaviour. Projects one and two followed a process of understanding others first, creating joint understanding, then moving to action, a process based on active listening principles (Hoppe, 2007) and suggested by this researcher to be consistent with RfP (Emiliani, 1998*,* 2003*;* Emiliani and Emiliani, 2013; Emiliani and Stec, 2005) and OL principles (Jones, 1996). Project One focused on understanding using the BPM to gain insight into respondent context and reinforcement history. Through interviews and workshops supporting this process, a number of themes emerged relating to personal and group relations, as well as opportunities for improving organisational processes.

The learning gained from Project One formed the basis for Project Two, which focused on creating a mutually supportive environment to develop ideas into commonly beneficial concepts (joint understanding) through to implementation (move to action). The physical, temporal, social and rule-governed aspects of the engagement context were considered by this researcher who acted as facilitator to the group of participants. Appropriate time and place for meetings decided by the participants was supplemented by active listening and mutuality support concepts, introduced through participant training sessions to help overcome a history of relational conflict and poor meeting discipline. Mutuality support, introduced to represent the RfP principle (Emiliani, 2003), provided informational reinforcement on relational behaviour (Foxall, 1998) to help participants become aware of behavioural impact and circumscribe their behaviour towards mutual support (Foxall, 1999), thereby reducing relational waste (Emiliani, 1998). The researcher modelled supportive relational behaviour focused on both the functional and symbolic aspects of engagement, assisting participants in maintaining balanced and comprehensive input, as well as helping them to overcome obstacles during meetings and identify and assign tasks for action between meetings.

Project Two was successful not only in delivering process improvement but also in increasing participant perceptions of their motivation, competence, autonomy and relatedness; all reporting a very significant increase in supportive climate. The results from the three surveys involved in Project Two support the hypotheses that supportive managers trained in active listening have subordinates who report more supportive work climate (H1), higher competence (H2), higher relatedness (H4), higher autonomy (H6) and higher motivation (H8). In addition, these variables increased between surveys one to three, thus supporting H3, H5, H7 and H9, which predicted that these variables would increase over time. These results are consistent with the cross-sectional studies performed by Baard et al. (2004), Deci et al. (2001) and Van den Broeck et al. (2010), extending them by indicating that work climate has continued effect over time and also in finding correlation with motivation. The other studies considered impact on well-being and task autonomy.

Project Three, based on a cross-sectional study of the wider organisation (n=328), introduced a novel variable relating to Lean/TQM engagement. This dichotomous variable identified whether a respondent was ‘active’ or ‘not-active’ in Lean. Predicting that active respondents report higher on all variables than not-active ones, the results supported this prediction. The data indicated four forms of engagement: positively motivated (RAI+) active, negatively motivated (RAI-) active, positively motivated not-active and negatively motivated not-active. Mann-Whitney tests revealed no statistical difference between the negatively motivated active and negatively motivated not-active groups, indicating other influences beyond the scope of this research. Regression analysis firstly tested the link between work climate and CAR, finding significant work climate influence on these variables. Hierarchical regression controlling for work climate, tested the influence of CAR on RAI2/amotivation, finding a small significant influence of circa 3%, work climate accounting for circa 18% and age 6%. A supportive climate is regularly found to relate to more autonomous motivation, through perceived autonomy support (Deci and Ryan, 1980, 2002; Gagné, 2003; Gagné et al., 1997; Lam and Gurland, 2008; Millette and Gagné, 2008), however this research finds a much stronger link to work climate than the autonomy variable. Overall, age, work climate and the needs variables, explain 26% of the variance in motivation, which whilst significant leaves a substantial part of motivation unexplained. Project Two’s small dataset for the final survey (n=30) does not lend itself to regression analysis, but indicates a very strong correlation ($r=0.745$, $p<.05$) for work climate and RAI2. One possible explanation for this is that supportive behaviour within the participant group led to higher connection

with reinforcing contingencies, in comparison to behaviour that focuses on autonomy support alone. Whilst further research is required empirically to test this hypothesis, this researcher observed high levels of engagement from participants able to engage in a personally worthwhile project. SDT focuses on creating environments that provide responsible choice and options to promote perceptions of autonomy and generate positive engagement. Using supportive listening behaviour to understand the participants' history and gain insight into contingencies that can positively influence them, this approach moves beyond providing choice to one that actively supports participants in achieving outcomes of mutual benefit.

### 7.2 Conceptual Contribution

Foxall (2007a) argues that understanding complex behaviour, especially where history is not immediately available, requires appropriate use of intentional methods. Applying the BPM framework to gain a qualitative understanding of respondent learning history proved a useful way to identify many of the issues and opportunities existing in the organisational Lean/TQM environment, providing valuable insight upon which an organisational intervention was developed (Project Two). Considering organisational and interpersonal relations from a bilateral and, in particular, mutuality perspective (Foxall, 1999; Harris and Harris, 1995) provided an underlying principle upon which a supportive active listening process (Hoppe, 2007) was introduced to create a work climate (Baard et al., 2004) conducive to collaborative Lean/TQM engagement (Emiliani, 1998; Jones, 1996). To measure the impact of supportive behaviour on participants' learning history, measures for work climate (Baard et al., 2004), CAR (Deci and Ryan, 2000) and motivation (RAI), adapted from Ryan and Connell (1989), provided a basis for empirically testing participant learning. The impact of this approach is illustrated in Table 62 below.

The participant group involved in Project Two's process intervention reported significant improvement ($p<.05$) between the start of the intervention (Survey 1) and its implementation (Survey 3) across all variables. Improvement for context (22%), competence (32%), autonomy (39%), relatedness (25%), amotivation (-64%) and RAI2 or motivation (106%) illustrates the change that the participants experienced from this intervention. Of particular note is the relative change in motivation and amotivation for this group. Applying the BPM to gain understanding of participants' situation and history during Project One provided valuable insight into the engagement landscape (situation), assisting facilitation during Project Two.

Focusing on mutuality as a guiding principle in Project Two enhanced active listening and provided the focus for listening and associated behaviour. This was particularly important for circumscribing inter-departmental behaviour towards achieving common understanding and common agreement on a mutually beneficial project. History regularly played out in the early meetings, resulting in wasteful behaviour. Introducing participants to mutuality principles and basic listening skills, supported by a project of high individual and group importance, had a visible impact on participant behaviour. The BPM and mutuality principles complement supportive work climate behaviours, extending the concept of autonomy support, as provision of subordinate choice and options, common to SDT (Deci and Ryan, 2002), actively connect subordinates to meaningful contingencies. This extended conceptualisation considers supportive environments as promoting autonomous choice based on principles of mutual respect and common interest.

**Table 61: Comparison of active respondents to Project Two participants**

| | *Project 3 Active* | *Project 2 participants* | | *Project2 % Difference* | | |
|---|---|---|---|---|---|---|
| | | *S1* | *S3* | *S1-S3* | *S1 vs Project3* | *S3 vs Project3* |
| ***N*** | 162 | 7 | 7 | | | |
| ***Context*** | 82.4 | 82.9 | 101.0 | 22% | 1% | 23% |
| ***Competence*** | 5.3 | 4.9 | 6.5 | 32% | -6% | 24% |
| ***Autonomy*** | 5.0 | 4.7 | 6.5 | 39% | -7% | 30% |
| ***Relatedness*** | 5.4 | 5.1 | 6.4 | 25% | -4% | 19% |
| ***Amotivation*** | 2.1 | 2.9 | 1.0 | -64% | 39% | -49% |
| ***RAI2*** | 9.0 | 5.3 | 10.8 | 106% | -42% | 20% |

Mean values, S1 = Survey 1, S 3= Survey 3

Comparing the Project Two participants to the active respondents of Project Three indicates these comparative groups experiencing similar context (work climate) prior to the research intervention (Project Two S1). This is the only similarity as S1 indicates higher amotivation (39%), marginally lower CAR (average 6%) and 42% lower motivation. This sizeable gap in motivation is indicative of the participants' low quality engagement in Lean/TQM as reported in Project One. The BPM framework facilitated reconnecting participants with an important, although initially poorly-defined, opportunity for improvement. The S3 results indicate the impact of engagement highlighting circa 20% higher motivation for the participant group in comparison to active respondents, this improvement was also reflected in context (23%) and the needs variables. Project Three identifies, through logistic regression, the two explanatory variables that significantly impact on Lean/TQM active engagement as context and motivation (RAI2). Each unit increase in context

increases the odds of an employee engaging in Lean by 4.7%, each unit change in motivation increasing odds by 64%. Regression analysis also indicates that context explains circa 20% of changes in motivation, with age and needs accounting for circa 5%. Therefore, 75% of motivational change is unaccounted for by change in context or work climate measure. One possible explanation for this is that the measure does not consider whether a manager helps subordinates connect with functionally or symbolically important outcomes. Where such a connection is made, it appears to reflect in a high mean context score (101.0), as in Project Two, indicating ability to connect may be an element of higher quality listening behaviour.

In summary, the BPM and mutuality principles extend SDT, especially regarding consideration of work climate. Baard et al. (2004) provide consideration of what managers do with subordinates and how it is experienced, through feelings of trust, acceptance and ability to be open; important elements in leader-subordinate social interaction. The BPM supports exploration of the wider factors influencing engagement (physical, temporal, social and rule-governed), as well as the functional and symbolic (informational) contingencies, past and present, influencing behaviour. With the exception of H8, all research hypotheses were supported (null rejected). Such insight facilitates listening and associated behaviour, providing some understanding of the participant situation. The two approaches complement each other, increasing the effectiveness of supportive behaviours alone. The next section considers the findings in terms of Lean/TQM and OL.

| ***Research Hypotheses*** | |
|---|---|
| H1 | Higher supportive listening behaviour leads to higher reported managerial work climate |
| H2 | Higher reported managerial work climate relates to higher reported CAR |
| H3 | Subordinates reporting to supervisors trained in supportive listening report higher work climate and CAR than those reporting to untrained supervisors |
| H4 | Subordinate perceptions of work climate and CAR increase over time when exposed to supportive listening |
| H5 | Subordinates reporting to supervisors trained in supportive listening perceive higher quality engagement in Lean/TQM than those reporting to untrained supervisors |
| H6 | Quality of motivation (RAI2) improves over time for subordinates with mutually supportive supervisors |
| H7 | Work climate has significant impact on active Lean engagement |
| H8 | CAR has significant impact on active Lean engagement |
| H9 | RAI2 has significant impact on active Lean engagement |

### 7.3 Contribution to Lean/TQM and OL

A principal barrier to Lean/TQM engagement is the lack of supportive, participative management promoting cooperative, collaborative organisational culture (Antony and Banuelas, 2002; Das et al., 2011; Emiliani, 1998; Emiliani and Stec, 2005; Emiliani and Emiliani, 2013; Flynn et al., 1994; Halling, 2013; Jones, 1996; Powell, 1995; Schonberger, 2007; Soltani et al., 2008b; Talib et al., 2011). This barrier limits the evolution of Lean to that of 'quality as continuous improvement', focusing more on the tools of change, rather than 'quality as commitment to learning', typical of a learning organisation (Hines et al., 2004; van Kemenade, 2014) requiring high levels of employee and management commitment to each other. A 'transformational leadership' style is considered superior for learning and Lean/TQM (Judge and Piccolo, 2004), with recent research linking such leadership to improvements in employee psychological needs (Hetland et al., 2011a, Kovjanic et al., 2012) and positive employee outcomes such as leader commitment and self-efficacy. Whilst research indicates the effectiveness of this style of management for learning and Lean/TQM, there is a dearth of research into the underlying behavioural elements. One such avenue is research into behaviour supporting the RfP principle, essential to effective TQM (Emiliani, 1998, 2003, 2008; Emiliani and Emiliani, 2013; Emiliani and Stec, 2005; Found et al., 2009; Halling, 2013), an area currently under researched that could have important impact on psychological well-being as well as Lean/TQM engagement (Fernet, 2013; Found et al., 2009). When comparing Emiliani's (1998) RfP behaviours, to Jones's (1996) OL behaviours and Baard et al.'s (2004) work climate behaviours, they all appear to centre on mutually supportive active listening behaviours (Hoppe, 2007, Jones, 2011), as explained in Chapter Two. This research has contributed to this area of interest. Supportive active listening and associated behaviour became the norm for group behaviour during the Project Two intervention, following participant training in basic listening techniques. This was achieved through committed facilitation of the group, based on mutually supportive principles to promote greater collaboration and cooperation within the participant group. This research supports and contributes findings on barriers to Lean/TQM, through a practical illustration as to how to overcome such barriers through facilitative leadership committed to providing conditions conducive to Lean engagement and collaborative learning.

A key value underlying the RfP principle is that of relational harmony or 'flow' (Emiliani and Emiliani, 2013). Based on collaborative principles, RfP requires that

the tools and principles be used for the benefit of all stakeholders, similarly reflected in Jones's (1996) OL principles and van Kemenade et al.'s (2014) 'commitment to learning'. Such commitment requires an active process of identifying the stakeholder, requiring high levels of employee and management commitment to learning together. Foxall's (1998, 2004) BPM provided the framework for generating understanding of respondent learning history, facilitating identification of personal experience and interest in Lean, as well as highlighting contextual issues and opportunities. Foxall's (1999) concept of mutually circumscribing behavioural choice to gain balance in relations appears particularly relevant to maintaining relational harmony/flow. A metaphor representing different relational positions, introduced to participants as a means for monitoring mutuality/harmony, was used to guide supportive listening behaviour. Together, supportive active listening and mutuality principles influenced group interactions throughout Project Two. SDT measures were used to assess the impact of a supportive work climate on perceptions of CAR, amotivation and motivation.

Results not only support earlier studies finding that supportive climates correlate with CAR (Baard et al., 2004; Deci et al., 2001; Van den Broeck et al., 2010), they also provide a useful indicator of learning. Project Two found significant change ($p<.05$) across all variables for the participant group, indicating that participants had improved their perceptions of CAR, important elements in Lean/TQM implementation success, especially as these results are supported by a successful project. They also reported higher motivation and lower amotivation, indicators of the quality of Lean/TQM engagement. The cross-sectional study of Project Three found significant variance ($p<.05$) between those active in Lean and not-active respondents. Project Three also found supportive listening behaviour, as represented by context, accounts for circa 20% of employee motivation towards Lean and the odds of an employee engaging in Lean increase by 4.7% for each unit increase in supportive listening behaviour (context). These findings contribute to both Lean/TQM and OL research, providing a subordinate perspective often overlooked in TQM research (Bhamu and Singh Sangwan, 2014). The next section considers how these findings contribute to practice.

**Table 62: Comparison of key variables – Projects Two and Three**

| | *Project 3* | | *Project 2 participants* | | *Project2 % Difference* | | |
|---|---|---|---|---|---|---|---|
| | *Not-Active* | *Active* | *S1* | *S3* | *S1-S3* | *S1 vs Project3* | *S3 vs Project3* |
| ***N*** | 150 | 162 | 7 | 7 | | | |
| ***Context*** | 64.2 | 82.4 | 82.9 | 101.0 | 22% | 1% | 23% |
| ***Competence*** | 4.7 | 5.3 | 4.9 | 6.5 | 32% | -6% | 24% |
| ***Autonomy*** | 4.2 | 5.0 | 4.7 | 6.5 | 39% | -7% | 30% |
| ***Relatedness*** | 4.9 | 5.4 | 5.1 | 6.4 | 25% | -4% | 19% |
| ***Amotivation*** | 3.7 | 2.1 | 2.9 | 1.0 | -64% | 39% | -49% |
| ***RAI2*** | -1.5 | 9.0 | 5.3 | 10.8 | 106% | -42% | 20% |

Mean values, S1 = Survey 1, S 3= Survey 3

## 7.4 Implications for Practice

The findings from this research start to provide some insight into the behaviours, both manager-subordinate and peer-peer dyads, that support both collaboration and effective Lean/TQM implementation. Some authors have suggested that the pre-existence of softer, intangible factors are essential to Lean/TQM success (Douglas and Judge, 2001; Powell, 1995; Spender, 1993; Szulanski, 1993; Winter, 1987). Whilst their existence can be very beneficial, easing implementation and gaining faster acceptance, this researcher argues that establishing the RfP principle should be the primary focus of any implementation. Hoppe's (2007) listening process proved a useful approach – understand first, develop joint understanding, then move to action or move to mutually beneficial action – and worked in this intervention.

**Understanding first** draws upon active listening and a focus on the other. This is essentially supportive or empathetic listening that has the primary aim of building trust and openness between parties. If this already exists, owing to familiarity and positive history, then this should be quite straightforward. If the enquirer does not have this relationship, then time is required to establish it through repetitive cycles of positive interaction. Project Three identified that the odds of engaging an employee in Lean/TQM increase as managerial behaviour becomes more supportive (4.7% per unit). Similarly, understanding should focus on what motivates the other, as this research found that the odds of engagement increase by 64% for each unit increase in motivation quality (RAI2). The BPM provides a really useful structure for considering the situation of others and is beginning to develop as a qualitative tool for investigation (Fagerstrøm et al., 2010).

**Developing joint understanding** required basic training in listening principles, along with exploration of mutuality principles, as participants had a history of contested, competitive relations. Having participants willing to take part was an important first step in this process. This included helping them to identify with why they were there (contingent influence), which in this case was represented by improvement ideas important to the participants, and also to trust that the leader or facilitator was committed to supporting them. Listening training focused on three things, working with silence, developing understanding and finding common ground. Within these steps mutuality was explored, considering the impact of differing power dynamics between listening partners. The facilitator focused on maintaining mutuality throughout the session, staying aware of the historical power dynamics and the importance of reinforcing progress towards, in this case, a very functional project. Many of the researchers focused on barriers to Lean/TQM highlight the importance of training, often referring to understanding the tools. In this case, the focus was on training and developing relational competence. Other facilitators provided expertise on 'tools' as and when required, the approach taken here focused on developing mutual respect, which also included the team providing feedback and demonstrations to senior management to gain their respect and approval for investment.

**Moving to Action** was the final phase of Project Two and was also a mini cyclic process involved in all sessions. A key focus here centred on mutual benefit and mutual responsibility, whereby participants brought their respective expertise to each part of the project. The result was a change in the group dynamic as not all parties needed involvement at every stage. The facilitator's role moved to one of maintaining cohesion, through periodic informational meetings where participants discussed progress and what still needed to be done.

The practice implications are that facilitators need to become more skilled in managing relational dynamics, as tools skills are not enough. Experience from working on this research project and a number of subsequent projects in the public and private sectors, has indicated that managers need to be more competent in supportive behaviour, including listening, if they want to transfer learning from the improvement team into the day-to-day workplace. Project Two provided evidence of such transfer. This researcher is currently working with management teams on developing mutuality supportive value-based behaviours, aligned with training in active listening skills.

### 7.5 Research Limitations and Direction of Future Research

Whilst this research has contributed to both theory and practice, it has a number of limitations, as well as opportunities for further research, some of which are covered here.

The first limitation is that it only focuses on one organisation. This limits the generalisability of the findings, as further studies in other organisations may not produce similar results and even though this approach is in operant behaviourism and SDT, both of which have a long pedigree, it still does not preclude consistency of future findings.

Second, and still related to the first, this was a relatively small study, with one longitudinal case and a relatively small (n=328) survey. Again, the initial results are encouraging and provide tentative evidence of theoretical link and practical benefit, but further applied studies are required in addition to more survey-based research. This requires time and resources to build confidence and greater credibility into these initial findings.

Third, the researcher created an environment that protected participants from the day-to-day influences of the 'natural' work environment. In fact the researcher was not facing these pressures himself. How easily these practices transfer into the workplace will be subject to further research.

Finally, there was no substantial evidence of the participant improvement having a positive impact on their wider staff base. Whilst this was partly by design, as those selected did not have significant numbers of direct staff reports, except for the two departmental heads, it was also a limitation. Though requiring a control group in the respective department, it was important not to include frontline, first level, supervision. By doing this a gap was created to offset the influence from this programme on to the control participants. Participant workplace reports suggested some workplace improvement, but how far this influence can potentially spread is not available in this study.

The findings from this research have been developed into a 'Personal Development Programme' focusing on relational practice. Over the last 18 months in excess of 100 participants have taken part in this programme, from within the sponsoring organisation and within Durham Constabulary. The results are very encouraging and

the programme is now being refined. Participants report improvement in their relational work environment as a result of their changing practice. This researcher has particular interest in developing greater understanding of the impact of context, or work climate, as supportive management behaviour in helping subordinates connect to positively motivating contingencies and further developing the relational programme to promote higher-quality leader-subordinate bilateral mutuality relations. The work to date is heading in that direction. Theoretically, this approach is starting to embrace relational frame theory and, whilst continuing to develop the BPM/SDT framework, is looking to contribute to relational competence theory, leader-member exchange, relational job design as well as TQM and OL.

### 7.6 Conclusion

This research has considered the influence of supportive manager behaviour on the manager-subordinate work climate and its impact on subordinate Lean/TQM engagement and quality of engagement. Based around three projects, the research combined the BPM and SDT variables to provide a framework to investigate subordinate learning history in relation to managerial work climate. Results from a longitudinal intervention and an organisation-wide, cross-sectional survey, provide evidence that supportive work climates influence engagement and Lean motivation, reflecting quality of engagement. These findings extend Baard et al.'s (2004) research into work climate behaviours that pragmatically support management commitment to Lean/TQM and OL. This research contributes to better understanding of the behaviours underlying culture conducive to learning and quality and suggests that leaders need to focus on the mutuality aspects of engagement to increase subordinate uptake.

Research limitations were discussed and further studies are taking place to overcome these. The encouraging findings have contributed to a subsequent programme that is now engaging managers and others in improving their relational practice.

## Appendix 1: Letter of Introduction

Durham Business School

Dear Colleague,

I am engaged in a research program with Durham University Business school and I would like to invite you to take part in this program through completion of a questionnaire included in this file.

The program focusses on the dynamics and complexity of individual/ group engagement relating to change programs such as "Lean".

This progam is based on Action Research principles and as such it seeks to engage and assist individuals / groups who are trying to tackle complex issues.

The program is about to enter it's second phase. The first phase has taken approximately six months work, from which the Blade shop and Engineering department will deploy the first part of a joint program they have collaborated on as a result of this program.

I am now looking to extend this approach across the wider organization and would really appreciate your input to start this next phase.
At present I have no idea as to what the next program will look like, as it is driven by yourselves.
The attached questionnaire provides a starting point for me and will also provide the basis for confidential feedback to you, if interested. Following on, I would like to engage you in a relatively short interview, where we can explore and extend the findings.

All responses are treated in the strictest of confidence and will not be divulged to anyone else without your expressed permission. This research is bound by Durham Business schools ethical guidelines.

The questionnaire will take approx 20 to 30 mins to complete (I would be interested in how long it takes you as I get very variable feedback on the time it has taken) and will provide the basis for feedback to yourself and the follow up interview.

If you have any questions relating to this please contact me.

Many thanks

Ian Leslie
Ext 2266

| | This questionnaire contains items that are related to your experience with the manager who is <u>your most immediate supervisor</u>. Managers have different styles in dealing with employees, and I would like to know more about how you have felt about your encounters with your manager. Your responses are confidential. Please be honest and candid. | Strongly disagree | | | Neutral | | | Strongly Agree |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | I feel that my manager/ supervisor provides me choices and options. | | | | | 5 | | |
| 2 | I feel understood by my manager. | | | | | | 6 | |
| 3 | I am able to be open with my manager at work. | | | | | 5 | | |
| 4 | My manager conveyed confidence in my ability to do well at my job. | | | | | | 6 | |
| 5 | I feel that my manager accepts me. | | | | | | 6 | |
| 6 | My manager made sure I really understood the goals of my job and what I need to do. | | | | | | 6 | |
| 7 | My manager encouraged me to ask questions. | | | | | | 6 | |
| 8 | I feel a lot of trust in my manager. | | | | | 5 | | |
| 9 | My manager answers my questions fully and carefully. | | | | | 5 | | |
| 10 | My manager listens to how I would like to do things. | | | | | | 6 | |
| 11 | My manager handles people's emotions very well. | | | | | 5 | | |
| 12 | I feel that my manager cares about me as a person. | | | | | | 6 | |
| 13 | I don't feel very good about the way my manager talks to me. | | 2 | | | | | |
| 14 | My manager tries to understand how I see things before suggesting a new way to do things. | | | | | 5 | | |
| 15 | I feel able to share my feelings with my manager. | | | | | 5 | | |

## Appendix 3: Needs Fulfilment Questionnaire

| | The following questions concern your feelings about your job during the last year. (If you have been on this job for less than a year, this concerns the entire time you have been at this job.) Please indicate how true each of the following statement is for you given your experiences on this job. Remember all responses are strictly confidential, your boss will never know how you responded to the questions. Please use the following scale in responding to the items. | Not at all TRUE | | | Somewhat TRUE | | | Very TRUE |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | I feel like I can make a lot of inputs to deciding how my job gets done. | | | | | 5 | | |
| 2 | I really like the people I work with. | | | | 4 | | | |
| 3 | I do not feel very competent when I am at work. | | 2 | | | | | |
| 4 | People at work tell me I am good at what I do. | | | | 4 | | | |
| 5 | I feel pressured at work. | | | 3 | | | | |
| 6 | I get along with people at work. | | | | 4 | | | |
| 7 | I pretty much keep to myself when I am at work. | | | | | | 6 | |
| 8 | I am free to express my ideas and opinions on the job. | | | | | 5 | | |
| 9 | I consider the people I work with to be my friends. | | | | 4 | | | |
| 10 | I have been able to learn interesting new skills on my job. | | | | 4 | | | |
| 11 | When I am at work, I have to do what I am told. | | | | 4 | | | |
| 12 | Most days I feel a sense of accomplishment from working. | | | | 4 | | | |
| 13 | My feelings are taken into consideration at work. | | | | 4 | | | |
| 14 | On my job I do not get much of a chance to show how capable I am. | | 2 | | | | | |
| 15 | People at work care about me. | | | | 4 | | | |
| 16 | There are not many people at work that I am close to. | | | | | | | 7 |
| 17 | I feel like I can pretty much be myself at work. | | 2 | | | | | |
| 18 | The people I work with do not seem to like me much. | | 2 | | | | | |
| 19 | When I am working I often do not feel very capable. | | 2 | | | | | |
| 20 | There is not much opportunity for me to decide for myself how to go about my work. | | 2 | | | | | |
| 21 | People at work are pretty friendly towards me. | | | | 4 | | | |

## Appendix 4: Self-Regulation Questionnaire

There are a variety of reasons why people do Lean Improvement activities. Please indicate how true each of these reason are for why you do Lean Improvement activities.

| | | Not at all TRUE | | Somewhat TRUE | | | | Very TRUE |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | **Why do you take part in Lean improvement Activities?** | | | | | | | |
| 1 | For the pleasure I feel when I take part in Lean improvement activities. | | | 3 | | | | |
| 2 | I used to have good reasons for doing Lean improvement activities, but now I am asking myself if I should continue doing it. | | 2 | | | | | |
| 3 | I would feel bad about myself if I was not taking time to do Lean improvement activities. | | | 3 | | | | |
| 4 | It is a good way to improve my work. | | | | | 5 | | |
| 5 | My Manager or other company members give me money or other rewards when I put forward Lean improvement ideas. | | 2 | | | | | |
| 6 | For the excitement I feel when I am really involved in Lean improvement activities. | | 2 | | | | | |
| 7 | I learn valuable lessons from Lean improvement activities. | | | | | 5 | | |
| 8 | It is absolutely necessary for me to do Lean improvement activities to feel good about myself. | | | 3 | | | | |
| 9 | It is not clear to me anymore; I don't really think there is any benefit from participating in Lean improvement activities. | | 2 | | | | | |
| 10 | My Manager, Supervisor, or colleagues tell me to do it. | | | 3 | | | | |
| 11 | For the pleasure of discovering new techniques. | | | | 4 | | | |
| 12 | I'm not sure why I still engage in Lean improvement, it doesn't seem to be going anywhere. | | | 3 | | | | |
| 13 | I think Lean improvement activities are a useful way to improve in my work. | | | | | 5 | | |
| 14 | My Manager, Supervisor, or colleagues would be mad if I didn't practice Lean improvement activities anymore. | | | 3 | | | | |
| 15 | I would feel awful if I didn't take part in Lean improvement activities anymore. | | | 3 | | | | |

## Appendix 5: Control Orientation Scale

The following questions require you to place yourself in the position of manager/ supervisor for the characters represented in a series of mini cases. Each one describes an incident and then lists four ways of responding to the situation. Please read each case and consider each response in turn. Think about each response option in terms of how appropriate you consider it to be as means of dealing with the problem described, and then rate it on the seven point scale, according to how appropriate you find the response. You might consider the response " very appropriate" in which case you would rate it a 7. Alternatively, you may consider the response highly inappropriate in which case you might rate it a 1. If you find the option reasonable you would select some number between 1 and 7 as its rating. So think about each option and rate it on the accompanying scale. Please rate each of the four options for each case. There are eight case with four options for each, for a total of 32 items.

There are no right or wrong ratings on these items. People's styles differ, and I am simply interested in what you consider appropriate given your own style.

| | | very Innappriate 1 | 2 | Moderately Appropriate 3 | 4 | 5 | 6 | very Appropriate 7 |
|---|---|---|---|---|---|---|---|---|
| A. | Jim, an employee for several years, has generally done work on a par with others in his branch. However, for the past couple of weeks he has appeared | | | | | | | |
| 5 | Impress upon Jim that it is really important to keep up with his work for his own good. | | 2 | | | | | |
| 6 | Talk to Jim and try to help him work out the cause of his listlessness. | | | | | | | 7 |
| 7 | Warn him that if he continues to work at a slower rate, some negative action might be taken. | | 2 | | | | | |
| 8 | Let him see how his productivity compares with that of his coworkers and encourage him to catch up. | | | | 4 | | | |
| B. | Sarah, one of your employees, has been going to night school working toward her degree. She has been working hard at it, doing extremely well and is proud of her accomplishments. However, you are concerned, because she is very hard to work with whenever the pressure at school is high. You decide the best thing to do is: | | | | | | | |
| 5 | Ask her to talk out how she plans to handle the situation. | | | | | | 6 | |
| 6 | Tell her that she ought to watch the balance between work and school and suggest she put more of her energies into her job. | | | | | 5 | | |
| 7 | Point out how other working "students" have handled the problem and see if that helps her handle the situation better. | | | | | 5 | | |
| 8 | Insist that she cut down on the studying or take fewer courses; you can't allow it to interfere with work. | | | 3 | | | | |
| C. | One of the work teams in another branch has been doing more poorly than the other groups all year. The appropriate way for that manager to handle the | | | | | | | |
| 9 | Tell them that performance has to improve and offer them tangible incentives to improve. | 1 | | | | | | |
| 10 | Let them know how the other teams are performing so they will be motivated to do as well. | | | | 4 | | | |
| 11 | for improving output. | | | | | | | 7 |
| 12 | Keep a record of each individual's productivity and emphasize that it is an important performance index. | | | | | 5 | | |
| D. | For some time Jack's down times have been at a steady, average level. You suspect however that he could do better. A useful approach might be to: | | | | | | | |
| 13 | Encourage Jack to talk about his performance and whether there are ways to improve. | | | | | | 6 | |
| 14 | Stress to Jack that he should do better, and that he won't get ahead if he continues at his current level. | | | | | 5 | | |
| 15 | Go over your evaluation with him and point out his relative standing with others. | | | | 4 | | | |
| 16 | Watch him more closely; praise him for increased output, and point out whenever he falls behind. | | | | | 5 | | |

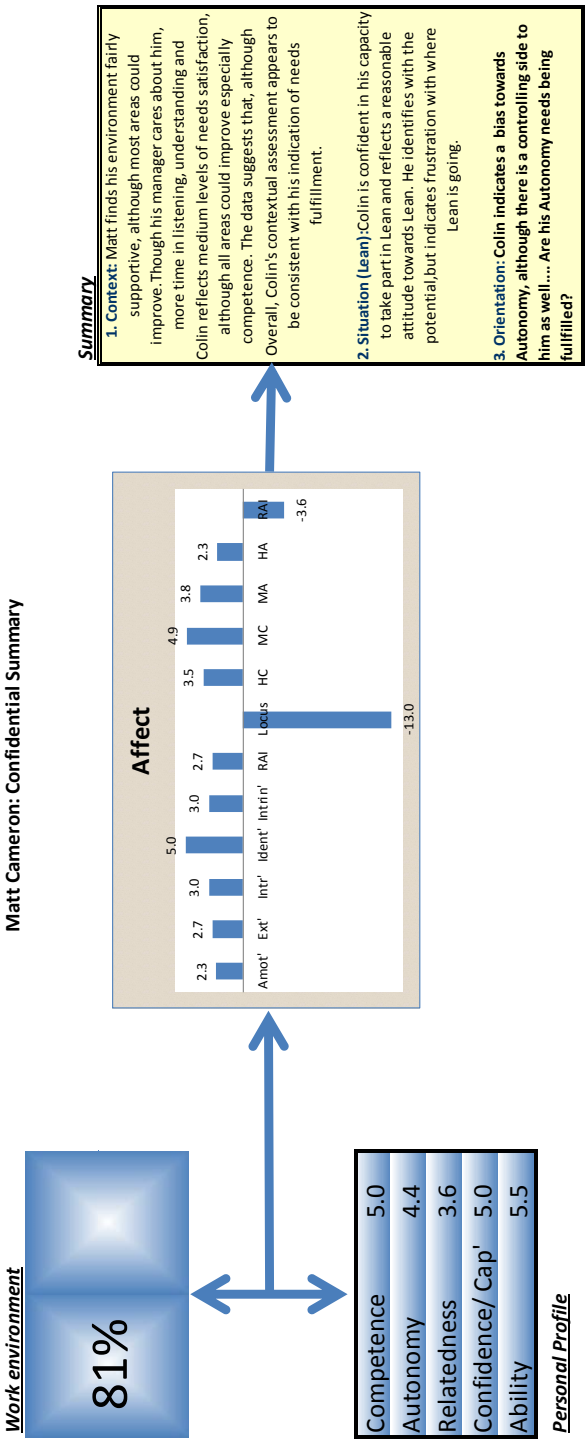
## Appendix 5 (continued)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| E. | Recent changes in the operation have resulted in a heavier work load for all the employees. Barbara, the manager, had hoped the situation would be | | | | | | | |
| 17 | Point out that her employees will keep their own jobs only if they can remain productive at the current rate; and then watch their output carefully. | | 2 | | | | | |
| 18 | Explain the situation and see if they have suggestions about how they could meet the current demands. | | | | | | 6 | |
| 19 | Tell all of her employees that they should keep trying because it is to their advantage to do so. | | | | 4 | | | |
| 20 | Encourage her employees to keep up with the work load by pointing out that people are doing it adequately in other branches. | | | | 4 | | | |
| F. | There is one assignment in your territory which is regarded by all as the worst. It involves a regular visit to an unpleasant building to work on equipment | | | | | | | |
| 21 | Let him know that the other people at his level also have to put up with unpleasant aspects of their jobs, and give him a few examples of these. | 1 | | | | | | |
| 22 | Be clear with him that it is his responsibility and be sure he continues to do it. | | | | 4 | | | |
| 23 | jokes that get directed at him. | | | | | | | 7 |
| 24 | Point out that the job is fairly assigned based upon seniority, and that such a system works for Dave's own good as well as others'. | | | | 4 | | | |
| G. | Harry, who manages the parts department, seems to be creating something of a bottleneck. Important parts are often "on order" and not in stock, and he | | | | | | | |
| 25 | Emphasize how important it is for him to keep up with orders and emphasize that he should meet ongoing demands. | | | | | | 6 | |
| 26 | Let him know how other people in comparable positions are managing to keep up, so he can think about it. This might help him figure out how to better keep up. | | | | | 5 | | |
| 27 | the deadlines. | | | | | | 6 | |
| 28 | Find out from Harry what he thinks is wrong and see if you can help him figure out how to better organize his operation . | | | | | | | 7 |
| H. | One of the customers has let you know that he is not very satisfied with the attitude of his service representative. The thing for you to do might be: | | | | | | | |
| 29 | Raise the matter with your subordinate to see what has been going on for him in dealing with that customer. | | | | | | | 7 |
| 30 | Point out that customer satisfaction is important and that he should work on relating better to the customer. | | | | | | | 7 |
| 31 | Show him some ways that others relate to their customers so he can compare his own style to others. | | | | | | 6 | |
| 32 | Tell him to see to it that the customer is more satisfied and let him know you will be checking | | | | | | | 6 |

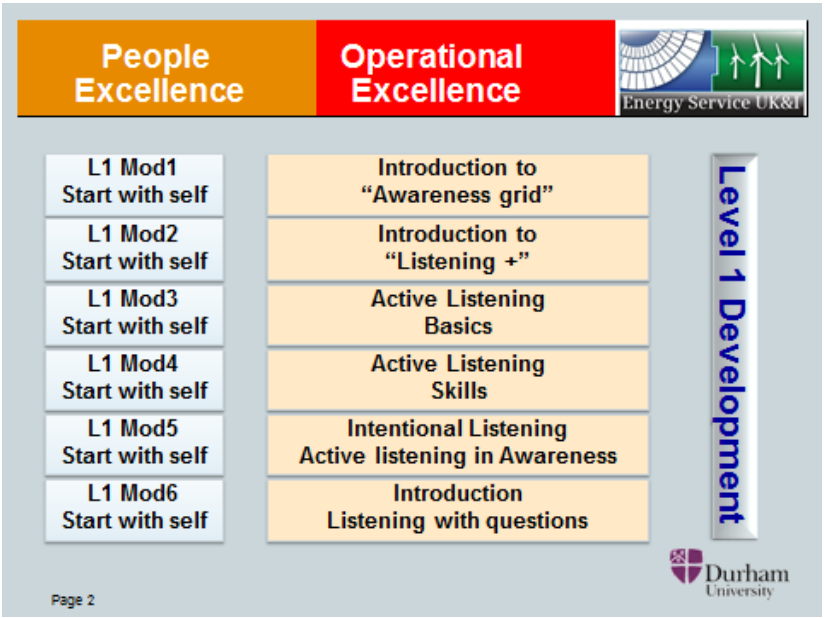
## Appendix 6: Lean Engagement Questionnaire

| | This is the final set of questions! .....Please respond to each of the following items in terms of how true it is for you with respect to your Engagement in Lean activities. | Strongly disagree | | | Neutral | | | Strongly Agree |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | I feel confident in my ability to engage in Lean activities. | | | | | 5 | | |
| 2 | I am capable of engaging in Lean activities | | | | | 5 | | |
| 3 | I am able to engage in Lean activities. | | | | | | 6 | |
| 4 | I feel able to meet the challenge of performing well in such activities. | | | | | 5 | | |

## Appendix 7: Example of Feedback to Interview Participants



**Appendix 8: Example of Feedback to Senior Management**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